NEXUS Documentation

Wood Australia

Aug 28, 2026

NEXUS SOFTWARE SUITE

CHAPTER

ONE

NEXUS

NEXUS is Wood's asset integrity management software suite that improves productivity, removes data duplication and provides real-time asset information both at site and office.

The NEXUS software suite offers the following features:

- Storage of live asset information during operation
- Anomaly tracking from initial discovery to close out
- Storage of inspection and condition-monitoring data
- Real-time calculations to predict and analyse common integrity issues
- Routines to automate reporting on current integrity status and integrity management strategy
- Dynamic risk assessment from real-time data/inspection results
- Planning for fixed interval and bespoke risk-based inspection (RBI) scheduling

NEXUS can integrate with various computerised maintenance management systems (CMMS) to help you reduce data duplication and improve productivity.

The NEXUS software suite provides the following solutions:

NEXUS IC

NEXUS Integrity Centre (NEXUS IC) is the core desktop application of NEXUS. It allows you to get access to all the main asset integrity management features that NEXUS offers. For more information, see *NEXUS IC Overview*.

IC-INSPECTION

An on-line eventing software application optimised for use in the off-shore environment. For more information, see *IC-Inspection*.

IC-INSPECTOR

A tablet application optimised for inspection data collection using an iPad, Android or Windows tablet. For more information, see *IC-Inspector*.

IC-RECORDER

NEXUS IC's digital video recorder software application that works seamlessly with IC-Inspection. For more information, see *IC-Recorder*.

IC-WEB

A web-based version of NEXUS IC, which aims to replicate the functionality of NEXUS IC in a web browser. For more information, see *IC-Web*.

Data Connectors

Subscription-based integration services that enable secure, structured data exchange between NEXUS and external systems. For more information, see *Data Connectors*.

REST Service

A service that provides an API consisting of a set of HTTP endpoints (methods) with the ability to create, retrieve, edit, or delete access to information stored in a NEXUS IC database. For more information, see *REST Service Specifications*.

Expert Systems

Database configurations for NEXUS IC that are managed by subject matter experts within Wood and are maintained to the latest standards/codes and best industry practice. For more information, see *Expert Systems Overview*.

For detailed information about how the different components of NEXUS work together and how you use NEXUS in your asset integrity management process, see *NEXUS Components* and *NEXUS Workflow*.

A PDF version of this documentation is available at https://docs.nexusic.com/latest/nexus.pdf.

See also

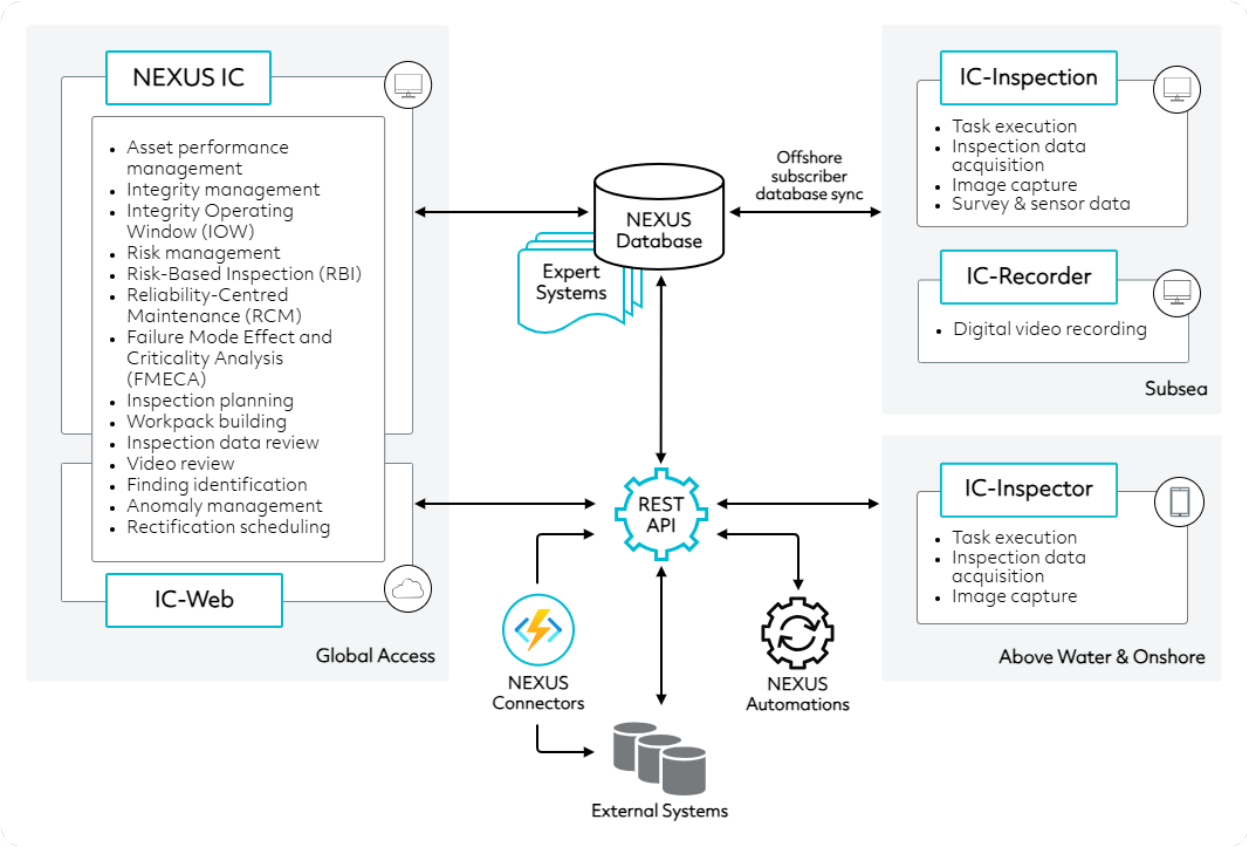
- *NEXUS Components*
- *NEXUS Workflow*
- *NEXUS Feature Matrix*
- *General Information*
- *NEXUS Support*
- *Legal Information*
- *Glossary*

CHAPTER

TWO

NEXUS COMPONENTS

The figure below shows how the different components of NEXUS work together. Click the elements of the graphic to navigate to the documentation of the specific component.

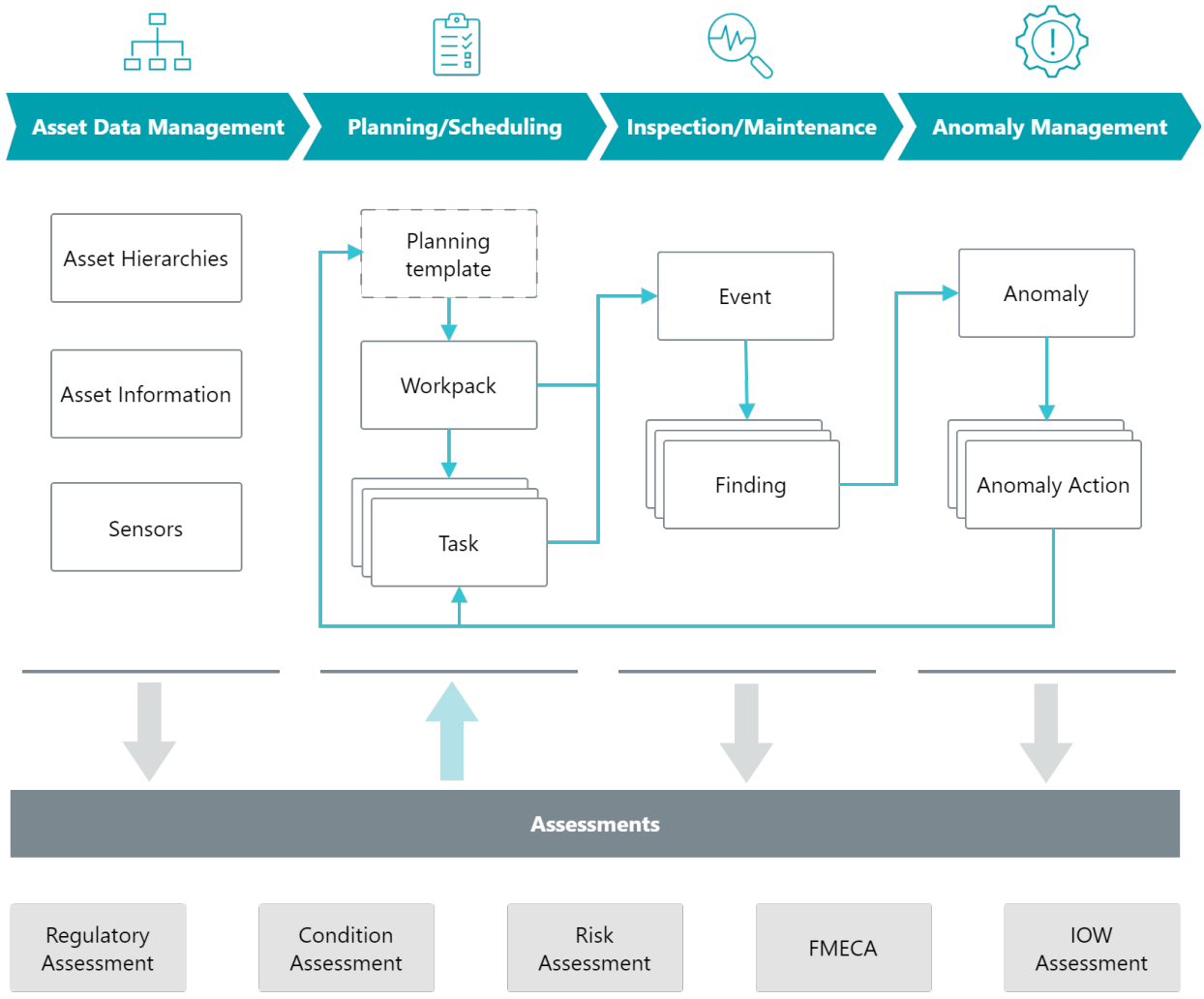


CHAPTER

THREE

NEXUS WORKFLOW

The figure below depicts the basic workflow of using NEXUS in your asset integrity management process:



3.1 Asset Data Management

In NEXUS, you can create hierarchies of assets (asset trees) where nodes represent individual assets and all data in the database can be linked to them. You can then record asset information in *Asset Information Groups (AIGs)* and store sensor data as required. You can maintain asset trees in NEXUS IC and IC-Web. For more information, see *Asset Data Management*.

3.2 Planning/Scheduling

During the Planning/Scheduling phase, you plan the actual inspection or maintenance work by setting up tasks to be carried out (see *Tasks*). Each task in NEXUS must be assigned to a workpack, which is used to group tasks and events. NEXUS also provides planning template functionality, which allows you to automatically set up future workpacks through the use of *planning tasks* that repeat on either a fixed or dynamic (calculated) frequency.

Results from various assessments (risk assessment, condition assessment, and so on) can be used to drive calculated task frequencies and dynamically update future workpacks.

You can create tasks, workpacks and planning templates in both NEXUS IC and IC-Web. For more information, see *Planning and Workpacks*.

3.3 Inspection/Maintenance

Events are data records from an inspection or maintenance activity for a specific asset. IC-Inspector and IC-Inspection are designed to facilitate recording of event data in the field. NEXUS IC and IC-Web can be used to review, edit and enter event data from anywhere.

One or more *findings* can be raised on each event (manually or automatically) to highlight possible concerns or significant observations associated with that event. You can create findings in IC-Inspection, NEXUS IC, or IC-Web.

For more information, see *Inspection*.

3.4 Anomaly Management

Findings are reviewed to determine if they need to be escalated and linked to an *anomaly*. In NEXUS, you can create actions from anomalies, assign them to people or set their due dates as required. As a result of an anomaly action, you can create follow-up tasks in workpacks or ongoing monitoring tasks in planning templates.

You can create anomalies in NEXUS IC and IC-Web. For more information, see *Anomaly Management*.

> **Note**
>
> This is a highly simplified workflow and does not cover all the functionality that NEXUS offers. For detailed information about all the functions, see the documentation of the individual solutions.

See also

- *NEXUS IC*
- *IC-Web*
- *IC-Inspection*
- *IC-Inspector*
- *IC-Recorder*

CHAPTER

FOUR

NEXUS FEATURE MATRIX

The following figures show the features supported by different NEXUS solutions. You can also see which features are available in Software as a Service (SaaS) and on-premise deployments.

4.1 Generic Features

The following generic user features are supported across the different NEXUS solutions and deployments:

4.2 Configuration/Administration Features

The following configuration or administration features are supported across the different NEXUS solutions and deployments:

Feature Category	Feature Subcategory	NEXUS IC	IC-Web	IC-Inspection	IC-Inspector
Assets Charts	View	●	~		
Asset Hierarchy	Add/Edit/Delete	●	●		
	View	●	●	●	
	Move	●			
	Show on Drawing	●	●	●	
Asset Information	Add/Edit/Delete	●	●		
Assets Sensors	Add/Edit/Delete/View	●	~		
Data Entry/Updates	Data Entry via UI	●	●	●	●
	Bulk Data Imports	●	○		
	Background Imports	○	○		
	Shortcut Execution	●	~		
	Subsea Data Acquisition			●	
	Onsite/Field Data Acquisition			●	●
Drawings	Add/Edit/Delete	●			
	Layers - Add/Edit/Delete	●			
	Layers - Navigate	●	●	●	●
	Layers - Show Traffic Lights	●	●	●	
Inspection	Add/Edit/Delete Events	●	●		
	Add/Edit/Delete Multimedia	●	●		
	Event and Finding Review	●	●		
	Video Playback	●	●*		
Library	Add/Edit/Delete Library Items	●	●		
Planning/Workpacks	Add/Edit/Delete	●			
	Apply/Update	●			
Reports	On-demand Report Generation	●	○	●	
	Scheduled Report Generation	○			
	Background Report Generation	●	○		
Risk Models	Assignment	●			

Key

● Available for SaaS and on-premise

○ Available for SaaS only

~ Planned for future

* Video playback in IC-Web on-premise requires video to be stored in a streaming format in web or cloud location.

Feature Category	Feature Subcategory	NEXUS IC	IC-Web	IC-Inspection	IC-Inspector
Audit History	Logging	●	●	●	●
	Viewing	●			
Configuration	Asset Types & Information Groups	●			
	Event & Survey Data Types	●			
	Lookup Lists and Tables	●			
	Functions & Charts	●			
	Shortcuts	●			
	Report & Dashboard Templates	●			
Database	Subscriber Creation & Synchronisation	●			
Security Settings	Security Group Permissions	●			
	Security User Group Assignment	●			
Authentication Method	Microsoft Entra ID	○	○		○
	Active Directory	□	□	□	□
	Database-Only (Username/Password)	□	●	□	□

Key

- ● Available for SaaS and on-premise
- ○ Available for SaaS only
- □ Available for on-premise only
- ~ Planned for future

CHAPTER

FIVE

WHAT'S NEW

We have transitioned to a continuous delivery model to bring you new features faster and more frequently. This section highlights the most significant updates released each quarter for NEXUS applications.

For a complete list of all changes, including minor enhancements and bug fixes, see *Change Log*.

Note

- The updates listed here are available immediately for **Software as a Service (SaaS)** clients.
- For **on-premises** installations, the latest updates can be obtained at any time. Contact your company's NEXUS administrator or reach out to *NEXUS Support* to request the most recent installers.

Prior to changing to a continuous delivery model, the last packaged release was version 6.9. For information about what was new in that release, see *What's New in 6.9*.

5.1 Feature Highlights

Q3 2026 (July - September)

Note

This quarter includes schema updates. You must update your database to access the latest features.

NEXUS IC

- **Search**
  - Search results now appear in a dockable **Search Results** pane instead of a modal dialog. The pane can be aligned to the right or bottom of the window and kept open while you continue working. See *View Search Results*.
  - Searches now run in the background, allowing you to continue navigating the application while results are being generated. Active searches can be cancelled at any time.
  - Multi-keyword queries are supported using OR logic, with quoted phrases providing AND grouping. See *Multi-Keyword Search Logic*.
  - A new event-specific search method allows you to locate events directly by combining the event type with its event number using the format `"EventType #EventNumber"`. See *Search Event Records*.
- **Risk Assessments and Scenarios**

  - A risk model can now be assigned to the same asset multiple times, allowing multiple independent risk assessments to be maintained for a single asset. See *Assign Risk Models*.
  - Scenario management has been redesigned. Scenarios can now be created directly using the new *Copy → To Scenario* toolbar option. Scenarios are displayed as child items beneath their parent risk assessment, making them easier to organise and manage. See *Manage Risk Assessment Scenarios*.
  - Risk assessments now support configurable **statuses**, enabling approval, review and lifecycle workflows. See *Edit Risk Assessments*.
  - The risk assessment editor now presents factors that contain editable fields as forms, providing a more intuitive way to review and update assessment values. See *Edit Risk Assessments*.
  - Risk assessments now include **Date** and **Description** fields. Assessment dates are automatically populated and descriptions can be used to record additional context for the assessment. See *Edit Risk Assessments*.

- **Risk Model Configuration**
  - You can now create risk model elements by copying existing Asset Information Group (AIG) fields. See *Create Risk Models*.
  - A new **Layout** tab is now available when editing risk model elements, allowing you to configure how element fields are displayed. See *Add/Edit Model Element Dialog*.
  - New **Field Order –> Grid…** and **Field Order –> Form…** toolbar options allow you to control the display order of risk model elements in hierarchy grids and forms. See *Changing Element Order*.

- **Tasks**
  - Event Type fields in tasks and planning tasks now support **sensor types**, allowing users to schedule and manually complete sensor readings. Completing a task with a sensor event type launches the relevant sensor data form and creates a sensor record for the associated asset. See *Launch Tasks*.

- **General Configuration**
  - Chart Templates now include two new aggregate axis types: **Min (Aggregate)** and **Max (Aggregate)**. These allow charts to display the minimum or maximum value of a selected field across all records included in the chart. See *Axis Type*.
  - When configuring shortcuts, you can now use the new **Shortcut** action, which allows one shortcut to execute another shortcut directly. See *Shortcut Elements*.
  - A new **System Information** configuration item has been added, which supports configurable field helps for specific system tables. You can define help text for individual fields, which appears as a hover hint when users work with those fields. See *Configure System Information*.

IC-Inspection

- A new **Anomalies (Task Related)** pane has been added, allowing you to view anomaly records associated with the selected task directly in IC-Inspection. See *Anomalies (Task Related)*.

Q2 2026 (April - June)

NEXUS IC

- **PDF export for reports** is now available, offering smaller files and automatic bookmarks based on report headings for easier navigation. See *Reports*.
- Two new toolbar options have been added to the **WORKPACKS** screen:
  - **Filter** provides access to workpack filters, including showing read-only workpacks and workpacks with no tasks.

  - **View** allows you to change the time resolution of the Gantt chart and to quickly navigate to today's date or jump to the start date of the selected workpack.

  See *WORKPACKS Screen*.

- A new **Anomalies** tab on the **WORKPACKS** screen allows you to review and manage anomalies associated with the asset of a selected workpack, giving you direct access to relevant anomaly records without switching screens. See *Anomalies (Workpacks)*.
- You can now control whether closed anomalies are visible in anomaly grids using the new **Show Closed** filter option. By default, closed anomalies are hidden. This option is available on both the **ANOMALIES** screen and the **Anomalies** tabs of the **ASSETS** and **WORKPACKS** screens. See *Filter Anomalies*, *Anomalies (Assets)* and *Anomalies (Workpacks)*.
- Survey data matching behaviour is now configurable using the new **Survey Threshold** field under *Database* → *Properties*, allowing you to control the time window used to match survey data to events. See *Matching Survey Sets to Events*.

IC-Web

- The **Anomalies** tab on the **ASSETS** screen now includes the **Multimedia** and **Risk Chart** panes, features also available in NEXUS IC. A new **View** toolbar button lets you toggle the **Multimedia**, **Risk Chart** and **Show Count** options. The new **View** toolbar option is also available on the **ANOMALIES** screen.
- The **Show Closed** filter option has also been added to IC-Web for anomalies, providing the same behaviour as in NEXUS IC. Refer to the NEXUS IC description above for more information.

Q1 2026 (January - March)

> **Note**
>
> This quarter includes a schema update from 8.216 to 8.217, delivered in build 36688. You must update your database to access the latest features.

NEXUS IC

- You can now launch tasks from the **Tasks** tab across all supported locations, including the **PLANNING** and **WORKPACKS** screens, when editing tasks in applicable dashboards or asset dashboards, and when editing workpacks. See *Launch Tasks*.
- The new **Tasks** tab is available in the **Edit Workpack** dialog, making it easy to view and manage the tasks associated with that workpack while editing it. See *Add/Edit Workpack Dialog*.
- You can now associate library items with tasks, enabling you to attach electronic documents needed to support and complete the task. See *Library Connections* and *Add/Edit Task Dialog*.
- You can create and manage *planning tasks* directly from anomaly actions. See *Assign Planning Task to Anomaly Action*.
- The new **View** toolbar button is available on the **ASSETS** and **ANOMALIES** screens. It allows you to toggle the visibility of various tabs and panes on the screens. See *ASSETS Screen* and *ANOMALIES Screen*.
- When editing findings, the **Edit Finding** dialog now includes a new **Multimedia** tab, which displays multimedia files associated with the event. See *Add/Edit Finding Dialog*.
- The **Anomalies** tab on the **ASSETS** screen now includes **Multimedia** and **Risk Chart** panes, as well as a new **View** toolbar button to toggle the **Multimedia**, **Risk Chart** and **Show Count** options. See *Anomalies*.

- You can now organise traffic lighting rules using traffic light categories. These categories appear as submenus in the **Traffic Lighting** toolbar and allow you to group rules for easier selection. See *Configure Traffic Light Categories*.

IC-Web

- PDF export for reports is now available, offering smaller files and automatic bookmarks based on report headings for easier navigation. See *Reports*.
- The **ASSETS** screen now offers the same dashboard functionality as **NEXUS IC**, providing a consistent dashboard experience across both applications.
- You can now navigate directly to specific asset dashboards using a URL, making it easier to bookmark and share dashboards. See *Navigating to a Specific Dashboard*.

Q4 2025 (October - December)

NEXUS IC

- Video parsing is now executed as a background job, allowing users to monitor progress and status via the blue ribbon above the Status Bar or through the Job Management Console. See *Parse Videos*.
- From the **Customise** toolbar in grids, you can use the new **Asset Format** option to choose whether assets in the **Assets** column appear with their names, full location or both. See *Customise*.

IC-Inspector

- You can now use your company credentials to log in to IC-Inspector using Single Sign-On (SSO). See *Log In to IC-Inspector*.

Q3 2025 (July - September)

NEXUS IC

- Unit conversion is now available in grids. See *Unit Conversion*.
- The new **Source** field is available in the **Edit Multimedia** dialog. See *Add/Edit Multimedia Dialog*.

IC-Inspector

- A new **Status** view is now available at the bottom of all screens that display task lists, such as **Summary**, **Tasks** and **Drawings**. This feature allows you to group tasks by their current status, such as *In Progress*, *Completed* or *Failed to Sync* (see *Grouping of Tasks*).
- On the **Settings** screen, under **APP INFO**, you can click **About** for the following options:
  - View the current app version
  - Navigate to IC-Web
  - Access the documentation
  - Check for available app updates

Q2 2025 (April - June)

NEXUS IC

- For shortcut configuration, the new *On New Row* value is available for the *Input Row* option of the **Inputs** shortcut element. See *Shortcut Elements*.
- The new **Show Statistics** button is available when configuring functions. See *Configure Functions*.

IC-Inspector

- On the **Settings** screen, under **SYNC**, the new **Send Sync Log to Support** option is available, which allows you to send a sync log to NEXUS Support in case of issues during synchronisation.

5.1.1 Change Log

This section provides a detailed list of all updates delivered during each quarter, including new features, enhancements and bug fixes across the NEXUS applications.

5.1.1.1 Q2 2026 (April - June)

NEXUS IC

Ticket No.	Type	Description
30264	Bug	Events don't load in Edit Finding form
40684	Feature	PDF Report export
50416	Bug	The Select Table Definition dialog should be filtered by Event type Tables only
51331	Feature	Allow setting the survey matching threshold
51482	Feature	Offload Report generation to SaaS process for NEXUS IC
51662	Feature	Persist user settings in the database
52856	Feature	Add Import/Export capability for Styles
55052	Bug	Anomaly Trigger form layout incorrect
55512	Feature	Support for Virtual UI SDK
60539	Feature	Pie Chart does not display all the legends from the source
61176	Feature	Add a Comments field to Shortcuts
66599	Bug	Error attempting to import AIG using Load Template - You do not have permissions to write to the row () in t
67183	Bug	Select Event Type dialog is showing all table def types but should be filtering for Event Type tables
67339	Feature	Show hint for validation image on tabs
69988	Feature	Add ability to enable/disable autoinc for system properties
70182	Feature	Hide closed anomalies by default in the ANOMALIES screen
71404	Bug	Year Column Display Issue on Planning Screen
71424	Bug	Close Anomaly Refresh Issue
71687	Bug	Matrix function element calculating incorrectly
72957	Feature	Remove redundant Asset Location fields.
73205	Feature	Updates for Delphi 12.2
74596	Bug	The menu items extend beyond the visible screen area
74812	Bug	Video not playing in Thinfinity
76018	Bug	Unable to Re-dock the Floating Dialog
78965	Bug	Unable to deselect of rows by Ctrl-Click, even though highlighting does change
80205	Bug	NEXUS Documentation Feedback Form - Subdomain info to be added to SaaS deployment doco page
80497	Feature	Add some standard preset filters for Date columns
80902	Bug	Menu too high to fit on one screen and no ability to scroll up or down
84300	Feature	Allow Video Parsing to be run as a job.
85608	Feature	Update Eurekalog to 7.14.0
86320	Bug	Show on Drawing asset menu lists Drawings where Show as Drawing is false
86757	Bug	Children Tab Refresh Issue After Clearing AIG Group Selections
87426	Bug	Unhandled Error when attempting to edit Anomaly.Action.Comments which contains invisible character (STX
87452	Feature	Add support to REST to enforce validation rules on Insert/Update
88049	Bug	Adding <New item> into Sentence Builder does not insert the <New item> at the current cursor position
88417	Feature	Allow NEXUS IC and IC Inspection to support Adhoc Tasks

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Table 1 – continued from previous page

Ticket No.	Type	Description
88718	Feature	Add some workpack filtering to the Workpacks screen.
88942	Bug	Search searches primary keys
90602	Bug	Data Refresh progress bar title shows “frmProcess”
90899	Feature	Drop Drawing table and move settings to User Setting
91732	Bug	Stuck with loading ANOMALIES screen
93301	Feature	Remove Latency Label for Thinfinity
95133	Bug	NEXUS prompts for credentials via Thinfinity.
95316	Feature	Improve latency check for Thinfinity
96359	Bug	Gauge chart not showing Indicator line
97041	Bug	Drag and Drop asset from hierarchy onto Drawing does not function
97139	Feature	Increase Thinfinity OTURL to 8 hours from 10 minutes
97240	Bug	App crashes when deleting any record that has a linked Action
97599	Bug	Data in a Simple Source filter value cell is not being restored correctly in the UI
97648	Bug	Deleting Event Type cases app crash
97668	Feature	Update Virtual UI SDK
98314	Bug	License dialog not appearing after restoring a database
98386	Bug	Opening video frame raises AV
98597	Feature	Display Anomalies on the WORKPACKS screen
98856	Bug	The Select Workpacks dialog should exclude read-only workpacks from the list
98859	Bug	Users should not be able to add library items to a read-only workpack
99167	Bug	Sensors should not be duplicated in the Select Event Type dialog
99197	Feature	Provide option to not sync Personnel.Email (in client database) to SSO Login
99360	Feature	The dashboard table should show the full field name when the user hovers over a truncated column header
99425	Bug	PDF generates duplicate image
99450	Feature	Grid header tooltip popup positions not appearing consistently
99489	Bug	Schema Update fails
99736	Bug	NEXUS allows user to continue when user account does not have a license assigned
100421	Bug	Set the Grid to have focus when launched
100454	Feature	Fill video to window
100618	Bug	Custom Asset Export does not allow me to choose no AIGs
100622	Bug	Fix alignment on Cancel button in the Status dialog
100641	Bug	Cancelling a Dashboard on Launch disables the Cancel button for the subsequently generated Dashboard
100675	Bug	Schema update fails from 8.210 to 8.216
100867	Bug	Select user grid is not focused for search
100905	Bug	Changing WT Reading for one event takes 3min30s to refresh
101104	Bug	AV when adding Workpack (NEXUS crashes, no Crashlog)
101208	Bug	Unhandled Error launching Task from WORKPACKS (NEXUS crashes without creating Crashlog)
101216	Bug	Report filters ‘Any’ grouping text cut off
101384	Bug	Loading dialog flashes multiple times when selecting single or all library items
101804	Bug	Slow when selecting a large number of rows.
102467	Bug	Blank overlay is visible on Assets Charts.
103039	Bug	Unit label disappears when I choose a different unt type from the list
103044	Bug	Crash when entering value which results in a numbr too big for Whole Number data type
103209	Bug	“?Ancestor for ?pnlTitle? not found?” error is raised when accessing the Anomalies screen

IC-Web

Ticket No.	Type	Description
49325	Feature	Migrate Children grid to Angular
79670	Bug	Global Table Link Editor for Angular V2 Forms is misssing
86648	Feature	Grid/Control doesn't remember height.
88207	Bug	Unable to add Asset as connections to Library items
88860	Bug	Export option disabled in Library panel
90471	Bug	Some boolean-type event detail fields cannot be modified using the dropdown list
91744	Bug	Global Table Link field values in IC-Web doesnt match with NEXUS
93334	Bug	Asset Dashboards displaying incorrectly
95274	Bug	Anomalies/Workpack not selected by default after creation
95443	Feature	Display database name
95692	Feature	Group dashboards by category
96667	Bug	Add missing tabs into Workpack
97026	Bug	The Reports toolbar menu does not display the report list on initial load
97046	Bug	Tick marks not displaying correctly on x axis on Risk Charts on Dashboard
97265	Bug	Global Table Lookup field is not ordering the drop down lists
97949	Bug	Unable to Null or clear a Foreign Key Lookup field from multi-select Edit dialog
98263	Bug	The preview image is displayed upside down compared to the original image
98355	Bug	Table of Data rows not populating correctly when edited in asset dashboard
98364	Bug	Auto-assign 0 instead of allowing NULL
98845	Bug	Clearing the Lookup list values does not refresh instantly unless changing tabs
98853	Bug	Currency field types are not being formatted as expected
99110	Bug	Videos fail to play and throws the console error
99245	Bug	Visible Form attribute should take precedence over any Visibility Rules
100439	Bug	Navigate to Anomaly button not visible on tool bar
100463	Bug	Unable to add attachments for a Library item in IC-Web
100553	Bug	Multi-select Edit on Workpack data is prompting Error popup
102471	Bug	Rename Finding tab to 'Findings' to match the Nexus on Anomaly Bottom section.
102538	Bug	Unexpected Error when user enables Child Assets in Risk tab
102567	Bug	Multi-select Delete on Workpack data is not working in Workpack screen
102935	Bug	Launch & Email buttons are enabled for Library item without attachment

IC-Inspector

Ticket No.	Type	Description
90619	Bug	On screen keyboard not appearing when sending sync log to support.
93755	Bug	Drawings missing in IC-Inspector (Android)
93756	Bug	Drawings missing in IC-Inspector (Windows)
98084	Bug	Set Multimedia Name Max Length To 50
98502	Bug	Event fields are not displayed for Tasks
100165	Bug	Lookup Lists editors not displaying lookup items
100173	Bug	Failing to connect to server names with trailing forward slashes with SSO sign in

SaaS Server

Ticket No.	Type	Description
83298	Feature	Add ability to host additional applications in NEXUS Portal

5.1.1.2 Q1 2026 (January - March)

NEXUS IC

Ticket No.	Type	Description
11219	Bug	Radiogroup controls not supported, but included in the Editor Type drop down
29802	Feature	Function History tab include Function Parts
32163	Bug	Report Template Text (Paragraph) Element has issues with inserted fields/styles/parameters
43074	Feature	Add Asset Type as available column to display in Event Listing and Findings Listing
43157	Feature	Add Anomaly Trigger.Asset and Anomaly Trigger.Type as columns to the Anomaly Trigger Import Template
43462	Feature	Need to add support to delete Survey Sets and Associated Survey Data
43683	Feature	Allows users to configure additional attributes on System tables
45029	Feature	Add a Qualifications field to Personnel Table
45855	Feature	Add new field Description to Status table
45918	Bug	Unable to output rows from the Function Part Input table to a report
46602	Feature	Make lookup list name unique
46662	Feature	Add multimedia tab in Edit Findings (readonly)
47088	Feature	Longer character limit for Multimedia Name field
47704	Feature	Allow adding Planning Task from Anomaly Action
53126	Feature	Make the Scheduled Reports.Format field visible in grid
56656	Feature	Hide disabled Personnel from the Personnel grid by default
56839	Feature	Update Eurekalog to 7.11.01
57292	Feature	Feature Request: Link library items to tasks
57327	Feature	Add a color field in the Anomaly Code table
57879	Feature	Add order number to chart series
61067	Feature	Add View menu to Anomaly screen
61178	Feature	Use Shortcut Description as hover hint where applicable
63378	Feature	Add support to retrieve a list of jobs
66343	Feature	Delphi 12 updates
66414	Feature	Update Eurekalog to 7.12
66905	Bug	Library Connection gets duplicated when you add Event Connection
67077	Feature	Port Risk Editor / Assessment
67304	Bug	Unable to edit Field Definition because of unknown validation
67428	Bug	Expert System - Not pulling through Shortcut Filter Field on Input Row elements
68556	Feature	Store report styles directly
69409	Feature	Add Notes field to Security Group
69841	Feature	Update FastMM5
69868	Feature	Create new Reference Number field in Planning Template Task
69900	Feature	Enhance the Traffic Light selection menu
70834	Feature	Add support for testing ‘error’ results in Function Tests
71395	Feature	Add ‘Launch’ Toolbar Button to Tasks List Grids
72848	Bug	Fix layer coordinates that contain a comma
72910	Feature	Update Eurekalog to 7.12.0.725
73117	Feature	Improve height of MEMO editors
75404	Bug	Function comments height is incorrect
75873	Feature	Add the Tasks Tab to the Edit Workpack Dialog
78132	Feature	Make Asset History.Date Completed unique for importing
78463	Feature	Add Order to a number of entities
79161	Feature	Add Multi-Select to Settings “Copy to User” functionality
80835	Feature	Add Colour field to Revision
81423	Bug	NEXUS Documentation Feedback Form - Update Known Issues
81744	Bug	Report comments field too tall

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Table 3 – continued from previous page

Ticket No.	Type	Description
82943	Feature	Add Multimedia to ASSETS Anomalies tab
83578	Feature	Allow users to task Continuous Events
84251	Bug	Strange Characters Showing in Dashboard Tooltips
84401	Feature	Ensure survey data tables have a GUID index created on them
85613	Feature	Update Fast MM
86694	Bug	Change Scheduled Reports.Recipients control from Edit box to Memo
86714	Feature	Add Commentary as column to search column for In-Grid filter search in INSPECTIONS | Event Listing
87100	Bug	Date columns in Union Sources are outputting blank values when they should be outputting date values
88419	Feature	Add a 'View' button in Assets screen to allow the user to show/hide each tab
88709	Bug	Crashlogs aren't being logged from Database Monitor Thread
88729	Bug	Select Workpack dialog does not show Workpacks where Revision.Read Only = NULL
88861	Bug	Time Field Displays as Date/Time in Event Listing Grid
88960	Feature	Allow Attributes columns to be moved in the grid
89219	Bug	Drag-and-Drop Library Item Fails to Add in Edit Workpack Popup
89353	Bug	Editing a row from Children Tab is not populating correct Global Table Link
89682	Bug	Ctrl + C does not copy from combo box
89802	Bug	Matched row is not selected when viewing Global Table Lookup
90054	Bug	Lookup is returning incorrect result
90618	Bug	Report generation time slower than previous version
90894	Bug	Survey Set Viewer cannot display data due to a non-resizable divider
90899	Feature	Drop Drawing table and move settings to User Setting
91039	Bug	Unable to assign Licenses
91124	Bug	Active ASSETS Tab Page is not being persisted correctly
91498	Bug	Default settings for the Edit Report Template dialog has the splitter off screen
91680	Bug	Drawing Pane takes a long time to load
91683	Bug	The Union Source is causing significant delays in report generation
91687	Bug	Scientific notation superscript digits are not displaying correctly
91729	Bug	NEXUS freezes when switching between screens
91847	Bug	Startup page hangs during Anomalies screen loading
91856	Bug	Scientific notation editors not displaying correctly for single digit numbers
91905	Bug	Global table link values are not correctly filtered
92624	Bug	Frame capture fails for image playback
93037	Bug	Anomaly Risk Chart not reflecting grid filters
93040	Bug	Tooltip gets cut off when dialog window is maximised
93201	Bug	Name field input not fully visible
93484	Bug	Cannot Export Primary Logo to file
93739	Bug	An error occurred while attempting to upgrade the database to schema version 8.217
94330	Feature	Add MariSoft DVR to third party DVR's
94362	Bug	Custom Export fails with an 'Out of Resources ? Unexpected Error'
95041	Bug	Global table lookups are not rendering when launched from the asset dashboard
95044	Bug	Rendering issues with the memo editor in the Edit Planning Task
96332	Feature	Add patch number for trunk version
96364	Bug	Save Template from Chart Templates screen appears to hang
96365	Bug	Main Menu does not work when certain dashboard visible
96499	Bug	Drag and Drop asset from hierarchy onto Drawing does not function
96754	Bug	AIG is not displayed on first entry

IC-Web

Ticket No.	Type	Description
43353	Feature	Modify Angular forms and form controls to remove all dependance on MetaTable information
68788	Feature	Add support for Form Pages
77380	Bug	Appearance of Double Scrollbars in Safari
77410	Feature	Asset Dashboard Functionality
86647	Bug	Resize button obscured and hard to use
88566	Feature	Enable URL Logging in Web services
88872	Bug	Search is not working in Select Asset Type popup
89276	Bug	Angular split library warning
89581	Feature	Add PDF option to Reports menu
89945	Bug	Getting unexpected error when adding Asset type as connection in Library panel
90466	Bug	Error in Planning screen when no tasks are associated to Assets
90484	Bug	Anomaly reports are not getting generated
90500	Bug	Unable to view the multimedia files added under Anomalies
90554	Bug	Anomaly navigation URL is not selecting the correct Anomaly
93012	Bug	Table of Data rows not populating correctly when edited in dashboard
93137	Feature	Hyperlinks in AIG calculated fields are not clickable
93591	Feature	Added URL link for directly opening Asset Dashboards
93657	Bug	The Date Time Picker is not functioning correctly in IC-Web
95153	Bug	An unexpected console error is triggered when attempting to access AIG via the ASSETS screen
95573	Bug	Gauge chart colors not displayed
96488	Bug	Save Artifacts button is not enabled even after Status is completed
97148	Bug	Workpack list shows empty view with rows count at bottom

IC-Inspector

Ticket No.	Type	Description
41600	Feature	IC-Inspector for Windows/Android tablet
72517	Feature	Pop-Up Keyboard Problem with IC-Inspector on Windows Desktops
85833	Feature	Calling Logout when signed in using SSO
86133	Bug	Stack overflow error when assigned a task with AIG with no visible fields
86299	Bug	Memory error on IC-Inspector Windows terminate on Delphi 13
88721	Feature	Support Completing Ad-hoc Tasks in IC-Inspector App (Android)
88722	Feature	Support Completing Ad-hoc Tasks in IC-Inspector App (Windows)
89287	Bug	Bottom bar shifts to the left in iOS 26.1 on Summary and Tasks List
89612	Feature	Add Device Memory Details to Sync/Crash Logs (iOS)
89613	Feature	Add Device Memory Details to Sync/Crash Logs (Android)
89614	Feature	Add Device Memory Details to Sync/Crash Logs (Windows)
89803	Bug	Intermittent Loading Demo Data Issue
90447	Bug	Task/Summary list Section title text limited to one line
90851	Bug	IC-Inspector not obeying “Show Caption” property of Region layers
91492	Bug	Workpack Display Name drop down options being displayed in incorrect order
94602	Bug	Cannot launch tasks
94606	Bug	Drawings and layers not appearing
95584	Bug	Remove READ_MEDIA_IMAGES permission

IC-Inspection

Ticket No.	Type	Description
91754	Feature	IC-Inspection 64-bit version
92181	Bug	Task launch menu is not grouping by child assets

IC-Recorder

Ticket No.	Type	Description
90897	Bug	Overlay designer not visible
90939	Bug	Overlay Designer throws an Access Violation when dragging multiple items
93437	Bug	Cannot minimise IC-Recorder

SaaS Server

Ticket No.	Type	Description
91065	Bug	Error attempting upload converted video files to Client_Name

5.1.1.3 Q4 2025 (October - December)

NEXUS IC

Ticket No.	Type	Description
5758	Feature	Identical asset names
71083	Feature	Add 'Developer' license module
72516	Feature	Update Virtual TreeView.
73973	Feature	Change Name column in Inspection to be relative location.
75001	Bug	Apply Best Fit does not apply best fit
78451	Bug	Asset Move - Disabled OK Button on Initial Load
79942	Bug	Unable to reorder columns in a Vertical Table when there are a lot of columns
79944	Bug	Spell Check Setting Not Instantly Reflected
80356	Bug	Minimising any modal dialog in Thinfinity results in the application becoming unusable
82714	Feature	Update Virtual Treeview to GIT revision 39f9d77
83419	Bug	Unable to parse UKduty holder video
83804	Bug	Global Table Link Field is displaying incorrect information in the UI
85131	Bug	Merge Last Row parameter does not persist
85731	Bug	CSV Export is malformed when Alphanumeric field contains trailing LF character
86112	Bug	Broken toolbar icons
86127	Bug	Asset/Event Information Not Displayed on Initial Load When Adding Library
86291	Bug	Apply of grid filter clears previous selection
86321	Bug	ASSET Dashboard does not refresh (or allow user to manually Refresh) when template is edited
86406	Feature	New 'Beta' license flag
86704	Feature	Change Asset View to be stored in settings
87098	Bug	Additional white space on image capture
87222	Bug	Ellipses is not painting on cells with NULL values
87853	Bug	Saved Artifacts Fails to Access File Directory
87881	Bug	Global Table link data not cleared on change
87985	Bug	Select Asset dialog is missing the toolbar, I can't change Asset Views
89020	Feature	Add support to connect to a Subscriber DB in TF environment
89230	Bug	Global table link automatically selects available value
89688	Bug	Do not allow users to minimise the Edit Field Definition dialog (or any Modal dialog)
90261	Bug	Shortcuts cannot be edited
90455	Bug	Deploying version 6.9.36465.0 to the client database results in an error

IC-Web

Ticket No.	Type	Description
50184	Bug	the Select Table Definition dialog should be filtered by Event type Tables only
72844	Bug	Event Types Not Populated Correctly When Adding Task
79954	Feature	Add isSaaS flag to version REST call
81583	Bug	Unable to authenticate REST/IC-Web with database having a Rest Call Shortcut Element configured
84498	Bug	Wrong img scale on grid
85281	Bug	Anomaly navigation URL is not selecting the correct Anomaly
86109	Bug	OK button remains disabled after changing Revision field in Workpack Edit
86117	Bug	Incorrect Event Number displayed in Add to Event on INSPECTION screen
86607	Bug	Adding sub aig rows is not working.
86622	Feature	IC-Web should load/save the active Asset View to settings.
86760	Bug	IC Web is not plotting the Anomaly Risk Score on the Anomaly Chart
86768	Bug	Merge Last Row parameter does not persist
87220	Bug	Component Data AIG not loading in IC Web
87532	Bug	Error editing a Finding from FINDINGS window
88203	Bug	Map Loads at Incorrect Location
88574	Bug	Inspection Dock - Incomplete Tasks Form getting console errors
88631	Bug	Atlantic LNG ? Unable to Access Planning Screen After SSO Migration
88871	Bug	Navigation Link in Workpack panel is not redirecting to the appropriate workpack
88873	Bug	Search is not working in Select Table Definition popup
88880	Bug	Navigation link not working in Anomalies screen
89031	Feature	Upgrade Angular version to 20.3
89702	Bug	Files Launch as PNG Regardless of Original Format

IC-Inspector

Ticket No.	Type	Description
63663	Feature	Implement SwiftUI for Task Instructions
64003	Feature	Convert Settings View in SwiftUI
64804	Feature	Convert Drawings list view in SwiftUI
65193	Feature	Convert Summary list view in SwiftUI
66012	Feature	Convert tasks list view in SwiftUI
66013	Feature	Convert Event detail list view in SwiftUI
67232	Feature	Convert Drawing detail view to SwiftUI
70160	Feature	Convert SideMenu view with SiwftUI
70457	Feature	Convert Scan Code view to SwiftUI
70823	Feature	Convert Photo Detail View to SWIFTUI
74373	Feature	Allow users to login using SSO (Android)
74375	Feature	Allow users to login using SSO (iOS)
82175	Feature	Add version number to side menu and redesign About screen
82239	Feature	Update Android API level
82843	Feature	Add “Status” as new Grouping option on Tasks and Summary views
83297	Feature	Add callable flags to the web portal URL to allow the request of a hash from IC-Inspector

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Ticket No.	Type	Description
83301	Bug	Update the text “Unable to create reachability” with more clarity.
84360	Feature	Move IC-Inspector Sync Logs into new IC-Inspector Synchronisation Logs project.
85599	Feature	Update Redmine hash key. (iOS)
85834	Feature	Calling Logout when signed in using SSO (iOS)
85836	Feature	Calling Logout when signed in using SSO (Windows)
85902	Feature	Show serverName and userName on settings screen for SSO login
86227	Bug	Tasks list bottom bar not working when coming from Summary screen
86351	Bug	Update Sync Log Redmine tickets to use User Name rather than Full Name
86411	Bug	Don’t maximise UI
87214	Bug	Display issue in Settings screen.
87221	Bug	Event detail view showing duplicate fields
87301	Bug	IC-Inspector controls appearing behind Android Status and Navigation bars.
87316	Bug	Tasks Search Screen Missing Letter
87356	Bug	IC-Inspector Login Issue for database login (should save LoginName, not UserName)
87447	Bug	Caption Layers are not appearing IC-INSPECTOR (iOS)
87589	Bug	Change Sign in text to “Sign In”
87878	Bug	User interface issue with iOS 26
88261	Bug	App crash in Saving and editing photo from crash log iOS 26
88726	Bug	Portrait Mode UI Display Issue Following iOS 26.1 Upgrade
88855	Bug	SSO based Sync is calling Logout
89177	Bug	Photo Order Displays Incorrectly in Event Details
89423	Bug	Unable to send sync logs from IC-Inspector
89595	Feature	Add task count to Summary cells.

IC-Inspection

Ticket No.	Type	Description
89984	Bug	Event listing not displaying

5.1.1.4 Q3 2025 (July - September)

NEXUS IC

Ticket No.	Type	Description
25033	Bug	When exporting to Excel, lookup list (field definition type yes/no with boolean type as attachment) has extra v
31990	Feature	Split options in Client table
47947	Feature	Support channel name from format YYYY-MM-DD_hhmmss_Channel Name
54128	Feature	Make Dashboard report parameters save per user
57675	Bug	Unhandled Exception error when assigning AIGs to expert system Asset Types
58562	Feature	NEXUS v6.9 miscellaneous documentation
59117	Bug	Help file URL links to v6.5 documentation
62338	Feature	Add Azure AD auth to IC-Web
64070	Bug	Grid export - malformed CSV if text contains comma characters
64922	Bug	Database monitoring does not correctly clear changes

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Ticket No.	Type	Description
65243	Feature	Prevent entering duplicate Anomaly names manually.
68380	Feature	Hide screens user has No Access to
68424	Bug	Refresh issue on the Finding Listing | Finding toolbar button menu
68442	Bug	Import sheet with empty Asset Location.Full creates assets with no name
68583	Bug	Empty grouping shown
69470	Feature	Add source field for multimedia
70263	Bug	Finding details not displayed when switching from Event Listing
70861	Bug	Connections missing for Finding and Action Status
70891	Feature	Add Right-click to all grids
71597	Bug	Dashboard table toolbar state updated when not visible
73015	Bug	Can't set Date parameter in Function when calling from REST API
73209	Feature	Create new DB management utility
73486	Feature	Show history of imported versions for an expert system
75413	Bug	Error attempting to import Base Expert System into ES_Demo
75715	Bug	AIG with Visibility rules slow to display in NEXUS IC
76547	Bug	Attribute Columns Not Displaying Values in Grid
76616	Bug	Script Not Reflecting Disabled/Deleted Users
76617	Bug	'Reset to Default' changes selected tab page
76618	Bug	Significant performance degradation in v6.9 of multiselect | edit functionality
78311	Bug	Not Responding when attempting to load the drawing
78731	Feature	New input type for Input Record in Shortcuts
79090	Feature	Updates for Delphi 12.3
80355	Bug	Database Monitor not correctly forming SQL for querying values.
80703	Bug	Slow display of user settings with large text
80870	Bug	Inspection shortcuts not saved
81653	Bug	Failure to Capture Video in Thinfinity
81656	Bug	Inspection Shortcuts Not Working After Database Reopen
82414	Bug	Guid is being changed after insert
82483	Bug	Unable to open newly upgraded database - "You are unable to modify the row identified by 'Anomaly.Priority
82501	Bug	Unable to Save Changes in Your Profile Dialog
82540	Feature	Implement Unit support for Grids
82629	Bug	SVG Images Not Generated in Report Template
83052	Bug	Missing Column Divider in Table of Data Layout
83158	Bug	AV when grouping by Event Type
83205	Bug	Schema Update is clearing Sub AIG values
83213	Bug	Applying a filter in Event Listing is not returning any rows
83410	Feature	Create Getting Started section in NEXUS Online Help
83547	Bug	Image folder on Custom Event Export is not copied to local folder in Thinfinity
83548	Bug	Application hangs on change of Design Life
83596	Bug	NEXUS takes a long time to respond when user multiselects Anomalies in UK Duty Holder
83759	Bug	Unable to parse video
83773	Bug	AV editing Anomalies
83790	Bug	Scrollbars Not Visible on WORKPACKS Screen
83863	Bug	Anomaly not showing in ASSETS Anomalies pane
83924	Bug	Input Row is not being filtered
84335	Bug	Multi-Select Finding Status Inconsistent Display
84504	Bug	Error importing Shortcut
84703	Bug	Daylight savings time isn't translated correctly
84775	Bug	Select All selects rows that are filtered out
84776	Bug	Error upgrading client database to v6.9

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Ticket No.	Type	Description
84847	Bug	Save Template does not allow user to unselect all dependencies
85231	Bug	Multi-Select Finding Status Undo and Null Value Limitations
85433	Bug	Traffic Light Colors Render Incorrectly on Button with Region Layer
85534	Bug	Grid Date Time Column Not Respecting Local Settings
85604	Bug	Thumbnail Display Issue
85615	Bug	ASSET Dashboard does not respect Font Styles

IC-Web

Ticket No.	Type	Description
16054	Feature	Utilise Angular2 to create writable forms to edit all grids in IC-Web
18784	Feature	Get Workflows from the Rest
32826	Feature	Add conditional colours in dashboard grids
57306	Bug	Sequential Videos with Same Channel Name Treated as Separate Channels
63382	Feature	Add support to view Job List and Dismiss Jobs in IC-Web
65807	Bug	Add, Edit and Delete Missing from Angular Trees on Asset Menu
66139	Bug	Sub-menu scroll bar issue
66389	Bug	Cannot Expand Children for Asset tree after deleting Asset or Linked Asset
68189	Bug	IC-Web should filter out Drawings with no attachments
72808	Bug	Vertical Table Inconsistency - Dashboard Table with no columns defined.
73322	Bug	Jobs dialog needs a default message when there are no jobs
73356	Feature	Add lineWeight in REST response for relevant chart series.
73459	Bug	Requesting SVG drawing data returns PNG data
73967	Bug	Change deployment scripts to update IC Web to 6.9 correctly
74959	Bug	Finding table is not highlighting the selected row
76174	Bug	Dashboard toolbar button show selected dashboard
77772	Bug	Display issue on Deleting the Asset with children and Editing the Asset details
78844	Bug	IC Web Asset search not working
78865	Bug	Navigate is not working in Drawings - IC Web
80888	Bug	New Library type added is not displayed instantly in ASSETS and INSPECTION screen
81188	Bug	Missing Timestamp in Video Player
81942	Bug	Has_Children not updating on Move
81949	Bug	Unexpected error received.
82352	Bug	Updating the Finding fields - Finding number, Reason and Remedial Action are duplicated for other Findings
83166	Bug	Video player doesn't unsubscribe, causing browser console error
83527	Bug	Pass-thru is displaying ID instead of Name
83885	Bug	Changing Library item not updating the values on details form v2
84417	Bug	Data Related Error on PLANNING screen
84497	Feature	Request User Name and IC-Web License info for sites using SSO.
85110	Bug	Make thumbnail images full height of the multimedia row
85144	Bug	Error attempting to play Quadrant Video

IC-Inspector

Ticket No.	Type	Description
63685	Bug	Adjust IC-Inspector style and layout for Android.
72024	Feature	Create reduced size thumbnail images of photos in IC-Inspector.

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Ticket No.	Type	Description
73051	Feature	Ability to Retry Sync if Failed Due to Network Connection
73252	Bug	Handle the Error for Assets Deleted by Backend User: Row with ID not found in the business object (404)
73255	Bug	Handle the Error for Assets Deleted by Backend User: Row with ID not found in the business object (404) (A
73257	Bug	Handle the Error for Assets Deleted by Backend User: Row with ID not found in the business object (404) (W
74344	Bug	Run time error generated when parsing nested fields within a field JSON doc.
74346	Bug	Run time error generated when parsing nested fields within a field JSON doc. (Windows)
73511	Feature	Remove Android WRITE_EXTERNAL_STORAGE permission
76546	Feature	Show more data on Sync completion related to last successful sync
77191	Bug	Visibility Issue with Adhoc Tasks in Summary View
77708	Bug	Getting Random tasks on every sync, API response returning duplicate tasks if tasks more than 100
77798	Bug	Remove “invalid values” test from Failed to sync in tasks list
78282	Bug	Tapping on “next” on iOS keyboard closes keyboard
79118	Bug	Secure Coredata and logfiles
79906	Feature	Create CrashLog ticket in Redmine for unsuccessful Sync
79907	Feature	Create CrashLog ticket in Redmine for unsuccessful Sync (Android)
79908	Feature	Create CrashLog ticket in Redmine for unsuccessful Sync (Windows)
79909	Feature	Create CrashLog ticket in Redmine for unsuccessful Sync (iOS)
81553	Bug	Upload does not abort when authorisation fails
81562	Bug	Device auto-locks during Sync
81582	Bug	Handle the Error for Assets Deleted by Backend User: Row with ID not found in the business object (404) (iC
81890	Bug	Sync failure with core data error: Multiple validation errors occurred.
81950	Feature	Device auto-locks during Sync (Android)
82020	Bug	AV in camera frame when no cameras available in Windows
82059	Feature	Check network reachability at one common place instead of all classes where it needed
82176	Feature	Add version number to side menu and redesign About screen (Android)
82177	Feature	Add version number to side menu and redesign About screen (Windows)
82193	Bug	Loader not hidden on Demo Data toggle failure in Settings
82264	Bug	Next Button Not Functioning
82392	Bug	Sync log with no data in it.
82453	Bug	Rendering Issue with Small Images (iOS)
82590	Feature	Create all FieldValues for Tasks during sync Process
82731	Bug	Add detailed rest response data in log file
82867	Feature	Add wait for 15 seconds before retry after sync failure
82868	Feature	Add wait for 15 seconds before retry after sync failure (iOS)
83057	Feature	Change loader text to “Finalising Sync..” after retrieving finished while Sync process.
83058	Feature	Change loader text to “Finalising Sync..” after retrieving finished while Sync process. (iOS)
83161	Feature	Add “Status” as new Grouping option on Tasks and Summary views (Windows)
83162	Feature	Add “Status” as new Grouping option on Tasks and Summary views (Android)
83371	Feature	Remove Schema Update prompt from IC-Inspector
83447	Bug	App Crash During Sync When ‘Remove Completed Tasks During Sync’ Setting Is Enabled
83449	Feature	Enable Task Sorting by Order Within the Same Workpack
83451	Feature	Enable Task Sorting by Order Within the Same Workpack (Windows)
83454	Feature	Enable Multiline Rendering in Large Text/Note Fields
83776	Feature	Populate source column in multimedia
83860	Bug	Posted tasks not removed when partial upload fails despite “Remove Posted Tasks” setting
83866	Feature	Request Logout after REST processes
83867	Feature	Request Logout after REST processes (iOS)
84022	Bug	App crash on end sync (appStore crash logs)
84361	Feature	Move IC-Inspector Sync Logs into new IC-Inspector Synchronisation Logs project. (Android)
84362	Feature	Move IC-Inspector Sync Logs into new IC-Inspector Synchronisation Logs project. (Windows)

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Ticket No.	Type	Description
84780	Bug	'In Progress' Missing for Ad Hoc Events
85609	Bug	@User display Login Name instead of User Name

IC-Inspection

Ticket No.	Type	Description
52922	Feature	Add support for Task instruction preview in Inspection Tasks Frame

IC-Recorder

Ticket No.	Type	Description
84997	Bug	IC-Recorder Launch Failure

SaaS Server

Ticket No.	Type	Description
76077	Bug	Hosting Script bug - Changing Culture on secondary server not changing

5.1.1.5 Q2 2025 (April - June)

NEXUS IC

Ticket No.	Type	Description
69631	Bug	Permissions error on Table Definiti
70142	Bug	Dashboard Table Border UI Issue
75585	Bug	Report returning error from correct
75857	Bug	Cannot use the Grid Export | Text |
76178	Bug	Cannot copy to clipboard - Thinfin
76606	Bug	Search Results Window Closes Ap
76728	Bug	Cannot enter text using keyboard in
77449	Bug	Finding column displays number in
77485	Bug	No crashlog screenshot from Thinf
77575	Bug	Intermittent issue attempting to cor
77634	Bug	Unable to re-order column in Verti
77649	Bug	Blank Planning Template Task Add
78231	Bug	Switch on In-Grid filtering in ASS
78262	Bug	Anomaly Triggers form is not displ
78267	Bug	Settings are not persisting Active D
78462	Bug	Import Wizard Error When File Pa
78498	Bug	Filter Pop-up Screen Blocking Acti

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Ticket No.	Type	Description
78677		Importer Rejects Pass/Fail Field Defined as Boolean Type for Yes/No Lookup List
78786	Bug	Incorrect dialog filter on save repor
78964	Bug	Table of data preview disappears
78967	Bug	Cannot move columns in different
79009	Feature	Add support for jfif images
79105	Bug	Workpack dialog is very slow to lo
79245	Bug	Enable in-grid text filter/search in t
79253	Bug	NEXUS Documentation Feedback
79279	Bug	Workpack search grid not displayir
79355	Feature	Prevent hover hints blocking looku
79372	Workpacks screen is slow to load	Bug
79617	Bug	Saved Desktop Disappearances
79619	Bug	Unable to Delete Event with Multi
79722	Bug	Unable to Add Sub-Event Data Wh
79782	Bug	Function list context menu not enal
79793	Bug	Delete from context menu deletes t
79798	Bug	F Column Filter Missing Finding C
79858	Bug	Vertical resize grips in ANOMALI
79865	Feature	Add support for Attributes to Expe
79902	Bug	NEXUS Documentation Feedback
80047	Bug	Issues Opening Excel Format Repo
80107	Bug	Asset Selection Persistence Issue fo
80175	Bug	Grid Displays Base Unit Instead of
80182	Bug	Export to CSV - Better file names
80217	Bug	Drop down column filter is listing r
80277	Bug	Edit Workpack slow to load
80370	Bug	Using the mouse scroll wheel on a
80430	Bug	Filtering is broken
80503	Bug	Clicking on Function Element in S
81007	Bug	Event Listing grid does not display
81024	Bug	Font combo not populating
81265	Bug	Multiple events selected after Add
81339	Bug	Show Caption Setting in Report Ch

IC-Web

Ticket No.	Type	Description
13499	Bug	ICWeb - Children grid doesn't have an export feature
38385	Feature	Allow the multi selection in the angular grids
62651	Bug	IC-Web – Yes/No fields displaying as true/false
62680	Bug	Field Layout - Form Order is not being respected in IC-Web
63032	Bug	Installer setup error
68411	Bug	Unsafe security header: Content-Security-Policy
69363	Bug	Error When Loading 1000 Items per Page
72812	Feature	Implement Relative Location Column in Children Tab
73324	Bug	Inspection Special Layout button not implemented correctly.
73826	Bug	Optimization of Expand Children in the Asset Toolbar Menu
74748	Bug	AIG dropdown menu is duplicating items
74750	Bug	Record Editor V2 not working when editing multiple rows.

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Ticket No.	Type	Description
75298	Bug	When license expires IC-Web doesn't give a helpful message
75486	Bug	Navigation Link Not Working in New or Different Browser Sessions
75567	Bug	The field *Charpy Impact Energy* is displayed blank after disabling the Set Visibility Rules in NEXUS IC whe
75676	Feature	Use '<blob>' in JSON for fields for boolean Values to reduce superfluous calls to the REST.
76154	Bug	Numeric fields with Default values not working in IC-Web
77577	Bug	Event Details are not displayed in ANOMALIES | Finding tab
77700	Bug	OK button is not enabling to allow me to save Edit Available Backups dialog
78085	Bug	Event definition Form Layout is not respected in INSPECTION
78165	Bug	WORKPACKS is not displayed filtered rows
78306	Bug	Users are getting old or invalid versions of valid.html
78503	Bug	Traffic Light Selection Menu Overflow Issue
78505	Bug	Traffic Light Loading Issue
78524	Bug	Add Loading Indicator When Expanding Asset Tree from Note Click
78683	Bug	Error object values are stopping forms V2 from being valid
78842	Bug	IC Web doesn't display Change History sub AIG
79031	Bug	Unit Conversion values for Numeric Event type are reflected as *NaN* in IC-web
79294	Bug	Event editor form validation behaviour
79783	Bug	Children grid grouping is broken
80001	Bug	Asset Tree node expansion using inefficient REST call
80006	Bug	Library Category not rendering rows that start are below the bottom of the browser
80029	Bug	Error when adding Library Item from ASSETS | Library | Add
80030	Bug	Unable to add Connection to Library Item from LIBRARY | Connections
80938	Bug	Library connections are added automatically if there are no Library items added for a Library Type

IC-Inspector

Ticket No.	Type	Description
41770	Feature	IC-Inspector (Windows & Android) Photo markup mechanism
44246	Feature	IC-Inspector (Windows) PDF support
44970	Feature	Allow an inspector to change the unit of a field before data entry.
62343	Feature	IC-Inspector display a report after the sync failed
66722	Bug	Task for Event with Boolean Type Field set to Default Pass/Fail fails to Upload (Windows)
66723	Bug	Task for Event with Boolean Type Field set to Default Pass/Fail fails to Upload (Android)
69128	Bug	Failing to upload completed tasks.
72088	Feature	Create reduced size thumbnail images of photos in IC-Inspector. (Windows)
72089	Feature	Create reduced size thumbnail images of photos in IC-Inspector. (Android)
74268	Feature	Request thumbnail data for Drawings through REST API
74269	Feature	Request thumbnail data for Drawings through REST API (iOS)
74037	Bug	Refactor creation of task cells to speed up creation of Task frame.
75181	Feature	IC-Inspector Photo markup mechanism (Android)
75182	Feature	IC-Inspector Photo markup mechanism (Windows)
75943	Bug	Update Tasks and Summary Tabbar to Toolbar and fix Search for iOS 18+ UI changes
75961	Feature	Redirect Documentation link in IC-Inspector to IC-Inspector overview web page. (iOS)
76175	Bug	IC-Inspector & Nexus-IC Unit Conversion Issue for 6.8 API calls
76207	Bug	Label Format Does Not Match Configured Settings
76365	Bug	Unable to select Lookup List values for some fields, showing No Options
76549	Bug	Issue with Drawing Module while selecting Layers, taking time and freezing.
76679	Bug	Random app crashes while Sync
77111	Feature	Replace icons in IC-Inspector

continues on next page

Table 11 – continued from previous page

Ticket No.	Type	Description
77456	Feature	Update “NO TASKS” message to provide information on possible filter selection
77674	Feature	View Last Sync Log functionality
77805	Bug	Missing Layers in the Summary view
78359	Bug	Asset Location changed from string to array in JSON data from REST Service.
78423	Bug	Data need to revert if app crashed or failed during Sync.
78425	Bug	Random app crash while updating TableDef (loading Field and field categories)
78455	Bug	Ancestor for SplashRec not found on Windows tablet.
78456	Bug	Lookup list popup window is too thin and abbreviating items.
78776	Bug	Display unit name and unit symbol in unit selection popup
78902	Bug	Remove Global Table Fields if the Event with globalTable unassigned and not used anywhere.
79015	Feature	Create Sync Log Redmine Ticket
79016	Feature	Create Sync Log Redmine Ticket (Android)
79017	Feature	Create Sync Log Redmine Ticket (Windows)
79167	Bug	Slow loading of tasks list
79955	Bug	Issue with attach photos and Sync gives faulty relation in database.
80041	Bug	Time selectors not allowing selection of seconds.
80042	Bug	Time selectors not allowing selection of seconds. (Android)
80043	Bug	Time selectors not allowing selection of seconds. (Windows)
80071	Bug	Intermittent “Invalid Bitmap” error on Android
80171	Bug	Incorrect error message displayed on sync with no wifi
80172	Bug	Incorrect error message displayed on sync with no wifi (Android)
80173	Bug	Incorrect error message displayed on sync with no wifi (Windows)
80237	Bug	App crashes attempting to mark up photo
80360	Feature	Add image and selected image count icon to images
80376	Bug	Clear Partial data before and after sync if any before and after sync.
80490	Bug	Commentary section is not visible in Adhoc event detail.
80491	Bug	Add build version as 6.9.revision
80494	Bug	Menu options not updating image immediately in drawings frame
80564	Bug	Tasks Were Removed After ‘Connect and Save’
80675	Feature	Allow user to add description (optional) before sending log file.
80961	Bug	Return Error message if commit core data failed
81282	Bug	App crashes due to memory allocation on device.
81567	Bug	Device auto-locks during Sync (iOS)
81568	Bug	Upload does not abort when authorisation fails (iOS)

CHAPTER

SIX

NEXUS IC OVERVIEW

NEXUS Integrity Centre (NEXUS IC) is the core desktop platform of NEXUS. It allows you to get access to all the main asset integrity management features that NEXUS offers.

6.1 Prerequisites

Before using NEXUS IC, ensure that you have set up the software as described in *Deployment*.

6.2 NEXUS IC Functions

In NEXUS IC, you can use various features and functions. **Click** the tiles below for more information.

- *Getting Started*
- *Setup and Configuration*
- *General Features*
- *Dashboards and Reports*
- *Asset Data Management*
- *Library*
- *Planning and Workpacks*
- *Inspection*
- *Anomaly Management*

CHAPTER

SEVEN

GETTING STARTED

Before you start using NEXUS IC, check out the following sections to get up and running:

Log In to NEXUS IC
: Access the system using your credentials. For more information, see *Log In to NEXUS IC*.

Familiarise Yourself with the Interface
: Explore the layout, grid operations, search tools, and navigation features. For more information, see *Familiarise Yourself with the Interface*.

Set Up Default Preferences
: Configure default settings, views units, and other settings to match your workflow. For more information, see *Set Up Default Preferences*.

7.1 Log In to NEXUS IC

All users must log in to access NEXUS IC. The login process differs depending on the deployment type:

- **SaaS Users**

  Log in and authenticate via the hosted environment using Single Sign-On (SSO). For more information, see *SaaS Login*.

- **On-Premises Users**

  Log in using credentials provided by your company's NEXUS administrator. When you log in for the first time, you must connect to the database. For more information, see *Connect to Database*.

7.2 Familiarise Yourself with the Interface

Understanding the layout and core functions of NEXUS IC is essential for efficient use.

Interface Overview

Learn the structure of the main workspace, including the main screens, toolbars, and menus. See *NEXUS IC Screen*.

Working with Grids

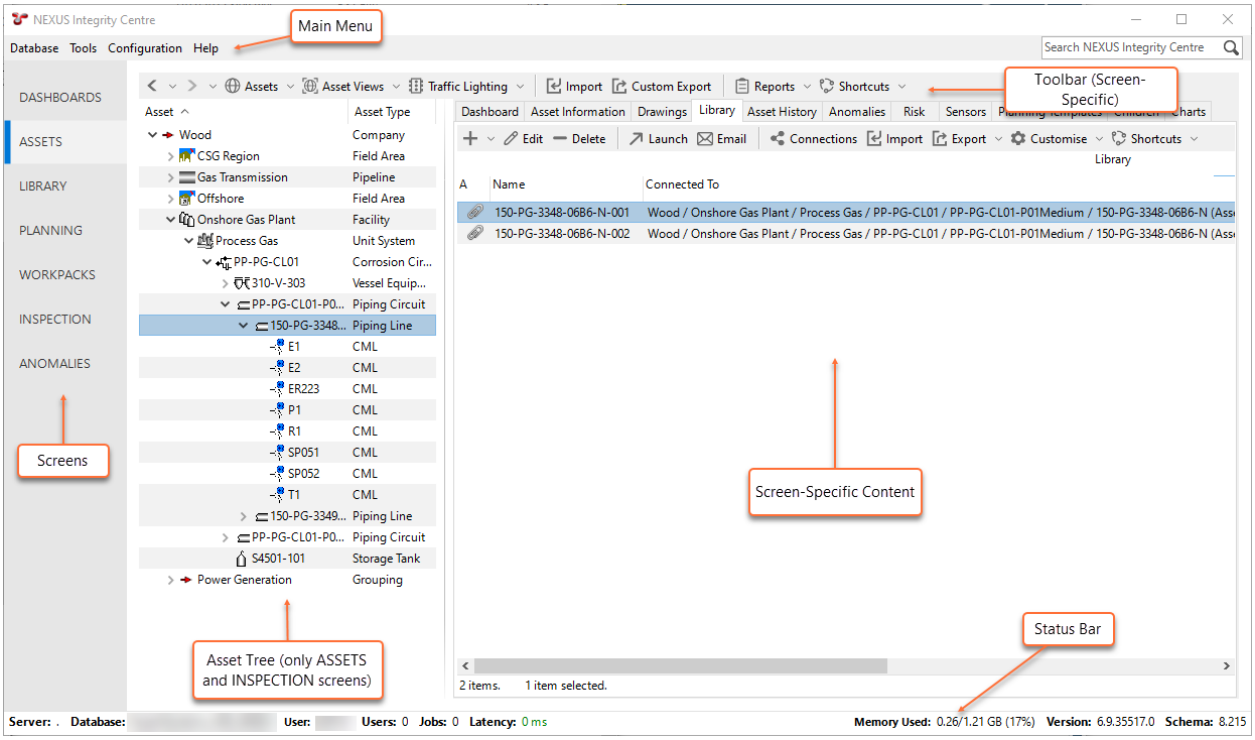
Understand how to use common grid functions, including sorting, filtering, grouping and customising data grids. See *Using the Grid*.

Searching

Learn how to locate data efficiently using various search tools available in NEXUS IC. See *Searching*.

7.2.1 NEXUS IC Screen

The NEXUS IC interface consists of several key components designed to support efficient navigation and task execution.



7.2.1.1 Main Menu

The main menu provides access to configuration and system-level functions, including:

- **Database Settings**: Manage database connections, user settings, and system-level operations. See *Database*.
- **Configuration Options**: Adjust application-level settings and preferences. See *Configuration*.
- **Tools Menu**: Access utilities that influence or monitor general application behaviour. See *Tools*.

If you need help, you can use the **Help** menu to access the documentation or to contact NEXUS Support.

7.2.1.2 Main Screens

The sidebar allows access to various functional screens within NEXUS IC, each supporting specific asset integration management tasks.

The following main screens are available:

Screen	Description	Screen Description
DASHBOARDS	Displays the output from any report template that you have configured in the report template library and marked as a Dashboard. For more information, see *Dashboards*.	*Using the Dashboard*
ASSETS	Allows you to access the asset tree where you can view and manage all the asset information stored in the NEXUS IC database. For more information, see *Asset Data Management*.	*ASSETS Screen*
LIBRARY	Allows you to manage library items. Library items are electronic documents that can be linked to data and data types in NEXUS IC. For more information, see *Library*.	*Library*
PLANNING	Shows tasks against their asset, in calendar form. You can maintain tasks, planning templates, risks or shutdowns from this screen. For more information, see *Planning and Workpacks*.	*PLANNING Screen*
WORKPACKS	Allows you to maintain workpacks, which are collections of tasks or events. For more information, see *Workpacks*.	*WORKPACKS Screen*
INSPECTION	You can upload, analyse, chart and review inspection event data from this screen. For more information, see *Inspection*.	*INSPECTION Screen*
ANOMALIES	You can maintain anomalies from this screen. Anomalies are records that identify discrete items or areas of concern. For more information, see *Anomaly Management*.	*ANOMALIES Screen*

Note

Certain screens and tabs on the NEXUS IC interface may be hidden if the user lacks the necessary permissions for the underlying tables. For more information, see *Permission Requirements for User Interface Elements*.

7.2.1.3 Asset Tree

The asset tree appears on the **ASSETS**, **PLANNING**, and **INSPECTION** screens of NEXUS IC and may be visible in various dialogs. Traffic lights can be enabled in the asset tree to display preconfigured traffic lighting values for the asset nodes within the tree. For more information, see *Asset Tree*.

7.2.1.4 Status Bar

The status bar, located at the bottom of the NEXUS IC interface, displays key system and session information including the connected database server and name, number of users and active jobs, connection latency, memory usage, software version, and database schema number. For more information, see *Using the Status Bar*.

7.3 Set Up Default Preferences

Before using NEXUS IC, it's recommended to tailor the application to match your personal preferences. See the sections below:

7.3.1 Set Default Unit Group

You can choose the system of measurement used for displaying units in NEXUS IC (for example, metric, US customary).

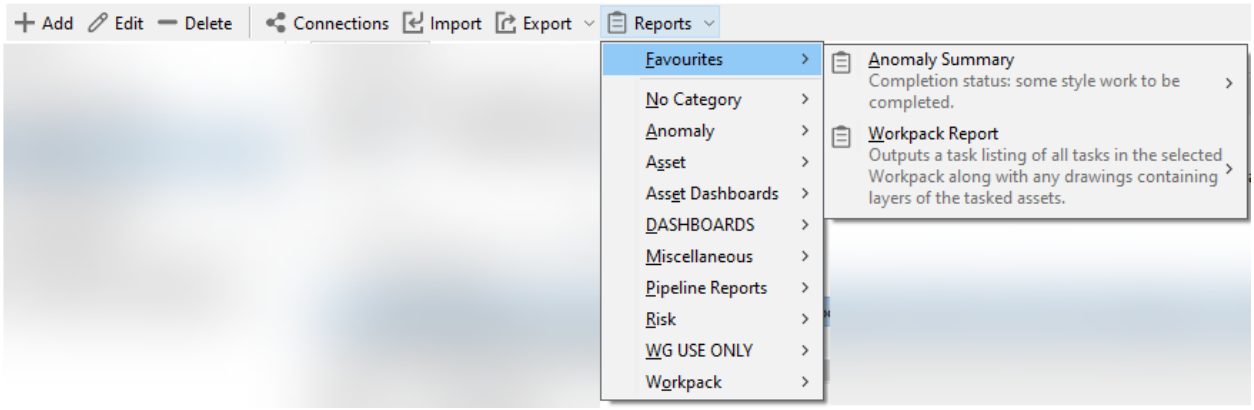
To set the default unit group:

1. In the menu, navigate to *Database* → *Your Profile...*.
2. In the **Profile** dialog, open the **Profile** tab.
3. Under **Display Options**, click the ellipsis (**...**) button in the **Unit Group** field.
4. In the **Select Unit Group** dialog, select the preferred unit group and click **OK**.
5. Click **OK** in the **Profile** dialog to save your changes.

For information about customising unit groups, see *Configure Unit Groups*.

7.3.2 Select Favourite Reports

You can mark frequently used reports as favourites for quick access during report generation. These will appear under the **Favourites** node in the **Reports** toolbar:



To add favourite reports:

1. In the menu, navigate to *Database* → *Your Profile...*.
2. In the **Profile** dialog, open the **Favourite Reports** tab.
3. Click the **Include** button in the toolbar.
4. In the **Select Report Templates** dialog, choose the required reports and click **OK**.
5. Click **OK** in the **Profile** dialog to save your changes.

> **Note**
>
> You can also remove reports from your favourites by clicking the **Exclude** toolbar button for the selected report.

For more information about generating reports, see *Reports*.

7.3.3 Customise Your Grids

Each grid in NEXUS IC can be customised independently to suit your workflow. You can choose which columns to display or hide, and organise records into collapsible groups for easier navigation and analysis.

For detailed instructions, see *Customise* and *Grouping*.

CHAPTER

EIGHT

SETUP AND CONFIGURATION

8.1 Database

You can perform tasks related to the database under the **Database** menu option as follows:

- *Database → Connect*
- *Database → Reopen*
- *Database → Backup*
- *Database → Subscriber*
- *Database → Expert Systems*
- *Database → Close*
- *Database → Your Profile*
- *Database → Change Password*
- *Database → Audit Log*
- *Database → Security*
- *Database → Properties*
- *Database → Export Repository*
- *Database → Show/Hide Status Bar*

8.1.1 Connect

8.1.1.1 Connect to Database

Before you start using NEXUS IC, you must connect to a database.

> **Note**
>
> This process is not required for hosted clients (SaaS), as the database is automatically connected.

To connect to the database, follow the steps below.

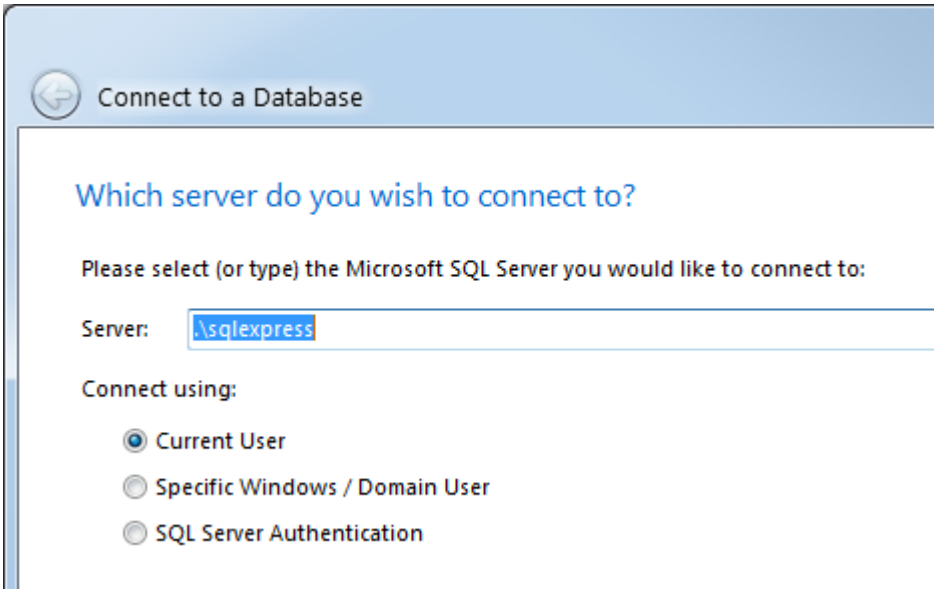
1. In the menu, navigate to *Database → Connect*.

> **Note**
>
> If you have connected to this database before, use *Reopen* instead.

2. Specify the name of a database server.

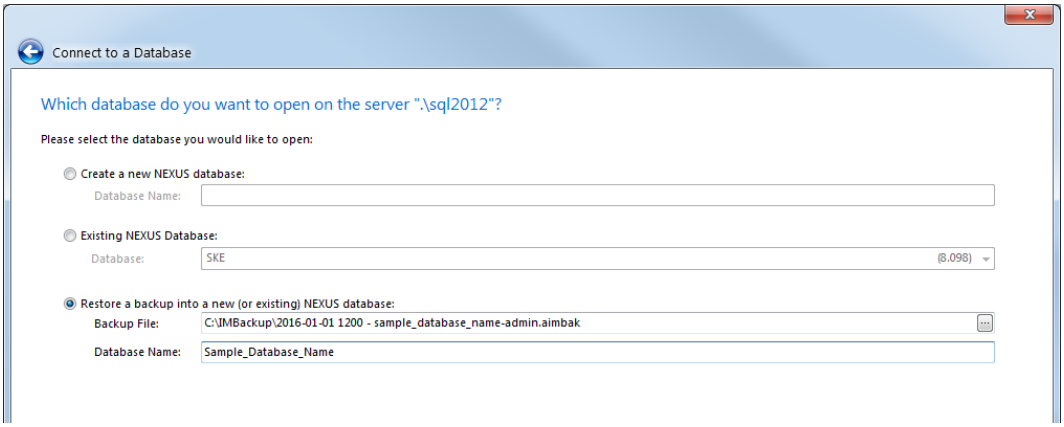
   A database server running on the same machine as IntegrityCentre may be called '.' or 'localhost', or may have a name like '.\sqlexpress'. Your IT administrator may provide you a database server name. We recommend that you use the server name to avoid issues with the software license validation.

3. Under **Connect using**, you usually use the default setting, **Current User**. This uses your Windows domain credentials to connect to the SQL Server. Note that NEXUS IC does not look or store a copy of your Windows domain password.



4. Click **Next**.

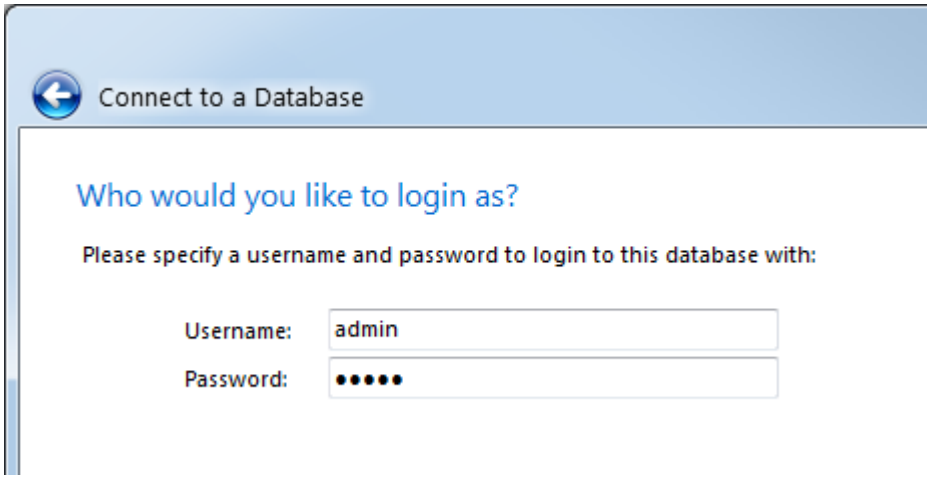
5. Select whether you want to create a new blank database, connect to an existing database, or restore a *Create a Backup*. Click Next.



6. Depending on your situation, you can proceed as follows:

   - If this database has a user account with your Windows domain credentials (see *Manage User Security and Permissions*) you should be immediately connected.

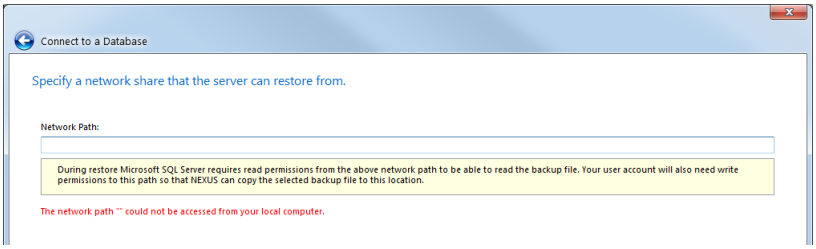
- If not, you will be asked for a NEXUS user name and password (which may not be the same as your Windows domain user name and password). This will be the case for offshore subsea inspection deployments.



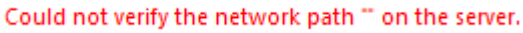
7. If this is your first run of NEXUS IC 6, you won't have yet set a restore path, so you will be asked for one. This needs to be a folder that you can read/write, *and* that the SQL Server process can read.

   This may be a UNC path (like '\\MyServer\MyShare') or if the database server and NEXUS IC are running on the same machine it may be a Windows path (like 'C:\Database Backups').

   When the path is valid (that is, it is visible to both Integrity Centre and the database server) the text will go black and the red warning message will disappear.



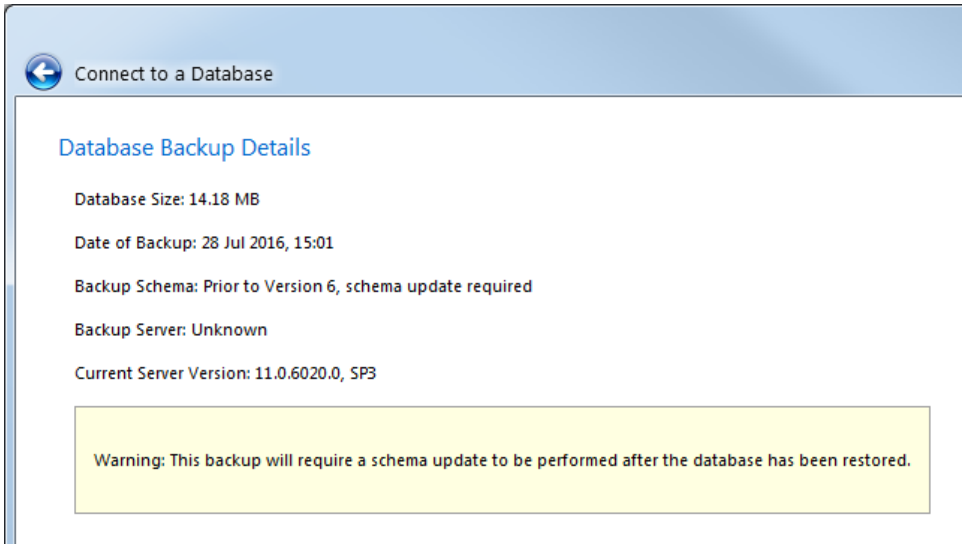
   If you enter a path that is valid for Integrity Centre but *not* the database server, you will see different red error text:



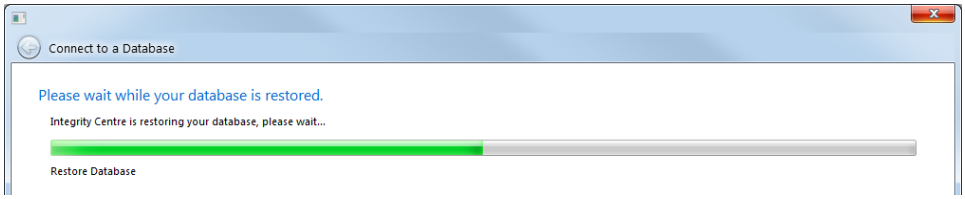
   If you are unable to work around this error by choosing an appropriate folder, you probably have a *deployment* problem, relating to SQL Server *service accounts* and/or *permissions*.

8. If you have chosen to restore a database from backup, you will be shown details of the backup file.

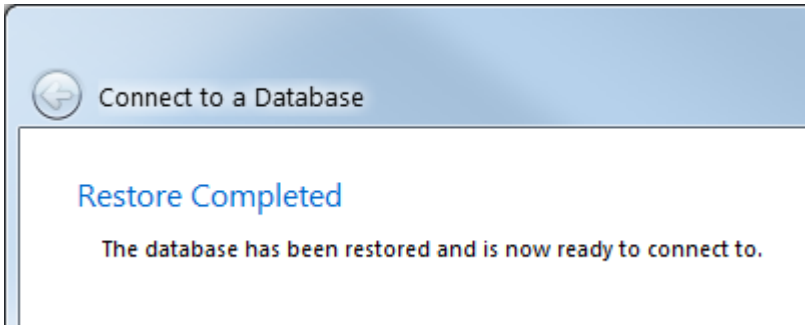
   a. Click **Next** to begin the restore.



b. You can track the progress of the restoration in the progress bar.



c. Once NEXUS IC tells you the restore has been completed, click **Connect**.



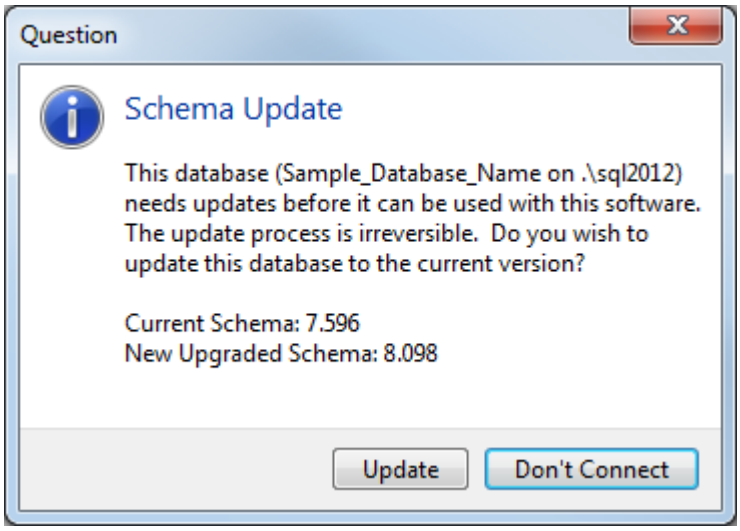
8.1.1.1.1 Schema Update

If a schema update is required, NEXUS IC will ask you if you want to proceed. Schema updates are only ever required when a major update is being applied to a database. For example, opening a v6.8 database with a v6.9 executable will prompt the user for a schema update.

> **Caution**
>
> Schema updates are irreversible, that is, any old backup files (including the one you just restored from) will continue to exist, but this running copy of the database can never be downgraded, and thus can never again be opened by old copies of NEXUS IC.
>
> This is not a problem when everybody is using the same version of NEXUS IC and you are confident there will never be a need to roll back to an older version. The circumstances that require caution are

those where you might be running a newer version than others, or there is a substantial chance that you will want to roll back to an older version.

Schema 7.596 is NEXUS IC 5; schema numbers that begin with '8' are NEXUS IC 6. Updates from 7.596 may take some time. We recommend that you start it in the evening and check the results in the morning as it doesn't need watching.



Refer to *Upgrading* for major version upgrade information.

Use this menu option to connect to a database. For more information, see *Connect to Database*. If you have connected to this database before, instead, use Reopen as described below.

8.1.2 Reopen

Choose a database that you have opened in the past from this list to re-open it. If you have filled in Windows domain credentials (see Security, below) you should be immediately connected. If not, you will be asked for a NEXUS user name and password (which may not be the same as your Windows domain user name and password). Clicking the 'eye' next to the password field will temporarily reveal the text in the field.

8.1.3 Backup

Use this menu option to create a backup for your database. For more information, see *Create a Backup*.

8.1.3.1 Create a Backup

You can create a backup of your NEXUS database any time, which allows you to restore your database later based on the backup file that you created. Your IT department may have a system of scheduled backups, thus, you may not need to create a backup on a regular basis. However, from time to time when you are about to do something hard to reverse in a database, such as deleting data, it is recommended that you take a backup first.

8.1.3.1.1 Prerequisites

Before you start, you can set up the default network path for backing up or restoring data under *Tools* → *Options* → *General*. For more information, see *Setting Up Network Path for Backup/Restore*.

8.1.3.1.2 Procedure

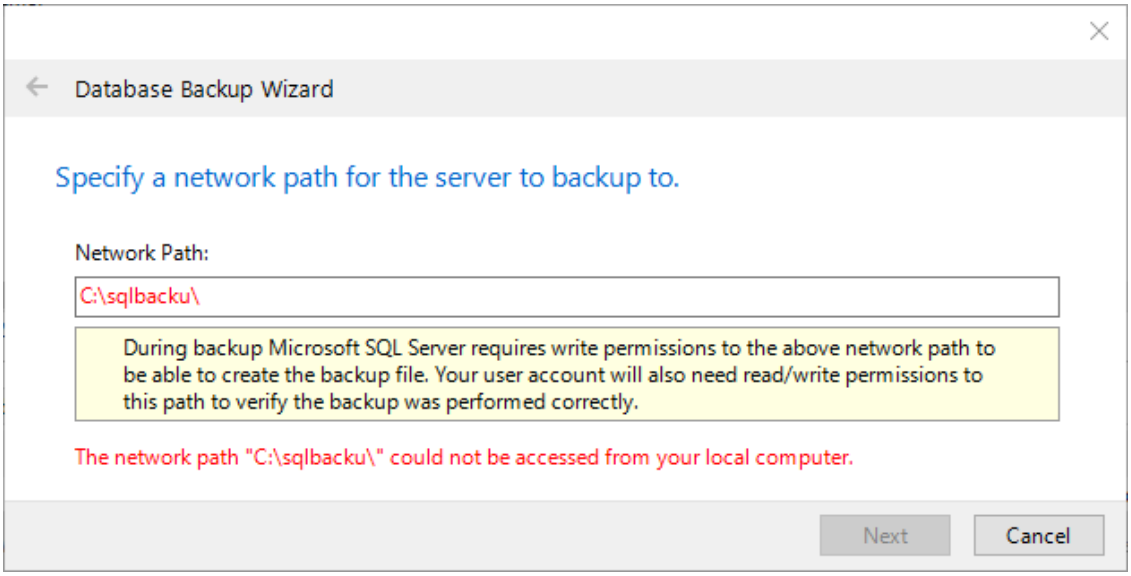
To create a backup, proceed as follows:

1. In the menu, navigate to *Database* → *Backup…*.
2. In the *Database Backup Wizard*, specify the network path and the name for the backup file.

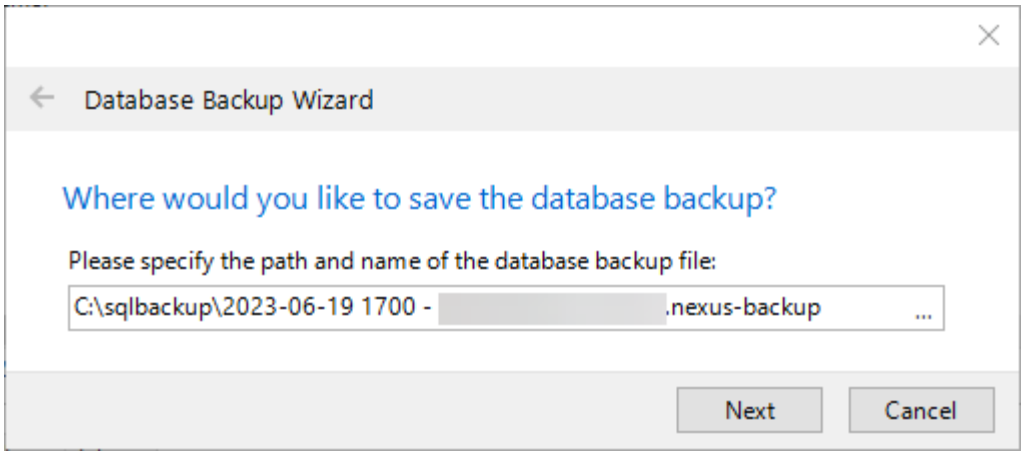
   The dialog offers you a default network path and name, which you can keep or overwrite as required.

   > **Note**
   >
   > For hosted clients (SaaS), the network path and backup file name is predefined and cannot be changed.

3. The system checks the validity of the specified path and highlights the text as follows:
   - If the path is invalid, the text appears in red colour and a message is displayed:



   - If the path is valid, the Wizard takes you directly to the screen that allows you to specify the name and path of the backup file and the text appears in black colour:



Note

To make the path valid, ensure the following:

- The path must be accessible to both the database server and to Integrity Centre. This may be a UNC path (like '\\MyServer\MyShare') or if the database server and Integrity Centre are running on the same machine it may be a Windows path (like 'C:\Database Backups').
- The database server process must have permission to read and write the folder in question.
- The user account requires read/write permissions to both the share (for UNC paths) and the folder.

4. Click **Next**.

   The system creates the backup file in the folder that you specified.

Note

During backup, a checksum is embedded in the file using an SQL Server feature. When you restore the database from a file created in NEXUS (see *Connect to Database*), a validation is performed using the SQL Server checksum to ensure that the file is not corrupted.

5. Click **Open Folder** to open Windows Explorer with your new backup file selected.

Hint

You can set up the system to offer you the creation of a backup file whenever you start NEXUS. To do that, under *Tools* → *Options* → *General*, tick the **Prompt to Backup Database on Startup** checkbox.

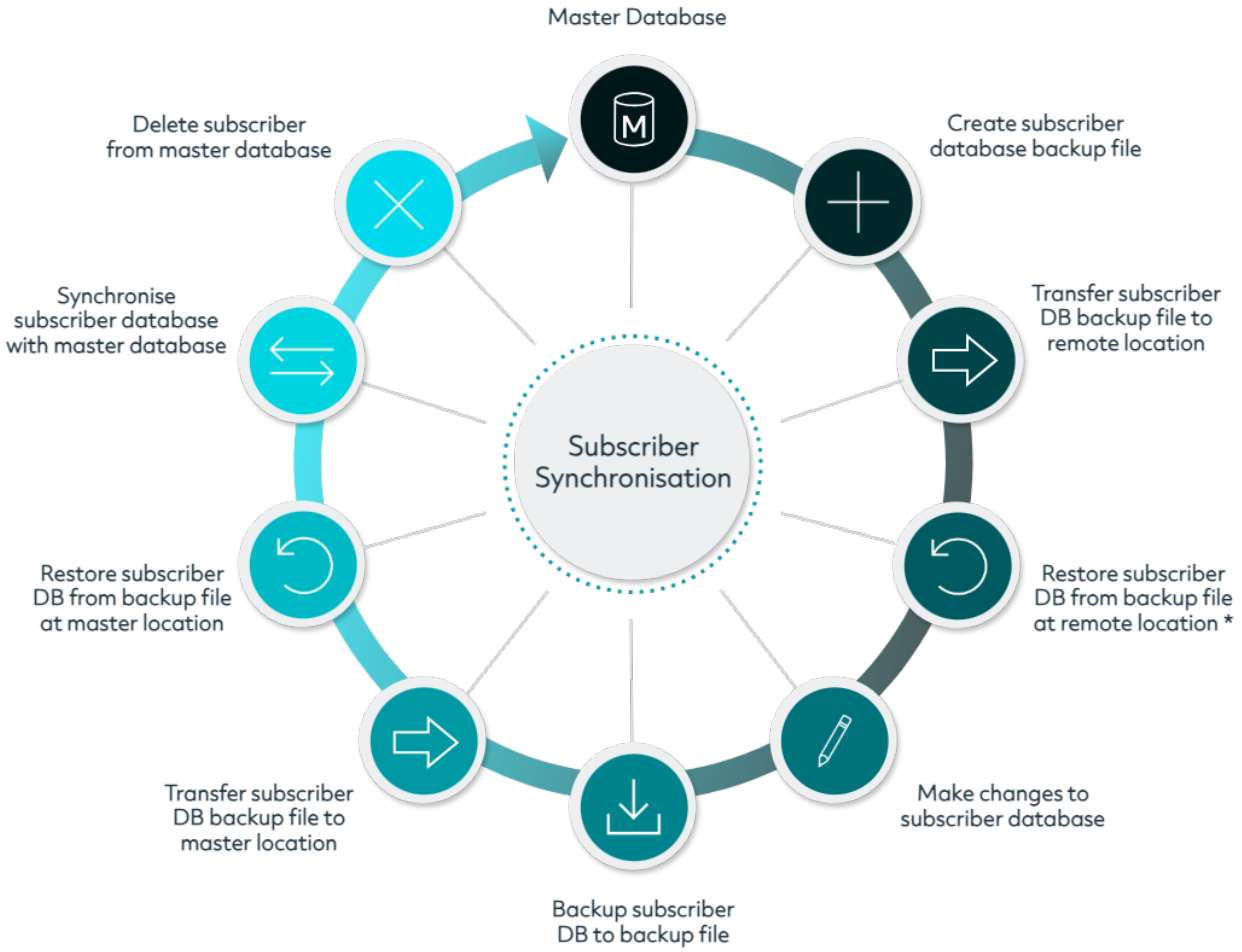
8.1.4 Subscriber

Use this menu option to create, synchronize, or view subscriber databases. For more information, see *Manage Subscriber Databases*.

8.1.4.1 Manage Subscriber Databases

Database synchronisation is based around the concept of master and subscriber databases:

- A **master database** is the primary database of an organisation. You can create one or more subscriber databases from a master database. You can make changes to the master database whilst there are active subscriber databases.
- A **subscriber database** is created from a master database and can be edited off-site and subsequently synchronised back into the master database. A subscriber database can only be synchronised with a master database (that is, you cannot synchronise two subscriber databases together).



* This restore process must be performed using the Database Connection Wizard in NEXUS. It must not be restored using SQL tools.

8.1.4.1.1 Create a Subscriber Database

You can either create subscriber database as a backup file, or via a direct connection to the off-site MS SQL Server. In most cases, subscriber databases are created by the backup file (manual) method, the backup file is then restored to the off-site MS SQL Server.

To create a subscriber database, proceed as follows:

1. Select *Database* → *Subscriber* → *New*.
2. Specify a name for your new subscriber database.
3. Click **OK**.

> **Result**
>
> NEXUS IC creates the subscriber as a database backup file. Once a subscriber database has been created, it will appear in *Database* → *Subscriber* → *View*.

8.1.4.1.2 Synchronise a Subscriber

All changes made to a subscriber database need to be synchronised back with the master database. To synchronise a live subscriber database, do the following:

1. Ensure that the active database in NEXUS IC is the master database.
2. Navigate to *Database* → *Subscriber* → *Synchronise*.

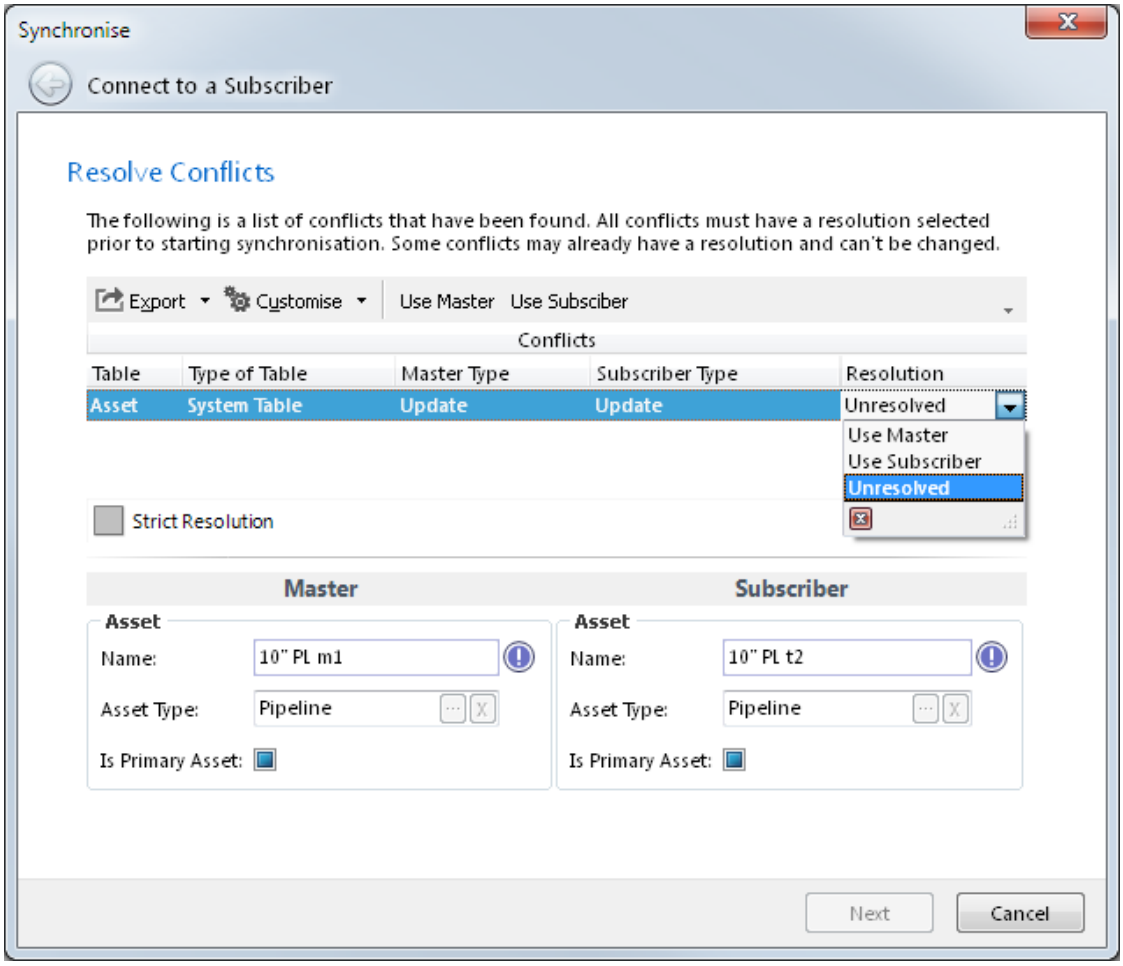
> **Result**
>
> The *Connect to Database* wizard appears. This is for the subscriber database.

4. If your subscriber is already present on a database server, then connect to it. If not, restore it under a *different* name from your main database. If you have the subscriber as a *.nexus-backup file, you must specify a temporary location to restore the backup to so that the synchroniser can work with it.

> **Note**
>
> During synchronisation, no other users can be connected to the database.

5. Resolve conflicts if required. In the below picture, an asset has been renamed from '10" PL' to '10" PL m1' in the master, and similarly renamed to '10" PL t2' in the subscriber. The Resolve Conflicts dialog requires that you tell it which change we want to keep. You can click the **Use Master** or **Use Subscriber** buttons to resolve all conflicts at once, and/or resolve conflicts individually.

> **Result**
>
> Once you have chosen a resolution for all conflicts, the **Next** button becomes available.



6. Click **Next**.
7. Once the synchronisation is complete, click **Commit**. Other users may now connect to the database again.

Note

Changes made to the following tables in a subscriber will not be synchronised back to the master:

- Email
- Report Schedule (hosted clients only)
- Map Server

Attention

Ensure that none of the machines essential to the sync shut themselves down due to power management settings. This includes the NEXUS IC machine and the SQL Server machine. Consider the following:

- If your network is subject to interruptions, try running NEXUS IC on the same PC that is running your SQL Server.
- If your location is subject to power failures, try running NEXUS IC on a laptop.
- If you are running Windows 10, try temporarily pausing Windows updates: *Start* → *Settings* → *Update & Security* → *Windows Update* → *Advanced options*, and set a "Pause until" date.

8.1.5 Expert Systems

8.1.5.1 Manage Expert Systems

The expert systems functionality allows you to export configurations for asset types, asset information groups, event forms, functions, report templates, shortcuts, risk models, charts, and so on, out of one database and import it into another.

This process can be accomplished in one of the following two ways:

- Clients can subscribe to one ore more expert systems as required. Expert systems are basically a central library of "base configuration" databases and the subscription allows for the clients' own database to be periodically updated from the base configuration databases. Expert system databases are maintained by a committee of Wood engineers. When new changes are made to the code, the "base configuration" database is updated and the changes to the configuration are pushed out to all the subscribers. For more information, see *Expert Systems Overview*.
- Configuration elements can be ported between databases using template files without reliance on the subscription model.

  Configuration tables that can be included as part of the template are:

  - Asset types and asset type icons
  - Asset and sub asset information groups (AIGs and sub-AIGs)
  - Event and sub-event definitions
  - AIG and event form and grid layouts
  - Anomaly triggers
  - Workflows
  - Global lookup tables and items
  - Lookup lists and items
  - Unit groups and units
  - Functions
  - Charts
  - Risk models and risk charts
  - Report templates

8.1.5.1.1 Creating and Deploying Expert Systems and Versions

The basic process of creating new expert systems or new expert system versions and deploying them in another database is the following:

1. You create a new expert system in the source database from which you want to export the configurations. For more information, see *Create Expert Systems and Versions*.

2. If the client has subscribed to the expert system and has access to Internet, then in the client management database, the new expert system has to be assigned to the client and the new version has to be made available. For more information, see *Make Expert System Version Available to Client*.
3. In the destination database, you import the expert system as required. For more information, see *Deploy Expert Systems and Versions*.

8.1.5.1.2 Worked Examples

See the following worked examples for a step-by-step guide on:

- Creating a new expert system and porting it to another database using an offline template: *Example: Create and Deploy Expert System Using Offline Template*
- Creating a new version for an expert system and deploying it in a destination database using online subscription: *Example: Create and Deploy Expert System Version Using Online Subscription*

See also

- *Create Expert Systems and Versions*
- *Make Expert System Version Available to Client*
- *Deploy Expert Systems and Versions*
- *Example: Create and Deploy Expert System Using Offline Template*
- *Example: Create and Deploy Expert System Version Using Online Subscription*

8.1.5.1.2.1 Create Expert Systems and Versions

You create a new expert system or a new expert system version in the source database from which you want to export the expert system.

8.1.5.1.2.2 Procedure

1. If you create a new expert system, add the new expert system entry.
   a. From the menu, navigate to *Database* → *Expert Systems.*. and choose **Add**.
   b. Enter a name that identifies the expert system, an owner, and in the *Comments* field, provide a brief description about the purpose and content of the expert system configuration.
   c. Click **OK** to save the expert system.
2. Add elements to the expert system as required.
   a. Select the new expert system from the **Expert Systems** dialog and click **Edit**.
   b. Choose which elements you want to include in the expert system in one of the following ways:
      - Choosing asset types on the **Asset Type** tab. When you select asset types, NEXUS will determine all the associated AIGs, event definitions, functions, report templates that are linked to that asset type and will include all those items in your template.
      - Choosing specific elements on the **Advanced** tab. This allows you to pick and choose which items of this database you want to include in your template. Based on your selection, NEXUS will still ensure that all associated AIGs, event definitions, functions, report templates linked to the items you have selected will be included in your template.
   c. Click **OK** to save the expert system.

3. Add a version to the expert system.
    a. Select the new expert system from the **Expert Systems** dialog.
    b. In the bottom part of the dialog, under **Versions**, choose **Add**.
    c. Enter a description for this version in the **Comments** field. The date and version number is auto-populated.
    d. Click **OK** to save the version.
4. Make the new expert system or expert system version available for the client to import. You can do this in one of the ways described below:
    - **Save to Offline Template**

      You can save the created expert system version into an offline template, which can then be imported manually to the client's database. To do that, proceed as follows:

      a. In the **Expert Systems** dialog, under **Versions**, click **Save Template**.
      b. Select the destination folder where you want to save the template and enter the name of the expert system. Keep the extension as *.expertsystem.
      c. Click **Save**.

      Result

      The expert system data file is created and can be imported into the destination database as described in ** Deploy Expert Systems and Versions*.

    - **Publish**

      If the client has subscribed to the expert system and has Internet access, you can publish the new expert system version. This can then be downloaded to the client's database from the Internet. To do that, in the **Expert Systems** dialog, under **Versions**, click **Publish**.

      Result

      The new expert system or expert system version is added to the Wood client management database (NEXUS_Clients), which you can see under the *Expert Systems* hierarchy when you open the **Feature Related** asset view. A signature is automatically generated for a new expert system. Before the customer can deploy the new expert system version, it must be made available to the client as described in *Make Expert System Version Available to Client*.

See also

- *Make Expert System Version Available to Client*
- *Deploy Expert Systems and Versions*
- *Example: Create and Deploy Expert System Using Offline Template*
- *Example: Create and Deploy Expert System Version Using Online Subscription*

8.1.5.1.2.3 Make Expert System Version Available to Client

If the client has subscribed to an expert system, in the client management database (NEXUS_Clients), the new expert system version must be made available for clients. In case of a new expert system, it also has to be assigned to the client first.

8.1.5.1.2.4 Prerequisites

The expert system or expert system version has been created and published in the source database as described in *Create Expert Systems and Versions*.

8.1.5.1.2.5 Procedure

1. Open the client management database (NEXUS_Clients).
2. In case it is a new expert system, assign the expert system to the client:
   a. Choose the **Default View** asset view and navigate to the client's database.
   b. Select the client's database and from the toolbar, choose *Assets* → *Add* → *Linked Asset (With Children)/Linked Asset (Without Children)*.
   c. Choose the **Feature Related** asset view and from the *Expert Systems* hierarchy, select the expert system that you want to assign to the client.
   d. Click **OK**.
   e. Make sure that the expert system appears as a sub-node under the client's database node in the asset hierarchy.
3. Select the relevant expert system from the asset hierarchy.
4. On the **Asset Information** tab, under *Versions*, double-click the new version of the database or select it and choose **Edit**.
5. In the dialog that opens, change the value of the **Available to Clients** field to *Yes* and click **OK**.

> **Result**
>
> The new expert system is now available for download in the client's database. It can now be deployed as described in *Deploy Expert Systems and Versions*.

> **See also**
>
> - *Create Expert Systems and Versions*
> - *Deploy Expert Systems and Versions*
> - *Example: Create and Deploy Expert System Using Offline Template*
> - *Example: Create and Deploy Expert System Version Using Online Subscription*

8.1.5.1.2.6 Deploy Expert Systems and Versions

Once new expert systems or expert system versions are available, in the destination database, you can import them as described below.

8.1.5.1.2.7 Prerequisites

- The expert system or expert system version has been created and published in the source database as described in *Create Expert Systems and Versions*.
- In case the client has subscribed to the expert system, the new version must have been made available to the client as described in *Make Expert System Version Available to Client*.

8.1.5.1.2.8 Procedure

The process of importing a new expert system or expert system version depends on whether you use an offline template or you subscribed to the expert system:

8.1.5.1.2.9 Importing Expert System from an Offline Template

1. In the destination database, navigate to *Database* → *Expert Systems.*. from the menu.
2. In the **Expert Systems** dialog, click *Import* → *Template File...*
3. Navigate to the expert systems file that you want to import.
4. Click **Open**.

> **Result**
>
> NEXUS retrieves the configuration template and makes the required changes in the destination database. It applies all the new or changed elements but it does not touch elements that are unchanged or exist in your database additionally.

5. Close and reopen the database for the changes to take effect.

8.1.5.1.2.10 Downloading Expert System Version Using Online Subscription

1. In the destination database, navigate to *Database* → *Expert Systems.*. from the menu.
2. In the **Expert Systems** dialog, click *Import* → *Download*.
3. Select the expert system version that you want to import.
4. In the **Summary of Items to Import** dialog, you can review all the elements that are included in the expert system. In the **State** column, you can filter the results to see all the elements or only elements that differ from the elements that exist in your database.
5. Click **Import**.

> **Result**
>
> NEXUS retrieves the configuration template via the internet and makes the required changes in the destination database. It applies all the new or changed elements but it does not touch elements that are unchanged or exist in your database additionally.

6. Close and reopen the database for the changes to take effect.

Tip

You can view the version history of imported expert systems in the **Update History** section at the bottom of the **Expert Systems** dialog (found under *Database → Expert Systems..*). This section shows the specific versions that have been applied, when they were applied, and any additional details available about them.

See also

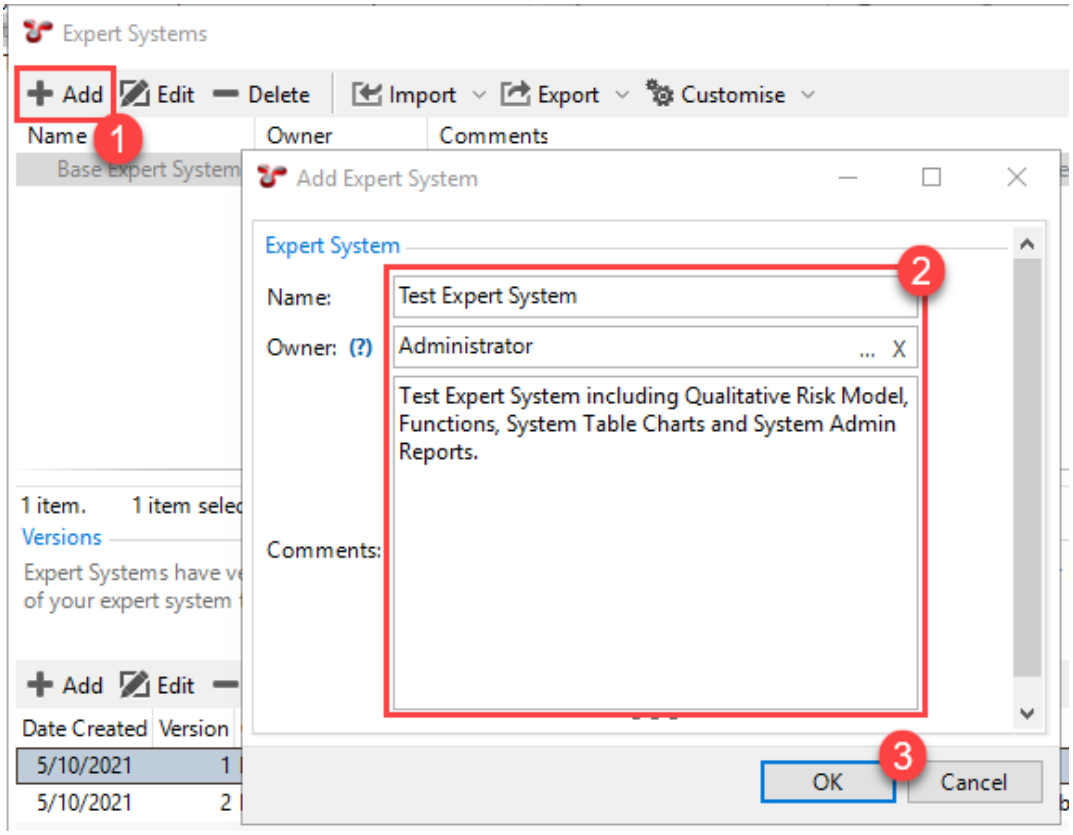
- *Create Expert Systems and Versions*
- *Make Expert System Version Available to Client*
- *Example: Create and Deploy Expert System Using Offline Template*
- *Example: Create and Deploy Expert System Version Using Online Subscription*

8.1.5.1.2.11 Example: Create and Deploy Expert System Using Offline Template

This example shows the end-to-end process of creating a new expert system, exporting it to a template and importing it in the destination database.

8.1.5.1.2.12 Procedure

1. Open the source database and from the menu, navigate to *Database → Expert Systems...*
2. Create the new expert system.
   a. Choose **Add** 1.
   b. Enter a name that identifies the expert system, the name of the owner, and in the *Comments* field, provide a brief description about the purpose and content of the expert system configuration 2.
   c. Click **OK** to save the expert system 3.



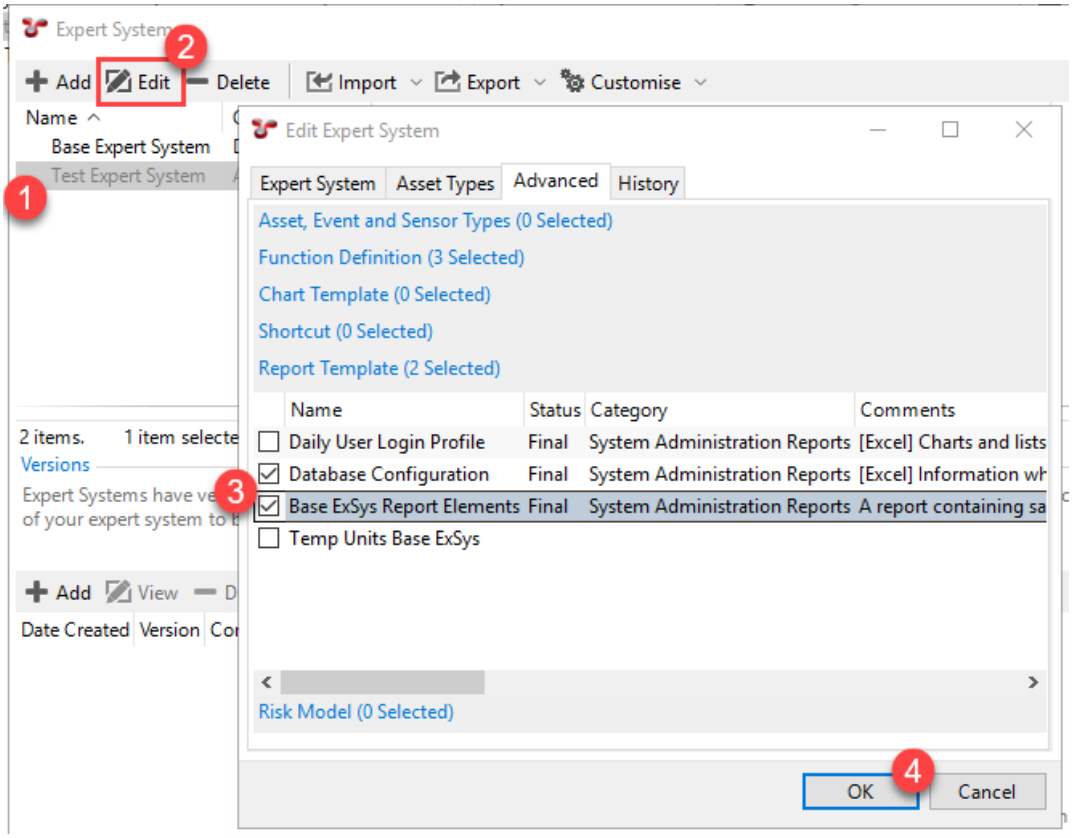
3. Add elements to the expert system as required.

   a. Select the new expert system from the **Expert Systems** dialog (1).

   b. click **Edit** (2).

   c. Select the elements you want to include in the expert system either on the **Asset Type** or the **Advanced** tabs (3).

   d. Click **OK** to save the expert system (4).



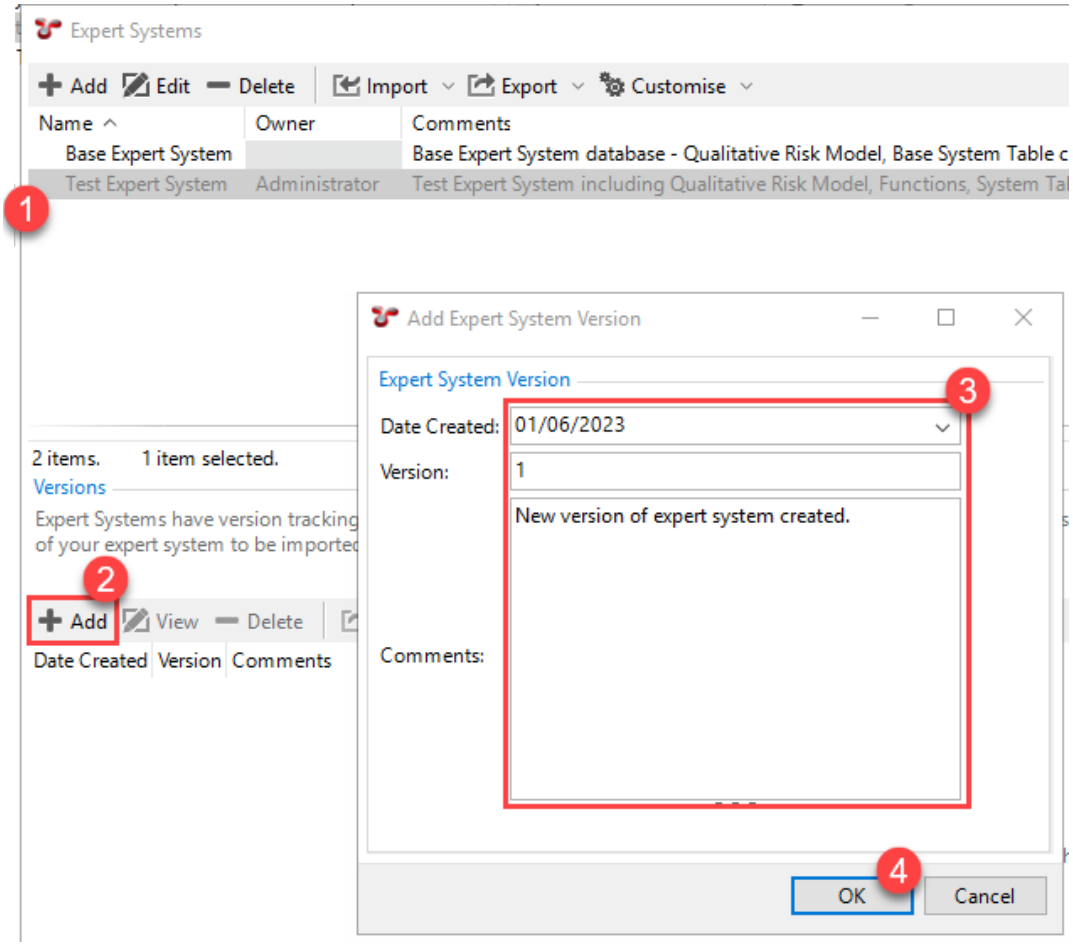
4. Add a version to the expert system.

   a. Select the expert system from the **Expert Systems** dialog (1).

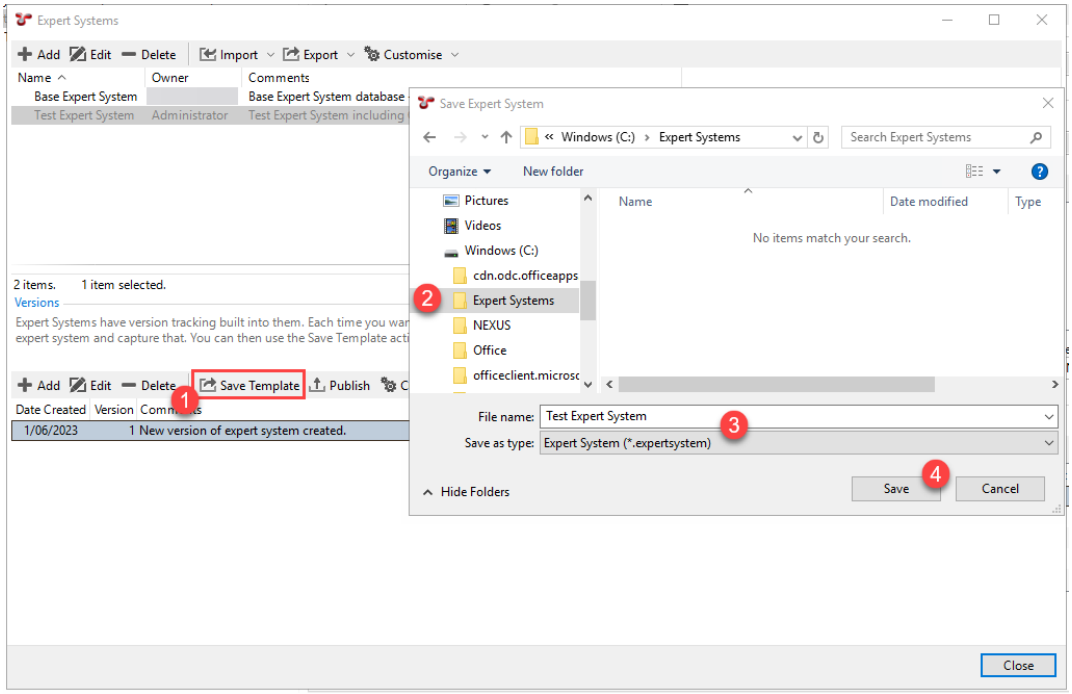
   b. In the bottom part of the dialog, under **Versions**, choose **Add** (2).

   c. Enter a description for this version in the **Comments** field. The date and version number is auto-populated (3).

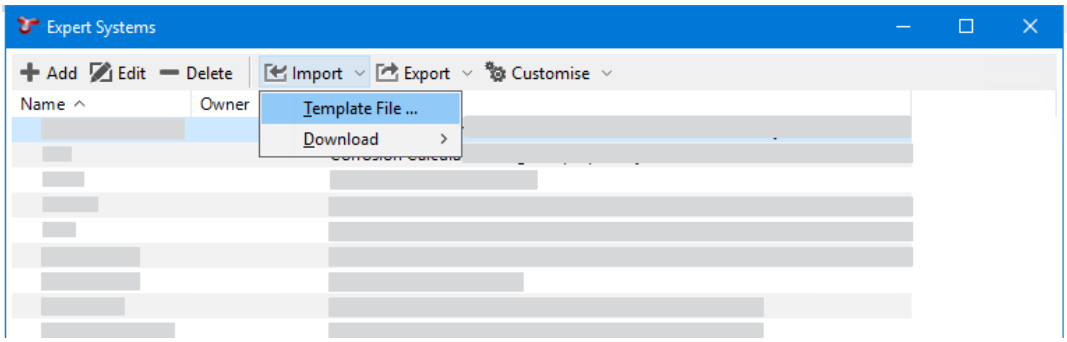
   d. Click **OK** to save the version (4).



5. Save the created expert system version into an offline template.
    a. In the **Expert Systems** dialog, under **Versions**, click **Save Template**.
    b. Select the destination folder where you want to save the template and enter the name of the expert system. Keep the extension as *.expertsystem.
    c. Click **Save**.



6. Open the destination database and navigate to *Database* → *Expert Systems*.. from the menu.
7. In the **Expert Systems** dialog, click *Import* → *Template File...*



8. Navigate to the expert systems file that you want to import.
9. Click **Open**.

Result

NEXUS retrieves the configuration template and makes the required changes in the destination database. It applies all the new or changed elements but it does not touch elements that are unchanged or exist in your database additionally.

10. Close and reopen the database for the changes to take effect.

See also

- *Create Expert Systems and Versions*

- *Make Expert System Version Available to Client*
- *Deploy Expert Systems and Versions*
- *Example: Create and Deploy Expert System Version Using Online Subscription*

8.1.5.1.2.13 Example: Create and Deploy Expert System Version Using Online Subscription

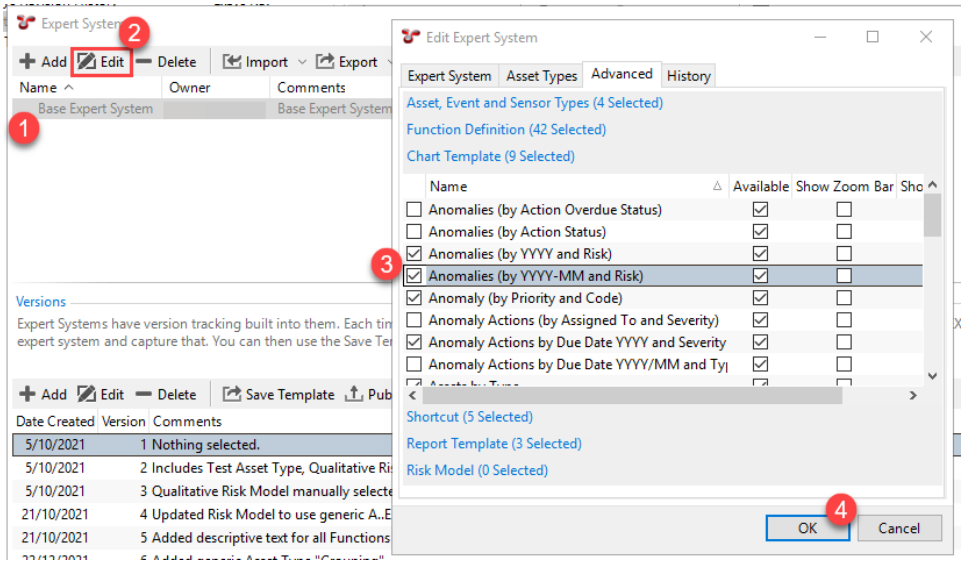
This example shows the end-to-end process of updating an existing expert system, creating a new version for it, making it available to clients in the client management system and deploying it in the destination database.

8.1.5.1.2.14 Prerequisites

You have previously created the expert system and in the client management system, it has been assigned to the client (that is, it appears as a sub-node under the client's database node in the asset hierarchy).

8.1.5.1.2.15 Procedure

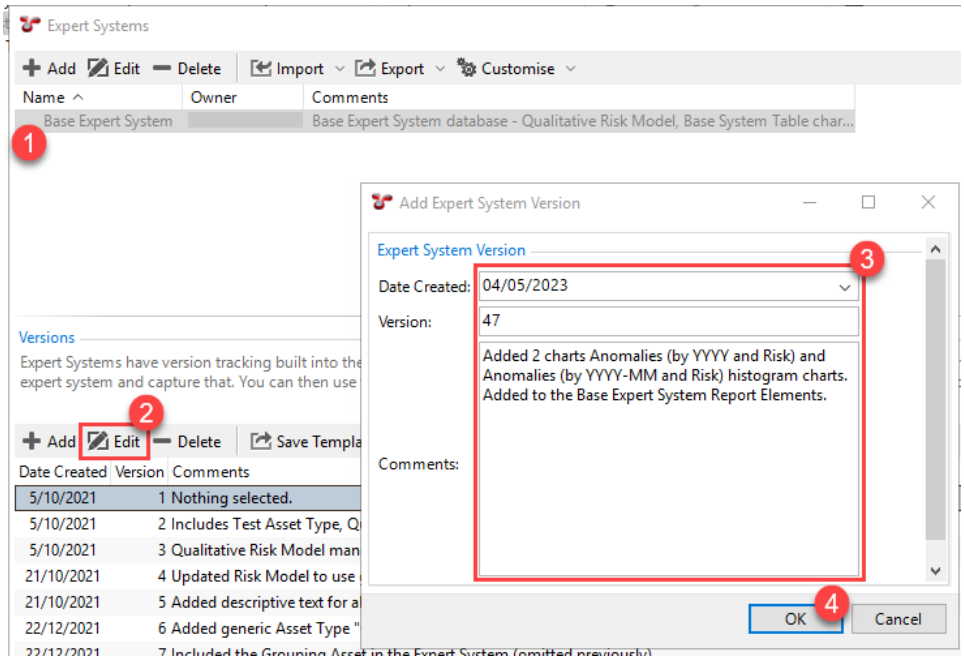
1. Open the source database and from the menu, navigate to *Database* → *Expert Systems...*
2. Add changes to the expert system as required.
   a. Select the expert system from the **Expert Systems** dialog 1.
   b. click **Edit** 2.
   c. Select the elements you want to include in the expert system on the **Asset Type** or the **Advanced** tabs 3.
   d. Click **OK** to save the expert system 4.



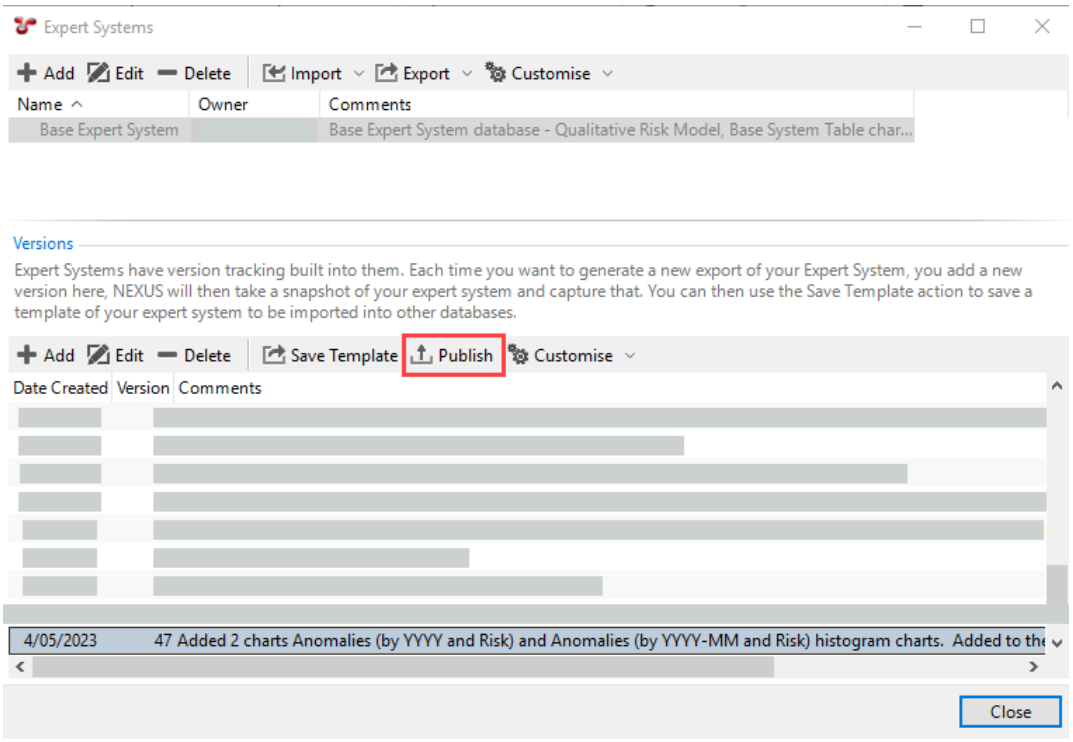
4. Add a new version to the expert system.
   a. Select the expert system from the **Expert Systems** dialog 1.
   b. In the bottom part of the dialog, under **Versions**, choose **Add** 2.

c. Enter a description for this version in the **Comments** field. The date and version number is auto-populated 3.

d. Click **OK** to save the version 4.



5. Publish the new version of the expert system by clicking **Publish** in the toolbar under **Versions**.



Result

The new expert system version is added to the Wood client management database (NEXUS_Clients).

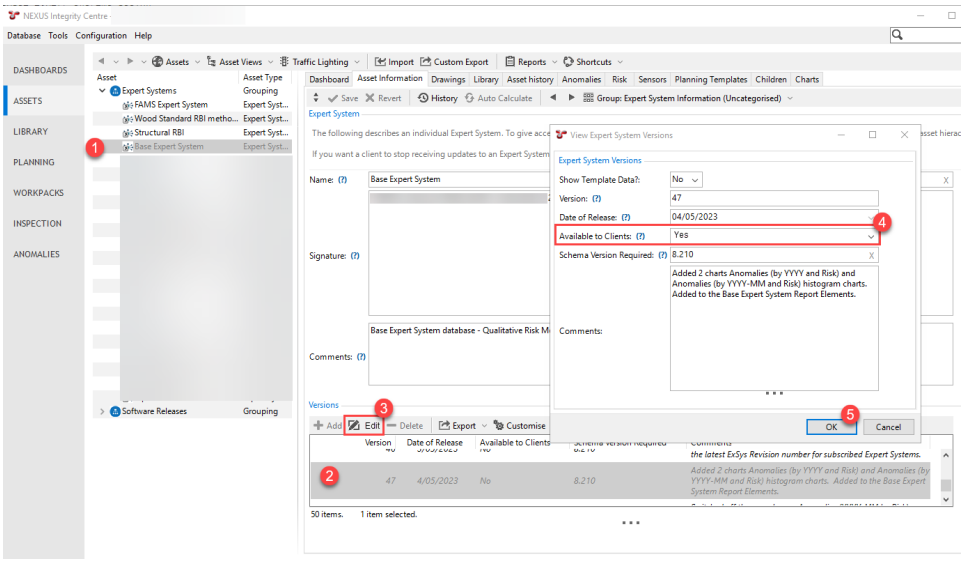
6. Open the client management database (NEXUS_Clients) and make the version available for clients.

    a. Select the relevant expert system from the asset hierarchy (1).

    b. On the **Asset Information** tab, under *Versions*, double-click the new version of the database or select it (2) and choose **Edit** (3).

    c. In the dialog that opens, change the value of the **Available to Clients** field to *Yes* (4).

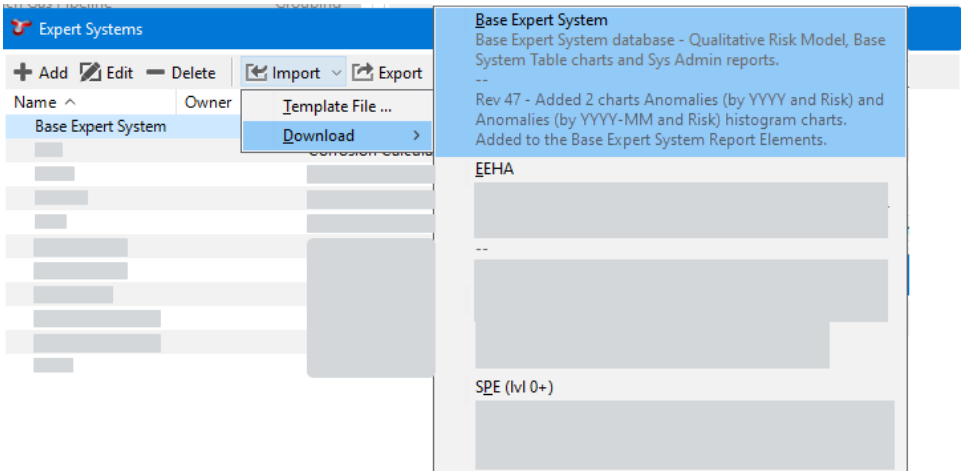
    d. Click **OK** (5).



Result

The new expert system is now available for download in the client's database.

7. Open the destination database and navigate to *Database* → *Expert Systems*.. from the menu.
8. In the **Expert Systems** dialog, click *Import* → *Download*.
9. Select the expert system version that you want to import.



10. In the **Summary of Items to Import** dialog, you can review all the elements that are included in the expert system. In the **State** column, you can filter the results to see all the elements or only elements that differ from the elements that exist in your database.
11. Click **Import**.

Result

NEXUS retrieves the configuration template via the internet and makes the required changes in the destination database. It applies all the new or changed elements but it does not touch elements that are unchanged or exist in your database additionally.

12. Close and reopen the database for the changes to take effect.

See also

- *Create Expert Systems and Versions*
- *Make Expert System Version Available to Client*
- *Deploy Expert Systems and Versions*
- *Example: Create and Deploy Expert System Using Offline Template*

Use this menu option to create and manage expert systems. For more information, see *Manage Expert Systems*.

8.1.6 Close

If you want to open a new database, close the currently open one first. Integrity Centre only allows you to have one database open at a time. If you would like two databases open at once, launch a second copy of Integrity Centre.

8.1.7 Your Profile

The *Database → Your Profile...* option opens the **Profile** dialog, where you can review and manage information related to your NEXUS user account. From this dialog, you can update your profile details, adjust user-specific settings and maintain your list of favourite reports.

For detailed information about each tab within this dialog, see *Profile Dialog*.

8.1.8 Change Password

To change your own NEXUS password, use this menu option. If you are using Windows credentials, this option is not useful or necessary, and will be greyed out.

8.1.9 Properties

This dialog allows you to view or edit a variety of values specific to your database. These include client name, client logo, paths for videos, a variety of default colours associated with drawings, a variety of settings associated with 3D drawings or risk models. For more information about the fields, see *Properties Dialog*.

You can also set up the email host that allows NEXUS IC to send emails (for example, to email a generated report or the contents of any of the grids). For more information, see *Set Up Email*.

The **License** tab contains details of your license key. As part of *Software Based Licensing*, this is where you will enter that license information.

8.1.9.1 Set Up Email

To ensure that NEXUS can send emails (for example, email a generated report or the contents of any of the grids), you must ensure the following:

- The NEXUS database must have an **email host** configured.

- You must define the **email address** for the recipient user.

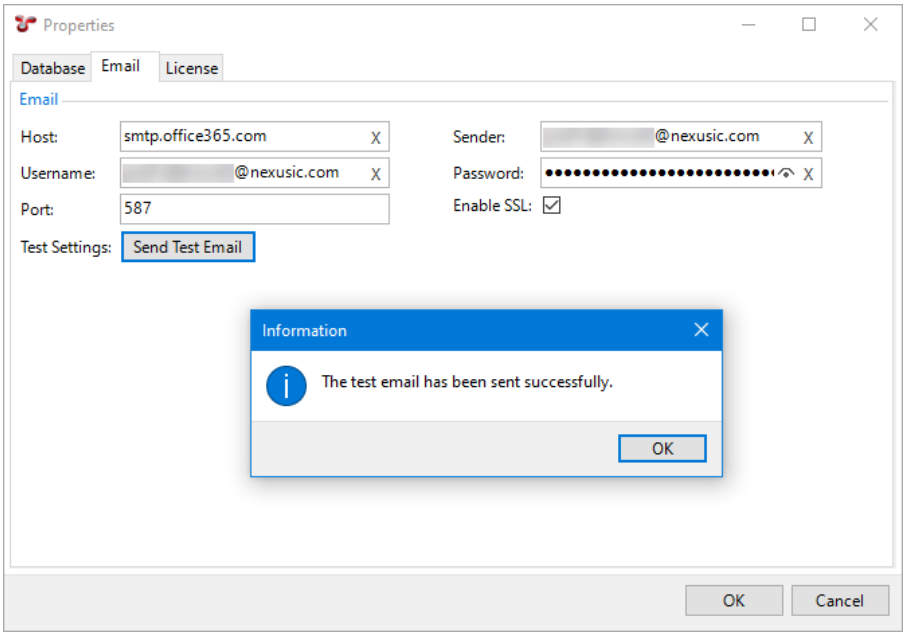
8.1.9.1.1 Set Up Email Host

NEXUS' SMTP host settings must be configured to enable the email functionality.

For Software as a Service (SaaS) customers, the email host is preconfigured. For customers using NEXUS on-premises, the email host must be set up as follows:

1. Navigate to *Database* → *Properties* from the main menu.
2. Go to the **Email** tab.
3. Configure the email host credentials, including **Host**, **Sender**, **Username**, **Password**, **Port**, **Enable SSL**. SMTP settings are specific to your email provider.

> **Note**
>
> We recommend that the NEXUS IC email account is set up by your company's IT team and all email activities are generated from this generic account. Contact your IT department for information on the Host, Username, Password, Port and SSL settings. If you are using a Wood email address, contact Wood IT for more information on this.



4. If required, you can send a test email using the **Send Test Email** button.
5. Click **OK** to save your settings.

8.1.9.1.2 Set Up Recipient's Email Address

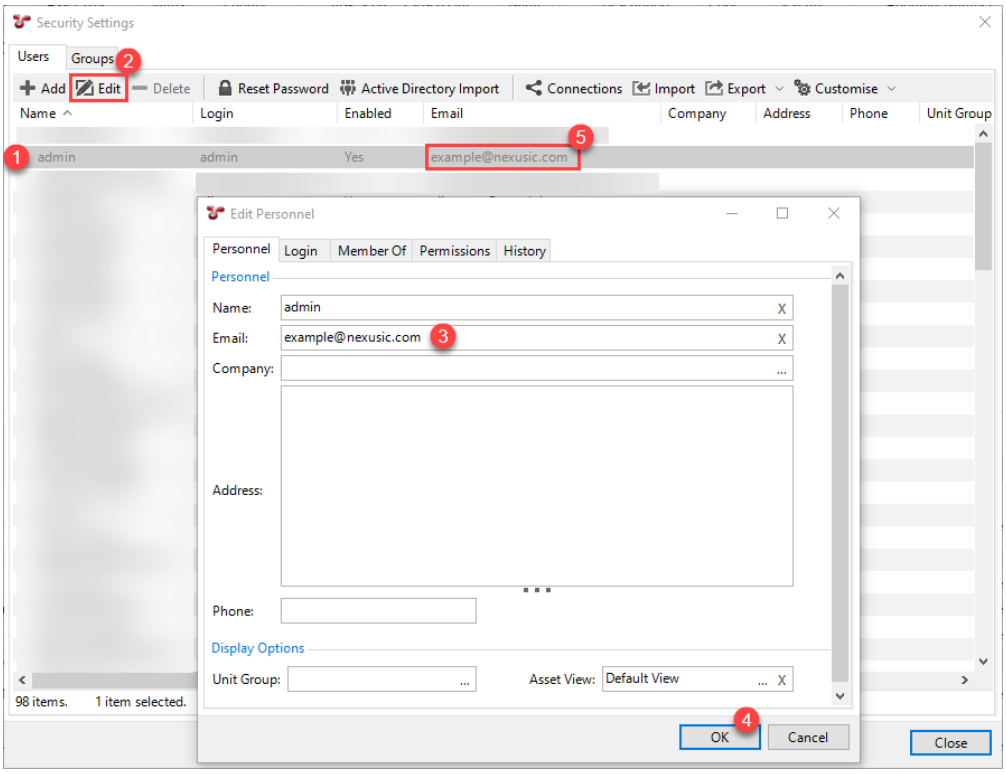
To define the email addresses of users to whom you may want to send emails, proceed as follows:

1. Navigate to *Database* → *Security* from the main menu.
2. Select the user to whom you want to send emails to (1).
3. Click **Edit** (2).

4. Enter the email address on the **Personnel** tab page 3.

5. Click **OK** 4.

   The email address appears in the **Email** column in the **Security Settings** dialog 5.



8.1.10 Audit Log

This dialog shows you a list of user sessions with details about the changes performed during their sessions. For more information about how to interpret the dialog, see *Audit Log*.

8.1.11 Security

You can create users and user groups and set up their permissions as described in *Manage User Security and Permissions*.

8.1.11.1 Manage User Security and Permissions

Before users can start using NEXUS, an administrator must create new users for them in NEXUS IC and assign the required permissions to them.

See the following documentation for detailed information about user management and permissions:

- *User Management*
- *Permissions*

8.1.11.1.1 User Management

Under *Database → Security…*, you can create and manage users, user groups, set up Single Sign-On (SSO) or force reset passwords.

8.1.11.1.1.1 Create a New User

1. In the menu, navigate to *Database → Security…*.
2. On the **Users** tab, choose **Add**.
3. In the **Add Personnel** dialog, complete the required fields on each tab (see *Add/Edit Personnel Dialog* for full field descriptions):
   - **Personnel** tab:
     - Enter the user's profile and contact information.
     - If required, set the **Unit Group** (Metric or US Weights and Measures) under **Display Options**.
   - **Login** tab:
     - Enter a **Login Name**.
     - Tick **Enabled** to enable the account for sign-in.
     - Select **Change Password** to set an initial password.
     - (Optional) Tick **Force Password Reset** to require the user to create a new password at first login.
     - (Optional) Configure **Single Sign-on (SSO)** (see *Set Up Single Sign-On (SSO)*).
   - **Member Of** tab:
     - Assign the user to the relevant security groups (if required).
   - **Permissions** tab:
     - Define any user-specific permissions (see *Set Up Permissions for User/User Group*).
4. Click **OK**.

8.1.11.1.2 Create a New User Group

1. In the menu, navigate to *Database → Security…*.
2. On the **Groups** tab, choose **Add**.
3. In the **Add Security Group** dialog, complete the required fields on each tab (see *Add/Edit Security Group Dialog* for full field descriptions):
   - **Security Group** tab:
     - Enter a name for the group and, if required, add a description or notes.
   - **Permissions** tab:
     - Configure the permissions assigned to the group (see *Set Up Permissions for User/User Group*).
4. Click **OK**.

> **Note**
>
> After creating the group, editing it will display an additional **Members** tab, where you can include or exclude users. You can also add users to the user group when creating or editing a user as described in *Create a New User*.

8.1.11.1.1.3 Set Up Single Sign-On (SSO)

You can configure a user to use Window domain credentials to log in to Integrity Centre. This is smoother as users will not need to enter a separate password when they start Integrity Centre — instead Integrity Centre will query the domain controller to check the user's credentials. To configure this:

1. Edit the user and go to the Login tab.
2. Click the button under 'Windows User'.
3. In the resulting 'Select User' dialog, you may need to click Locations and select Entire Directory.
4. Type the user's full or partial Windows login name, and click Check Names, choose the appropriate name from the list and click OK.

Note

- This configuration is relevant for on-premises deployment only. For information about setting up SSO for Software as a Service (SaaS), see *Software as a Service (SaaS) Deployment*.
- Windows domain credentials may not work when you are away from the Windows domain.

Tip

You can always bypass the automatic connection to the database using domain credentials by holding down the **Shift** key as Integrity Centre starts up.

8.1.11.1.1.4 Force Reset Password

If you are *not* using SSO, you can force a user to reset their NEXUS password on their next login. (You would typically do this when you have just created a user account and have set a temporary password.) On their next login, the user will be required to enter their old password and then choose a new one before they can proceed.

To enable this feature, under *Database → Security...*, go to the **Login** tab and tick the **Force Password Reset** checkbox.

8.1.11.1.2 Permissions

In general, permissions are applied at the table level, whether it is a dynamic or system table. Special permissions can be used if necessary. For more information, see *Generic Permissions*.

Note

Some screens or tabs on the NEXUS IC interface are only visible if the user has the necessary permissions for the underlying tables. For more information, see *Permission Requirements for User Interface Elements*.

You can also set up permissions at the asset view level. For more information, see *Asset View-Specific Permissions*.

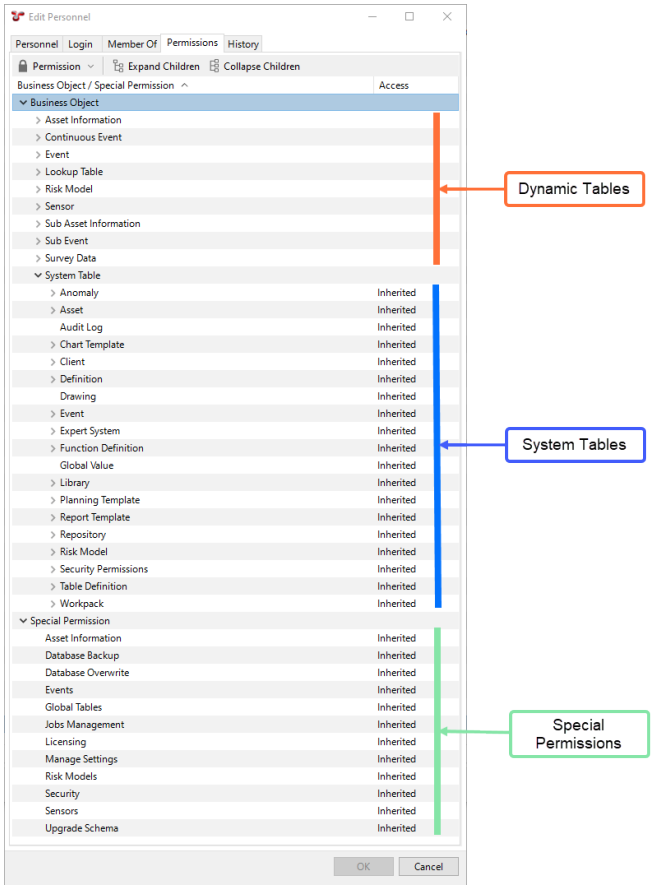
8.1.11.1.2.1 Generic Permissions

Generic permissions are managed on a table-by-table basis, rather than on a screen-by-screen basis. For example, if you want a user to be able to add or delete assets, you should edit the user or the user's group and give them **Read / Write** permission on the system table 'Asset'. If you want to enable this user or group only to view assets but not to add or delete them, give the user or group **Read** permission.

You can set up permissions on business objects, which can be either dynamic tables (tables defined by client or expert system) or core system tables.

In addition to setting up permissions on specific tables, you can set up Special Permissions. For more information, see *Special Permissions*.

You set up all these permissions on the **Permissions** tab of the **Edit Personnel** dialog (see *Set Up Permissions for User/User Group*):



8.1.11.1.2.2 Inheritance of Permissions

Each user has their own permissions, plus they inherit the permissions of any user group they are a member of. If a user has their own permissions, these override the permissions they inherit from any user group.

When multiple permission levels apply, they are prioritised as follows:

Priority	Permission Level
1	User-specific permission
2	Permissions inherited from user group

8.1.11.1.2.3 Determining Permissions

To figure out the permission for an item, NEXUS proceeds as follows:

1. It retrieves the permissions specific for the user for the relevant business object (dynamic or system table).
2. If no user-specific permissions have been set up, it checks the same permissions of all groups the user is a member of. If the user is a member of several groups with different permission settings, it determines the permission based on the permission types (see below).
3. If there are no resultant permissions set, then NEXUS checks if there is a Special Permission that can be applied. For example, if an Asset Information form has no explicit permissions (because it is set to **Inherited**), then NEXUS will use the *Asset Information* special permission.

8.1.11.1.2.4 Permission Types

The following types of permissions can be applied:

Permission Type	Description
Read/Write	Allows a user to both view and modify the contents of a table or item. This permission is additive and overwrites **Read** and **Inherited**.
Read	Allows a user to view the contents of a table or item but not make any changes. This permission is additive and overwrites **Inherited**.
Inherited	It means that no specific permissions have been applied for this security item, for this user or user group. In case of a user, permissions will be inherited from the user group as described above. In case of a user group, **Inherited** means that no permissions are set up, that is, the permission will be **Deny All**.
Deny	Denies Write permissions. This permission is subtractive and overwrites **Read/Write** and **Inherited**.
Deny All	Denies Read/Write permissions. This permission is subtractive and overwrites all other permission types.

For example, if a user is a member of several user groups, and their permission in one user group is **Read**, in the other it's **Read/Write**, then **Read/Write** will apply. If, however, the permission is **Deny All** in any of the user groups, **Deny All** will apply.

Caution

- To log in to the database, a NEXUS login must have **Read** permissions (as a minimum) to the *Personnel* table, so ensure that *Business Object* → *System Table* → *Security Permissions* is set to **Read** for all users.
- Setting **Deny All** on the Special Permission *Security* will disable the *Database* → *Security* main menu item, regardless of what permissions have been set on the security permissions tables.

8.1.11.1.2.5 Special Permissions

Special permissions can be used in case there's no relevant business object (dynamic or system table) for which the permissions can be applied to, or, if you want to apply permissions to specific types of system tables in general when there's no permission set up for specific tables. See below for more information about each special permission:

Special Permission	Description
Asset Information	Applies as the default permission for any AIG or Sub AIG business objects where the AIG or Sub AIG table permission itself is set to *Inherited*.
Database Backup	Permission for creating database backups. There's no relevant system table business object.
Database Overwrite	Permission for overwriting the database. There's no relevant system table business object.
Events	Applies as the default permission for any Event, Sub Event, Continuous Event and Survey Data dynamic table business objects where the permission is set to *Inherited*. This special permission does not include the core Event system tables (such as Event, Bookmark, Multimedia). These are covered under the *Event* node of the System Table business objects only.
Global Tables	Applies as the default permission for any Global Table business objects where the permission is set to *Inherited*. This pertains only to the data within the Global Tables. Security permissions for the configuration of Global Tables are managed in the *Table Definition* node of the *System Table* business object.
Jobs Management	Permission for using the Job Management Console. There's no relevant system table business object.
Licensing	Permission for managing licences. There's no relevant system table business object.
Manage Settings	Permission for configuring the NEXUS database. There's no relevant system table business object.
Risk Models	Applies as the default permission for any Risk Model business objects where the permission is set to *Inherited*. This does not include the Risk Assessment system table.
Security	Applies as the default permission if the permission of the Security Permissions system business object is set to *Inherited*.
Sensors	Applies as the default permission for any Sensor business objects where the permission is set to *Inherited*. This pertains only to the data within the Sensor Tables. Security permissions for the configuration of Sensors are managed in the *Table Definition* node of the *System Table* business object.
System Information	Permission for maintaining System Information configuration items, including field helps for specific system tables. There's no relevant system table business object.
Upgrade Schema	Permission for performing schema update. There's no relevant system table business object.

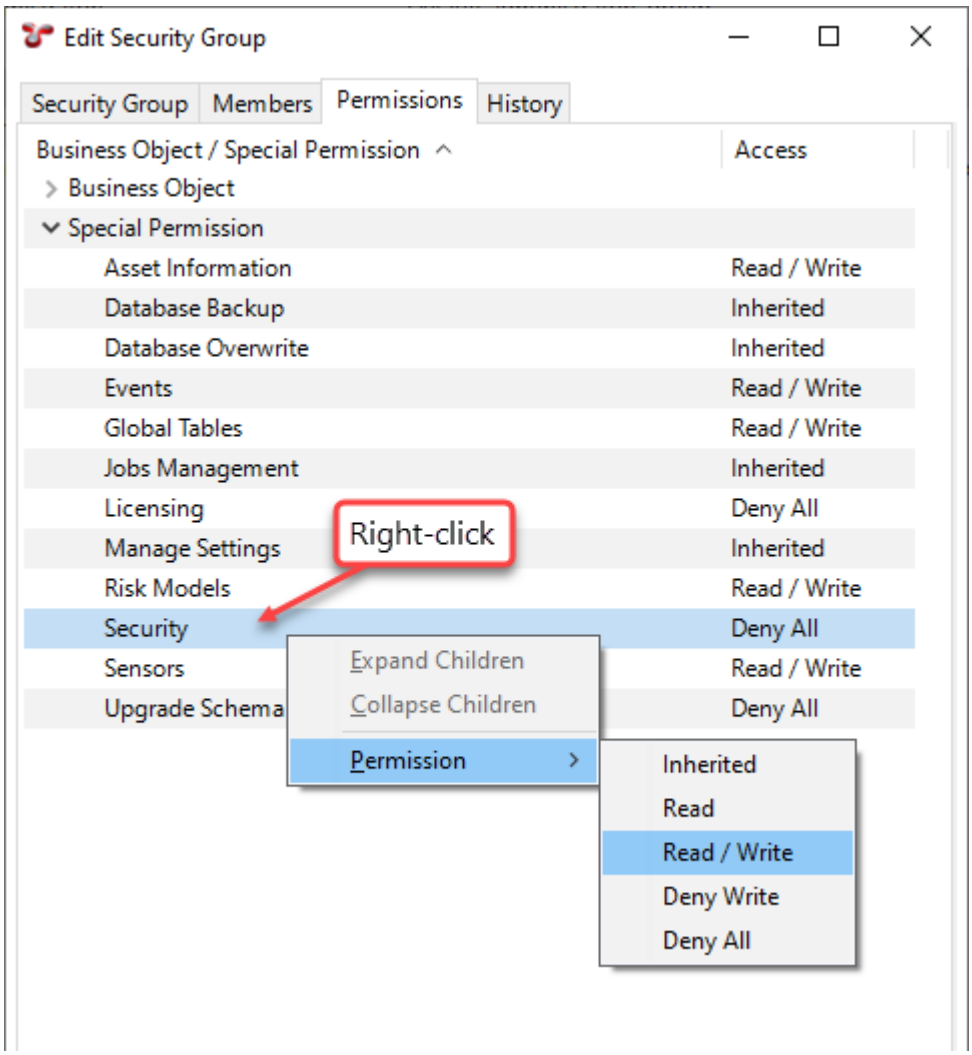
8.1.11.1.2.6 Set Up Permissions for User/User Group

Once you have a user or user group created in your database, you can assign permissions to them as described below. By default, most permissions are inherited based on the permission management rules described above.

1. In the menu, navigate to *Database* → *Security*....
2. On the **Users** or **Groups** tab, select the relevant user or user group and click **Edit** in the toolbar, or just double-click the item to open the dialog for editing.
3. In the dialog that appears, go to the **Permissions** tab.
4. Select either a business object or a special permission for which you want to make permission settings.

5. Right-click the selected item and in the drop-down menu, select the required permission under **Permission**.

   For example, if you want to change the *Security* permissions for a user group from *Deny All* to *Read / Write*, proceed as follows:



6. Click **OK**.

8.1.11.1.2.7 Permission Requirements for User Interface Elements

Certain screens and tabs on the NEXUS IC interface are hidden if the user lacks the necessary permissions for the underlying tables.

To ensure visibility, the following screens and tabs require at least **read** access to the specified system tables:

Screen	Tab	SYSTEM TABLE
ASSETS	**Drawings**	Library
ASSETS	**Library**	Library
ASSETS	**Asset History**	Asset -> Asset History
ASSETS	**Anomalies**	Anomaly
ASSETS	**Risk**	Risk Model, Risk Model -> Risk Assessment
ASSETS	**Planning Templates**	Planning Template
LIBRARY (main screen)	n/a	Library
PLANNING (main screen)	n/a	Workpack -> Task
PLANNING	**Tasks**	Workpack -> Task
PLANNING	**Risk**	Risk Model, Risk Model -> Risk Assessment
PLANNING	**Shutdowns**	Workpack -> Shutdown
WORKPACKS (main screen)	n/a	Workpack
WORKPACKS	**Tasks**	Workpack -> Task
WORKPACKS	**Risk**	Risk Model, Risk Model -> Risk Assessment
WORKPACKS	**Shutdowns**	Workpack -> Shutdown
ANOMALIES (main screen)	n/a	Anomaly
ANOMALIES	**Actions**	Anomaly -> Anomaly Action
ANOMALIES	**Findings**	Anomaly -> Finding
ANOMALIES	**Library**	Library

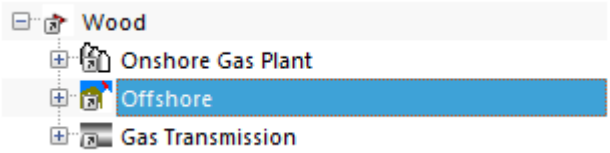
8.1.11.1.2.8 Asset View-Specific Permissions

Asset security is a feature that allows even more granular control of access to information than our generic permission settings do. It allows you to set what asset views in your database you want each user to have access to.

Asset security works on the principle that all users have access to everything by default, and then database admins remove access as necessary. Restricting access is as simple as creating an asset view that contains the parts of the hierarchy to be restricted, and then setting appropriate access rules on that asset view. Parts of the hierarchy can appear in multiple views with multiple security rules and the rules will be applied across all of their views.

8.1.11.1.2.9 Example

Suppose you have the following asset hierarchy:



You want to restrict access to the “Offshore” part of the hierarchy by making it visible to Offshore Engineers but block access to Onshore Engineers. To do that, make settings as follows:

1. Log in as an administrator.
2. Ensure that you have created user groups for “Offshore Engineers” and “Onshore Engineers”.
3. On the **ASSETS** screen, create a new Asset View (see *Asset Views*) and give it a helpful name, such as “Offshore assets - Offshore Engineers only”.

4. Display the new Asset View by clicking *Asset Views → Offshore assets - Offshore Engineers only*.
5. Insert the Offshore part of the hierarchy as a link:
    a. Choose *Assets → Add → Linked Asset (With Children)* from the toolbar.
    b. Select the relevant offshore asset and click **OK**.
6. Set the permissions on this asset view as follows:
    a. Choose *Asset Views → Edit*.
    b. On the **Permissions** tab, click **Add**.
    c. Set appropriate permissions for each user group:
        - For Offshore Engineers, set the permissions to "Read/Write" to give them full access.
        - For Onshore Engineers, set the permissions to "Deny All" to block these users.

Result

The Offshore Engineers will have full access to that part of the tree, and Onshore Engineers will have no access. This access will be applied across asset views, so that Onshore Engineers will not be able to circumvent their restrictions by switching to a different asset view. If people who are blocked from assets try to view them, they will see the following:

Note

- In setting up asset level security rules, a user will have the lowest access they have set up.
- If you remove a user group's access from the "Default View", it will give them no access to any assets (as they now have deny access on all assets).
- If a user belongs to multiple user groups, and one of the groups has access in one view but another group does not have access, then the user will not have access to the assets. The rule is that the most restrictive permission is applied.
- Giving a user Read-Only access is the same as Deny Write (in this context).

Asset security also applies to *Library* items. If a library item is *connected* to an asset that the user has no permission to read and/or write, then the user will similarly have no permission to view and/or edit that library item.

Note that asset security is likely to have an impact on performance, because NEXUS IC must look up every asset to check its security before it can be displayed to the user.

8.1.12 Export Repository

Use this menu option to export all library items (including drawings) and event multimedia. (In previous versions, this option also exported survey data, but survey data in version 6 is no longer stored in the same way and is therefore not exported from this menu option.)

8.1.13 Show/Hide Status Bar

Under *Database* → *Show/Hide Status Bar*, you can toggle the status bar at the bottom of the main screen of NEXUS IC on or off. For more information about the status bar, see *Using the Status Bar*.

8.2 Configuration

8.2.1 General Configuration

When you choose *Configuration* → *General* from the main menu of NEXUS IC, you can make settings for the following:

8.2.1.1 Configure Boolean Types

Under *Configuration* → *General* → *Boolean Types*, you can set up boolean type values for Yes/No fields.

By default, Yes/No fields in NEXUS have the values *Yes* or *No*. However, if you need values different from Yes/No, you can define different boolean types under *Configuration* → *General* → *Boolean Types*. For example, if you have a field called "Secure?", you can assign a boolean type to the field with the values *Secure* and *Not secure*.

8.2.1.1.1 Creating Boolean Types

To create a new boolean type, proceed as follows:

1. Choose **Add**.
2. Enter the name of the new boolean type.
3. Click **OK**.
4. Select the boolean type that you've just created and click **Edit**.
5. Set up the values of the boolean type on the **Values** tab. A boolean type can have two or three values: one for the true state, one for the false state, and an optional third state for "null" (neither checked nor unchecked state). A field with a boolean type assigned to it will appear as a combo box where the user can select from the predefined values from a drop-down list.
6. If you want a boolean field to have just two states, tick the *Required* checkbox for that field.

8.2.1.2 Configure Chart Templates

8.2.1.2.1 Charts and Drawings

You can put a drawing behind a chart template. This is useful when the chart template shows event data — you can show that event data right on a drawing or photo of the asset itself.

You can also show regions (points, lines, shapes) from events on a chart template, and you can show multimedia (photos) on a chart template.

Configuring this involves visiting several different areas of NEXUS IC, so it is documented here, rather than in any specific area.

8.2.1.2.1.1 Configuring an Event Type to include a shape

First, take a database backup.

Then go to *Configure Event Types*. Ensure that a sub-event is created, and that in the bottom half of the configuration dialog it has two numeric fields called X and Y.

Still in *Configure Event Types*, select the event you want to show as a polygon, series of lines, or point on the chart template. In the bottom half of the configuration dialog, ensure that it has a field of type Table Link. Edit this field. On its Field Definition page, ensure that its **Sub AIG/Event** is set to the sub-event you created in the previous step.

On its Field Layout page, look at its Editor Type. If you would like this to show on the chart template as a series of line segments (i.e. as an open curve, good for representing cracks, scratches, etc) select **Graphical Markup (Line)**. If you would like it to show as a point, select **Graphical Markup (Point)**. If you would like it to show as a polygon (i.e. a closed curve), select **Graphical Markup (Region)**.

8.2.1.2.1.2 Configuring the Chart Template to support Drawings and Event shapes

Go to *Configure Chart Templates*. Edit the chart template you want to show events on. Ensure that **Show Drawings** is checked.

Still on that Chart Template, in the bottom half of the dialog, ensure that the Chart Template has a Series for the Event Type that you want to display on the chart. Edit the Series. Ensure that its **Series Type** is set to match the Editor Type that you picked for the Event's Table Link field: **Points** for **Graphical Markup (Point)**; **Polygon** for **Graphical Markup (Region)**; **Polyline** for **Graphical Markup (Line)**. On the Series' Axis page, ensure that it has an X and a Y axis. Edit each Axis. For the X Axis, ensure that the **Parameters (Inputs)** value is set to the X field of the Sub Event. For the Y Axis, similarly ensure it is set to the Y field of the Sub Event.

8.2.1.2.1.3 Configuring a Drawing to support display behind a Chart Template

Go to *Drawings*, click Edit Layers, add a rectangle layer, change its type to Coordinates, set an Asset for that layer, set left/right/top/bottom for that layer.

On the Inspections screen, in the *Charts* pane, select the Chart Template. Click the Drawings button/menu and pick the Drawing from the list.

At least one event must have event shape data on it for the Chart Template to show the Drawing — the Chart Template zooms to Event data, not to the coordinates layer. If that Event's Shape is completely outside the Coordinates you selected for the drawing Layer, the Drawing may not be visible.

Once the image is set up correctly in the Chart Template, it will also show in the Event shape editor.

8.2.1.2.1.4 Photos in Events onto Chart Templates

You can have a multimedia (e.g. a photo) on the event's shape layer. In shape layer editor in *Event Details*, click **Multimedia** then pick photo. You can move and size the photo.

Mouse wheel zoom may not work in the Event shape editor. This is a focus issue related to Windows. Use the magnify+ and magnify- buttons instead.

When you change an Event's shape, the Chart Template may not automatically refresh in 6.0. Click off the asset and back on to force a refresh.

8.2.1.2.2 Configure Axes for a Chart Template Series

When you edit a series (see *Maintain Series for Chart Templates*), you can configure one or more axes for it on the **Axis** tab.

> **Note**
>
> This tab isn't visible when you've just added a series. Click **OK** and then **Edit** to make the tab visible.

Each axis must have a name. If your chart has several series, you may wish to give the X axis the same name in each series, and give the Y axis the same name in each series.

8.2.1.2.2.1 Axis Kind

The kind of an axis reflects the way the axis is graphically represented in the chart.

You can use the following axis kinds:

Axis Kind	Description
X Axis	Used to define the primary horizontal axis of the chart. The X Axis controls how values are positioned along the horizontal dimension, typically based on time, KP or any other field that represents progression or sequence in the data.
X2 Axis	Useful where something covers a span of time or a distance of KP. For example, you can set the X Axis to Event.Start KP and the X2 Axis to Event.End KP, allowing the chart to show the full span of each item. If the chart covers a period of years, NEXUS will attempt to pick axis ticks on the first day of the month or the first day of the year.
Y Axis	Defines the primary vertical axis of the chart. Use the Y Axis for numeric or quantitative values you want to measure or compare, such as counts, durations, depths or any other sensor data.
Z Axis	A specialised axis used in the **Pipeline View** chart template (a 3D chart). This axis is not normally used in other chart types.
Z2 Axis	A second specialised axis used alongside the Z Axis in the **Pipeline View** chart template. It is not typically used in other chart types.
Colour Axis	Maps a data field to colour, allowing you to visually distinguish values, categories or series using a discrete colour set. This is useful when you want to show a third variable without adding additional series or axes.
Split Series Axis	Allows you to split data on one series into several series by some field you choose, such as Asset or Workpack. For example, if you have data in several different workpacks, and you'd like each workpack represented on your chart as a separate series, add a Split Series axis, and set its Parameters (Inputs) to Event.Workpack. Similarly, if you'd like to split data from different assets into different series, you would choose Event.Asset for your input. Splitting by asset is only useful when you filter to include child assets in your event listing, and have selected an asset that has children. Otherwise, all the data in the listing will by definition be from just one asset. The series will each show separately in the chart legend, and the user can make individual series visible or invisible.
Split Chart Axis	Works the same way as Split Series Axes, except that instead of your data appearing as several series on one chart, they will instead appear as a series of charts, one above another. Any other series on the chart that don't have a Split Chart axis will appear on all of the split charts.

For an X/Y chart, you may have two axes, but charts may have more axes, up to one each of the kinds listed below.

Depending on the **series type**, you can use different axis kinds as follows:

Series Type	Axes
3D Events series	Used to represent events along the pipeline, with: • Z and Z2 axes representing the start and end of each individual event • a Y axis representing the diameter with which that event should be drawn (diameter is inflated slightly "for free", to make the events stand out from the pipeline) • a Split Series axis (see below), which is typically used to separate different event types into separate series • a Colour axis, to determine the colour to paint each event.
3D Mesh series	Used to represent the seabed. The Z axis is used to represent the KP (i.e. the distance *along* the pipeline). The X axis is used to represent the distance *away* from the pipeline. The Y axis is used to represent the vertical distance, to show the actual variation in the seabed.
3D Pipeline series	Used to represent the pipeline itself, and has Z and Z2 axes which represent the start KP and end KP of the whole pipeline. It also has a Y axis, which represents the diameter of the whole pipeline.
Anomaly Trigger series	Similar to Horizontal Line series. When you specify a value field for this series, NEXUS does not pull data directly from that field. Instead, it looks for *anomaly triggers* configured on that field, and shows one horizontal line for each trigger. If there are several different triggers on this field (perhaps with different severities or codes), you will get several different lines. The vertical position of each horizontal line is determined by the trigger value. If there are different trigger values for different horizontal positions (for example, a pipeline might have different allowable span lengths at different KP ranges), you can add an X axis of *type* Auto and NEXUS will behave appropriately.
Bars series	X, X2 and Y axes. X and X2 are used to define the left and right edge of each bar.
Bezier Lines Point and **Line** series	Only X and Y axes
Bubble series	Only X and Y axes. If there are multiple points at the same location in a bubble series, the resulting bubble will be drawn larger.
Contour series	Can be used to show contour lines for some "height" value, as seen in a topographic map or an isobaric weather chart. <explain axis settings>
Donut or **Pie Chart** series	Use an X Axis to give the name of each pie slice, and a Y Axis to set the size of each slice. Donut and pie charts don't really have an X or Y axes, so in this case, axes represent a different meaning. Optionally, you can also add a Colour axis to specify the colour of each slice. If your chart represents event counts, Table Definition.Colour might be a good choice. If you don't specify a Colour axis, NEXUS randomly uses a different colour for each slice.
Gantt series	X, X2 and Y axes. X and X2 are used to define the beginning and end of each horizontal Gantt line. If you have a Split Series axis on a Gantt series, ticking the Gantt series' **Show Stacked** checkbox will show each separate split value in its own vertical space. If you untick **Show Stacked**, the split series will share vertical space. For example, if your Split Series splits on Event Type, ticking **Show Stacked** will give a row for each event type; unticking it will combine all event types in one row. However, you can still distinguish event types by colour, and can make individual series visible/invisible.
Gauge and **Gauge Indicator** series	These series are designed to be used together. A Gauge series is like the top half of a donut chart, in a half-circle. Gauge series have X and Y axes: X is used to define the order in which entries should be shown in, and Y sets the size of each slice. A colour axis is also typically used. The Gauge Indicator series is the needle showing the value on the scale, and has a Y axis for value, and X axis for label. **Tip:** Create a *Global Table* to define the Gauge series colour, order and values.
Heat Map series	Similar to *Contour* series, but shows the "height" value as a colour axis, instead of as a series of colour lines. You can combine a Contour series and a Heat Map series on a single chart, to give two different representations of the same data. <explain axis settings>
Histogram series	Only X and Y axes. X is used to define the centre of each bar.
Horizontal Line series	Only a Y axis
Polygon and **Polyline** series	These series are very similar. Polygon is a "closed curve", where we connect the last point back to the first. They are useful where events have defined shapes (for example, delamination on a concrete wall). See *Charts and Drawings* for more details. Polyline is an "open curve". <explain axis settings>
Vertical Line series	Only an X axis

You can add a Split Series axis, Split Chart axis or Colour axis to almost any chart series. For example, a Split Series axis on a Histogram series will give a stacked bar chart.

Example

You want to use some piece of event data to set the Y value of points on your chart. In this case, you would add a Series of type Points, and within that, you would add an Axis of kind Y Axis, with an axis type of Field, then select the database field you want to use for your Y values. You'd also pick something for your X position: you'd add another Axis to your Series, with kind X Axis, and then choose whatever type and other details were appropriate.

8.2.1.2.2.2 Axis Type

The type of an axis reflects the source of data to be represented using the given axis.

You can use the axis types below as follows:

Axis Type	Usage
Auto	Automatically generates a numeric axis based on the minimum and maximum values you specify. The system determines appropriate tick spacing and calls the solver function repeatedly across that range if used with a Calculation axis. Useful when you want the axis values to be driven by a defined range rather than by data stored in fields.
Average (Aggregate)	An aggregate axis type. Calculates the average of the selected field across all records included in the chart. Use this when you want to display mean values rather than raw data points.
Calculation	Specify a function (see *Configure Functions*), and specify inputs for that function. You could equivalently create that function as a field on your form, and then use the Field type, but sometimes you only want the function in the chart, and you don't want it cluttering up your form.
Count (Aggregate)	An aggregate axis type. Counts the number of records that match the filter criteria for each point or category plotted. Useful for frequency charts or when you want to show how many occurrences fall into a given bucket.
Field	The simplest axis type. Specify a field from a table that you want the chart series to pull data from.
Min (Aggregate)	An aggregate axis type. Computes the minimum value of the selected field across all records included in the chart. Useful when you want to show the lower bound of a dataset, such as the minimum remaining life or the lowest sensor reading over time.
Max (Aggregate)	An aggregate axis type. Computes the maximum value of the selected field across all records included in the chart. Useful when you want to show the upper bound of a dataset, such as the highest sensor reading or the maximum remaining life range.
Sum (Aggregate)	An aggregate axis type. Computes the total (sum) of the selected field across all included records. Use this when you need cumulative values rather than individual entries.

Example

You have wall thickness depletion as a percentage, and you want a chart showing how often each percentage occurs. Set up an Auto axis, ranging from 0 to 100, and set up the other axis as a Calculation type. In the function you select for that Calculation axis, include a Solver element. NEXUS IC will call your solver function many times, for different points along your axis range, and those values will get plotted on your chart. As your Auto axis' range increases, the step size increases, but not proportionately. This means that if you choose a very wide range (for example, 1 to 1000000), then your Solver function may get called a very large number of times. That may take a long time.

8.2.1.2.2.3 Sensor Clock

When configuring a date/time axis for a chart of sensor data, you cannot pick the Clock value as usual. In general, when configuring Clock for an Event table, you can just pick Event.Start Clock and/or Event.End Clock. However, Sensor has no analogous "parent" table, so you can't do this. You can't pick Clock directly from the specific sensor table either; although the sensor table has Clock and Asset fields, they don't show up in the picker because they're key fields. (Asset

is a foreign key, except of course in the Asset table, where it's the primary key. And keys of type date/time are special; they count as foreign everywhere.)

That is, to configure a date/time axis for a chart of sensor data, proceed as follows:

1. Set up your other axis first (typically the Y axis), which refers to the sensor table data field.
2. Set up your date/time axis (typically an X axis). Instead of entering a value under **Parameters (Inputs)**, go to **Parameters (Values)** and enter the special value `:Clock` (including the colon) in the *value - any* field.
3. Click **OK**.

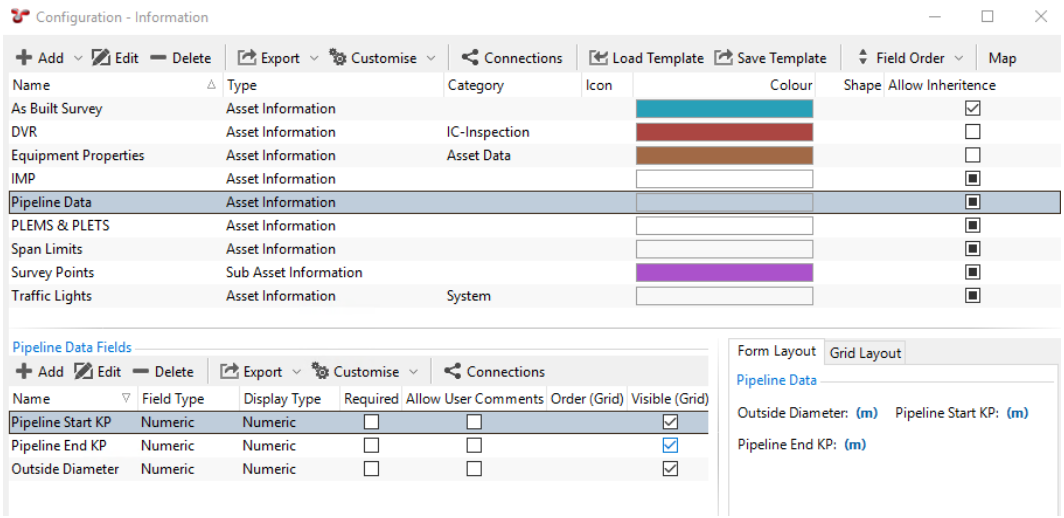
When you come back to edit this axis, you'll find `Clock` (without colon) filled in under **Parameters (Inputs)**, showing that NEXUS has understood that you want a Clock field, and has found the relevant sensor table to pick it from.

8.2.1.2.3 Configure Pipeline View Chart

The **Pipeline View** chart is displayed on the **INSPECTION** screen on the **Charts** tab and it shows various events on a pipeline. The **Pipeline View** chart template is predelivered for NEXUS IC, however, to ensure that the pipeline and its events are displayed correctly in the **Pipeline View** chart, you must make a number of settings as described below.

8.2.1.2.3.1 Procedure

1. Ensure that you have an Asset Information Group (AIG) that stores your pipeline data and contains the following fields:
   - Pipeline Start KP
   - Pipeline End KP
   - Outside Diameter



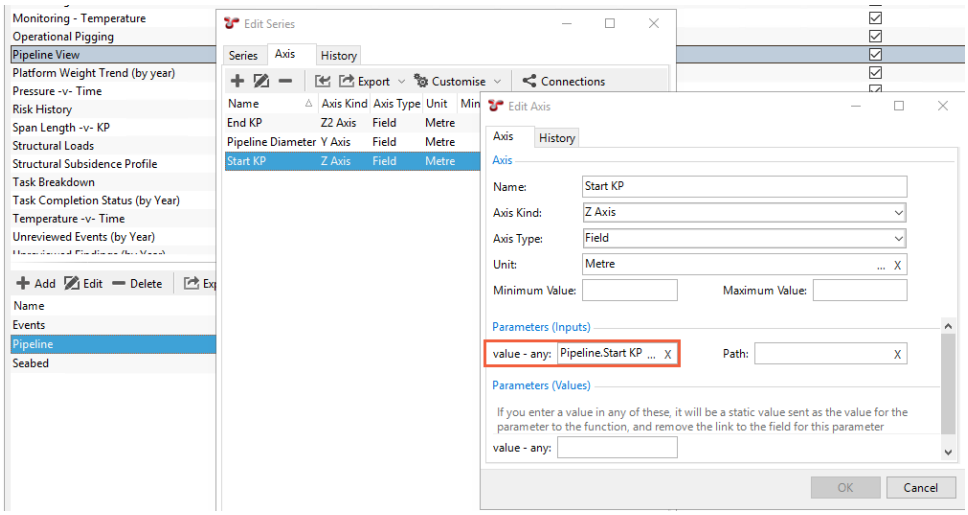
   For more information about setting up an AIG, see *Configure Asset Information Groups*.

> **Note**
>
> To make sure that there is actual pipeline data to be displayed in the chart, you must define values for these fields when maintaining this AIG.

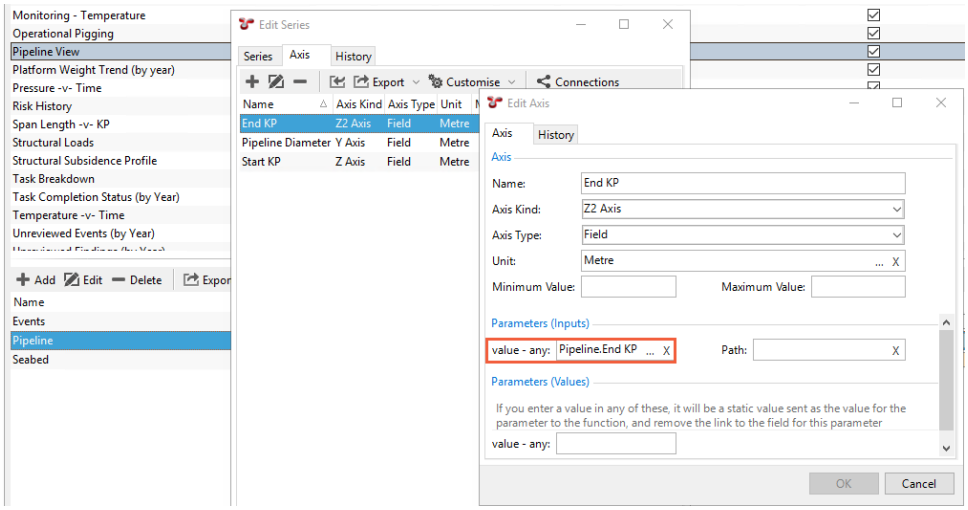
2. Configure the **Pipeline View** chart template under *Configuration* → *General* → *Chart Templates* as follows:

a. The axes of the **Pipeline** series must refer to the corresponding pipeline data AIG fields:

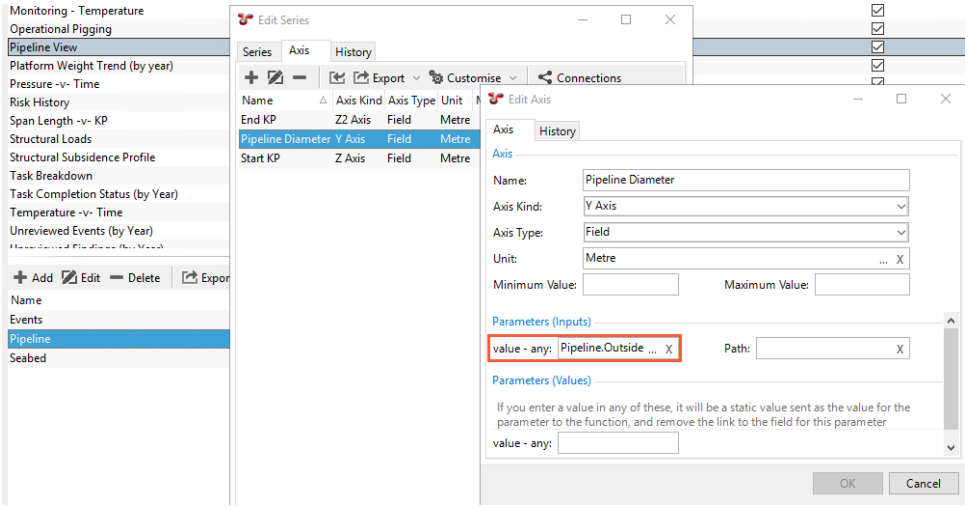
- The *Start KP* (Z) axis must refer to the *Pipeline Start KP* AIG field:



- The *End KP* (Z2) axis must refer to the *Pipeline End KP* AIG field:

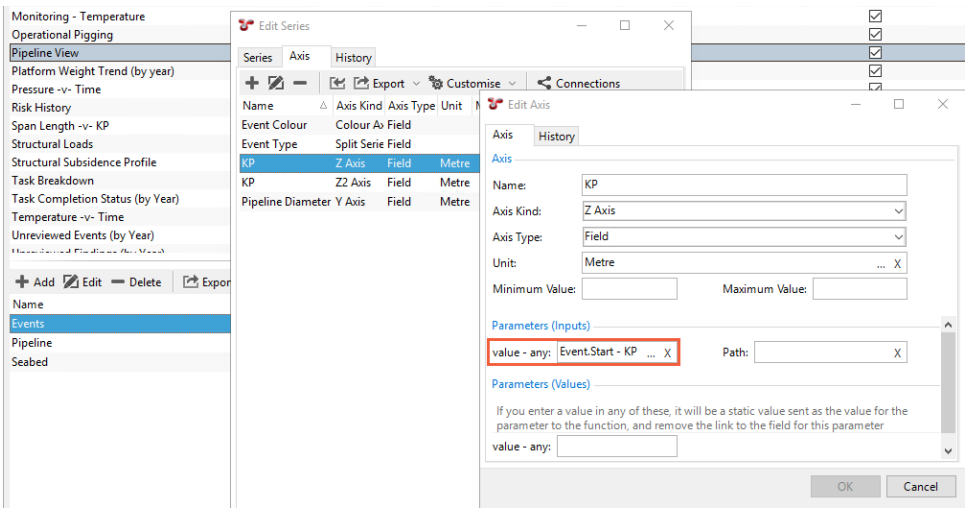


- The *Pipeline Diameter* (Y) axis must refer to the *Outside Diameter* AIG field:

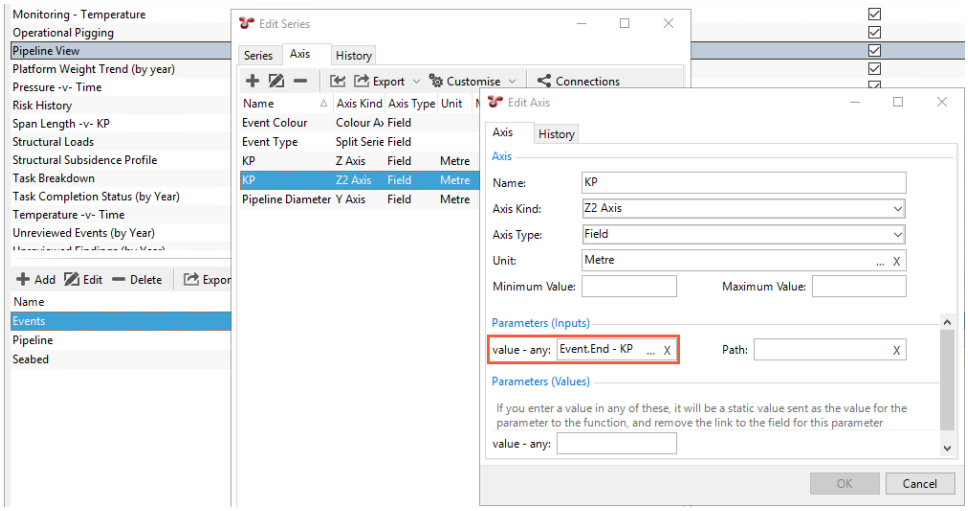


b. Similarly, the axes of the **Events** series must refer to the corresponding event fields and the pipeline diameter field:

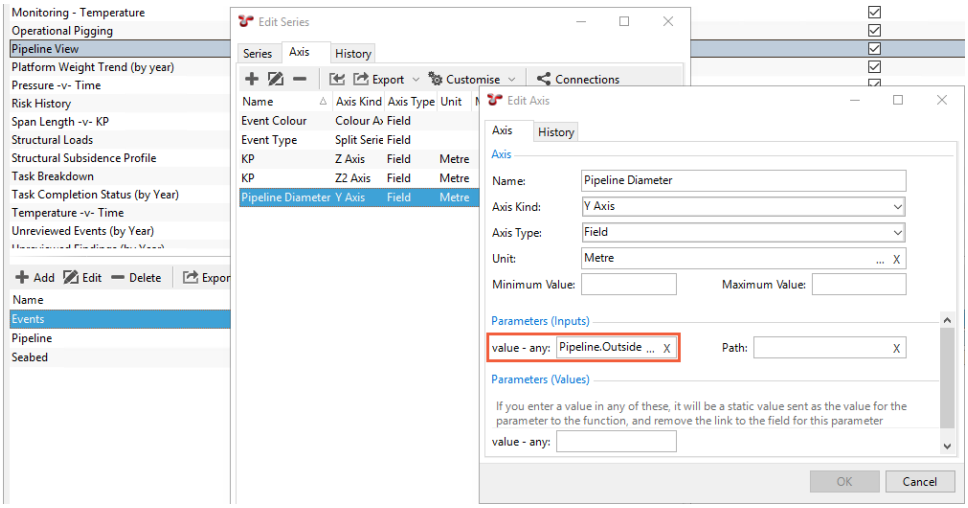
- The *KP* (Z) axis must refer to the *Event Start KP* field:



- The *KP* (Z2) axis must refer to the *Event End KP* AIG field:



- The *Pipeline Diameter* (Y) axis must refer to the *Outside Diameter* AIG field:

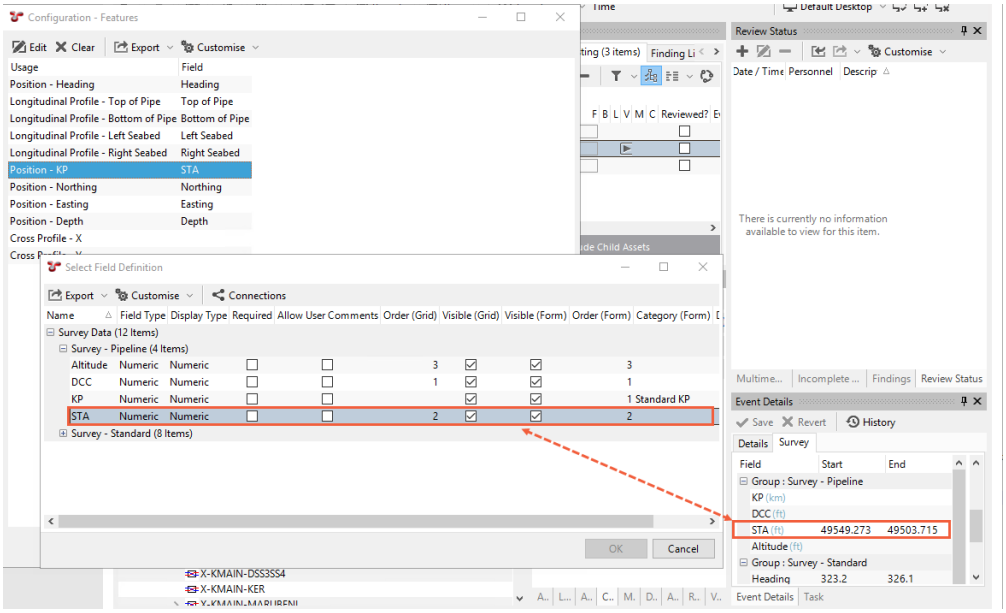


c. If you have imported post-processed profile data into the database, you can also perform field mapping for the **Seabed** series as required.

> **Note**
>
> Except for mapping fields, do not change other preconfigured values for the axes.

3. To ensure that NEXUS can determine the position of the event on the pipeline, map the **Position - KP** usage item to the relevant survey data field in the database under *Configuration* → *Events* →

Features. The survey data field that you map to the **Position - KP** usage must correspond to the survey data field that stores the start and end KP values:



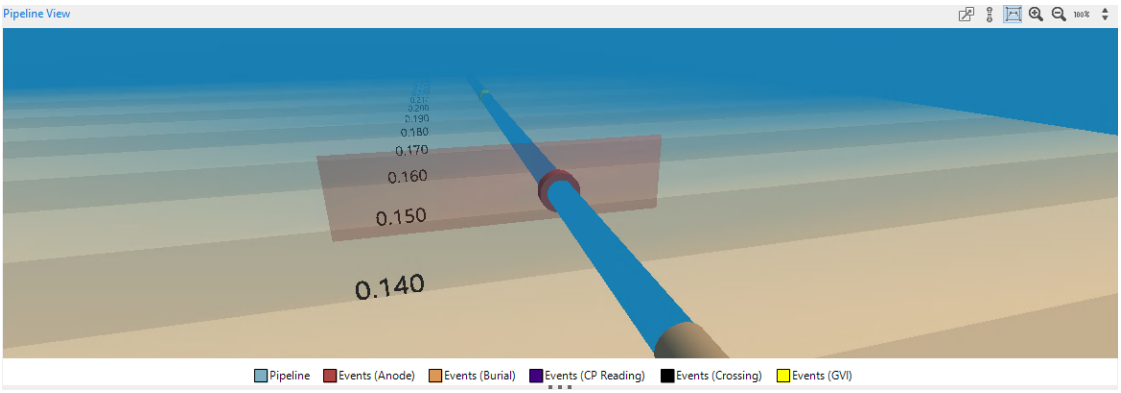
> **Note**
>
> To make sure that there is actual event data to be displayed in the chart, you must have defined values for the **Start KP** and **End KP** fields in your survey data under *Configuration* → *Events* → *Survey Sets*.

4. Once you have completed all the steps, close and reopen the database for the changes to take effect.

> **Note**
>
> In IC-Inspection, you may need to make a few more additional steps to get the chart displayed correctly. For more information, see *Displaying Pipeline Views*.

8.2.1.2.3.2 Result

The **Pipeline View** chart is now displayed correctly on the **Charts** tab including pipeline and events data:



Under *Configuration → General → Chart Templates*, you can add, edit and delete chart templates and assign series to them.

These templates can then be visible on the *Charts* tab of the **INSPECTION** screen and in *Configure Report Templates*. Charts can also appear on the **Charts** tab of the **ASSET** screen and as part of dashboard reports on the **Dashboard** tab of the **ASSET** screen as well as on the **DASHBOARDS** screen. Note that charts will only be displayed on the **Charts** tab if they are relevant to the selected data set (for example, inspection data charts on the **INSPECTION** screen, asset data if you've selected a relevant asset, and so on).

On the **Configuration - Chart Templates** dialog, you can do the following:

- In the top half of the dialog, you can create, edit, or delete **chart templates** (see *Create Chart Templates*).
- In the bottom half of the dialog, you can add, edit or delete **series** within a chart template (see *Maintain Series for Chart Templates*).

8.2.1.2.4 Create Chart Templates

To create a new chart template, proceed as follows:

1. Click the **Add** button at the top of the **Configuration - Chart Templates** dialog.
2. On the **Chart Template** tab, give your new chart template a name and define other attributes as required (see *Add/Edit Chart Template Dialog*).
3. Assign at least one series to a chart template. For more information, see *Maintain Series for Chart Templates*.
4. For each series, assign one or more axes. For more information, see *Configure Axes for a Chart Template Series*.
5. If required, you can also set up a drawing or image as the background of the chart. For more information, see *Charts and Drawings*.

To edit an existing chart template, select it and click **Edit**, or just double-click it.

8.2.1.2.5 Maintain Series for Chart Templates

You can add/edit/delete a chart template's series in one of the following ways:

- By editing the chart template and clicking on the **Series** tab
- By using the bottom half of the main *Configuration - Chart Templates* dialog.

At the bottom right of the screen, you can see a preview. As you add or edit a series, random sample data is displayed in this preview to show you conceptually what your chart will look like. If you have chosen options that cause the chart to have a legend, the legend is interactive: you can mouse over a legend item to highlight the corresponding item in the chart, and you can click legend items to toggle the corresponding chart item off/on.

When you add or edit a series, you'll need to give it a name and define other parameters as required (see *Add/Edit Series Dialog*).

8.2.1.2.5.1 Configuring Axes

You also need to configure one or more axes for a series as described in *Configure Axes for a Chart Template Series*.

8.2.1.2.6 Load/Save Chart Templates

Clicking **Save Template** will save the selected Chart Template and related details to a .chart file. NEXUS IC will find all items related to this Chart Template (asset information forms, event definitions, chart templates, lookup tables, etc), and will present a dialog listing all the dependencies it's found, with a checkbox for each row. Untick any that you don't want saved with your Chart Template.

This Chart Template can then be loaded into this or another database via **Load Template**. Note that if the previously saved Chart Template still exists in this database, Load Template will overwrite that existing Chart Template — it will not create a new copy of it. Similarly with any other elements saved in the .chart file: asset information fields, lookup tables, etc.

8.2.1.2.7 Predelivered Chart Templates

The **Pipeline View** chart template is predelivered for NEXUS IC. It is a 3D view, and uses the Y Axis to represent the diameter of the pipeline. If you don't set a Y Axis value of some kind, you won't see a pipeline. Since it uses Y for diameter, it uses Z Axis and Z2 Axis to represent distance along the pipeline. As with X and X2, the two different axis types are used to represent the start and end of an item on the "chart". For more information about all the configurations required to have the **Pipeline View** chart displayed correctly, see *Configure Pipeline View Chart*.

See also

- *Charts and Drawings*
- *Configure Axes for a Chart Template Series*
- *Configure Pipeline View Chart*
- *Add/Edit Chart Template Dialog*

8.2.1.3 Configure Company

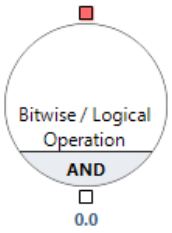
Under *Configuration* → *General* → *Company*, you can specify details related to a company, such as its name, address, phone, Fax or website URL.

Company entries can be used to group personnel (to show what company a given person works for) and schedules (to show what company will be carrying out a particular scope of work). If you have defined company entries, you can assign them to users under *Database* → *Security*....

8.2.1.4 Configure Functions

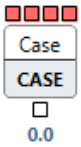
8.2.1.4.1 Function Elements

You can access function elements when you create or edit a function under *Configuration* → *General* → *Functions* and you expand **ELEMENTS** on the **Elements** tab.



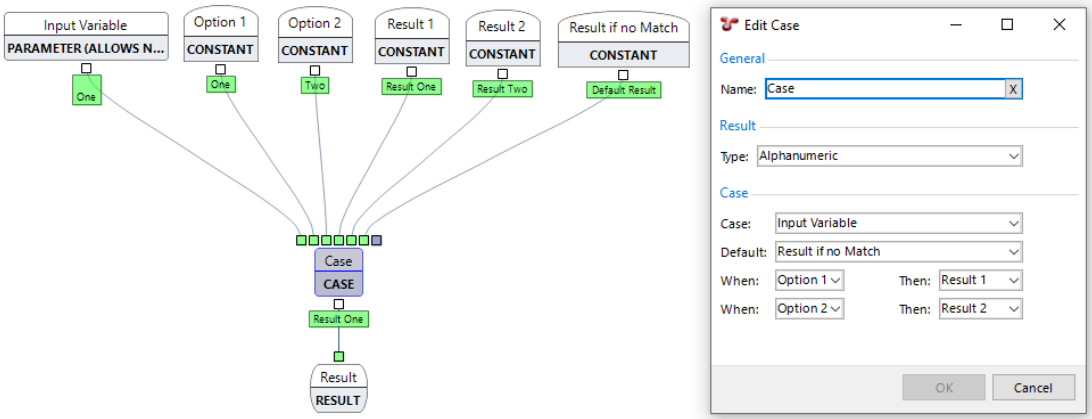
8.2.1.4.1.1 Bitwise / Logical Operation

These are similar to Operation elements, but carry out bitwise operations. Bitwise / Logical Operation elements can be configured for And, Or, Xor (eXclusive Or), or Not. You should set the Result Type of a Bitwise / Logical Operation to "Whole Number". They differ from *Any True* and *All True* in that Bitwise / Logical Operations work on all bits of a whole number, rather than just on a yes/no basis. For example, 1010 AND 1001 = 1000; 1010 OR 1001 = 1011; etc.



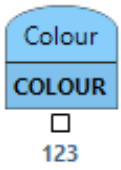
8.2.1.4.1.2 Case

This is a decision function element. It evaluates a list of conditions and returns one of multiple possible result expressions. If the Case input does not equal any of the defined conditions, then the Default is returned. The concept is similar to switch statements in many programming languages, or nested IF functions in Excel.



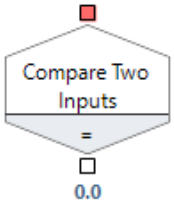
In the above example, the Case object is configured so that:

- When Input Variable matches Option 1, Result 1 will be output. (This is indeed the path taken in this case.)
- When Input Variable matches Option 2, Result 2 will be output.
- When Input Variable does not match any of the "When" options, the Default, Result if no Match, will be returned.



8.2.1.4.1.3 Colour

Colour function elements are like a Constant element, but they are always whole numbers. When you edit a Colour, it presents you with a colour picker. Click the ▼ arrow to choose a colour from the list, or click the ... button to choose a custom colour.



8.2.1.4.1.4 Compare Two Inputs

This is a decision function element. It compares two inputs (comparators) and returns one of two values depending on whether the inputs match. Comparisons available in the Compare decision include: Equals (=), Not equals (<>), Greater than (>), Less than (<), Greater Than or Equal (>=), Less Than or Equal (<=).

8.2.1.4.1.5 Concatenate

This is similar to the Operation element, but is designed to concatenate several inputs together (converting them to alphanumeric if necessary) and give an alphanumeric as an output. You should set the result type of a Concatenate element to "Alphanumeric".

The Format property can be used to control how values are converted to strings, and how the final concatenated string appears. (Programmers may find this similar to the concept of printf format strings in C.) If the input is a whole number, you can put %d in the format string at the point where you'd like that whole number to appear. If the input is a numeric, you can put %f. You can put other text in the string literally as desired, and to get a % symbol, put %%.

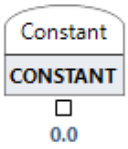
For example, the format string "There are %d apples, which fill %f%% of the basket" would result in the output "There are 1 apples, which fill 12.34% of the basket". If your input types don't match the format string you've specified, you'll

get an error message. So in this example, we've assumed that the first input is a whole number. If it was in fact a numeric, you'd see an error like "Format is invalid for the inputs."

You can put a number between the "%" and the letter to specify the width. If the number turns out to be less characters than the width you've specified, it will be padded with spaces. You can put a "." after that width (or just directly before the "%") followed by a precision, to specify the number of decimal places for a numeric. So "%2d" might result in an output like " 1" and "%.3f" might result in an output like "12.340".

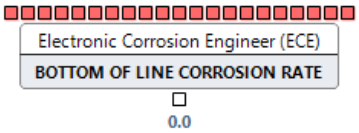
You can use types other than "d" for whole numbers and "f" for numerics. Find below the possible types:

Type	Output
d	Decimal. Input must be a whole number.
u	Unsigned decimal. If the input is negative, it will be shown as positive. Input must be a whole number.
e	Scientific. You will get an output like "1.234E1"
f	Fixed. You will get an output like "12.34".
g	General. You will get a fixed or scientific output, whichever is shorter.
n	Number. You will get a number with thousand separators, like "123,456.78".
m	Money. You will get a currency output, formatted as specified by your settings in the Windows control panel.
s	String. If one of your inputs is a string, you can use "%s" to put it in the format string: "There are %d %s, which fill %f%% of the %s". If you specify a precision, like "%.3s", the string will be limited to at most that many characters and any remainder will be truncated.
x	Hexadecimal. Input must be a whole number.



8.2.1.4.1.6 Constant

Constant function elements are used when a data value is known and will remain the same for every situation where the function is run. When defining a Constant, you need to supply a name for the constant, the value of the Constant and the field type. Constants (like Input function elements) can be alphanumeric, numbers, boolean values (true or false), or date/time values.



8.2.1.4.1.7 Electronic Corrosion Engineer (ECE)

If you drop an ECE element into a function, it will call Wood's proprietary ECE library. Specify the **ECE Result Type** to determine which value it will return an estimate for. ECE is a separately licensed feature; contact support@nexusic.com for details.

The following ECE result types are available:

- Bottom of Line Corrosion Rate
- Top of Line Corrosion Rate
- Fe concentration
- pH
- Pitting Corrosion Rate

The input parameters can be linked to Asset Information Fields to allow the calculation to work automatically for all assessed assets.

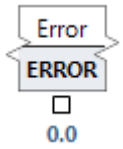
The required input parameter units are:

- Start Pressure - bar
- End Pressure - bar
- Start Temperature - °C
- End Temperature - °C
- Liquid Holdup - %
- Inlet Pressure - bar
- Inlet Temperature - °C
- Oil Density - °API (API gravity)
- Section Length - m (metres)
- Inside Diameter - m (metres)
- H2S Concentration - Mole %
- CO2 Concentration - Mole %
- Percentage Carbon - Mole %
- Chloride - g/l (Grams per litre)
- Acetic Acid - ppmw (Parts per million by weight)
- Bicarbonate - ppmw (Parts per million by weight)
- Gas Production Rate – $MMSm^3/d$ (million metric standard cubic metres per day)
- Oil Production Rate - m^3/d (Cubic metres per day)

- Water Production Rate - m^3/d (Cubic metres per day)
- Fe Concentration - moles/litre

The **Section Start Fe Concentration** field is optional and can be null. When it is null, supersaturated = true. This relates to the dissolved iron concentration in the water at the inlet, which may be low in Fe, or may be supersaturated with iron carbonate. There are two options:

- The default setting is supersaturated, assuming that the water has been flowing through carbon steel equipment for some distance before entering the flowline: this would be appropriate if the fluids come from a well completed with carbon steel production tubing, for example.
- When most of the water comes from condensation from water vapour in gas, this setting should be changed to none, which can lead to increased corrosion rates for a short distance at the inlet region. This would be appropriate for a gas overhead line from a separator vessel, for example.

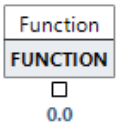


8.2.1.4.1.8 Error

In version 6, the function builder includes the concept of errors. You can see errors, for example, when dividing by zero or by feeding an element an input of a type it did not expect.

However, you can also deliberately include errors. For example, suppose you have a function whose input must not be 0. You can add a comparison that compares that input to 0, and if true, it returns the value of an Error element. If you set the Error value inside the Error element to "Oh no! An 0!", then when the function has its input set to 0, the user will see that error message output.

The advantage of using an Error element is that it can give a textual description to the user explaining what is wrong without changing the output type of the function — the output of the function might still be of type Numeric. This means that if this function's output is in turn consumed by other functions, those functions will get a Numeric value as they expected. In this way, functions can chain to other functions, while also giving descriptive messages to the user.

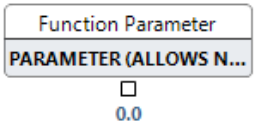


8.2.1.4.1.9 Function

You can embed an entire other function into this function using the Function element. This is the same as dragging in a system function or a user function from under **FUNCTIONS** on the **Elements** tab.

When editing the parameters of the function element, you can select the required function from the *Function* field. You can select either a system function or a user function as described below:

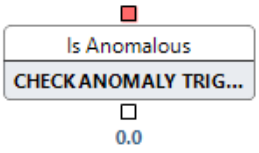
- **System Functions**
  System functions are predelivered functions and are listed with the Function Category *System*. For information about the available system functions, see *System Functions*.
- **User Functions**
  User functions are functions that have been defined by the users. They can be further categorised by type.



8.2.1.4.1.10 Function Parameter

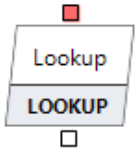
A function parameter is an input to the function. For example, in a function that calculates the circumference of a circle given a radius value, you can add a Function Parameter element, that provides the ability to enter a value for the radius. This value is then multiplied by 2 and by the value of pi to calculate the circumference of the circle. When defining a Function Parameter, you need to give it a name and a data type. Function Parameters may be alphanumeric, whole numbers, real numbers, boolean values (true or false), dates, times, or combined date/time values.

If you tick "Allow Null Inputs", you can specify a default value to be used when the input is null.



8.2.1.4.1.11 Is Anomalous

You can use this element to check, within a function, if a particular event field causes any Anomaly Triggers to fire. Its input should be an event Header_ID.



8.2.1.4.1.12 Lookup

Returns a summarised value from various sources of data within the NEXUS IC database.

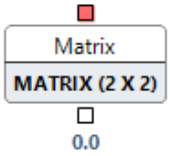
For instance, if you need to fetch an asset information field from an asset, you can select that asset information field as the **Result Field**, and connect the asset input to a function parameter that will be fed from the asset.

For information about setting up the fields for a lookup function, see *Edit Lookup Dialog*.

8.2.1.4.1.13 Lookup Optimisation

Lookups may be executed a large number of times, so we recommend that you configure them so that NEXUS can best optimise their execution. Consider the following lookup optimisation tips:

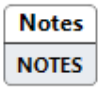
- **Aggregates and Filters**: Aggregates (for example, "Max") perform better than Filters (for example, "highest"). Additionally, "=" is more optimisable than "<," ">", "<=," or ">=" in Filters.
- **Caching Results**: Results may be cached, so subsequent lookups in a particular circumstance may be faster than the first lookup. When the return value of a function is deterministic, NEXUS IC caches the result for a given set of inputs. For instance, consider a function that adds two numbers: 1 plus 2 always equals 3. In this case, NEXUS IC stores this result in its cache. When the same calculation is needed again, the system retrieves the value directly from the cache, avoiding redundant recalculation. However, when a function involves a Lookup, caching behaviour changes. NEXUS IC will cache the Lookup result only if it is confident that the outcome remains deterministic. In other words, if you rerun the function with the same inputs, it will consistently produce identical outputs. Lookups tied to dynamic data (such as finding the closest event to a specific date) may not exhibit this determinism. If events are added, deleted, or their dates change, the Lookup result could vary. To ensure deterministic results and thus enhance performance, consider organising each lookup into separate functions (see *Function*). If your main function contains several Lookups and runs slowly, create individual functions for each Lookup. Then replace the Lookups in your main function with calls to these new simple functions. By doing so, NEXUS IC can optimise caching separately for each function.
- **Avoid Slow Aggregates**: In time-critical scenarios, avoid aggregates across tables, aggregates across fields referencing other tables, and aggregates across slow fields.
- **Small Tables**: In case of small tables (typically containing a few hundred rows) that are frequently accessed, NEXUS IC efficiently caches all rows. These cached entries remain available throughout the entire application run. If any value within the table changes, the cache entries are appropriately expired and then re-cached when requested by a function. Additionally, NEXUS IC may clear parts of its cache if it runs low on memory.



8.2.1.4.1.14 Matrix

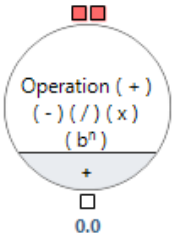
This is a decision function element. It evaluates a number of inputs and returns the looked-up value. You can add more inputs with the **+Column Input** and **+Row Input** buttons. If you have several column inputs or several row inputs, they must *all* be matched for that cell to be picked. That effectively means that this is an *n* dimensional matrix. The 2-dimensional case (with one column input and one row input) is the simplest and most common, but if you require more dimensions, add inputs that are needed.

When no cells are matched, the Default Value will be used. You must ensure that the result type of the Default Value is the same as the result type of the Matrix.



8.2.1.4.1.15 Notes

Notes are used when building functions for reference and documentation purposes. Notes are placed in the Function Builder workspace. You can use Notes whenever you think a function is not self-explanatory, or when you want to refer to a standard, document changes to a function, and so on.

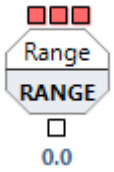


8.2.1.4.1.16 Operation

Operation function elements provide data manipulation functions. Operators take input data from various sources such as Input, Constant or Decision elements, or even other system or user-defined functions. You can drag in as many inputs as you like to an Operation. You can use the following operation types:

- *Addition*, *Subtraction*, *Multiplication*, *Division*, *Modulus* and *Power* are all arithmetic operations. Note that *Modulus* only works with whole numbers as inputs.
- *Minimum*, *Maximum* and *Average* take the minimum or maximum or average of all their inputs. (If some inputs to a *Minimum*, *Maximum* or *Average* are null, those null inputs will be ignored.)
- *Coalesce* works the same as SQL's COALESCE operator: if the first input is not null, it will return that first input. If the first input *is* null, it will look at the second input. It will keep looking along its inputs until it finds one that is not null. If all are null, it returns null.
- *Any True* and *All True* are logical operations. They expect inputs of type Yes/No, and you should set their output type to Yes/No.

In case you use more than two inputs, the behaviour may not be obvious. We recommend that you experiment with it and confirm that it works as expected.



8.2.1.4.1.17 Range

This is a decision function element. The Range element is similar to the Case element, except that you specify a range of input values for each case, rather than a single specific value.

Range evaluates a numeric input against a series of numeric ranges and returns the found value. For each range, you specify the Lower (>=) and Upper (<=) as numeric values, and then choose a Result from the available inputs.

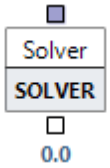
A Range element needs at least three inputs:

- One to supply the Case value that will be used to decide which range is matched (if any)
- One for the Default Value that will be used if no range is matched
- One to define a result for the first range

If you want more than one range, add more than three inputs. If you want to reuse one input several times, drag that input onto the Range element several times. If multiple ranges match the input, the first matched range will be used, so if your ranges are 1 to 5 and 2 to 6, only inputs of greater than 5 will match the second range.

8.2.1.4.1.18 Risk (*Deprecated*)

Returns the aggregate risk value for an asset and all its children in a particular asset view. The Risk function element takes the risk assessment ID (RMC_ID) as the input and returns the risk result as an alphanumeric value. This function element has been deprecated and will be removed in later versions. We recommend that you use the Lookup element instead.



8.2.1.4.1.19 Solver

The solver element is used within charts to solve for a particular input parameter of a function. See *Chart Template Axis Type* for details.

See also

- *System Functions*
- *Configure Functions*

8.2.1.4.2 System Functions

You can access system functions when you create or edit a function under *Configuration* → *General* → *Functions* and on the **Elements** tab, you expand **FUNCTIONS –> SYSTEM**.

System functions are predefined by NEXUS and cannot be edited, however, you can use them as they are or when you build your own functions. System function elements in the NEXUS IC database can be broken up into character/string functions, mathematical functions and other functions. See below for more details about some of the main functions:

8.2.1.4.2.1 Character/String Functions

Function	Description	Example of Use
ASCII	Returns the ASCII code value of the leftmost character of a character expression.	ASCII('Alphabet') = 65
Chr	Converts an ASCII code to a character.	CHR(65) = 'A'
InStr	Returns the starting position of the specified expression in a character string.	INSTR('CORPORATE FLOOR','OR', 3) = 14 INSTR('CORPORATE FLOOR','OR', 1) = 2
Len	Returns the number of characters of the given string expression.	LEN('Alphabet') = 8
Length	Same as LEN.	LENGTH('Alphabet') = 8
Lower	Returns a character expression after converting uppercase character data to lowercase.	LOWER('Alphabet') = 'alphabet'
LTrim	Returns a character expression after removing leading blanks.	LTRIM(' Alphabet') = 'Alphabet
Replace	Replaces all occurrences of the 2nd given string in the 1st string with a 3rd string.	REPLACE('Alphabet','ph','f') = 'Alfabet'
RTrim	Returns a character string after truncating all trailing blanks.	RTRIM('Alphabet ') = 'Alphabet'
SubStr	Returns a part of a character expression.	SUBSTRING ('Alphabet',0,6) = 'Alpha'
Upper	Returns a character expression with lowercase character data converted to uppercase.	UPPER('Alphabet') = 'ALPHABET'

8.2.1.4.2.2 Mathematical Functions

Function	Description	Example of Use
Abs	Returns the absolute, positive value of the given numeric expression.	ABS(-15) = 15
ACos	Returns the angle, in radians, whose cosine is the given value.	ACOS(.3) = 1.26610367
ASin	Returns the angle, in radians, whose sine is the given value.	ASIN(.3) = .304692654
ATan	Returns the angle in radians whose tangent is the given value.	ATAN(.3) = .291456794
Ceiling	Returns the smallest integer greater than, or equal to, the given numeric expression.	CEILING(15.7) = 16
Cos	Returns the trigonometric cosine of the given angle (in radians).	COS(180 * 3.14159265359/180) = -1
Erf	Gaussian Error function. See https://en.wikipedia.org/wiki/Error_function	ERF(0) = 0
Exp (10^x)	Returns the exponential value of the given numeric expression.	EXP(4) = 54.59815
Exp (e^x)	Returns the exponential value of the given numeric expression.	EXP(4) = 54.59815
Floor	Returns the largest integer less than or equal to the given numeric expression.	FLOOR(15.7) = 15
InvErf	Inverse Gaussian Error Function	INVERF (0.25) = 0.225312071859631
IsNumber	Returns true if the Alphanumeric input can be converted to a Whole Number.	ISNUMBER(“three”) = false
IsNumeric	Returns true if the Alphanumeric input can be converted to a Numeric.	ISNUMERIC(“three point one four”) = false
Ln(x)	Returns the natural logarithm of the given numeric expression.	LN(95) = 4.55387689
Log(x)	Returns the base-10 logarithm of the given numeric expression.	LOG(100) = 2
Log_b(x)	Returns the base-b logarithm of the given numeric expression.	LOG_B(2, 256) = 8
Round	Returns a numeric expression, rounded to the nearest whole number.	ROUND(15.193) = 15
RoundTo	Returns a numeric expression, rounded to the specified length or precision.	ROUNDTO(15.193,1) = 15.2 ROUNDTO(15.193,-1) = 20
Sign	Returns the positive (+1), zero (0), or negative (-1) sign of the given expression.	SIGN(- 15) = - 1
Sin	Returns the trigonometric sine of the given angle (in radians).	SIN(30 * 3.14159265359/180) = .5
SqRt	Returns the square of the given expression.	SQRT(26) = 5.09901951
Tan	Returns the tangent of the input expression.	TAN(135 * 3.14159265359/180) = -1
ToNumeric	Converts the input to a numeric data type. (Use Concatenate to go the other way.)	TONUMERIC(‘123’) = 123 TONUMERIC(TODATE(‘22 April 2005’)) = 38462
Trunc	Returns n truncated to a whole number.	TRUNC(15.79) = 15.7
TruncTo	Returns n truncated to m decimal places. m can be negative.	TRUNCTO(15.79,1) = 15.7 TRUNCTO(15.79,-1) = 10
UnitExample	Used under the hood to provide examples in *Configuration* → *General* → *Configure Unit Types*	n/a

8.2.1.4.2.3 Compare Functions

There are a variety of Compare functions ("Compare A = B", "Compare A < B", "Compare (A = B and C = D) or (E in (F, G, H) and I = J)", etc.) They all compare the various inputs in the way described in the function name.

8.2.1.4.2.4 Date/Time Functions

Function	Description	Example of Use
CurrentDate	Returns the current system date.	CURRENTDATE( ) = <Today's current date>
CurrentDateTime	Returns the current system date and time.	CURRENTDATE( ) = <Today's current date and time>
DateDiff (Day Of Month)	Returns the difference between the day-of-month of two dates. Returns a whole number from -30 to +30.	DATEDIFF (DAY OF MONTH)(2005-04-22, 2006-06-12) = 10
DateDiff (Days)	Returns the number of days between two dates.	DATEDIFF (DAYS)(2005-04-22, 2006-06-12) = -416
DateDiff (Month of Year)	Returns the difference between the month-of-year of two dates. Returns a whole number from -11 to +11.	DATEDIFF (MONTH OF YEAR)(2005-04-22, 2006-06-12) = -2
DateDiff (Months)	Returns the number of months between two dates.	DATEDIFF (MONTHS)(2005-04-22, 2006-06-12) = -13.667
DateDiff (Years)	Returns the number of years between two dates.	DATEDIFF (YEARS)(2005-04-22, 2006-06-12) = -1.139
Day	Returns the Day part of a date.	DAY(2005-04-22) = 22
LastInspectionDate	Returns the last inspection date for a component.	N/A
Month	Returns the Month part of a date.	MONTH(2005-04-22) = 4
NextInspectionDate	Returns the next inspection date for a component.	N/A
ToDate	Converts the input value to date data type.	TODATE(38462) = 2005-04-22 TODATE('22 April 2005') = 2005-04-22
Year	Returns the Year part of a date.	YEAR(2005-04-22) = 2005

8.2.1.4.2.5 Special System Functions

Function	Description	Example of Use
System - Anomaly - Risk Score	Used to set up the anomaly risk matrix. Calculates the actual risk score of each anomaly. The result of this function is a number that will be used to position the anomaly in the corresponding square inside the risk matrix.	See *Set Up Anomaly Risk Matrix*.
System - Audit Log Change Item	Extracts and provides the name of a row from Sync_Change.	SYSTEM - AUDIT LOG CHANGE ITEM (3806961) = (2024-Wellsite A) Coating Assessment on Wood / Offshore / 24" PL
System - Audit Log Change Summary	Extracts and provides a summary of all change fields from the Sync_Change row.	SYSTEM - AUDIT LOG CHANGE SUMMARY (3806961) = Event: "" -> "Coating Assessment #48", Is Completed: "No" -> "Yes"

8.2.1.4.2.6 Other Functions

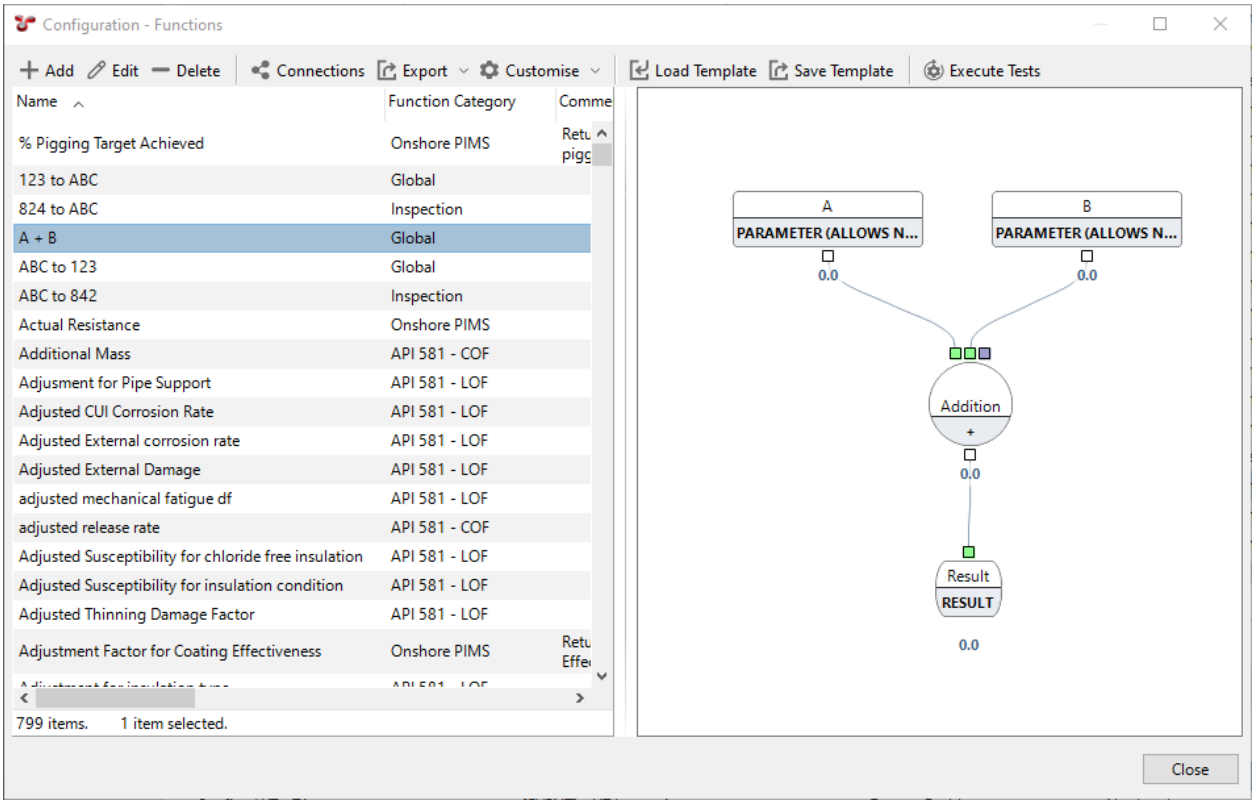
Function	Description	Example of Use
IsNull	ISNULL(A, B) returns A if A is not null; or B if A is null. The syntax for this function is ISNULL(check_expression, replacement_value), where check_expression is the expression to be checked, and replacement_value is the expression to be returned if check_expression is NULL. check_expression can be of any type. replacement_value must have the same type as check_expression. Note that an alphanumeric field that contains an empty string is *not* null — to set the field value back to null, click the "X" button at the right of the field.	ISNULL(<null>, 10) = 10 ISNULL(30,10) = 30
Linear Interpolation	Specify Ymin, Ymax, Xmin and Xmax, and for a given Xset, this function will return Yset. **Note**: Xmin, Xmax, and Xset cannot have *date* data type as their input. If you need to interpolate between dates, then first convert the *date* inputs to a numeric data type.	LINEAR INTERPOLATION(0,0, 2,4, 1) = 2
Length	Calculates length from two parameters, i.e. ABS(Param2 - Param1)	LENGTH(5.418 – 6.254) = 0.836
PassThru	Returns parameter value without modifying its display type.	PASSTHRU('Alphabet') = 'Alphabet' PASSTHRU(123) = 123

Under *Configuration* → *General* → *Functions*, you can create, edit and delete functions.

The **Functions** dialog lets you build and maintain customised calculations, referred to as *functions*, which can be reused throughout NEXUS IC. Functions can be referenced, for example, from *Asset Information Groups (AIGs)* fields, *Event* fields and *Report Sources*.

You define a function by dragging and dropping individual elements into the **Function Editor** (right-hand side of the dialog) and connecting them to control how data flows through the calculation.

Functions are a core building block in NEXUS IC. They are used extensively in risk models (for example, to define models, matrices and parameters), asset information (such as corrosion rates, retirement dates, pressures and wall thicknesses) and event definitions (for example, calculating remaining wall thickness or span lengths).



See the sections below for detailed information:

- *Create Functions*
- *Manage Functions*
- *View Statistics*
- *Handling Null Values*
- *Test Functions*
- *Save/Load Function Templates*

8.2.1.4.3 Create Functions

To create a new function:

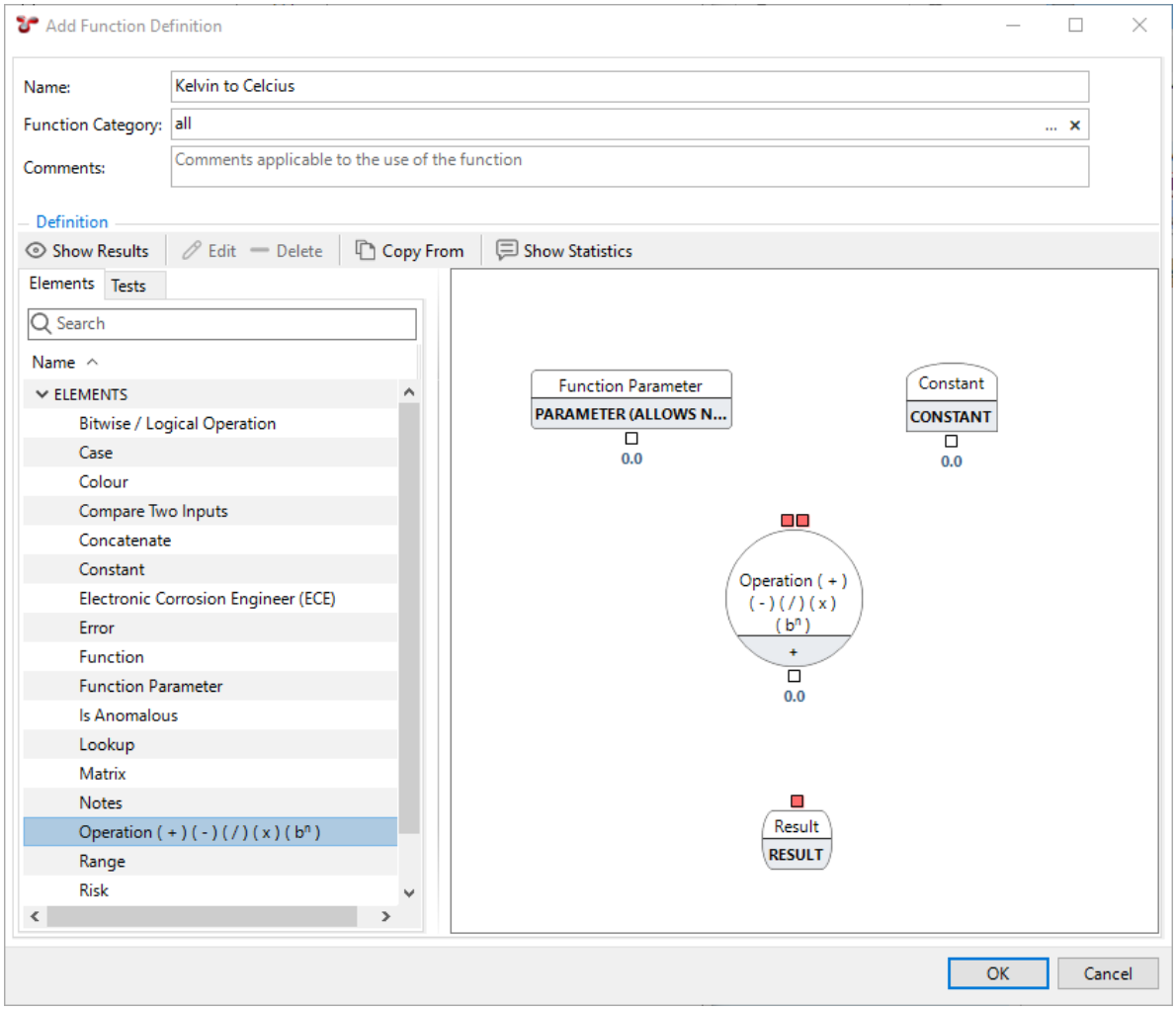
1. Click **Add** at the top of the **Configuration - Functions** dialog.
2. Enter a name for the function and optionally assign it to a category.
3. In the lower part of the dialog, click ❯ next to **ELEMENTS** to expand the element list. Drag a *function parameter* from the ELEMENTS tree into the design area on the right.

   Every function must contain at least one function parameter.

   For information about individual function elements, see *Function Elements*.

4. Add further elements as required. For example, to create a function that converts temperature from Kelvin to Celsius, add:

   - A function parameter to capture the temperature in Kelvin
   - A constant element with the value 273.15
   - An operator element for subtracting the constant value from the value in Kelvin
   - A result element to output the value in Celsius



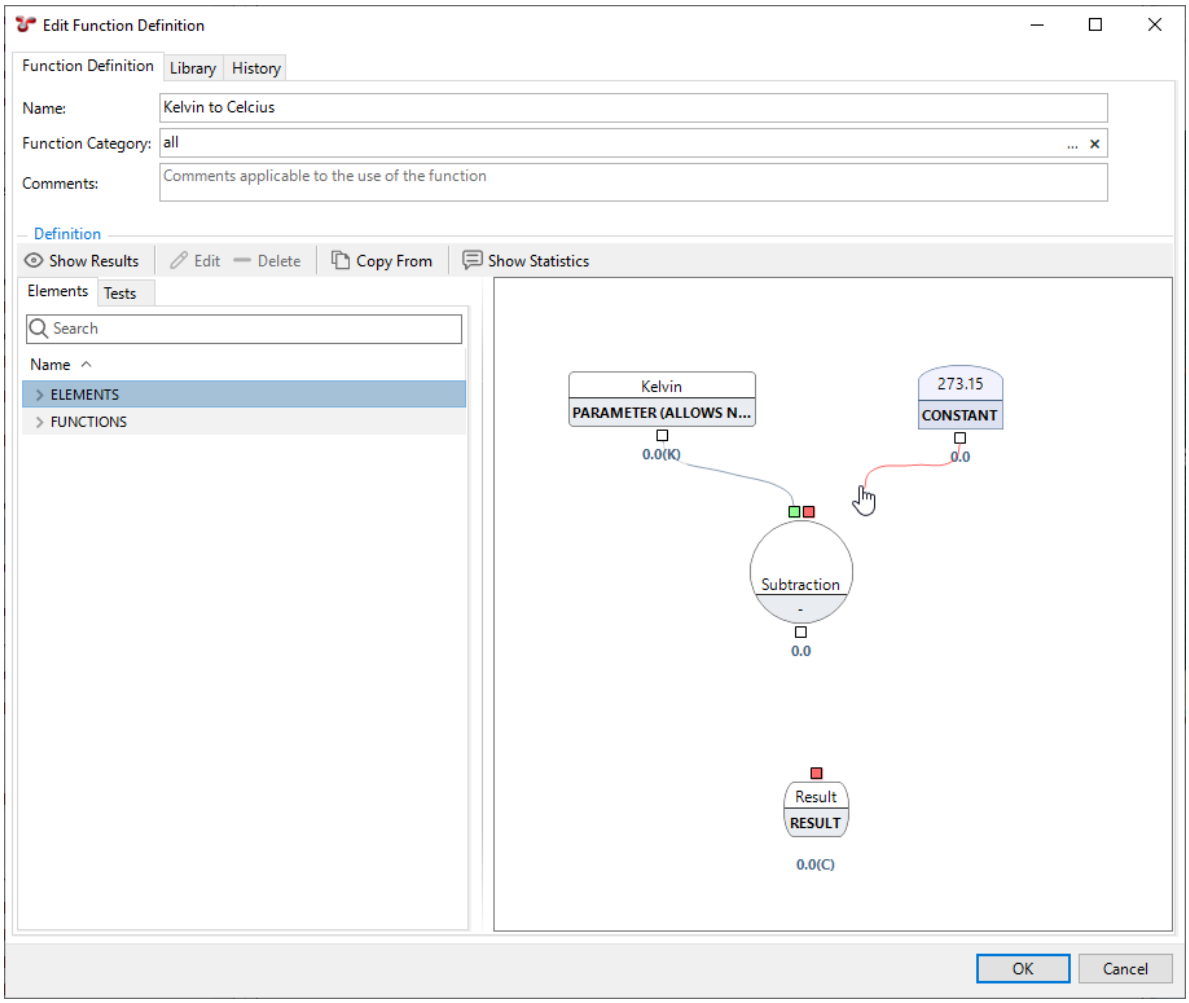
5. Double-click each element to define its properties. The available parameters depend on the type of the element, but typically include name, type, unit and default value. For the temperature conversion example, configure the elements as follows:

   - **Function Parameter**
     - **Name**: Kelvin
     - **Type**: Numeric

  - **Unit**: Kelvin
- **Constant**:
  - **Name**: 273.15
  - **Type**: Numeric
  - **Value**: 273.15
- **Operation**
  - **Name**: Subtraction
  - **Operation**: Subtraction
  - **Type**: Numeric
- **Result**
  - **Name**: Result
  - **Type**: Numeric
  - **Unit**: Celsius

> **Tip**
>
> Right-click an element to view, edit or delete it using the context menu.

6. Connect the elements by dragging from the output square at the bottom of a source element to a target element. The drag must start from the source element's output square, but can end anywhere on the target element.



Note

- To replace an existing connection, drag from an output square to the specific input square you want to overwrite.
- To remove a connection, drag it off the input square and drop it onto an empty part of the design area.
- A single output can be connected to multiple inputs.

7. Click **Show Results** to display intermediate values for the function elements in the design area.
8. You can test the function as described in *Test Functions*.
9. Click **OK** to save the function.

8.2.1.4.4 Manage Functions

Under *Configuration* → *General* → *Functions*, in the **Configuration - Functions** dialog, you can manage functions using the standard grid functionality:

- To edit a function, double-click it or select it and click **Edit**.
- To delete existing functions, select them in the dialog and click the **Delete** button at the top of the dialog. You can also right-click the function and select **Delete** from the context menu.
- To export functions, see *Export* for full description of the export functionality.
- To see if a function is being used elsewhere in the application, click **Connections**.

Functions and function elements in NEXUS IC are unit aware. For example, if an Addition element receives one input in metres and another in millimetres, NEXUS IC automatically applies the appropriate scaling factor before performing the calculation. The direction of the scaling depends on the output unit selected for the operation.

For many elements, you can explicitly select the output unit. NEXUS IC is not dimensionally aware; for example, dividing a length by a time does not automatically result in a velocity unit.

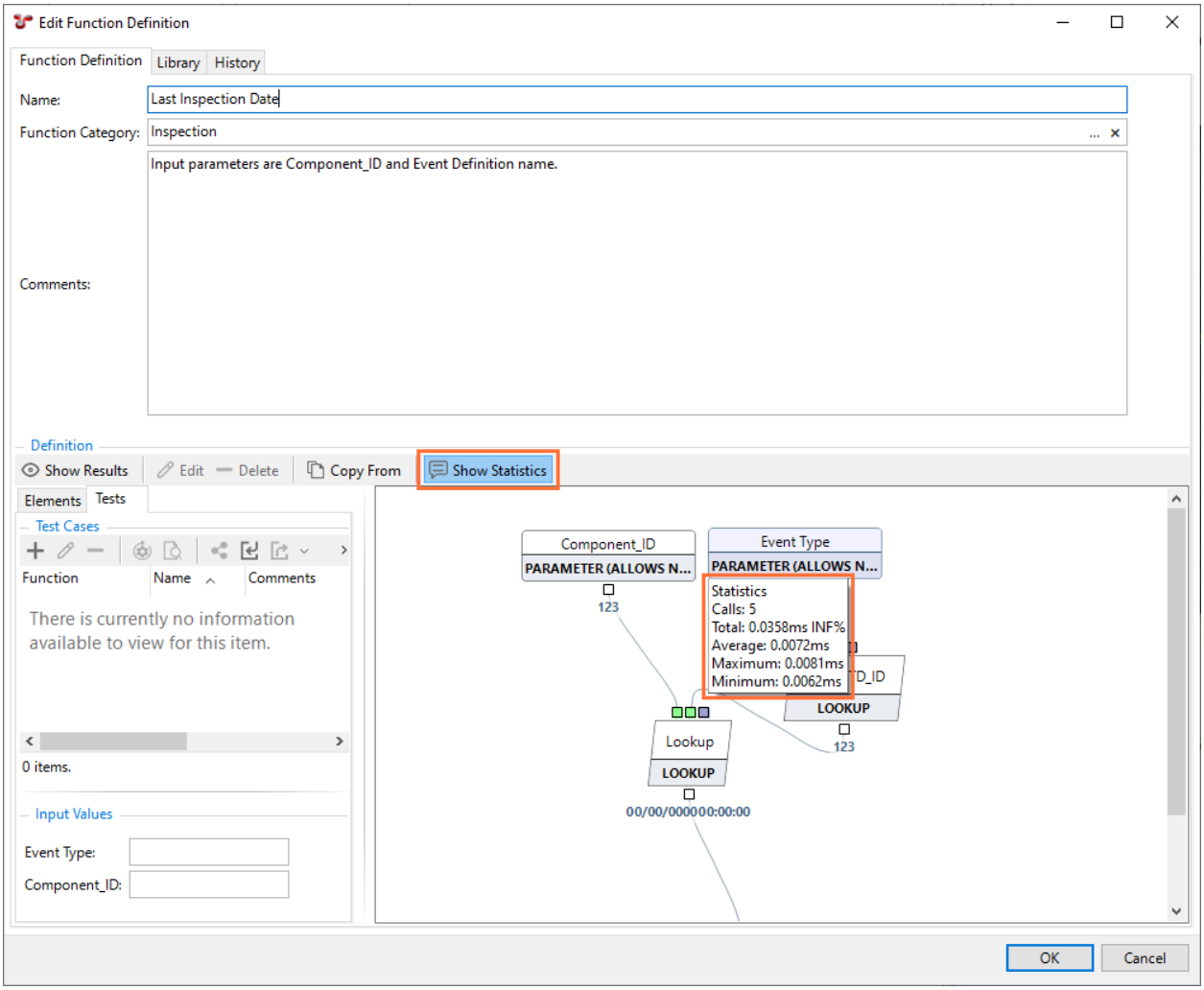
8.2.1.4.5 View Statistics

NEXUS IC can record performance statistics for individual function elements. These are displayed as a hint when you hover over an element and include:

- Number of function calls
- Total, average, maximum and minimum computation time
- Time spent retrieving function parameters
- Total time including parameter retrieval

To view statistics, navigate to *Configuration* → *General* → *Functions*. If a function has been executed and its results cached, the statistics appear when you hover over its elements.

When editing a function, statistics are only shown if **Show Statistics** is enabled.



8.2.1.4.6 Handling Null Values

Null values can significantly affect calculations and comparisons. The following rules apply.

General Behaviour

- **Arithmetic Operations**: Any calculation involving a null will return null. Example: 2 + null = null
- **Comparisons**: Any comparison involving a null will return *false*. Note that this includes comparing null to null, which also returns the value defined for the *False* case in a Comparison element. This behavior aligns with standard practices in the IT industry for handling nulls in data.

Exceptions

For some operations, a numeric result is required even if some inputs are null. For minimum, maximum and average operations, null values are ignored.

For example, the average of `1` and `null` is `1`. If all inputs are null, the result is null.

> **Note**
>
> When using lookups, handle null inputs carefully. If a lookup filter is set to null, NEXUS IC attempts to find a matching row with a null value, which can be inefficient for large datasets. To avoid performance issues, validate lookup inputs and skip the lookup when filters are null or invalid.

8.2.1.4.7 Test Functions

You can test functions both individually while editing them and in bulk across multiple functions. Testing helps verify that a function produces the expected results and continues to behave correctly after changes.

8.2.1.4.7.1 Test Individual Functions

You can test a function while editing it in the **Edit Function Definition** dialog.

8.2.1.4.7.2 Check Intermediate Results

To evaluate a function using specific input values and see intermediate results:

1. Open the function for editing.
2. On the **Tests** tab, enter values in the *Input Values* section at the bottom of the tab.
3. Make sure the **Show Results** button is enabled.

The function is evaluated using the entered inputs. The values of input parameters, intermediate elements and the final result are shown next to the corresponding elements in the design area.

8.2.1.4.7.3 Create Test Cases

You can define test cases for a function on the **Tests** tab. Test cases allow you to verify a function as you create it and to re-validate its behaviour after changes.

To create and run a test case:

1. On the **Tests** tab, click **Add**.
2. In the **Add Function Test** dialog, enter the test details:

Field/Checkb Name	Description
Name	Enter a name the uniquely identifies the test case.
Comments	Optional notes describing the purpose or expected behaviour of the test.
Error Result	Select this option if the function is expected to return an error defined by an error element. The test passes if the expected error is returned and fails if no error occurs.
Result	The expected result of the function for this test case.
Fields under **Test Values**	The fields under this dialog section correspond to the input parameters that you specified for the function. Enter the input values that you want to test for each parameter.

3. Click **OK** to save the test case.

4. Back on the **Tests** tab in the **Edit Function Definition** dialog, click **Execute Tests** to run all test cases for the function.

Result

- The test result columns are updated for each test case:
  - **Test Result** shows the expected result defined in the test.
  - **Actual Result** shows the value calculated by the function.
  - **Pass/Fail** shows *Pass* if the actual result matches the expected result, or if an expected error is correctly returned. *Fail* is shown in all other cases.
  - **Error Result** shows *Yes* if the test case was configured to expect an error.
- If **Show Results** is enabled, the values shown next to the elements in the design area are updated. If an element receives an input of an unexpected type, a yellow error message appears at the bottom of that element explaining the issue. Similar messages are shown for other error conditions, such as division by zero.

  By default, the element values shown correspond to the first test case in the list. To inspect values for a different test case, select the test case and click **Inspect** in the toolbar.

Tip

When creating test cases, it is recommended that you include at least one test that produces a valid result. If the function can return errors (see *Error*), include at least one test case for each possible error condition.

8.2.1.4.7.4 Test Functions in Bulk

If test cases are defined for multiple functions, you can execute them together from the **Configuration – Functions** dialog under *Configuration* → *General* → *Functions*.

To generate a test report:

1. In the **Configuration – Functions** dialog, select the functions to test.
2. Click **Execute Tests** on the toolbar.
3. NEXUS IC executes all test cases for the selected functions and displays the results in the **Function Tests** dialog. Results are grouped by function and can be expanded to view individual test case outcomes.

Tip

To quickly identify failed and passed functions, you can group the results by pass or fail status. Right-click the **Pass/Fail** column header in the **Function Tests** dialog and select **Group**.

8.2.1.4.8 Save/Load Function Templates

Clicking **Save Template** will save the selected function and related details to a .function file. NEXUS IC will find all items related to this function (asset information forms, event definitions, chart templates, lookup tables, and so on), and will present a dialog listing all the dependencies it has found, with a checkbox for each row. Untick any that you don't want to be saved with your function.

This function can then be loaded into this or another database via **Load Template**. Note that if the previously saved function still exists in this database, Load Template will overwrite that existing function and it will not create a new copy of it. This is similar for any other elements saved in the .function file: asset information fields, lookup tables, and so on.

See also

- *Function Elements*
- *System Functions*

8.2.1.5 Configure Global Tables

Global tables allow you to look up data based on another field or fields. Global tables can be used to store a series of data (for example, properties of different materials, piping schedule data), which can be then referenced from fields in Asset Information Group (AIG) forms to get the required input values.

You can configure global tables under *Configuration* → *General* → *Global Tables*. Much of their configuration is similar to *Configure Asset Information Groups* or *Configure Event Types*, but the way they are used is quite different.

8.2.1.5.1 Using Global Tables

Once you have configured global tables, you can use them in the following ways:

- You can link them to an AIG by adding an AIG field with field type *Global Table Link* and referring to the global table. In this case, on the AIG form, the fields of the global table will appear as drop-down lists with fixed values to choose from, where the available fields and field values will depend on your selection of values in the other fields of the global table. For more information, see *Global Table Link Field*.

  For an example of how to configure a global table for use as a global table link, see *Example: Configure Global Table for Global Table Link*.

- You can configure AIG fields with field type *Global Lookup* (global lookup fields), from which you can link to specific fields within the global table and on the AIG form and set up a function to get the field value based on the values of these other fields. For more information, see *Global Lookup Field*. Note that global lookup fields are distinct from *lookup list* fields. Lookup lists let the user choose from a drop-down list, whereas global lookup fields are more like a calculation, filling in a value without the user taking any action, and without the user being able to later modify that value.

  For an example of how to configure a global table for use in a global lookup field, see *Example: Configure Global Table for Global Lookup List*.

8.2.1.5.2 Create Global Tables

The basic process of creating a new global table is the following:

1. Click **Add** at the top of the **Configuration - Global Tables** dialog and choose **Lookup Table**.
2. Specify the main parameters of the table in the **Add Table Definition** dialog. For more information, see *Add/Edit Table Definition Dialog*.

   When setting up the table, you can also use some standard buttons from the top toolbar of the **Configuration - Global Tables** dialog (see *Using the Grid*). In addition, you can:

   - Use the **Field Order** button to move a field up or down in the form or grid. For example, if you want to place a field between two other fields in the form, select **Form ...** from the drop-down list, and in the **Form Field Order** dialog, you can move the field with the **Move Up** or **Move Down** buttons available in the toolbar.
   - Check the dependency map using the **Map** button.
3. Add new fields to the table by choosing **Add** from the middle toolbar of the **Configuration - Global Tables** dialog.
4. Specify the main parameters of the fields in the **Add Field Definition** dialog. For more information, see *Add/Edit Field Definition Dialog*.

   When setting up the fields, you can also use some standard buttons from the middle toolbar of the **Configuration - Global Tables** dialog (see *Using the Grid*).
5. Enter data for each field of the global table either by manually adding data (**Add** button) or importing data from an Excel or text file (**Import** button) from the bottom part of the **Configuration - Global Tables** dialog. You can add a series of data as required.

See also

- *Example: Configure Global Table for Global Table Link*
- *Example: Assign Global Table Link to AIG*
- *Example: Configure Global Table for Global Lookup List*
- *Example: Set Up Global Lookup Field*

8.2.1.5.2.1 Set Up Workflow Rules

If you want a field's properties to be controlled by other data, you can set up workflow rules for the field. You can set up workflow rules for fields in an Asset Information Group (AIG), a global table, or an event form.

To set up a workflow rule for a field, proceed as follows:

1. Start editing the required field in either of the following ways:
   - In case of an AIG field, choose *Configuration* → *Assets* → *Information* from the main menu, select the relevant AIG form in the top of the dialog and double-click the required field from the bottom of the dialog or select it and choose **Edit**.

- In case of a global table field, choose *Configuration* → *General* → *Global Tables* from the main menu, select the relevant global table in the top of the dialog and double-click the required field from the middle part of the dialog or select it and choose **Edit**.
- In case of field in an event form, choose *Configuration* → *Events* → *Event Types* from the main menu, select the relevant event type in the top of the dialog and double-click the required field from the bottom of the dialog or select it and choose **Edit**.

2. In the **Edit Field Definition** dialog (see *Add/Edit Field Definition Dialog*), go the the **Workflow Rules** tab.
3. Choose **Add** to create a new workflow rule, or, if you want to change an existing workflow rule, select it and choose **Edit**.
4. On the **Field Trigger** tab, enter a name for the workflow rule and in the **Trigger Type** field, select the required trigger type from the following options:

Trigger Type	Description
Clear Field Value on Form	Automatically empties out a field's value when a specific condition is met, for example, you can use it to make two fields mutually exclusive, so that users can fill in one field or the other, but not both.
Set Field Readonly on Form	Sets the field to read-only in case a specific condition is met.
Set Field Required on Form	Marks a field as required in case a specific condition is met.
Set Field Visibility on Form	Use this trigger type if you want a field to be visible only when some other field is filled in (or vice versa). If the assigned function returns a *Yes* value, the field will be visible, when *No*, the field will be invisible.
Validate Field Value	Validates the value the user has entered in the field, for example, if it is required in a specific format or if it matches another configured set of items. If the assigned function returns a *Yes* value, the field value is considered valid, if it returns *No*, the value is considered invalid and a yellow exclamation mark () will appear next to the field.

5. On the **Function** tab, choose a function that returns a *Yes*/*No* value.

   There are a set of system functions that you can use, which means that you don't need to create custom functions:

   - Compare - Is Null
   - Compare - Is Not Null
   - Compare A = B
   - Compare A <> B

6. Click **OK** to save your changes.

Note

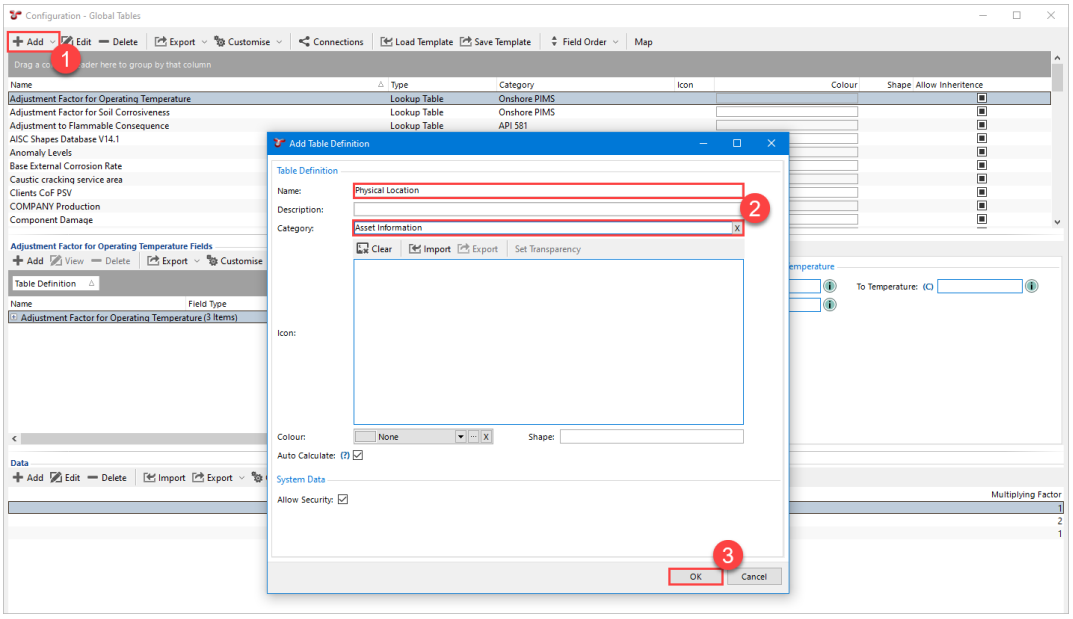
> Workflow rules are run when forms are viewed interactively, but are not applied during *imports*. If you have ticked the *Required* checkbox on the **Field Definition** tab of the **Edit Field Definition** dialog, this *will* be enforced during imports, that is, rows that are missing required fields will be rejected. But if a workflow rule makes a field required, this will *not* be enforced during imports.

8.2.1.5.2.2 Example: Configure Global Table for Global Table Link

The steps below show an example for setting up a global table that can be used in an Asset Information Group (AIG) using the *Global Table Link* field type. Once you have configured the global table, you can then assign it to the AIG as described in *Example: Assign Global Table Link to AIG*.

8.2.1.5.2.3 Process

1. From the menu, choose *Configuration* → *General* → *Global Tables*.
2. Add a new global table.
   a. To add a new global table, click **Add** (1) and select **Lookup Table** from the drop-down menu.
   b. In the **Add Table Definition** dialog, enter the table name and category of the table in the **Name** and **Category** fields (2).
   c. Click **OK** to save the new global table (3).



3. Configure global table fields.

   Now that the global table has been created, you can add its fields. These will be points of user input where the user may choose from a list of predefined values. When creating a global table for use with a global table link, the first field will be a lookup list that lists the values based on which the remaining fields are filtered. Since the rest of the fields are dependant on this first lookup list field, they must be of type alphanumeric.

The steps and the screenshot below show the setup of the first field:

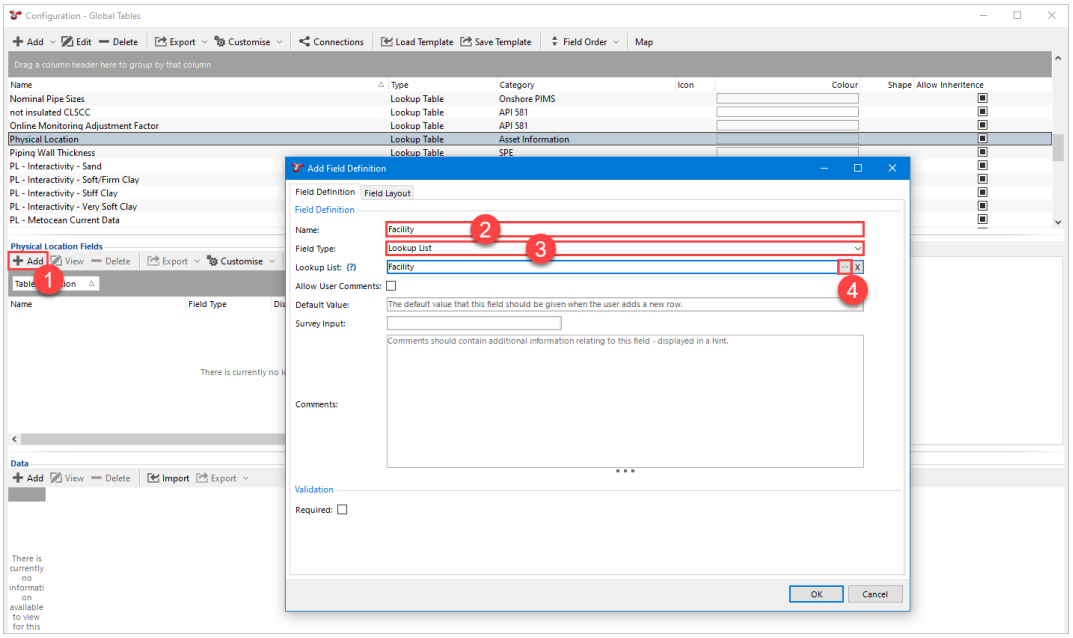
a. Click **Add** from the middle toolbar to add a new field (1).

b. Enter the field name in the **Name** field (2), and select *Lookup List* from the drop-down list under the **Field Type** field (3).

c. Link the field to a lookup list by clicking the ellipses in to the **Lookup List** field (4).

d. In the **Select Lookup List** dialog, proceed in either of the following ways:

- Create a new lookup list to be used in your global table. If you create a new lookup list, proceed to step 4.
- Select an existing lookup list if that suits your purposes. In this case, proceed to step 5.



4. Create a lookup list.

To create a new lookup list, proceed as follows:

a. Click **Add** in the **Select Lookup List** dialog

b. Enter a name and category for the lookup list as required.

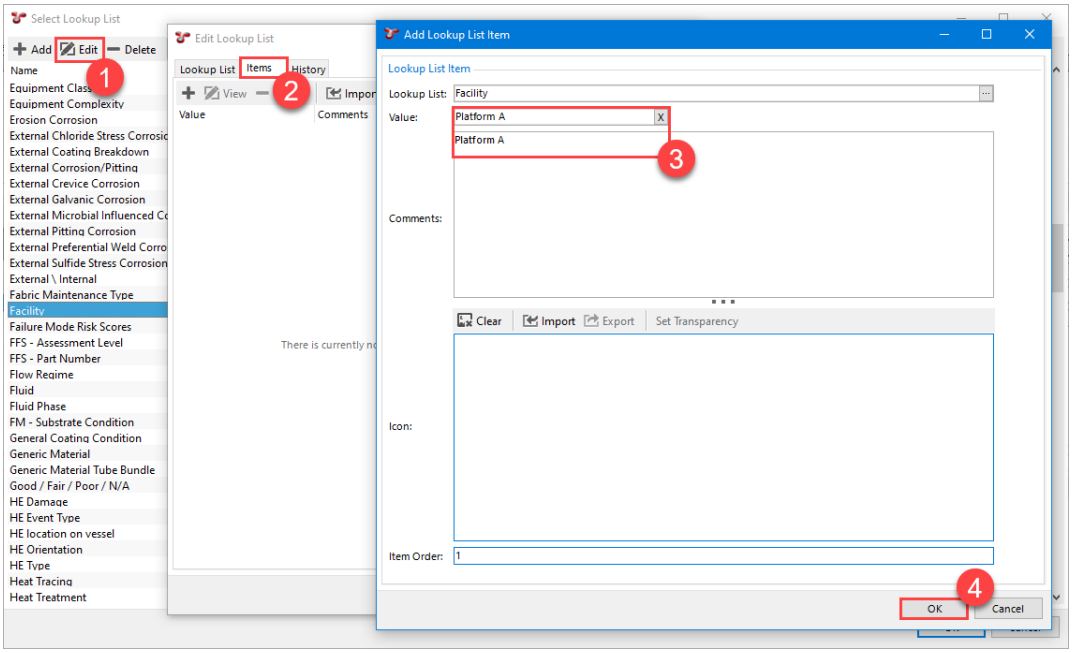
c. Click **OK**.

d. Start adding items to the lookup list by selecting it and clicking **Edit** (1).

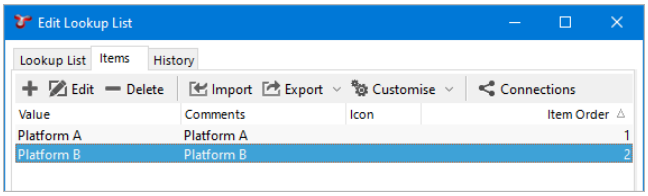
e. On the **Items** tab, enter the lookup list items. These items will be any values (3) you would like to be included in the first drop-down list in the global table form, which will then filter the options in the subsequent drop-down fields.

f. Click **OK** to save these changes 4.

g. Add other lookup list items as required.

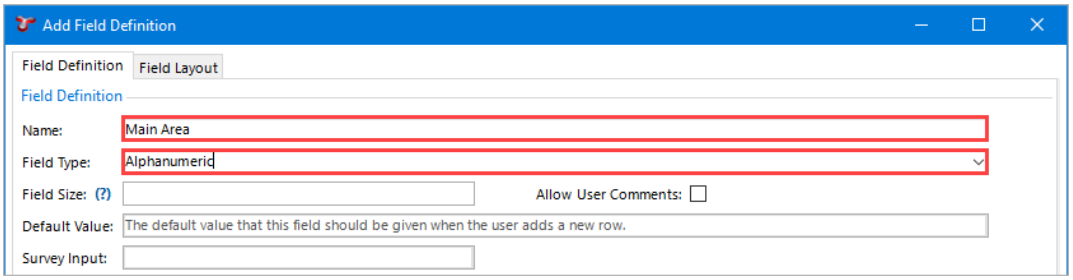


h. After adding the lookup list items, you can see all the items in the **Edit Lookup List** dialog as shown below. Click **OK** to save these changes and return to the **Configuration - Global Tables** dialog.



5. Create the remaining global table fields.

   Now you can create the rest of the global table fields. For each of these remaining fields, use the field type *Alphanumeric*.



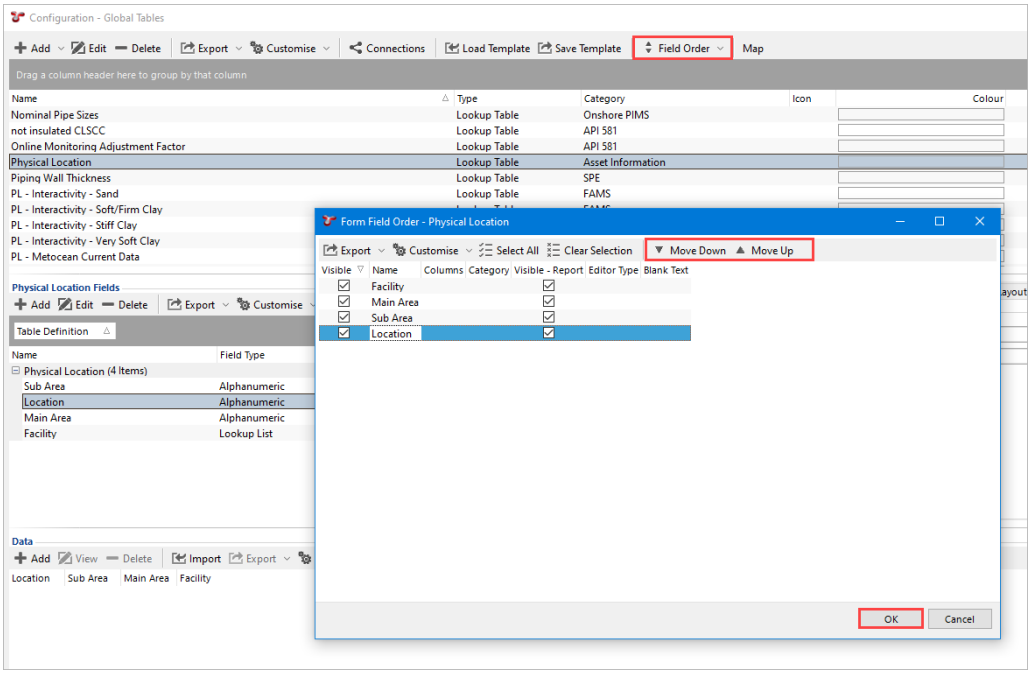
6. Adjust the form field order.

   To order the fields correctly in the form, you can adjust their order as follows:

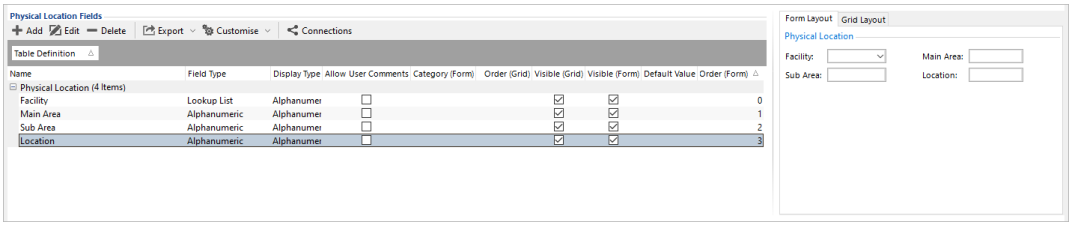
   a. Choose **Field Order -> Form** from the top toolbar of the **Configuration - Global Tables** dialog.

   b. Use the **Move Down** and **Move Up** buttons to change the order of the fields.

   c. Click **OK** to save your changes.



The screenshot below shows the fields after re-ordering. You can see the **Form Layout** preview on the right of the screenshot:



In this example, the **Facility** field will be presented first, giving the user a list of facility locations to choose from. The second field to appear in the form will be **Main Area**, and its options will be based on the user's selection in the **Facility** field. **Sub Area** and **Location** will also be filtered based on the previous fields. This results in the last field in the form, **Location**, which will provide the most filtered and refined options available for selection.

7. Change the form field layout.

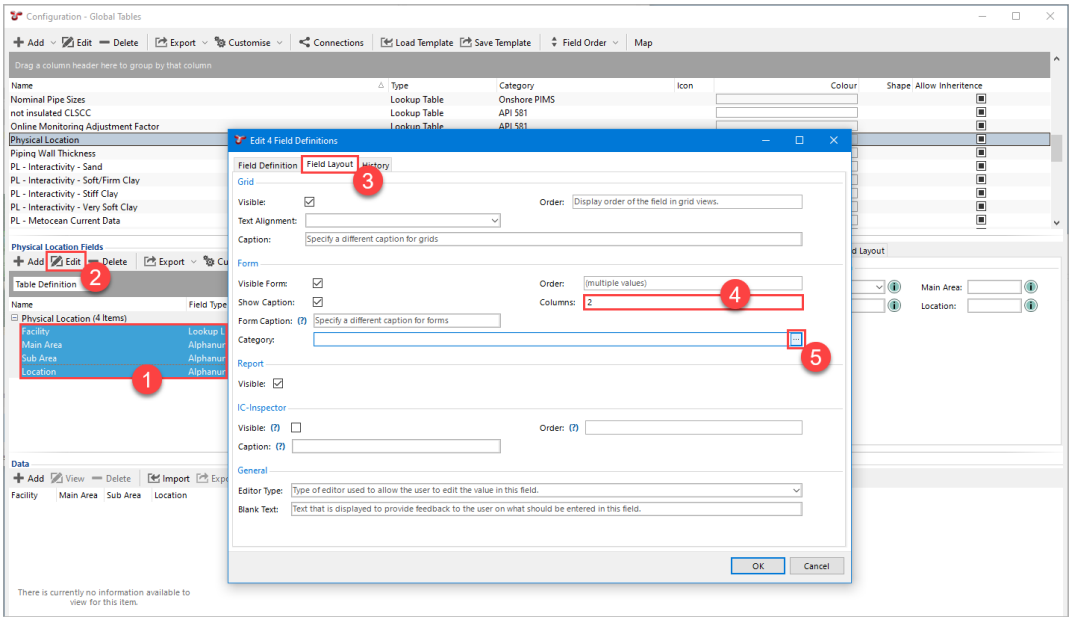
   If you want to reformat how the fields are arranged, for example, each on a new line, or two fields per line, and so on, you can change these settings for each field as follows:

   a. Select all the fields (CTRL + Click or SHIFT + Click) 1.

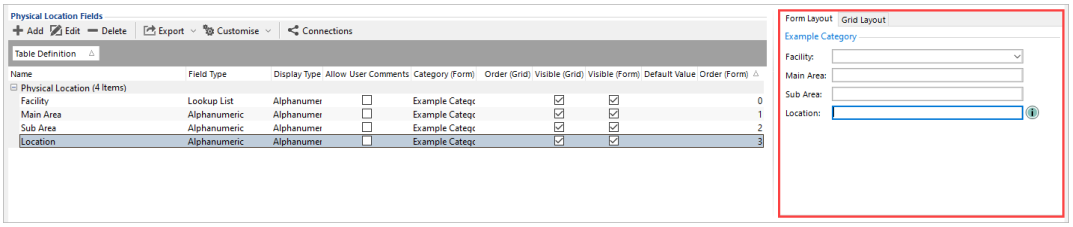
   b. Click **Edit** 2.

   c. On the **Field Layout** tab 3, enter the number of columns you would like each field to take up 4.

   d. In the **Category** field, click the ellipses to access the **Category** dialog 5 and choose how many columns wide the form will be.

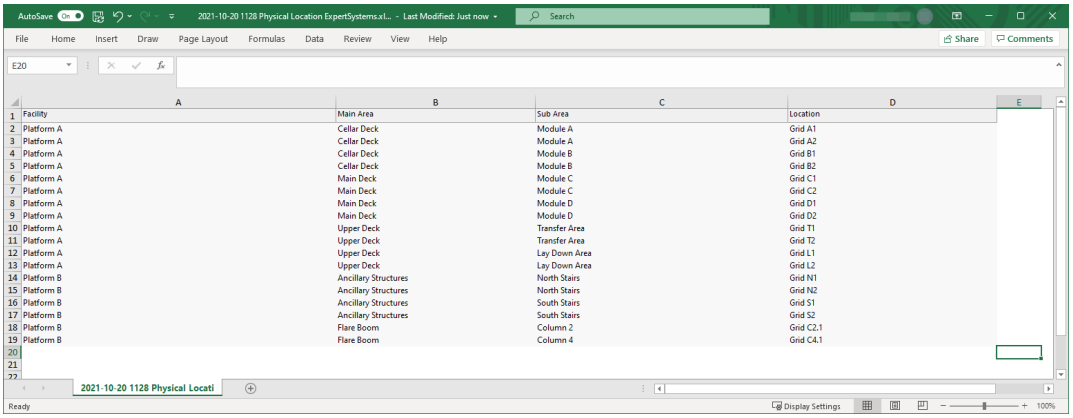


In this example, we choose Columns = 2 in the Field Layout, and Columns = 2 in the Category layout, setting each field on its own line:



8. Import the global table data.

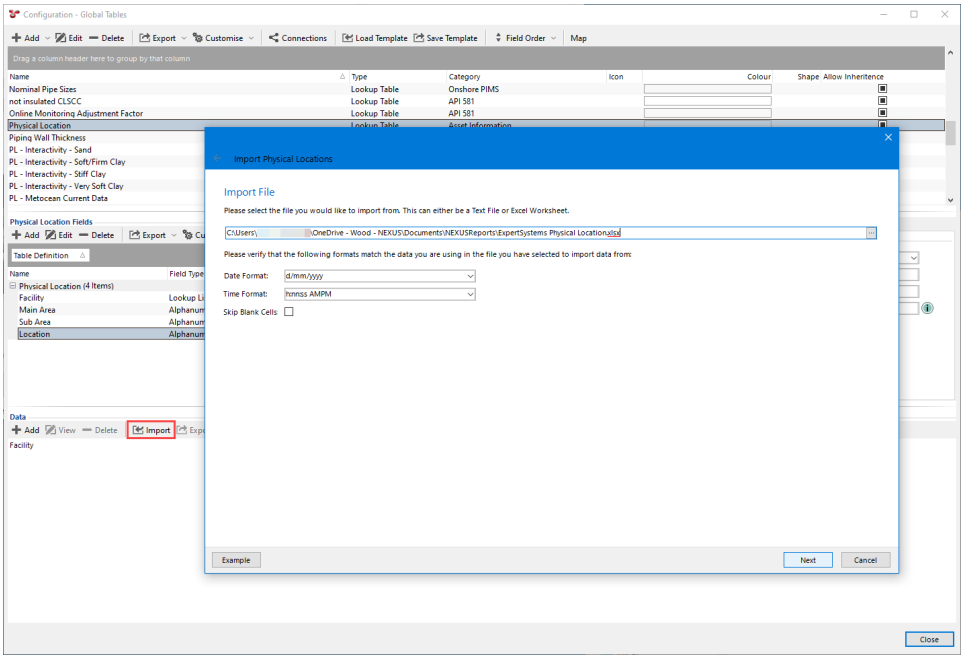
   Now the global table is ready for data to be imported. The data sheet defines how each global table link field relates by listing each possible combination of entries into the form. See the example EXCEL data sheet below. Note that the headers correspond to the names of the global table fields:



   To import the sheet, proceed as follows:

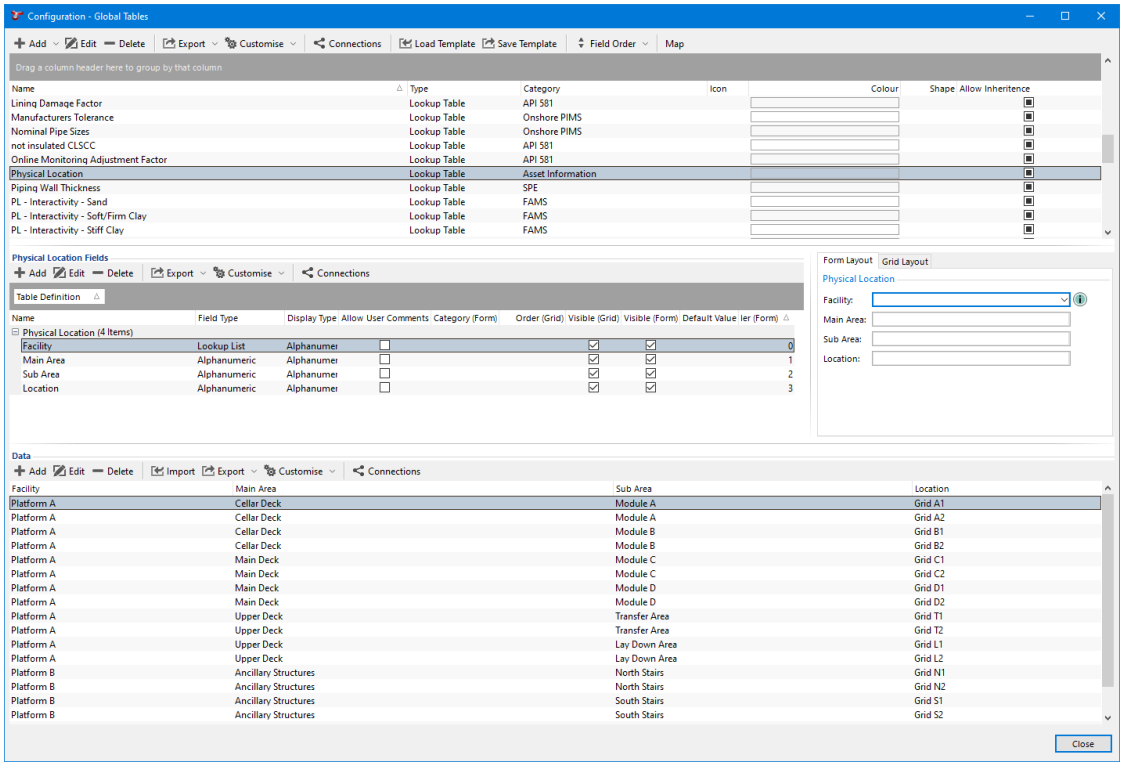
   a. Click **Import** under **Data** from the bottom toolbar.

   b. In the import wizard select the file to be imported and go through the steps as required.



8.2.1.5.2.4 Result

Once your data has been imported successfully, the **Configuration - Global Tables** dialog should look like the screenshot below. Note the order of the fields, the form fields formatted for one field per line, and the global table data visible under **Data**:



You can now link the global table to an AIG form as described in *Example: Assign Global Table Link to AIG*.

8.2.1.5.2.5 Example: Configure Global Table for Global Lookup List

In this example, we set up a global table that contains a series of data for the possible combinations of outside diameter and nominal pipeline size (NPS) of a pipeline. We then want to refer to the data of this global table in an asset information group (AIG) called *Pipeline* and set up a global lookup field for the **Outside Diameter** field on this AIG. This global lookup field will return the value for the **Outside Diameter** field by:

- Checking the value of the **NPS (Inch)** field on the same AIG
- Using a Compare function to find a match between the value of the **NPS (Inch)** field and an outside diameter value stored in the global table
- Return the first matching outside diameter value to the **Outside Diameter** field

The process below shows how you can configure a global table that can be used for this example. You can then set up the global lookup field as described in *Example: Set Up Global Lookup Field*.

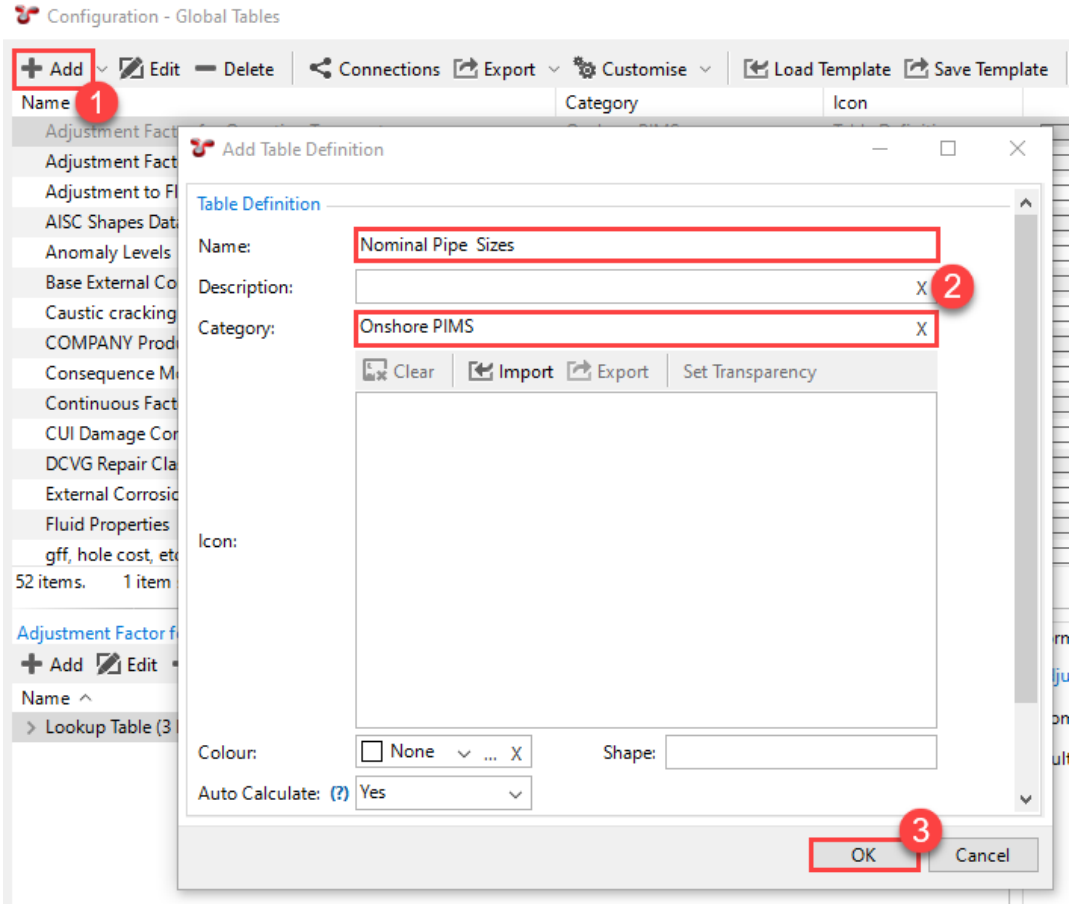
8.2.1.5.2.6 Process

1. From the menu, choose *Configuration → General → Global Tables*.
2. Add a new global table.

    a. To add a new global table, click **Add** 1 and select **Lookup Table** from the drop-down menu.

b. In the **Add Table Definition** dialog, enter the table name and category of the table in the **Name** and **Category** fields (2).

c. Click **OK** to save the new global table (3).



3. Configure global table fields.

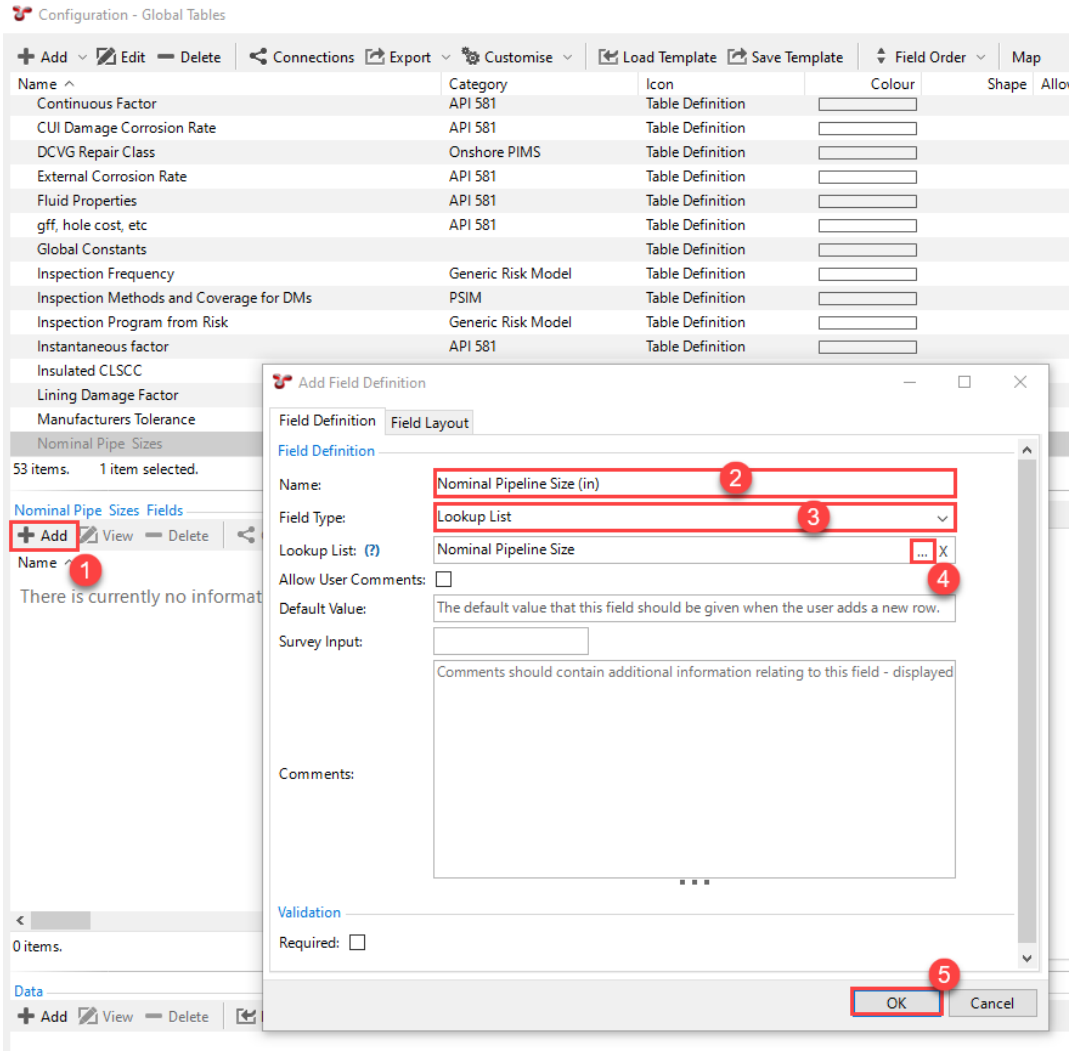
   Now that the global table has been created, you can add its fields. These fields will store the data of the possible outside diameters and the nominal pipeline sizes in mm and inches. In this example, the *Pipeline* AIG already contains the **NPS (Inch)** field, which is associated with the lookup list *Nominal Pipeline Size*. This lookup list contains the possible values of nominal pipeline sizes in inches. We first create a global table field that refers to this lookup list.

   a. Click **Add** from the middle toolbar to add a new field (1).

   b. Enter the field name in the **Name** field (2), and select *Lookup List* from the drop-down list under the **Field Type** field (3).

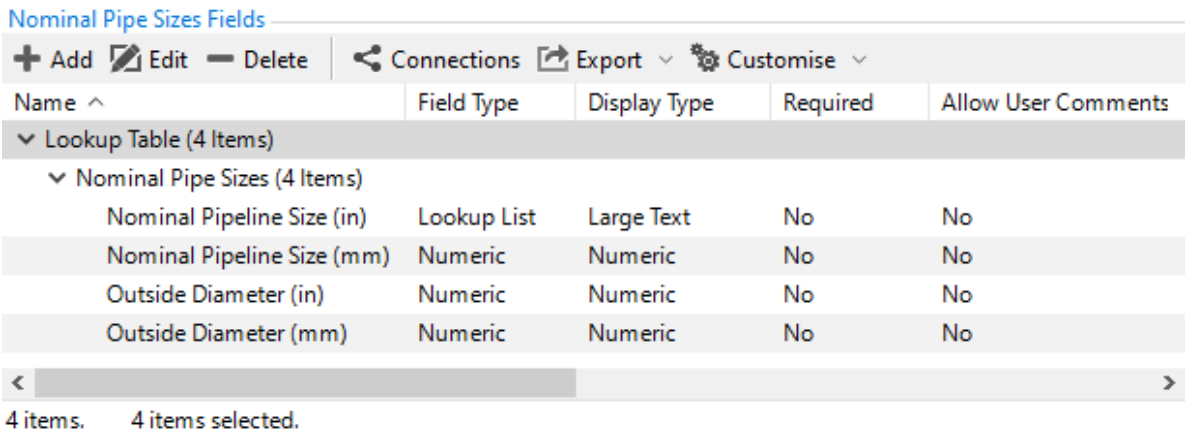
   c. Click the ellipses in the **Lookup List** field (4) and select the lookup list *Nominal Pipeline Size*.

d. Click **OK** to save the global table field 5.



4. Create the remaining global table fields.

   Now you can create the rest of the global table fields for the nominal pipeline size in mm, and the outside diameter fields in mm and inches. For each of these remaining fields, use the field type *Numeric*.

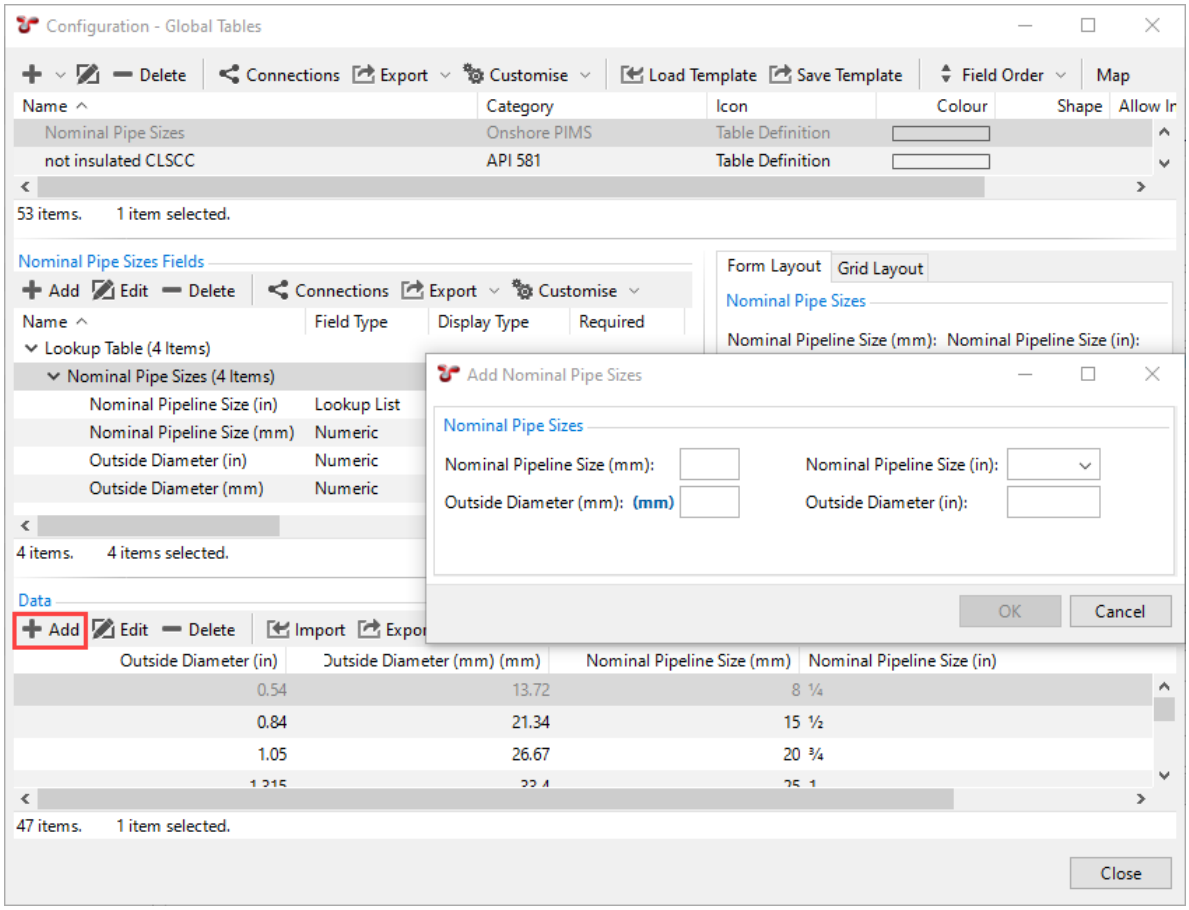


5. If required, you can adjust the form field order or the form field layout.

   For information about how to do that, you can check the relevant steps described in *Example: Configure Global Table for Global Table Link*.

6. Add data to the fields of the global table.

   Choose **Add** in the bottom toolbar to enter the possible values of the fields one by one. Alternatively, you can import data from a file using the **Import** button.



8.2.1.5.2.7 Result

You now have a global table with the possible combinations of values for *outside diameter* and *nominal pipeline size* defined. You can set up a global lookup field for the outside diameter as described in *Example: Set Up Global Lookup Field*.

8.2.1.6 Configure Lookup Lists

Under *Configuration* → *General* → *Lookup Lists*, you can manage lookup lists and lookup list items using the **Configuration - Lookup Lists** dialog.

Lookup lists store information that is reused throughout the application, ensuring consistent and uniform data entry. They are used in asset information forms (see *Configure Asset Information Groups*), event forms (see *Event*) and global table forms (see *Global Table*). In these forms, lookup list fields appear as drop-down lists from which the user selects a value.

Lookup lists are particularly useful when you need to restrict a subjective assessment to a predefined set of values. For example, a lookup list is an effective way to ensure consistency when assigning a priority level. If you define lookup list items such as `High`, `Medium` and `Low` (with associated values of three, two and one respectively) in a lookup list called `Priority`, users are restricted to select values from a predefined priority schema.

The **Configuration - Lookup Lists** dialog is divided into two sections, each with its own grid and toolbar:

- The **upper section** displays lookup lists. Its toolbar provides the standard grid options for managing lookup lists, including adding, editing and deleting records, managing connections, importing and exporting data and customising the grid layout. For more information, see *Using the Grid*.

  An additional **Item Order** toolbar option is also available here. This option applies to the currently selected lookup list and opens the **Item Order** dialog, where you can control the order in which that lookup list's items appear in drop-down lists using the **Move Up** and **Move Down** toolbar buttons.

- The **lower section** displays the lookup list items associated with the currently selected lookup list. Its toolbar provides the standard grid options for adding, editing and deleting lookup list items, as well as other common grid actions.

8.2.1.6.1 Create a Lookup List

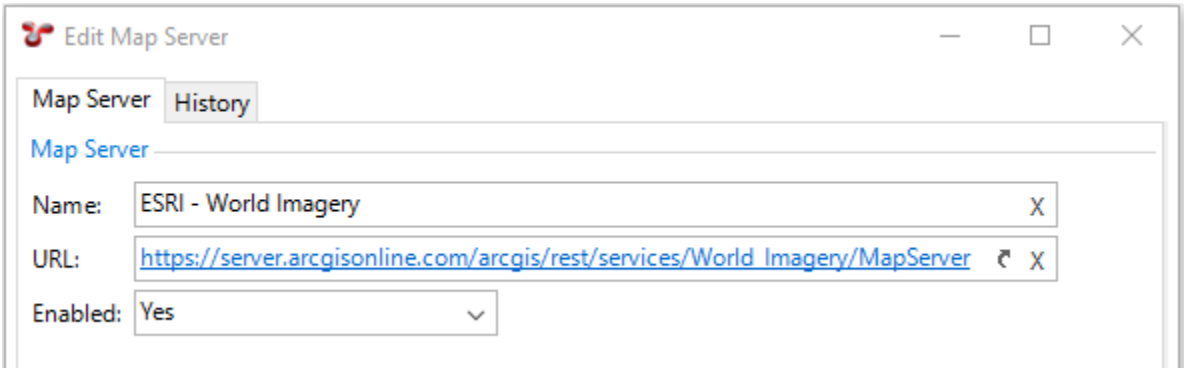
To add a new lookup list, proceed as follows:

1. Click the **Add** button at the top of the **Configuration - Lookup Lists** dialog.
2. In the **Add Lookup List** dialog, enter a name for the lookup list and optionally assign it to a category. For more information, see *Add/Edit Lookup List Dialog*.
3. Click **OK** to save the lookup list.
4. Add items to the lookup list in either of the following ways:
   - Edit the lookup list and define items on the **Items** tab of the **Edit Lookup List** dialog. This tab is only visible after the lookup list has been saved.
   - Select the lookup list and click **Add** in the lower part of the **Configuration - Lookup Lists** dialog.
5. In the **Add Lookup List Item** dialog, define the required parameters for each lookup list item. For more information, see *Add/Edit Lookup List Item Dialog*.
6. Click **OK** to save the lookup list items.

8.2.1.7 Configure Map Servers

Map servers are used by the **Map** tab on the **INSPECTIONS** screen.

If you have your own geographic information system (GIS) system, you can specify its tile server URL under *Configuration → General → Map Servers* to make your own GIS available in NEXUS IC's maps tab. Your GIS must offer map tiles in the way NEXUS IC is designed to consume them. For more details, contact NEXUS Support.



8.2.1.7.1 Server List

See below for the current map servers in use by NEXUS:

Map	Server URL	Updated
ESRI - World Imagery	https://server.arcgisonline.com/arcgis/rest/services/World_Imagery/MapServer	6th May 2022
ESRI - World Ocean Base	https://server.arcgisonline.com/arcgis/rest/services/Ocean_Basemap/MapServer	6th May 2022
ESRI - World Physical Map	https://server.arcgisonline.com/arcgis/rest/services/World_Physical_Map/MapServer	6th May 2022
ESRI - World Street Map	https://server.arcgisonline.com/arcgis/rest/services/World_Street_Map/MapServer	6th May 2022
ESRI - World Terrain	https://server.arcgisonline.com/arcgis/rest/services/World_Terrain_Base/MapServer	6th May 2022
ESRI - World Topographic	https://server.arcgisonline.com/arcgis/rest/services/World_Topo_Map/MapServer	6th May 2022

Your selection in the **Enable** field determines whether the map server is available from under the **Map Layers** button on the **Map** tab.

8.2.1.8 Configure Traffic Lights

Traffic lights appear as coloured dots next to each asset in the *asset tree*. You can display them by selecting the required traffic lighting option from the **Traffic Lighting** toolbar button (see *Traffic Lighting*).

You set up the traffic lighting rules under *Configuration* → *General* → *Traffic Lights*.

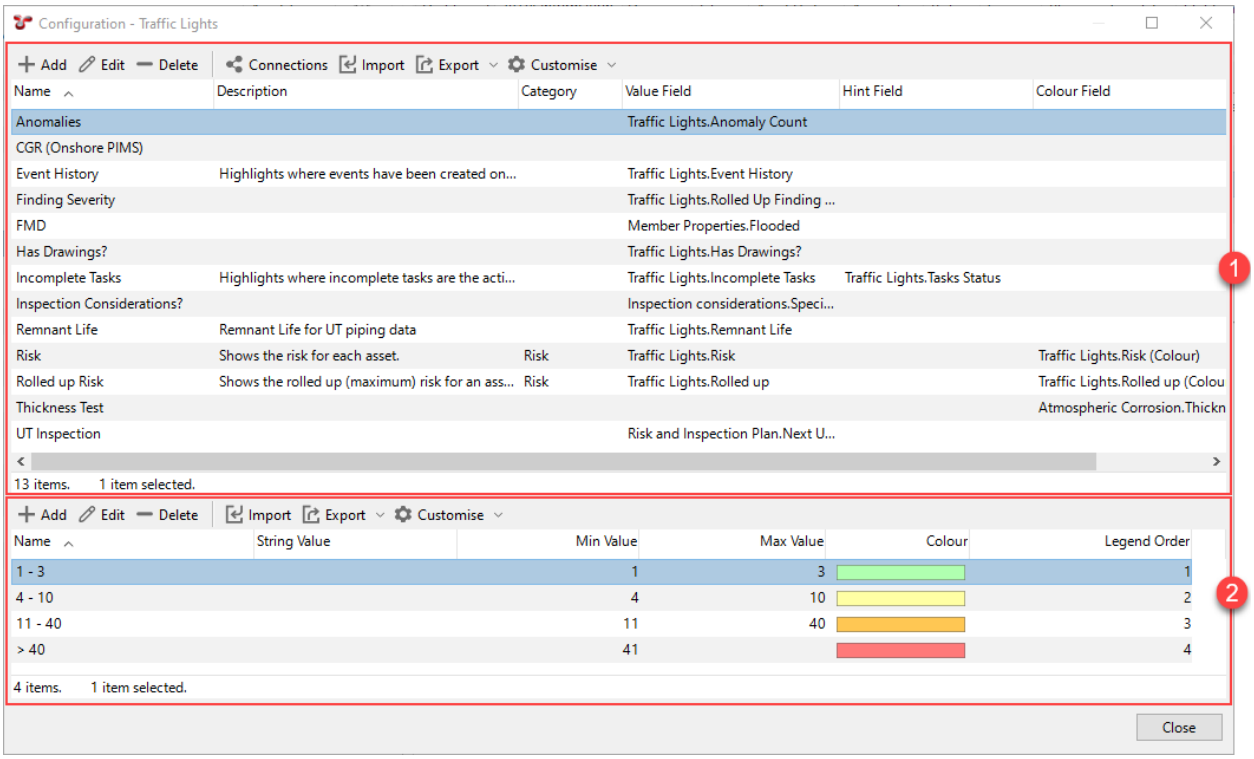
NEXUS predelivers the **Traffic Lights** asset information group (AIG), which centralises the asset information fields used for traffic lights. This allows you to review all traffic lights for an asset in one place. You can also define colour fields in this AIG.

8.2.1.8.1 Set up Traffic Lighting Rules

Traffic lighting rules define how coloured dots are shown next to assets in the asset tree. A rule can determine the colour in one of two ways:

- by referencing a calculated colour field in an AIG, or
- by using manually defined overlay values that map field values to colours.

The **Configuration - Traffic Lights** dialog under *Configuration* → *General* → *Traffic Lights* is divided into two main sections:



1 **Traffic Lighting Rule Configuration**:

You use the standard grid toolbar (see *Using the Grid*) in the top section of the dialog to create, edit, delete, import or export traffic lighting rules or check connections. Choosing **Add** or **Edit** opens the **Add/Edit Traffic Light** dialog (see *Add/Edit Traffic Light Dialog*).

If a rule uses a colour field in an AIG, that calculated colour is used directly. In this case, overlay values are not required. For information about creating traffic lights using this method, see *Create Traffic Lights Using AIG Colour Fields*.

2 **Overlay Value Configuration**:

You use the standard grid toolbar (see *Using the Grid*) in the bottom section of the dialog to create, edit, delete, import or export overlay values associated with the selected rule. Choosing **Add** or **Edit** opens the **Add/Edit Overlay Value** dialog (see *Add/Edit Overlay Value Dialog*).

If no colour field is specified, you must define overlay values to map the **Value Field** to colours. For information about creating traffic lights using this method, see *Create Traffic Lights Using Overlay Values*.

8.2.1.8.1.1 Create Traffic Lights Using AIG Colour Fields

If the **Traffic Lights** AIG contains colour fields with functions that calculate a colour, you can reference these fields directly in your traffic lighting rules. To use this method:

1. Choose *Configuration* → *General* → *Traffic Lights* from the menu.
2. In the **Configuration - Traffic Lights** dialog, choose **Add** from the top toolbar.
3. In the **Add Traffic Light** dialog (see *Add/Edit Traffic Light Dialog*), enter the required details and in the **Colour Field** field, select the colour field defined in your AIG.
4. Save your entries.

8.2.1.8.1.2 Create Traffic Lights Using Overlay Values

If you do not define a colour field in the AIG, you can manually specify overlay values instead. Overlay values map the values of the **Value Field** to specific traffic light colours. To set up a traffic lighting rule using overlays:

1. Choose *Configuration* → *General* → *Traffic Lights* from the menu.
2. In the **Configuration - Traffic Lights** dialog, choose **Add** from the top toolbar.
3. In the **Add Traffic Light** dialog (see *Add/Edit Traffic Light Dialog*), enter the required details and leave the **Colour Field** field empty.
4. Save your entries.
5. In the **Configuration - Traffic Lights** dialog, select the traffic light you created and choose **Add** from the bottom toolbar to create the first overlay value.
6. Enter the required details in the **Add Overlay Value** dialog (see *Add/Edit Overlay Value Dialog*).
7. Save your entries.
8. Repeat steps 5 to 7 to define additional overlay values.

8.2.1.8.2 Set up Permissions

Permissions determine which users and groups can view or edit each traffic light. If you do not configure permissions, all users can view all traffic lights by default.

To configure permissions:

1. Edit a traffic light.
2. Choose the **Permissions** tab.
3. Click **Add**.
4. Double-click an empty field under **User / Group** and pick a user or group.
5. Under **Permission**, use the drop-down list to select a permission:
   - *Read Only* or *Deny Write*: the user or group can use the traffic light but cannot edit it.
   - *Read/Write*: the user or group can use and edit the traffic light.
   - *Deny All*: the user or group cannot view or edit the traffic light.

   Take care not to deny access for all users, otherwise the traffic light cannot be deleted. See *Manage User Security and Permissions* for details on how permissions interact.
6. Save your entries.

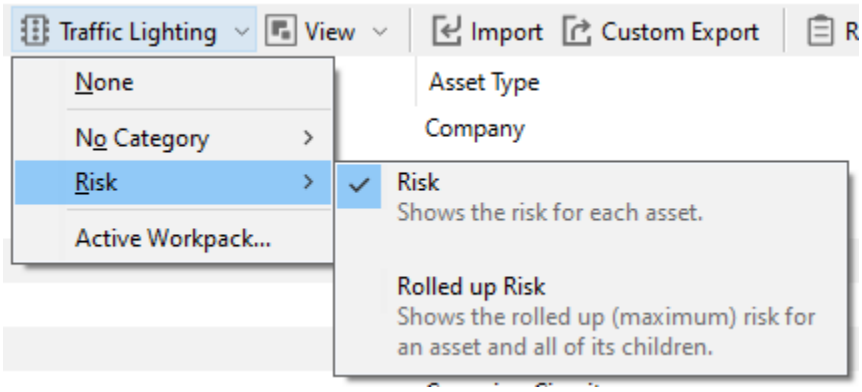
See also

- *Traffic Lighting*
- *Configure Traffic Light Categories*

8.2.1.9 Configure Traffic Light Categories

Under *Configuration → General → Traffic Light Categories*, you can create and manage traffic light categories. Categories group traffic lighting rules, and each category appears as a submenu in the **Traffic Lighting** toolbar menu.

When you open the **Traffic Lighting** menu, clicking a category expands its submenu and shows the traffic lighting rules assigned to it, as shown below:



If a traffic lighting rule has no category assigned, it is automatically listed under the **No Category** group.

8.2.1.9.1 Defining a Category

To define a new category:

1. Choose *Configuration → General → Traffic Light Categories* to open the **Configuration - Traffic Light Categories** dialog.
2. Click **Add**.
3. Enter the name of the category.
4. Save your entries.

The new category then appears as a submenu in the **Traffic Lighting** toolbar menu. If any rules have been assigned to it (see *Add/Edit Traffic Light Dialog*), it will appear within that submenu.

See also

- *Traffic Lighting*
- *Configure Traffic Lights*

8.2.1.10 Configure Unit Types

The unit type reflects the type of quantity that is being measured, for example, area, time or mass.

Under *Configuration → General → Unit Types*, you can create, edit and delete unit types.

Unit types make NEXUS IC unit-aware, and allow you to switch units in a field.

The NEXUS IC database comes pre-populated with a standard set of unit types and units. When a unit is assigned to an asset information group field, the value can be converted to any other unit that belongs to the same unit type.

Numeric fields that are defined with a unit group appear in the asset information group with a blue label. To convert the value to a different unit type, click and select the unit type.

8.2.1.10.1 Maintaining Unit Types

You can maintain unit types in the top part of the **Configuration - Unit Type** dialog.

To assign and maintain units within a unit type, use the bottom part of the dialog.

For each unit type, you must maintain a reference unit. When you add units to a unit type, you must define the conversion rate in the **Gradient** field, which tells the system how to perform conversions between the unit and the reference unit.

8.2.1.11 Configure Unit Groups

Unit groups reflect the system of measurement that you use for measuring units.

Under *Configuration → General → Unit Groups*, you can create, edit and delete unit groups. Users can then select their required unit group under *Database → Your Profile...* (see *Your Profile*).

Unit groups allow you to quickly switch to different systems of measurement, for example, switching between metric and US weights and measures.

By default, the NEXUS IC database is preconfigured with the following two unit groups:

- Metric
- US Weights and Measures

If required, you can create additional unit groups (for example, cgs and MKS, Potrzebie). When editing these unit groups, you can change which units belong to this unit group on the **Units** tab.

8.2.1.11.1 Automatic Conversion Between Unit Groups

When a user views a field and the default unit for that field is not in the currently selected unit group, that field is instead displayed in the closest unit that **is** in the currently selected unit group. That is, if a field has an underlying unit of centimetres, and the user has selected the "US Weights and Measures" unit group, that field will instead be displayed in inches.

8.2.1.12 Configure Providers

Connections allows you to create point-to-point connections to external databases. Connection types shown in the following table:

8.2.1.12.1 Definitions

Connection Type	Description
Push	where changes made in NEXUS are sent to the external field, but not vice versa
Pull	where changes made in the external table are pulled into the field in NEXUS.
Push & Pull	where changes made in either the external table or in NEXUS are propagated to the other

There are three steps to setting up a point-to-point connection. They are:

1. Set up the **Provider**
2. Set up the **Tables**; and
3. Set up the **Columns**.

8.2.1.12.2 Setting up the Provider

1. Click on *Configuration* → *General* → *Providers*
2. Click **Add** from the Configuration - Providers toolbar.
3. In the Add External Provider dialog, enter a descriptive **Name** for the Provider (eg. MAXIMO)
4. Choose the Provider Type (currently supports Oracle, MSSQL Server and Excel). Based on the Provider Type selected, you will be presented with further options (eg. if you choose Oracle type, then you will need to enter the Oracle Easy Connect String; if you choose Excel type, then you will need to enter the full path to the Excel file; and if you choose MSSQL Server you will be required to enter the Server Address, Database Name and other Authentication information.)

8.2.1.13 Configure Connections

8.2.1.13.1 Setting up the Tables

Source Name

When you are adding a new Table, click on OK after you have chosen the Provider. When you relaunch the dialog, the list of available Sources will be available for selection from a dropdown list.

1. Click on *Configuration* → *General* → *Connections*
2. Click **Add** from the Configuration - Connections toolbar.
3. In the External Table dialog, click on the Ellipsis ( ) button to choose the Provider set up previously, and enter a **Name** for the Table (eg. Workpack).
4. Enter the **Source Name**, this will be the database table name or for Excel the named table (eg. Workorder).
5. The **Primary Key** is the column or field defined in the External table which will be used to match to field in NEXUS IC which identifies the row to be updated. The values in the chosen field must be unique (eg. Name).
6. Check or uncheck **Allow Insert** determines if NEXUS will insert rows into the External Table or the NEXUS table.

8.2.1.13.2 Setting up the Columns

1. Click on *Configuration* → *General* → *Connections*
2. Click **Add** from the bottom toolbar in the **Configuration - Tables** dialog.
3. In the **Add External Field Map** dialog, click on the Ellipsis ( ) button to choose the Table set up previously.
4. The **External Field Name** will be the name of the Excel column or the name of the field in the MSSQL Server table.
5. The **Primary Key Field** is a column or field defined in the NEXUS IC database which will be used to match to the Primary Key field in the External table.
6. Choose which direction the data is to be passed from the **Sync Direction** dropdown list.

7. Finally, click on the **Internal Field** ellipsis button to choose a field in NEXUS which is mapped to the External field column.

8.2.1.14 Configure Attributes

Under *Configuration → General → Attributes*, you can extend the following system tables with additional fields. The identifiers in brackets indicate the primary key for each table:

- **Anomaly** (`Anomaly_ID`)
- **Anomaly Action** (`Action_ID`)
- **Library** (`Library_ID`)
- **Planning Template** (`LTIP_ID`)
- **Task** (`Task_ID`)
- **Workpack** (`Workpack_ID`)

When you extend any of these tables, an additional **Attributes** tab will appear in the corresponding create/edit dialog. This tab allows users to fill in the fields you have configured.

Additionally, you will be able to:

- Select these fields in Simple Sources when configuring report templates
- Select these fields when configuring chart templates
- Users can populate these fields via an import

> **Note**
>
> Calculated fields within an Attributes table can only directly reference other fields from the *same* table. If your calculation inputs require data from a different table, you need to implement an intermediate lookup function. This function should retrieve the required field using available input parameters.
>
> For example, when extending the **Anomaly** table, you might have a calculated field that requires asset details not stored directly in that Attributes table. In this case, you would create a sub-function that uses the Attribute's primary key (`Anomaly_ID`) to retrieve the related `Component_ID`, and then use that to look up the required data from the appropriate source table.

8.2.1.14.1 Add Custom Fields to System Tables

1. Under *Configuration → General → Attributes*, select the system table that you want to extend at the top of the **Configuration - Attributes** dialog.
2. To add a new field, choose **Add** from the bottom toolbar of the **Configuration - Attributes** dialog.

   The **Add Field Definition** dialog appears.

   > **Note**
   >
   > When you create the field for the first time, not all tabs are visible in the dialog. Save the field, select it and click **Edit** to return to the dialog with all the tabs visible.

3. Specify the main field parameters in the **Add/Edit Field Definition** dialog.

   In this dialog, you can define the main properties of the field, configure its layout, assign functions, set up workflow rules, and so on. For more information, see *Add/Edit Field Definition Dialog*.

> **Note**
>
> For Attributes, not all field types are supported.

4. Click **OK** to save your changes.

8.2.1.14.2 Configure Field Order

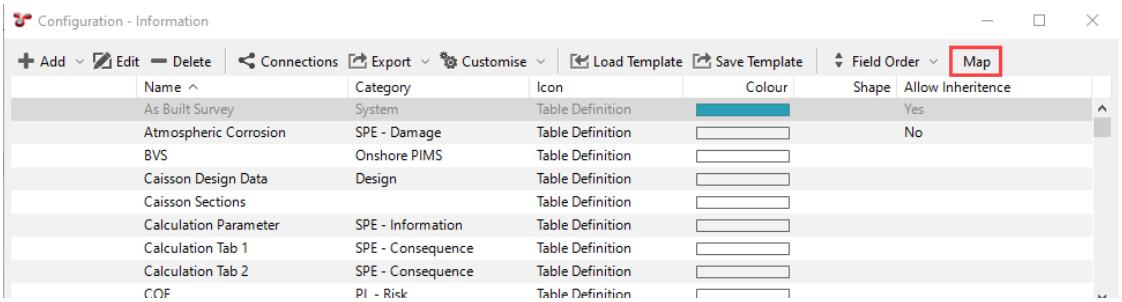
You can specify the order of your custom fields as they appear on a grid or a form. This can be done either on the **Field Layout** tab of the **Add/Edit Field Definition** dialog (see *Add/Edit Field Definition Dialog*), or within the **Configuration - Attributes** dialog by following these steps:

1. At the top of the **Configuration - Attributes** dialog, select the relevant system table.
2. From the toolbar, choose **Field Order** and select whether you want to specify the order within a form or a grid.
3. In the dialog that appears, select a field as required and choose either **Move Down** or **Move Up** to adjust its position within the form or grid.
4. Choose **OK** to save your changes.

8.2.1.14.3 View Dependency Map

The dependency map is a visual representation of an Asset Information Group (AIG), Event Type's, or global table's dependencies.

You can access the dependency map by choosing **Map** in the toolbar of the configuration dialogs when configuring AIGs (see *Configure Asset Information Groups*), event types (see *Configure Event Types*) or global tables (see *Configure Global Tables*).

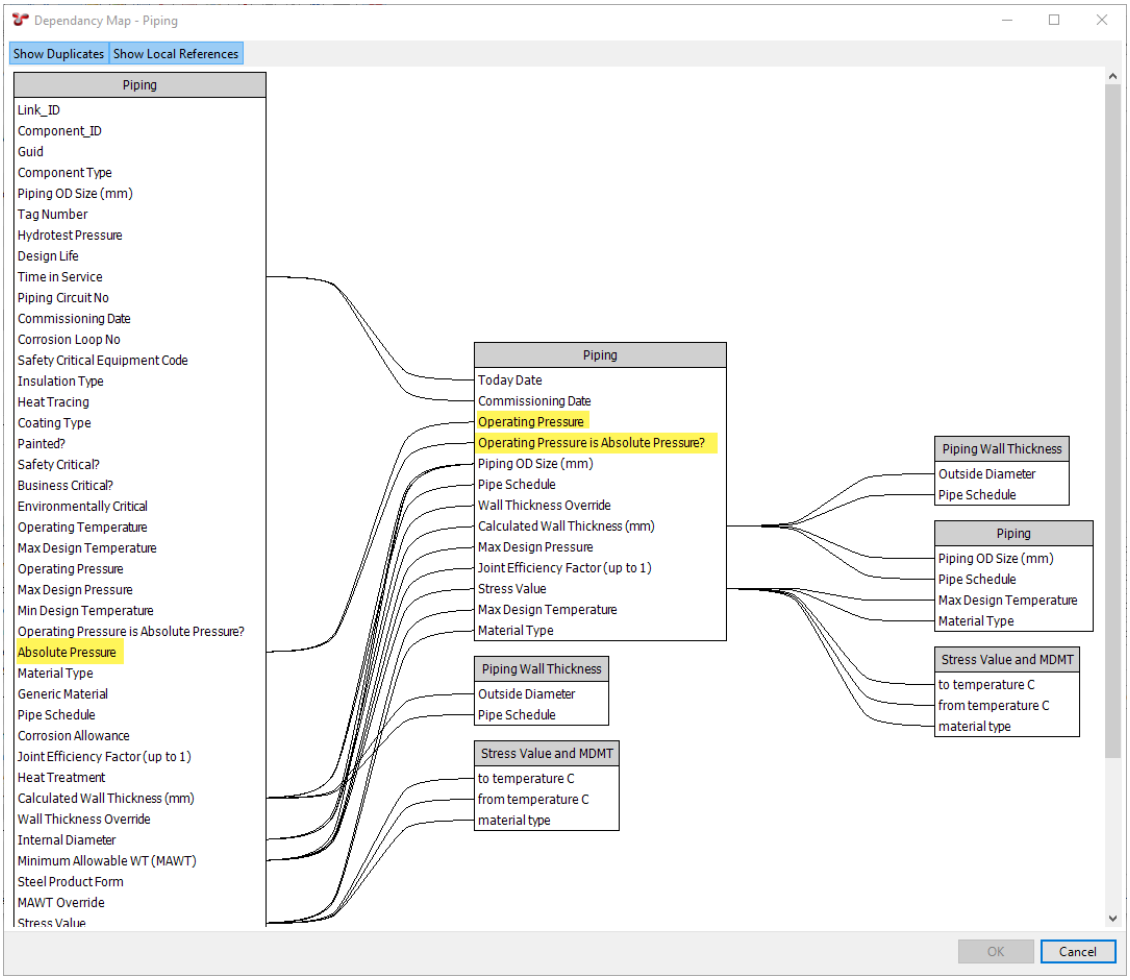


The map is represented as a series of interlinked fields grouped in columns, each column representing the AIG/Event Type/Global Table to which the fields belong.

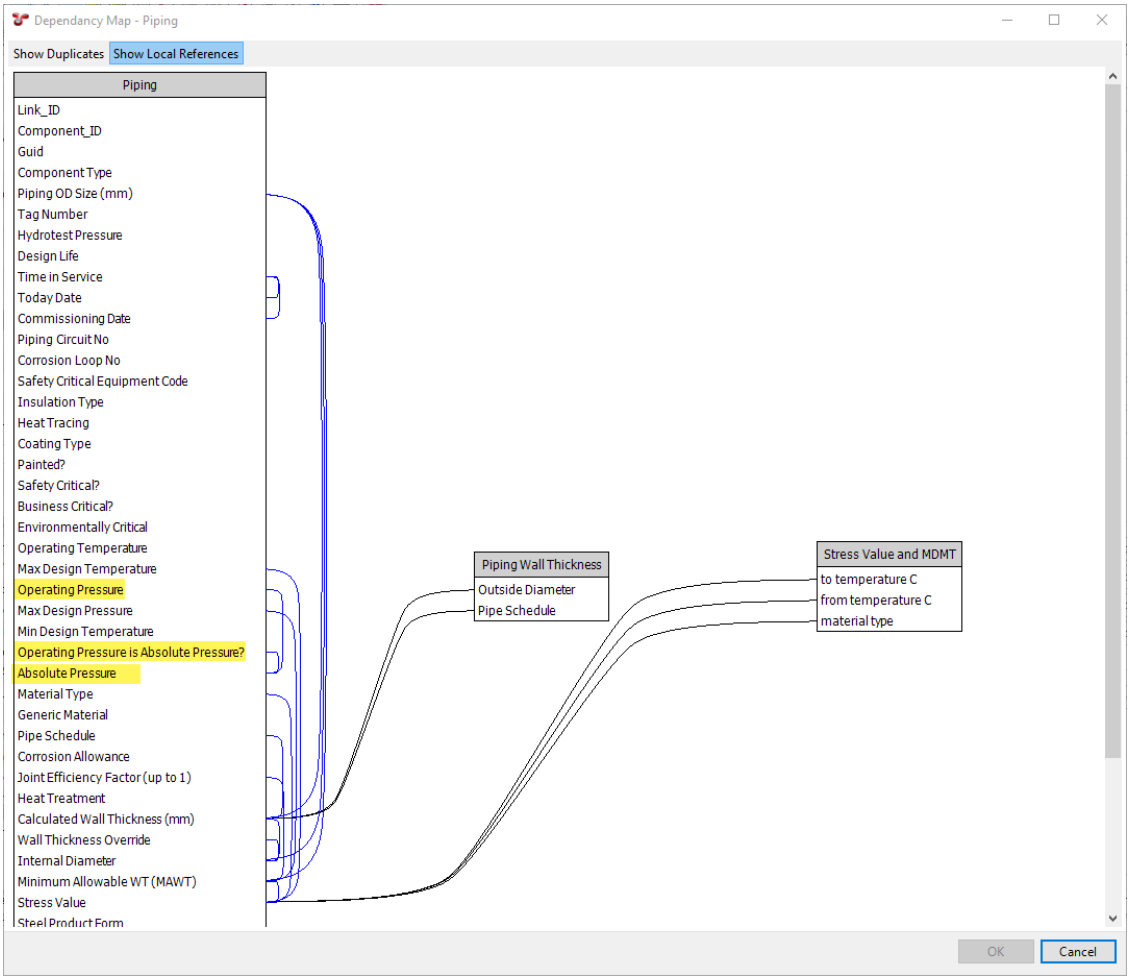
The map is hierarchically arranged from left to right, with the target AIG/Event Type/Global Table located in the left-most column, and its dependencies and sub-dependencies located to the right.

You can also toggle the view using the following buttons at the top of the dialog:

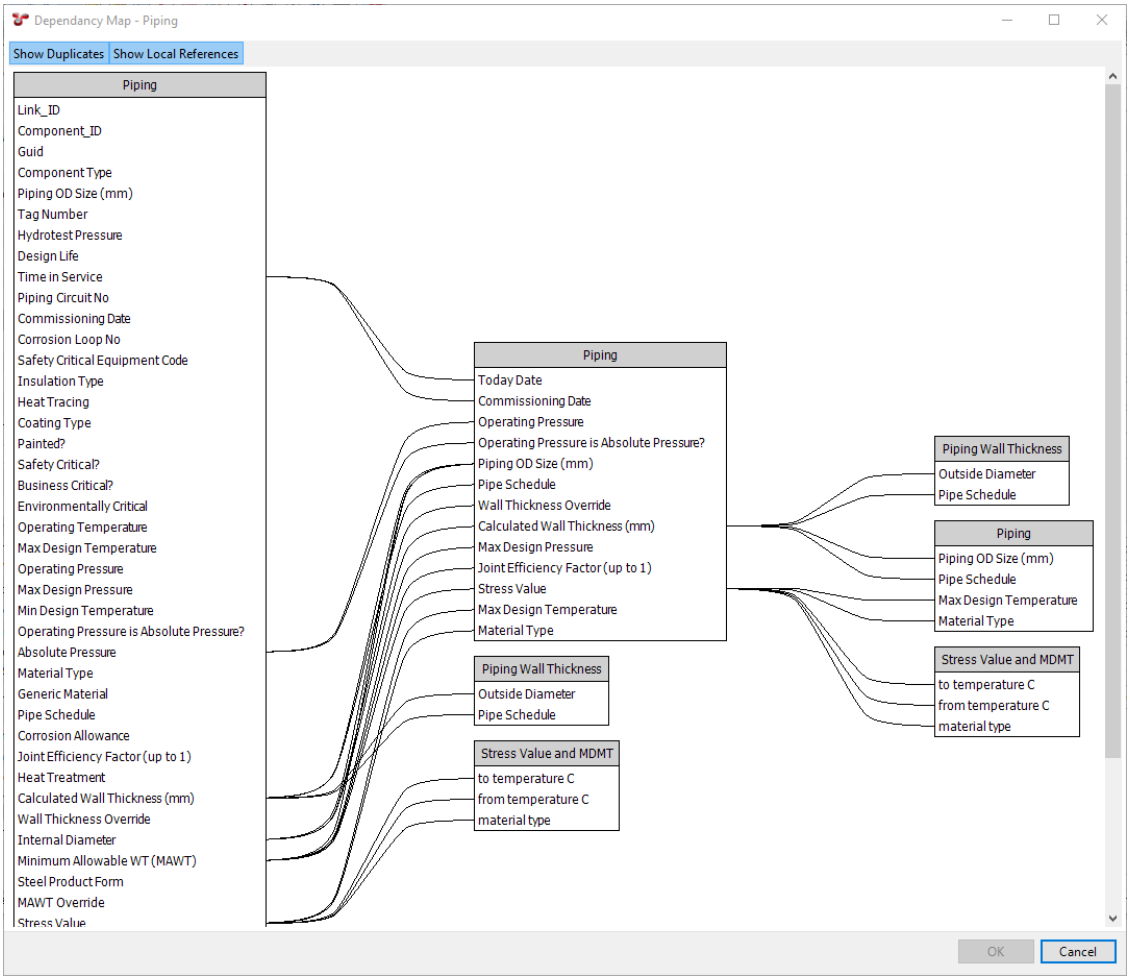
- **Show Duplicates**: If this button is switched on, and a field has a reference to another field in the same AIG/Event Type/Global Table, the field and the AIG/Event Type/Global Table will be displayed again in a separate column. If you switch this button off, the fields will be displayed only once and any self-referential dependencies will be displayed as a closed loop in a single column. For example, if you have a field called **Absolute Pressure** in the **Piping** AIG, which has references to two other fields from the same **Piping** AIG, the dependency map is displayed as follows:
  - **Show Duplicates** button **ON**:



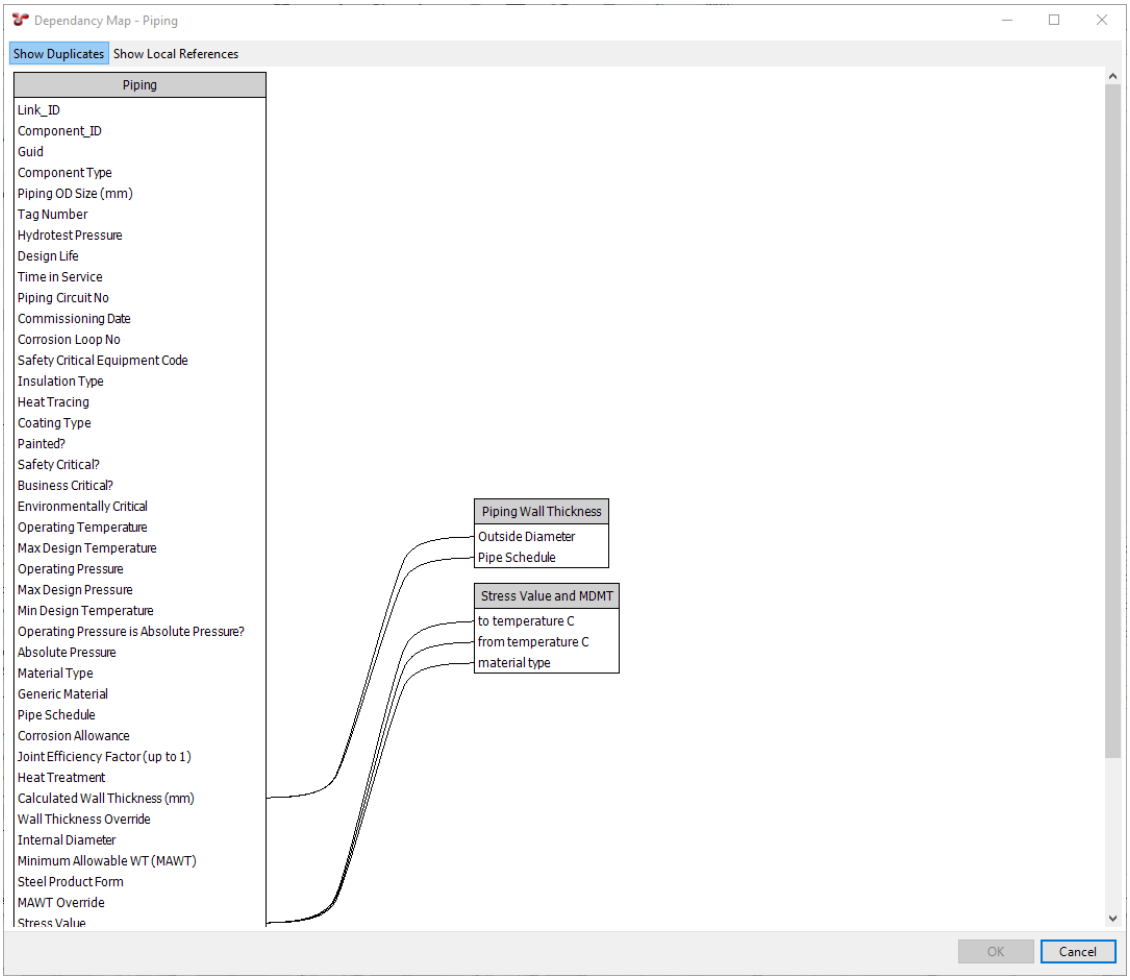
– **Show Duplicates** button **OFF**:



- **Show Local References**: If this button is switched on, and a field has a reference to another field within the same AIG/Event Type/Global Table, this dependency will be displayed on the map. If you switch this button off, these self-referential dependencies will not be displayed at all. See how the example mentioned above is displayed when toggling this button on or off:
  - **Show Local References** button **ON**:



– **Show Local References** button **OFF**:



8.2.1.15 Configure System Information

Under *Configuration* → *General* → *System Information*, you can set up field helps for fields in specific system tables. These appear as hover hints for users when they work with the relevant field. You can configure field helps for the following system tables:

- **Anomaly**
- **Anomaly Action**
- **Task**
- **Workpack**

8.2.1.15.1 Prerequisites

To maintain field helps, you need:

- A licence that includes access to this configuration
- Read/Write permission for the **System Information** special permission

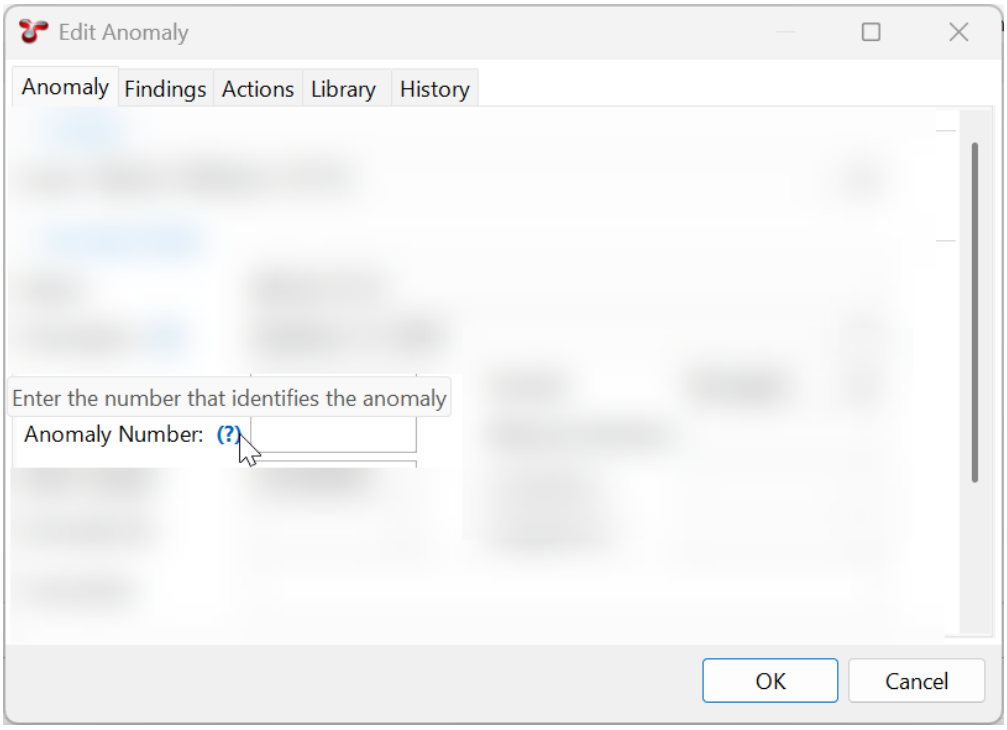
8.2.1.15.2 Add Field Help

1. Under *Configuration* → *General* → *System Information*, expand the row for the table that contains the field you want to update.
2. Double-click the required field, or select it and choose **Edit** in the toolbar.
3. In the dialog that opens, enter the text you want to display as the field help in the **Comments** field.
4. Choose **OK**.

Result

In the maintenance dialog for the relevant table, a blue question mark appears next to the field. When the user hovers over the question mark, the hint text is displayed.

For example, after you add a field help for the **Anomaly Number** field in the **Anomaly** table, the hint text is displayed as shown below:



8.2.1.16 Configure Shortcuts

Under *Configuration* → *General* → *Shortcuts*, you can create, edit and delete shortcuts.

Shortcuts are a series of steps grouped into a single menu item. They work similarly to Excel macros. Editing a shortcut is comparable to editing a function.

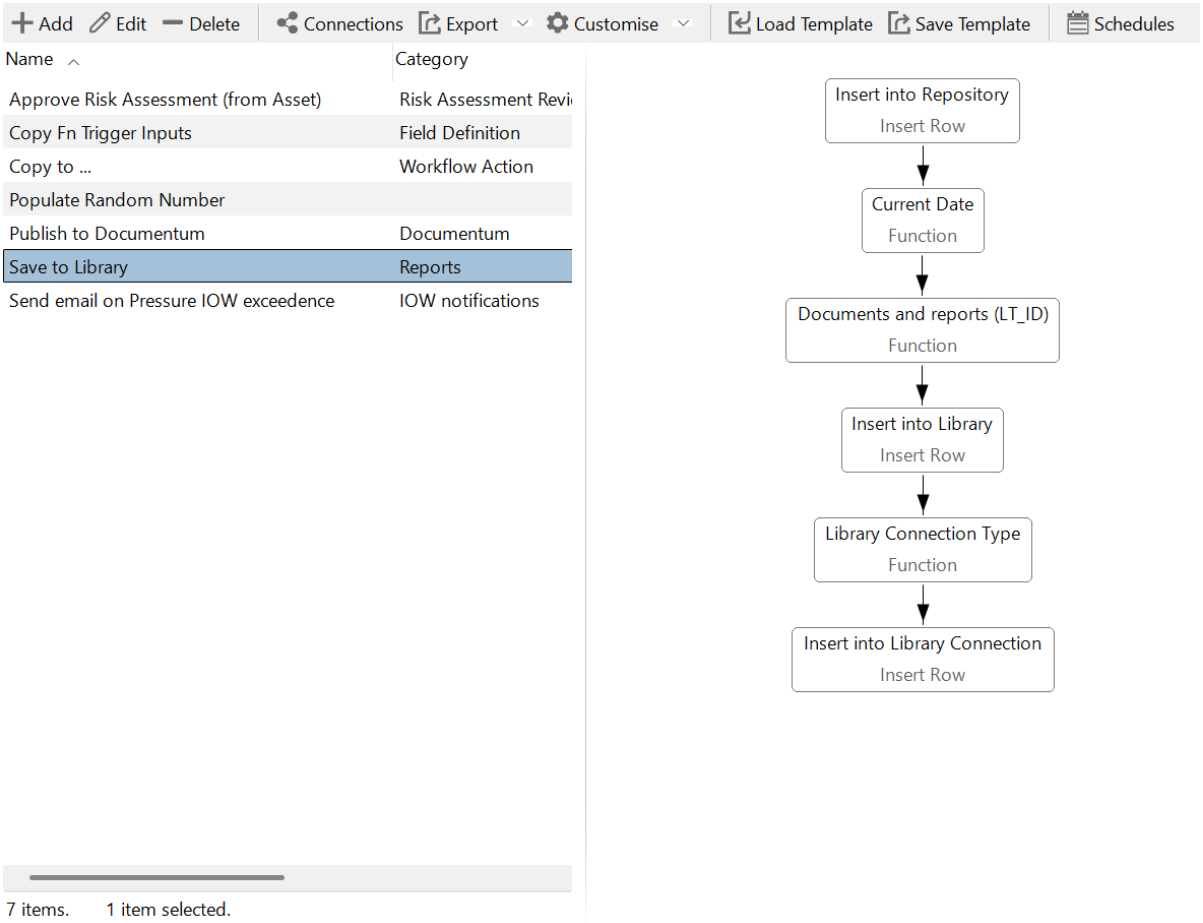
Caution

Thoroughly test shortcuts before using them in a production environment. An incorrectly configured shortcut can have a destructive effect on a NEXUS database.

Note

Some database tables in NEXUS IC are **read-only** and cannot be modified by shortcuts. For the full list of read-only tables, see *Read-Only Tables*.

On the **Shortcuts** screen, you can see all shortcuts in the database and a visual preview of the components making up the selected shortcut. You can use the standard grid functions (see *Using the Grid*) in the toolbar to edit, delete, import, export shortcuts or check their connections.



8.2.1.16.1 Create Shortcuts

To create a new shortcut:

1. Open the **Shortcuts** screen under *Configuration* → *General* → *Shortcuts* and click **Add** in the toolbar.
2. In the **Add Shortcut** dialog, specify the **main shortcut parameters** at the top of the dialog:

Field/Checkb Name	Description
Name	Enter a name that uniquely identifies the shortcut.
Category	If required, assign a category to the shortcut. For more information, see *Shortcut Categories*.
Enabled	Select **Yes** to enable the shortcut. New shortcuts are unavailable until enabled. Once enabled, the shortcut appears under the **Shortcuts** toolbar button. Enabling or disabling a shortcut requires closing and reopening the database for changes to take effect.
Description	Optionally, enter a brief summary (maximum 100 characters) describing what the shortcut does and how it is used.
Comments	Add comments to help users understand the shortcut. These appear under the relevant menu option in the toolbar dropdown.
Order	If multiple shortcuts appear under the same toolbar menu option, assign numbers to specify the order in which they appear. Lower numbers appear first in the list. Items without an order value are sorted alphabetically by name. If the toolbar menu uses categories, sorting is applied within each category; if there are no categories, sorting applies to the whole list.

3. Add **shortcut elements** (see *Shortcut Elements*) at the bottom of the dialog as follows:
   a. Under **INPUTS**, select the required element and choose **Add**, or select the element and drag it to the grey section of the shortcut editor screen area (right-hand side).
   b. Edit the element or double-click it to define its parameters.
   c. Under **ACTIONS**, select the required element and choose **Add**, or select the element and drag it to the white section of the shortcut editor screen area (left-hand side).
   d. In the dialog that opens, define the element's parameters.
4. Enable the shortcut by selecting *Yes* in the **Enabled** field.
5. Click **OK**.
6. Close and reopen the database.

> **Note**
>
> After creating or editing shortcuts, close and reopen your database to refresh the available shortcut options.

8.2.1.16.1.1 Worked Examples

See the following worked examples for information about how you can set up shortcuts for specific cases:

- *Set up a Shortcut to Send an Email*
- *Set up a Shortcut to Publish to Documentum*

8.2.1.16.2 Save/Load Shortcut Templates

On the **Shortcuts** screen, you can click **Save Template** in the toolbar to save the shortcut and related details to a .shortcut file. NEXUS IC will find all items related to this shortcut (functions, asset information forms, event definitions, chart templates, lookup tables, etc), and will display a dialog listing all the dependencies it's found, with a checkbox for each row. Untick any that you don't want to be saved with your shortcut.

To load a previously saved .shortcut template, click **Load Template**. Note that if the previously saved shortcut still exists in this database, *Load Template* will overwrite that existing Shortcut and it will not create a new copy of it. This works similarly for any other elements saved in the template file: asset information fields, functions, and so on.

8.2.1.16.3 Multi-select

You can have multi-selected rows feeding into your shortcut, so the user can select several items in a grid and then run your shortcut. But user selection dialogs launched within the shortcut are single-select. If the user multi-selects and runs a shortcut that has a selection dialog, an **Apply to All** checkbox appears at the bottom left of the selection dialog. If the user ticks this checkbox, their selection will apply to all remaining runs of the shortcut. If they don't, their selection will be used for this run, and the selection dialog will be shown again for the next run.

Within an input, the *From* option of *Retrieve Focused Item* is inherently multi-select: your shortcut actually gets run once for each selected item.

8.2.1.16.4 Shortcut Categories

Shortcuts can be put into categories. If a shortcut's category matches the name of an existing button menu, then the shortcut menu item will be placed in that menu.

You can set up shortcut categories under *Configuration* → *General* → *Shortcut Categories*.

For example, if a shortcut is placed in a category called *Assets*, then on the **ASSETS** screen, this shortcut will be placed under the **Assets** toolbar button. The **INSPECTION** screen also has an **Assets** toolbar button, so the shortcut will also be placed under the **Assets** menu on that screen.

If the shortcut was instead placed in a category called *Asset Views*, then on the **ASSETS** screen, it would be placed under the **Asset Views** toolbar button. The **INSPECTION** screen has no such toolbar button, so instead, it would be placed under a toolbar button called **Shortcuts**.

Shortcuts do show when appropriate on other panes within a screen. For example, shortcuts that act on an asset will appear on the **Children** pane on the **ASSETS** screen. But shortcuts will *not* appear on *Picker* dialogs that work on that type. That is, if you edit a drawing layer and pick an asset for that layer, you *won't* see shortcuts.

When shortcuts appear in a list within a context menu (accessible via right-click) or under a toolbar menu option, you can see them grouped based on the assigned shortcut categories.

8.2.1.16.5 Shortcut Elements

The shortcut editor contains the following two types of elements:

- Actions

  Actions appear in the white centre part of the shortcut editor screen area. An action can have inputs and outputs.

- Inputs

  Inputs appear in the grey part of the shortcut editor screen area on the right-hand side. Inputs can have an action.

These two items are very similar as some inputs may perform an action and some actions may be able to act as an input, but they are categorised and displayed in the editor based on what their *primary* purpose is.

8.2.1.16.5.1 Actions

Name	Description
Concatenate String	This action builds a string using a set of inputs and the result can then be used as an input into another element.
Documentum	This action uploads library items and documents to Documentum.
Email	This action generates an email.
Function	This action executes a NEXUS function, the output of the function can be used as an input into another element.
Insert Row	This action is used to create a new row in a business object.
REST Call	Performs a simple REST GET request to a specified URL. Supports both HTTP and HTTPS. Optional parameters may be defined as name/value pairs; when provided, they are appended to the URL as query string parameters. Only GET requests are supported.
Set Value	This action sets the value of a variable.
Shortcut	Calls another shortcut from within the current shortcut. The action supports zero or more Input Row inputs. If any of these inputs provide multiple rows, the called shortcut is executed once for each combination of those rows.
Update Row	This action updates a row in a business object. You can use it to show a dialog to the user, by setting the action's style to *Allow User to Edit*.

8.2.1.16.5.2 Inputs

Constant	A constant value, used as an input to an action.
Input Row	This forms the basis of where a shortcut exists and is triggered.
Null	Used to represent a NULL constant. For example, when using the *Update Row* action to set a field to NULL.
Password	Used to store an encrypted password. Currently used in the *Documentum* element.
Variable	Holds temporary information within the shortcut, used as an input to an action.

If you select the *Input Row* option, the value you define in the **From** field determines when the shortcut is available:

- *On Add*/*On Edit*/*On Delete*

  If you choose one of these options, the shortcut runs every time a row is added to/edited/deleted in the selected object, that is, database table. In these three cases, the shortcut is only executed when the row is added/edited/deleted by our software, be it NEXUS IC, IC-Inspection or the REST service used by IC-Web, IC-Inspector and third parties.

- *Retrieve Focused Item*

  If you choose this option, the shortcut appears as a menu option on grids for the relevant object. For example, if the object is the *Anomaly* table, your shortcut appears as a menu item on the toolbar above the anomaly table on the **ANOMALIES** screen, on the **ASSETS** screen and on any dialog where the user is selecting an anomaly. With this option, the shortcut works only if there is at least one item in the grid.

- *Prompt User to Select Row*

  If you select this option, a picker dialog is displayed on the appropriate database table when the shortcut runs, prompting the user to select a row.

- *Prompt User to Select One or More Rows*

  Selecting this option displays a picker dialog on the appropriate database table when the shortcut runs, allowing the user to select one or multiple rows. The shortcut will then be executed for each selected row.

- *On New Row*

  This option is similar to the *Retrieve Focused Item* option but also works when there are no items in the grid. However, since it won't have any data at the time of creation, it cannot prefill data based on a selected row.

The name you set for your input will be used as a title text on a user selection dialog.

8.2.1.16.6 Read-Only Tables

The following database tables are **read-only** and cannot be inserted into, updated, or deleted by shortcuts.

Category	Table Name
Charts Tables	Axis_Kind Axis_Type Line_Weight Point_Style Series_Type
Component Tables	Info_Def
Drawing Tables	Layer_Type
Event Data Tables	MM_Type
Function Tables	Function_Definition Function_Part Function_Part_Input Part_Option
Library Tables	Lib_Conn_Type
Metadata Tables	Boolean_Exception Editor_Type External_Provider_Type Field_Def Field_Layout Field_Type Map_Direction MT_Action Table_Def Text_Align
Planning Tables	LTIP_Frequency LTIP_Task_Task LTIP_Workpack
Reports Tables	Schedule_Repeat Schedule_Kind
Security Tables	Security_User Security_Token Security_Permission Security_Object Security_Group
Synchronisation Tables	Expert_System Expert_System_Version Expert_System_Row Operation Sync_Change
Workflow Tables	Approval Approval_Note Approval_Group Approval_Field Trigger_Type Workflow_Filter Workflow_Item Workflow_Item_Input Workflow_Item_Type

See also

- *Set up a Shortcut to Send an Email*
- *Set up a Shortcut to Publish to Documentum*

8.2.1.16.6.1 Set up a Shortcut to Send an Email

The following process shows an example for setting up a shortcut that sends an email when data in an Asset Information Group (AIG) is edited and saved. In this example, we want NEXUS to generate an email each time when any data is edited on the **Pipeline** AIG.

8.2.1.16.6.2 Prerequisites

Ensure that you have set up your NEXUS email host settings and recipient email addresses. For more information, see *Set Up Email*.

8.2.1.16.6.3 Process

1. From the menu, choose *Configuration* → *General* → *Shortcuts* and click **Add** in the **Configuration - Shortcuts** dialog.
2. Enter the name (mandatory) and category (optional) of the shortcut as required. You can also specify a description.
3. Set up the shortcut trigger. The trigger for sending the email will be data updates in the AIG titled **Pipeline**. For this, we need an **Input Row** element.

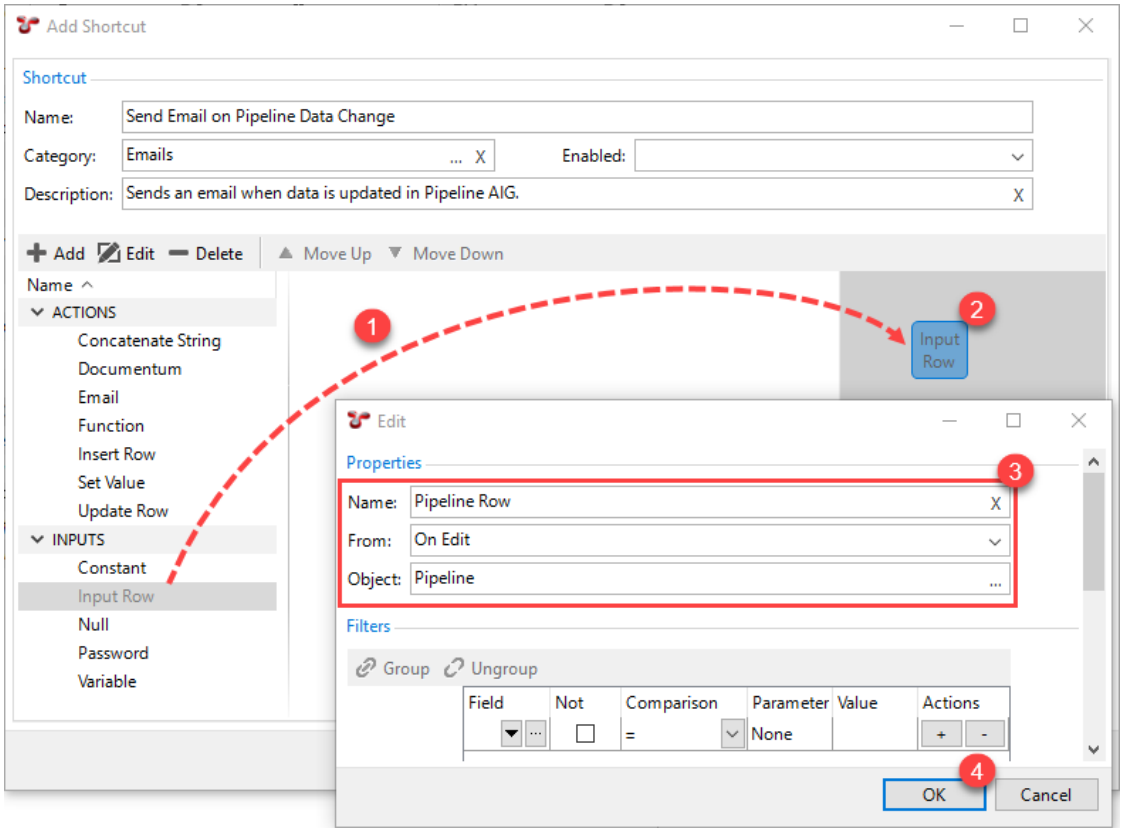
   a. Under **INPUTS**, choose the **Input Row** element and drag it to the grey shortcut editor screen area 1.

   b. Double-click the new **Input Row** element 2.

   c. Define the element's properties as follows 3:

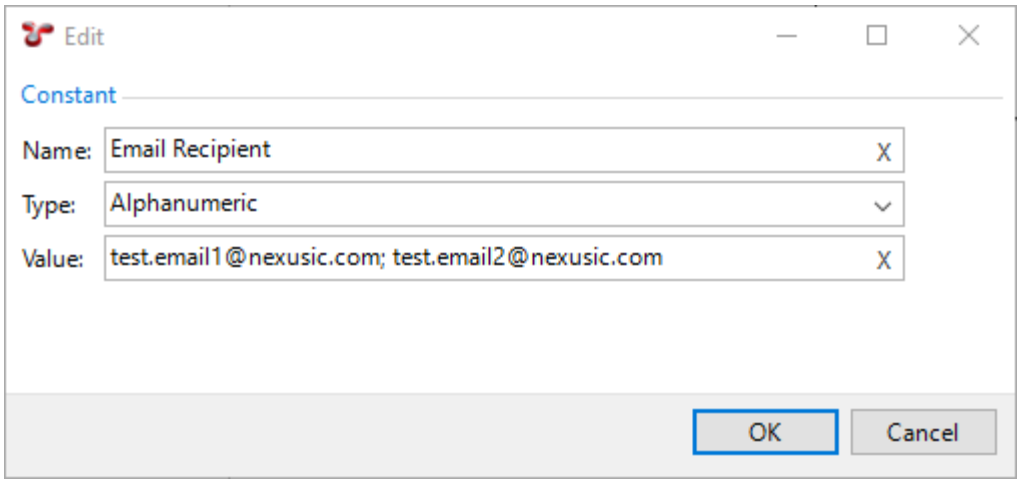
      - **Name**: Specify a unique name for the triggering element.
      - **From**: Choose *On Edit* from the drop-down list.
      - **Object**: Click the ... and select the AIG **Pipeline** from the list of tables.

   d. Click **OK** 4.

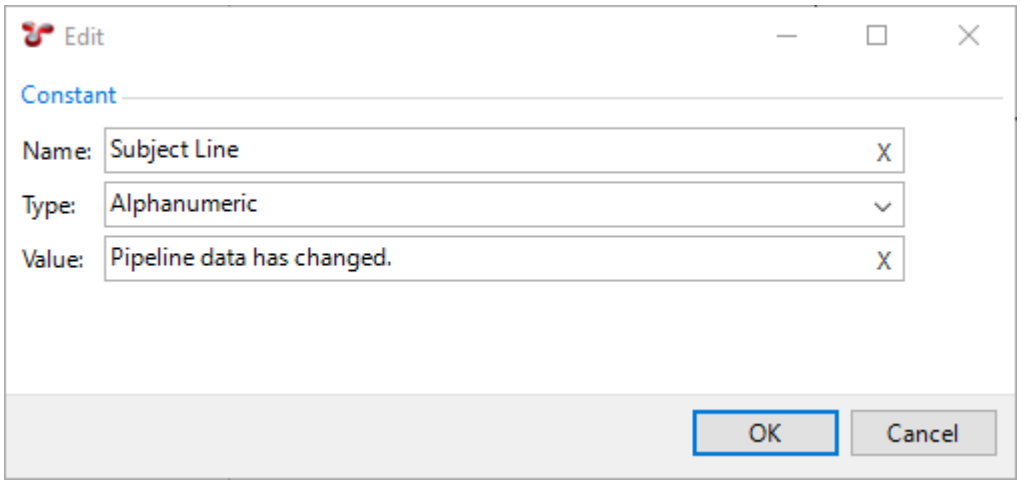


4. Similarly to the step above, add a **Constant** input element to define the email recipient. Define its properties as follows:

   - **Name**: Enter *Email Recipient* so that the element can be identified later.
   - **Type**: Specify *Alphanumeric*.
   - **Value**: Enter the email address to which you want to send the emails. If required, you can specify multiple email addresses separated by a comma or semicolon.



5. Add another **Constant** input element to specify the subject line. Define its properties as follows:
   - **Name**: Enter *Subject Line* so that the element can be identified later.
   - **Type**: Specify *Alphanumeric*.
   - **Value**: Enter the text that you want to appear in the subject line of the email, in this case, *Pipeline data has changed*.



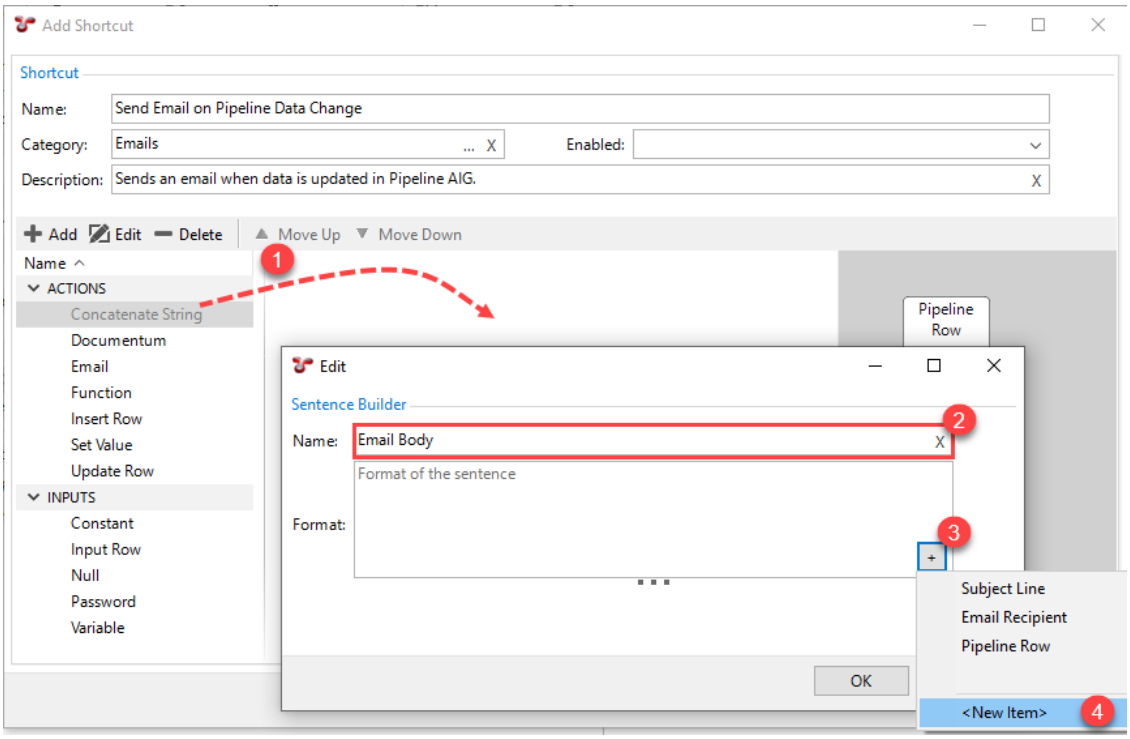
6. Set up the body text of the email by adding a **Concatenate String** action element. We want the body text to include the data of the pipeline AIG fields that have been changed.

a. Under **ACTIONS**, choose the **Concatenate String** element and drag it to the white shortcut editor screen area 1.

b. Enter the name of the shortcut element so that it can be identified later 2.

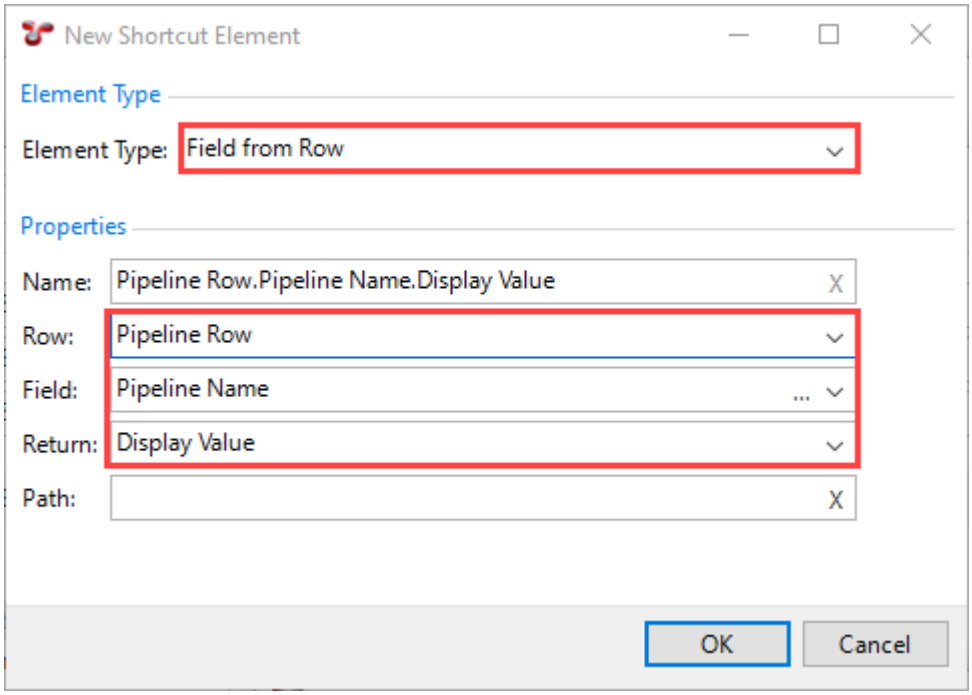
c. Click the **+** button in the bottom right hand corner of the dialog 3.

d. Choose *New Item* 4.



e. In the **New Shortcut Element** dialog, define the element's properties as follows:

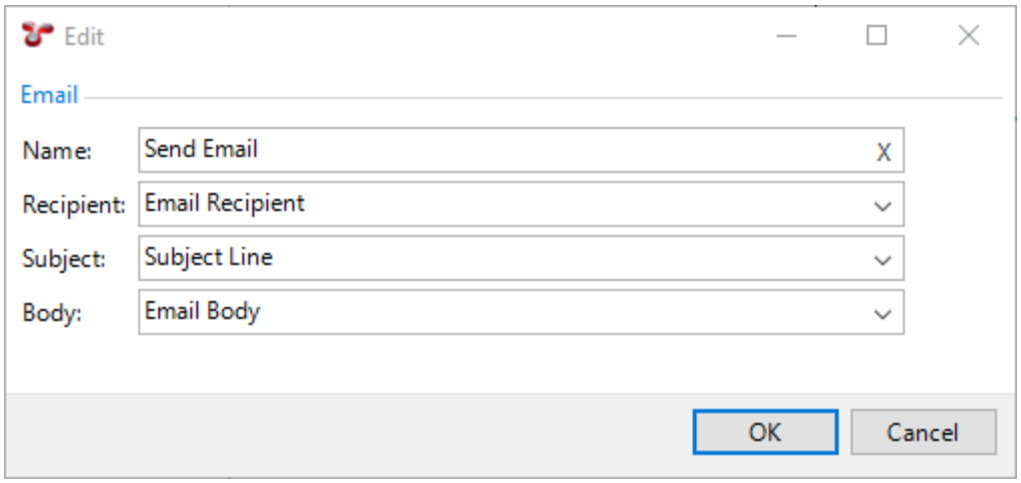
- **Element Type**: Select *Field from Row*. This indicates that the element will retrieve data from a field in a table row.
- **Row**: Select *Pipeline Row*. This refers to the Input Row element that you created for the shortcut trigger.
- **Field**: Select *Pipeline Name*. This refers to the field within the AIG, whose changes you want to track with this shortcut.
- **Return**: Select *Display Value*. This will return the display value of a field, not the functional value. The functional value is usually a unique identifier in the database table, which is not visible to the end users. The display value is the user-friendly name of the field selected above.
- **Name**: This field is automatically filled by the system based on your selections above.



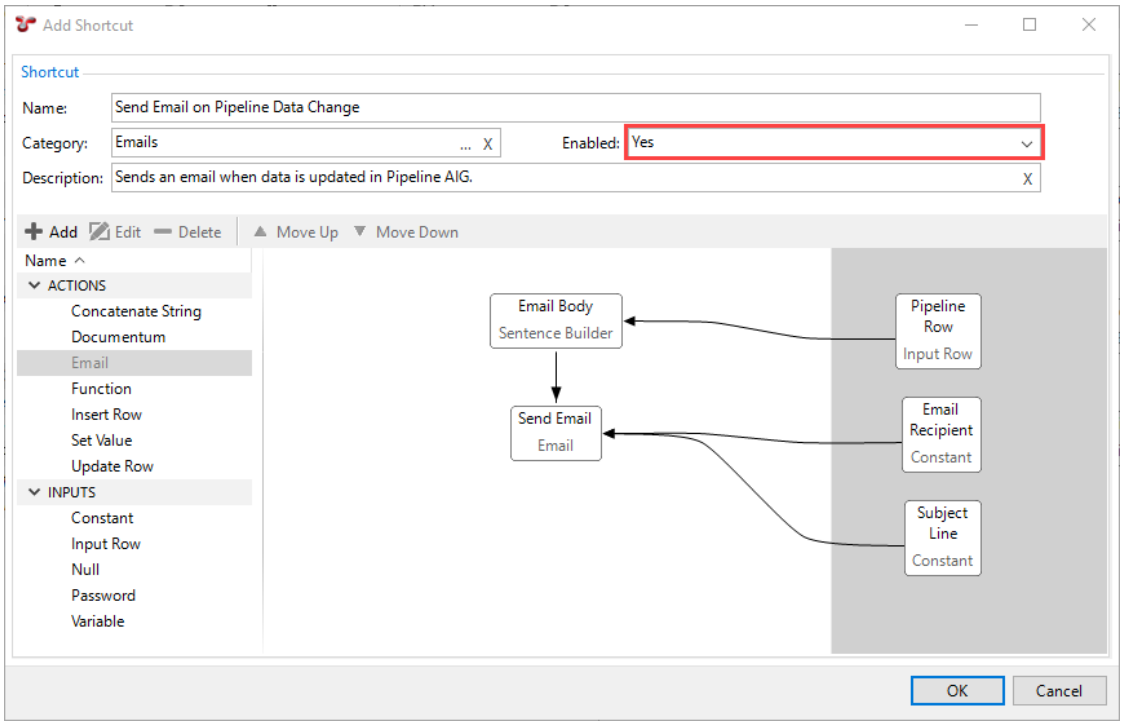
f. Click **OK**.

7. Set up the final action of sending the email by adding a new **Email** action element. Use the other shortcut elements defined above as input parameters:

   - **Name**: Enter *Send Email* so that the element can be identified later.
   - **Recipient**: Select *Email Recipient*, which refers to the constant input element that you defined for the recipient.
   - **Subject**: Select *Subject Line*, which refers to the constant input element that you defined for the subject line.
   - **Body**: Select *Email Body*, which refers to the *Concatenate String* action element that you defined in the previous step.



8. The shortcut is set up with all the parameters required. Enable the shortcut by selecting *Yes* in the **Enabled** field.



9. Click **OK**.

10. Close and reopen the database for your new shortcut to take effect.
11. To test this functionality, change some data in the Pipeline AIG and save your changes.

See also

Configure Shortcuts

8.2.1.16.6.4 Set up a Shortcut to Publish to Documentum

The Documentum tool can be used to upload library items and documents to Documentum. Documentum is a secure hosting service that can be used for document management, collaboration, search and classification of documents. This example shows how you can use the tool in NEXUS by configuring a shortcut to prepare the document and relevant metadata for upload. Once the shortcut has been created, a new toolbar button will be available on the **LIBRARY** screen that allows you to publish the selected library item to Documentum.

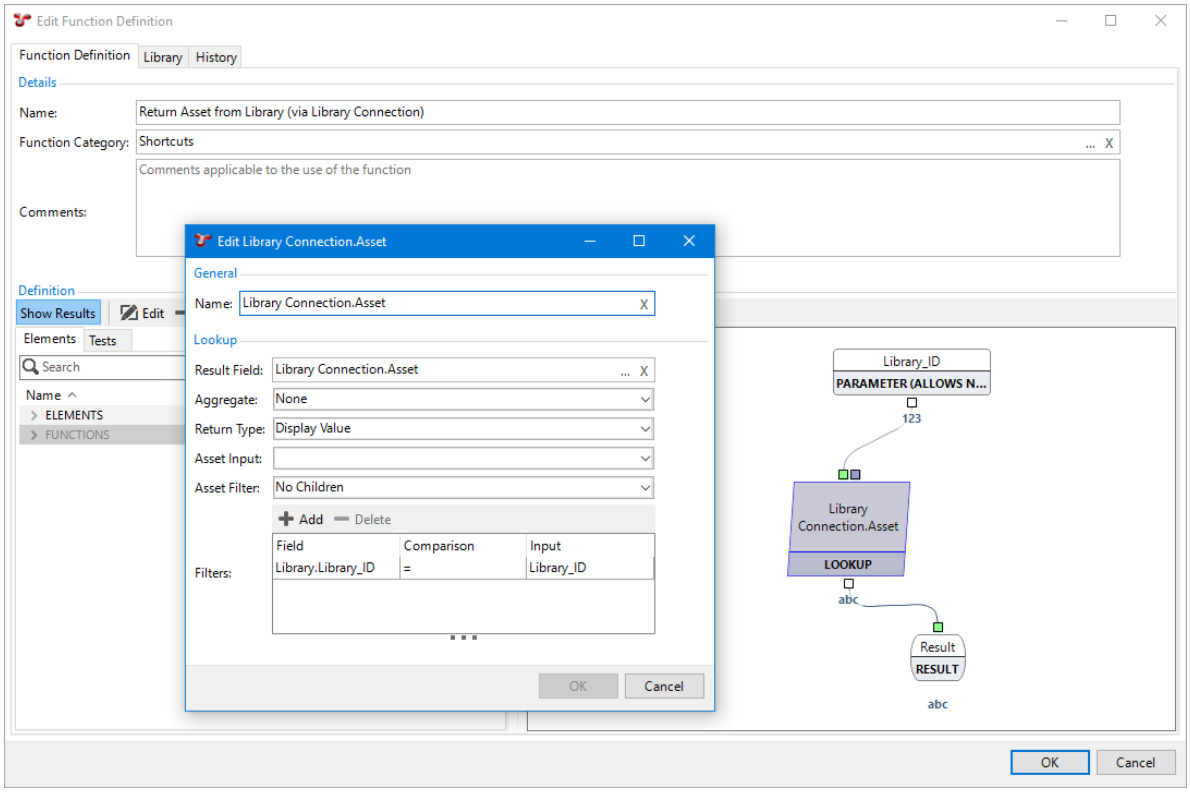
Note

- You must completely close and reopen NEXUS when you make any change to a shortcut. Shortcuts do not refresh.
- We recommend that you regularly save the shortcut (click **OK**) and reopen the editing window as you progress through the setup process. This saves any progress you have made and ensures that changes are not lost.

8.2.1.16.6.5 Prerequisites

Before you set up the shortcut, you must have the following functions available:

- A function that returns the Asset ID of the asset to which a specific library item belongs:



- A function that returns the current date.

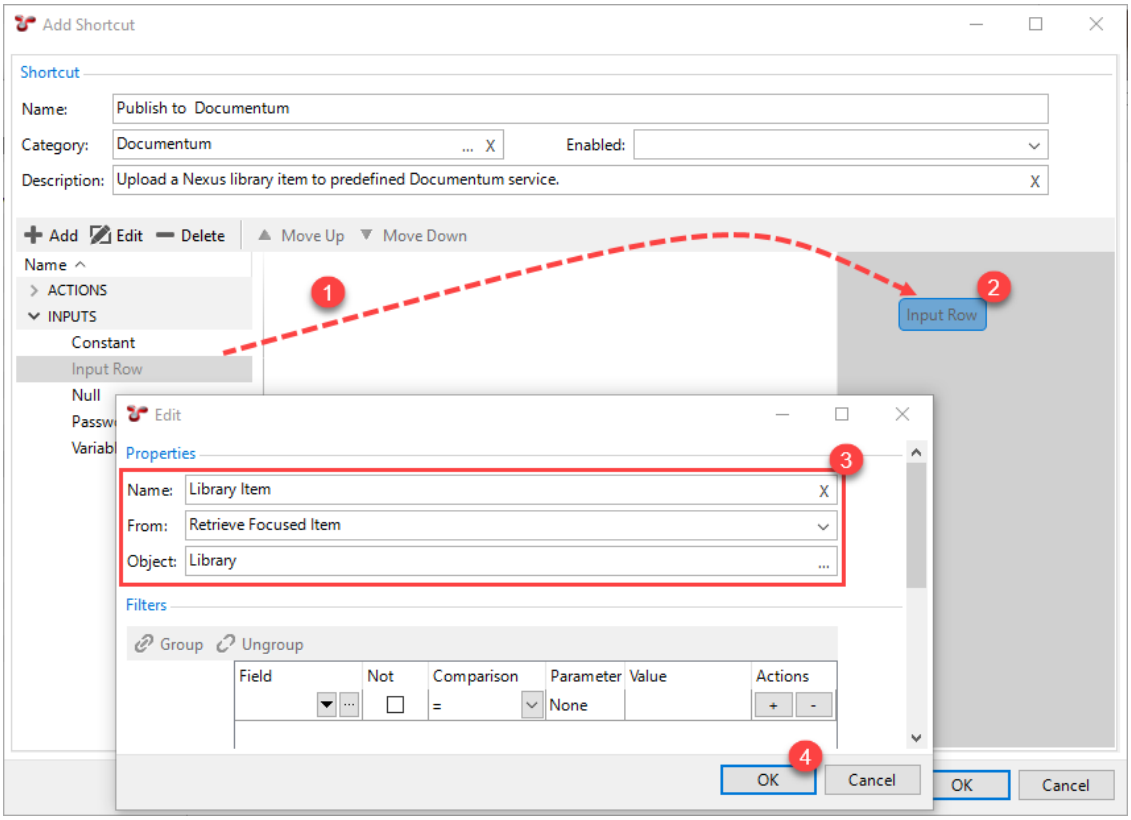
8.2.1.16.6.6 Process

1. From the menu, choose *Configuration* → *General* → *Shortcuts* and click **Add** in the **Configuration - Shortcuts** dialog.
2. Enter the name (mandatory) and category (optional) of the shortcut as required. You can also specify a description. In this example:
   - **Name**: *Publish to Documentum*
   - **Category**: *Documentum*
   - **Description**: *Upload a Nexus library item to predefined Documentum service.*
3. Set up the shortcut trigger, which will be the library item that you want to be uploaded to Documentum. For this, you need to add an **Input Row** input element.
   a. Under **INPUTS**, choose the **Input Row** element and drag it to the grey shortcut editor screen area (1).
   b. Double-click the new **Input Row** element (2).
   c. Define the element's properties as follows (3):
      - **Name**: Specify a unique name for the triggering element, for example, *Library Item*.
      - **From**: Choose *Retrieve Focused Item* from the drop-down list.

- **Object**: Click the … and select the *Library* system table.

Optionally, you can add **Filters** for the client-specific Documentum workflow.

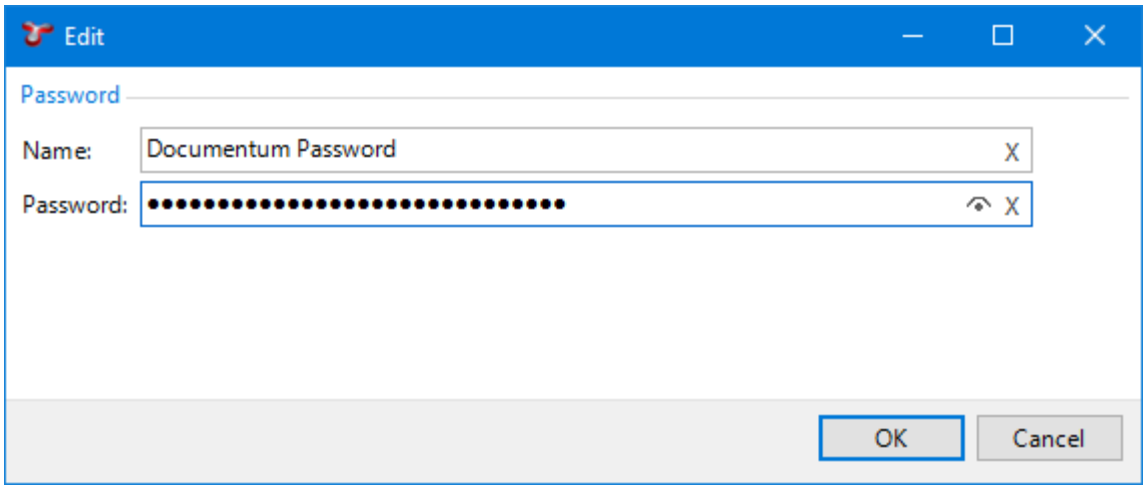
d. Click **OK** 4.



4. Similarly to the step above, add **Constant** input elements with the following properties:

Name	Type	Value
Field Name	Alphanumeric	Asset Field
Published By	Alphanumeric	NEXUS IC
Approved	Alphanumeric	Approved
Department	Alphanumeric	Integrity
Yes	Yes / No	Yes
Folder Path	Alphanumeric	{example repository folder}
UserName	Alphanumeric	pims
Documentum REST URL	Alphanumeric	{http://example_URL}
Respository	Alphanumeric	EDMS_PROD
Cabinet	Alphanumeric	Knowledge Repository
Object type	Alphanumeric	ad_tcio_document

5. Similarly to the steps above, add a **Password** input element. This will store the password to your Documentum service.



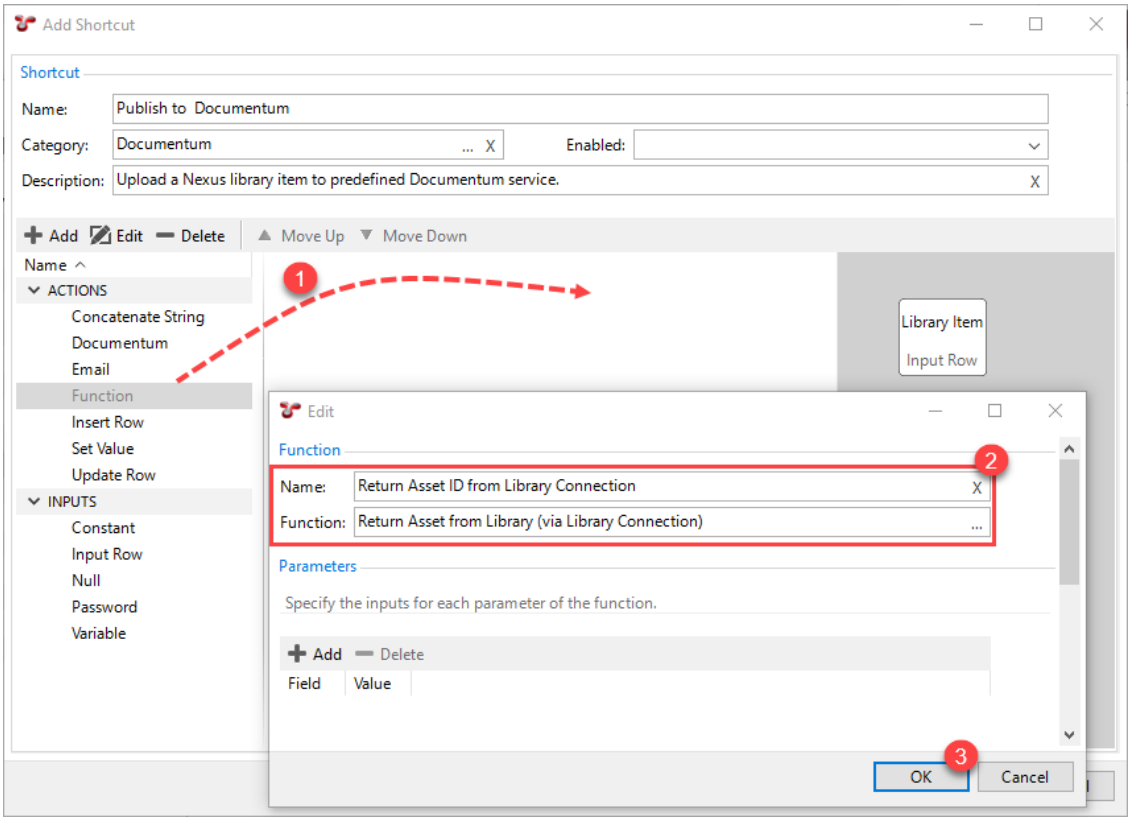
6. Add a **Function** action element to return the Asset ID. This will take in the functional value of the library item in the Input Row, that is, the document being uploaded to Documentum. Based on this functional value, this function outputs the asset ID of the asset to which the library item belongs.

   a. Under **ACTIONS**, choose the **Function** element and drag it to the white shortcut editor screen area 1.

   b. Define the element's properties as follows 2:

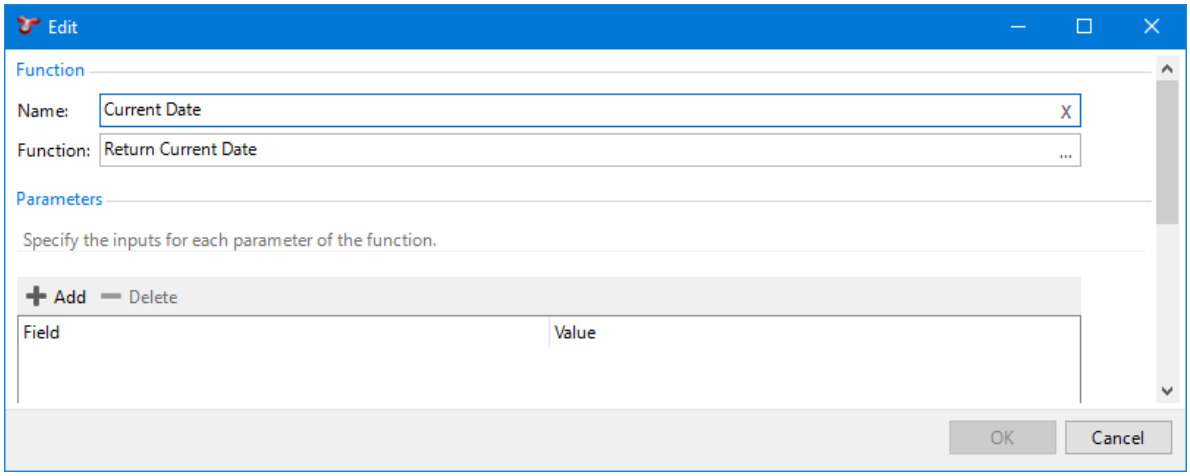
      - **Name**: Enter a name to identify the function, for example, *Return Asset ID from Library Connection*.
      - **Function**: Select the predefined function that returns the asset ID (see *Prerequisites*).

   c. Click **OK** 3.

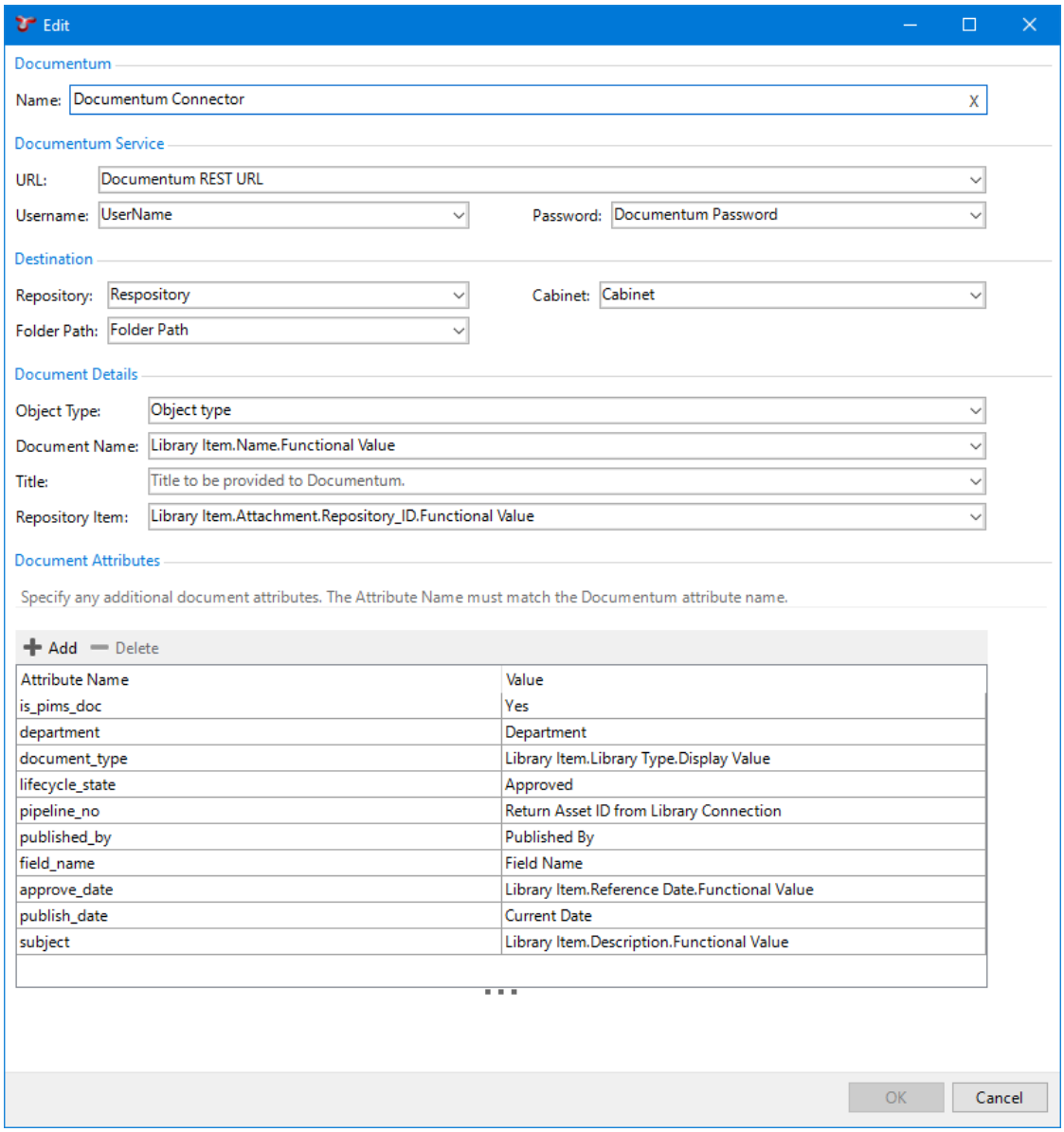


7. Similarly to the step above, add a **Function** action element with the properties below to return the current date. The date will be used as a parameter in the Documentum submission.

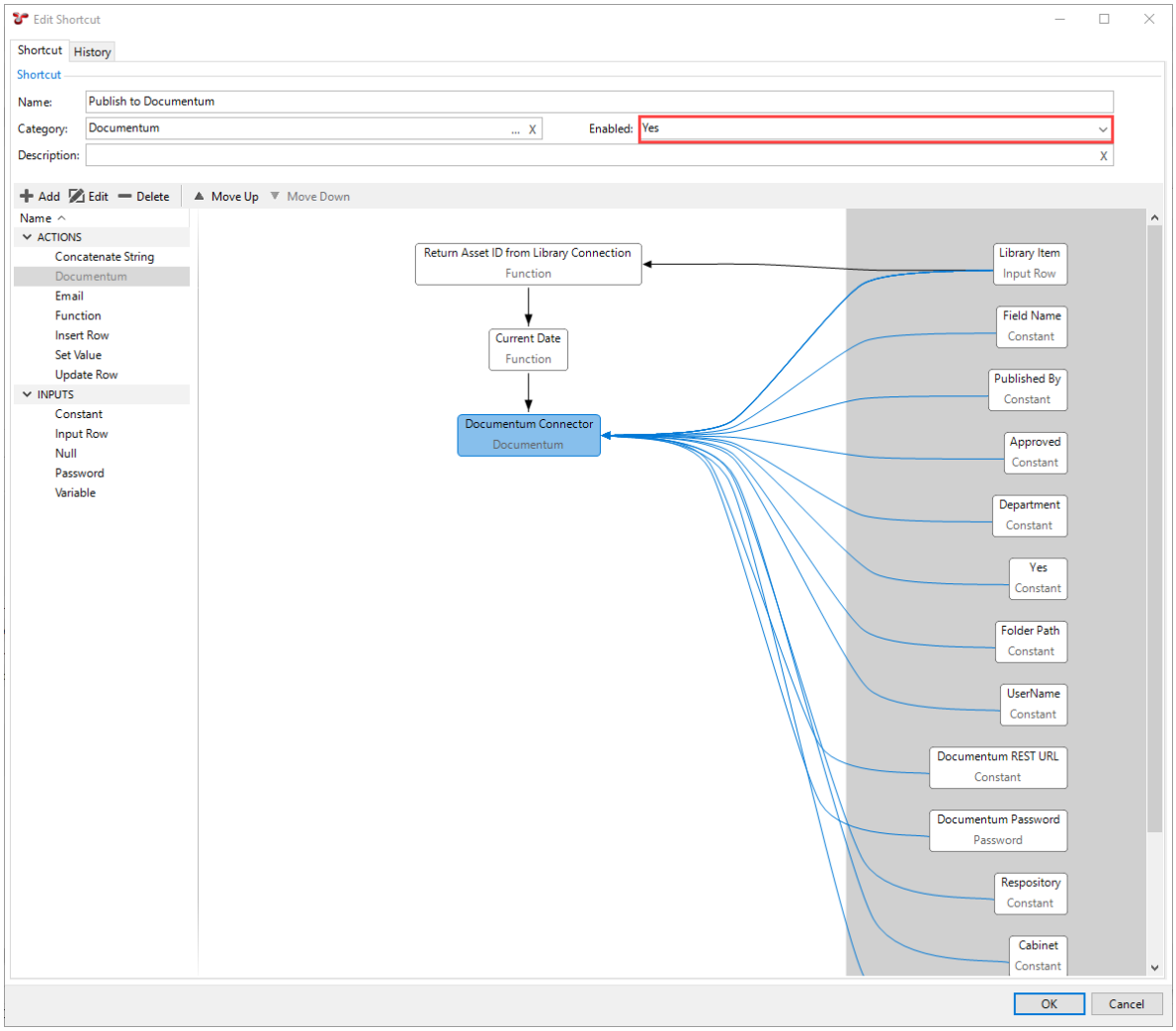
   - **Name**: Enter a name to identify the function, for example, *Current Date*.
   - **Function**: Select the predefined function that returns the current date (see *Prerequisites*).



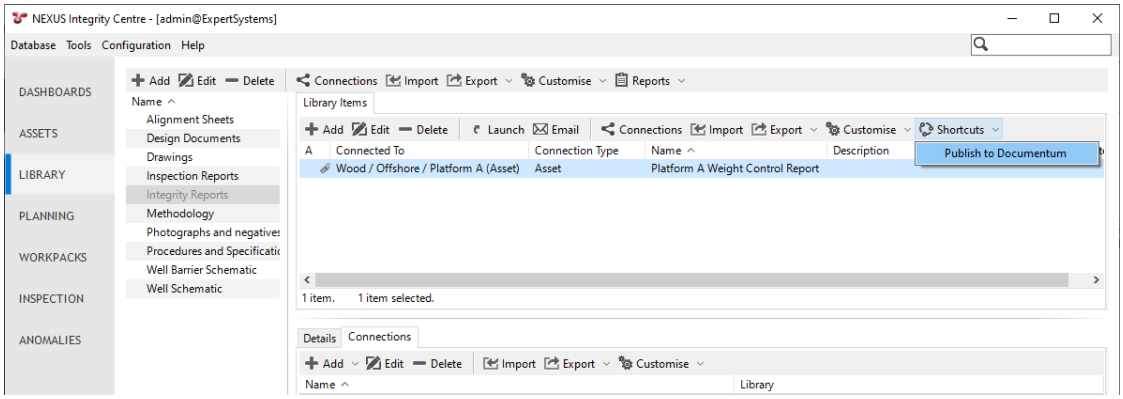
8. Add a **Documentum** action element. This connector uses the data supplied by the rest of the shortcut to upload to the Documentum service. Select the shortcut elements that you have created before to define its parameters:



9. The shortcut is set up with all the parameters required. Enable the shortcut by selecting *Yes* in the **Enabled** field.



10. Click **OK**.
11. Close and reopen the database for your new shortcut to take effect.
12. To test this functionality, go to the **LIBRARY** screen, select a library item and choose the new **Shortcuts -> Publish to Documentum** toolbar button.



See also

Configure Shortcuts

8.2.1.17 Configure Workflows

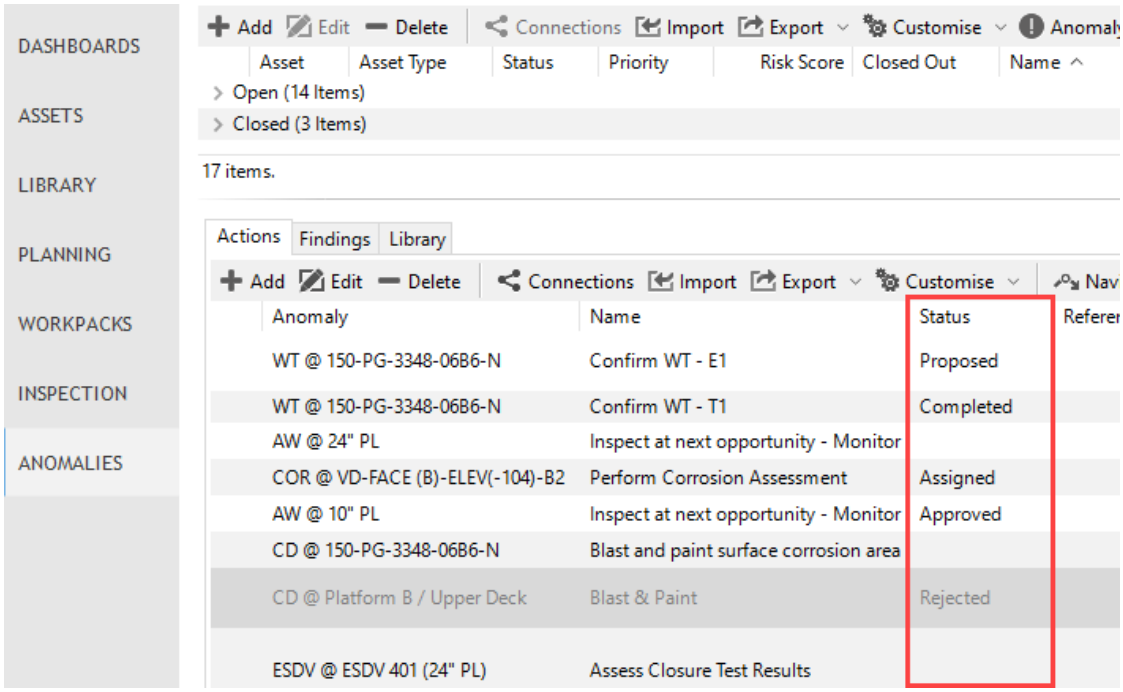
Under *Configuration* → *General* → *Workflows*, you can define workflows by setting up permissions for specific user groups, which determine what changes they are allowed to make in the values of given system table fields.

The available system table fields for which you can set up permissions are predefined, that is, you can configure only those fields that are listed in the **Configuration - Workflows** dialog.

8.2.1.17.1 Example: Define Workflow for Status Field in Anomaly Actions

For anomaly actions, the **Status** field can have the following values:

- *Proposed*
- *Approved*
- *Assigned*
- *Completed*
- *Rejected*



You want to allow **data entry users** (user assigned to *Data Entry Users* group under *Database* → *Security...*) to change the value of this field as follows:

- Change the value to *Proposed* if the field has no value
- Change the value to *Assigned* if the original value of the field is *Approved*
- Change the value to *Completed* if the original value of the field is *Approved* or *Assigned*

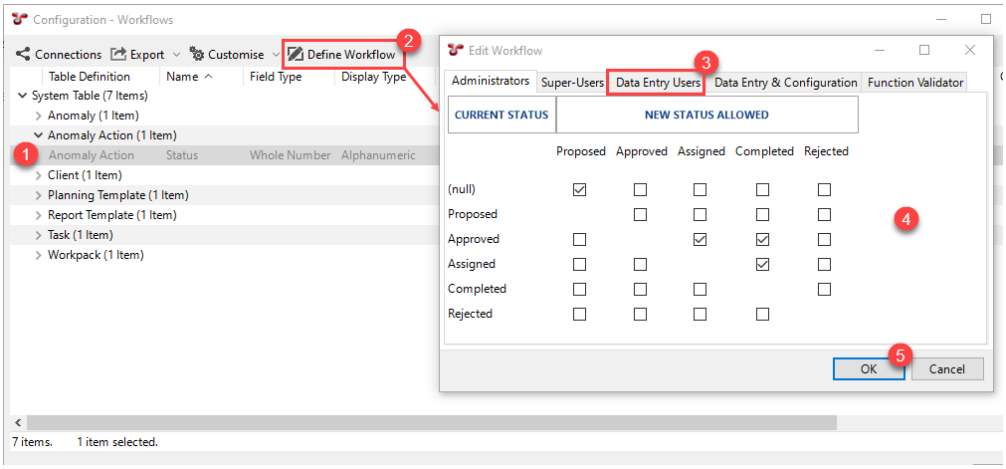
You do not want to allow this user to change the status to *Approved* or *Rejected* from any statuses.

In this case, make settings as follows:

1. Choose *Configuration* → *General* → *Workflows* from the menu.
2. In the **Configuration - Workflows** dialog, select the system table field *Anomaly Action - Status* (1).
3. Choose **Define Workflow** (2).
4. Select the **Data Entry Users** tab (3).
5. In the *NEW STATUS ALLOWED* columns, select to which values the user is allowed to change the original value, if the original value is as indicated in the *CURRENT STATUS* column (4):

CURRENT STATUS	NEW STATUS ALLOWED
Null	Proposed
Approved	Assigned, Completed
Assigned	Completed

6. Click **OK** (5).



8.2.2 Configure Assets

When you choose *Configuration → Assets* from the main menu of NEXUS IC, you can configure asset-specific functions as described below:

- *Configure Asset Information Groups*
- *Configure Asset Types*
- *Configure Features*
- *Configure Sensors*
- *Configure Risk Charts*
- *Configure Risk Models*

8.2.2.1 Configure Asset Information Groups

Under *Configuration → Assets → Information*, you can create and configure Asset Information Group (AIG) forms (see *Asset Information Groups (AIGs)*). You can then use these forms to record data against assets.

You can create the following types of forms here:

- An **Asset Information Group (AIG)** form (see *Asset Information Group (AIG)*) has a one-to-one relationship with an asset. Once an AIG is created, you must assign the AIG to an asset type (see *Configure Asset Types*). This ensures that when you select an asset with that particular asset type, the AIG will be available for selection under the **Group** toolbar button on the **Asset Information** tab. You can then enter data into that AIG form against that particular asset.
- A **Sub Asset Information Group (sub AIG)** form (see *Sub Asset Information Group (Sub AIG)*) is a table within an AIG form, which allows you to have multiple rows within the AIG. This means that multiple records can be created as part of a single instance of an AIG.

You can maintain AIGs and sub AIGs from the **Configuration - Information** dialog as follows:

- In the **top** half of this dialog, you can add, edit and delete AIG or sub AIG forms. You can use the standard toolbar functions for maintaining the forms (see *Using the Grid*). In addition, you can:
  - Use the **Field Order** button to move a field up or down in the form or grid. For example, if you want to place a field between two other fields in the form, select **Form ...** from the drop-down list, and in the **Form Field Order** dialog, you can move the field with the **Move Up** or **Move Down** buttons available in the toolbar.

    Using the **IC-Inspector...** item under this button, you can also define the order of asset information fields that appear under *ASSET INFORMATION* when checking task information in IC-Inspector.
  - Check the dependency map using the **Map** button (see *View Dependency Map*).
- In the **bottom** half, you can add, edit or delete fields within AIG or sub AIG forms and use the standard toolbar functions for maintaining the fields within the forms (see *Using the Grid*). You can also review how fields appear in the form or grid layouts.

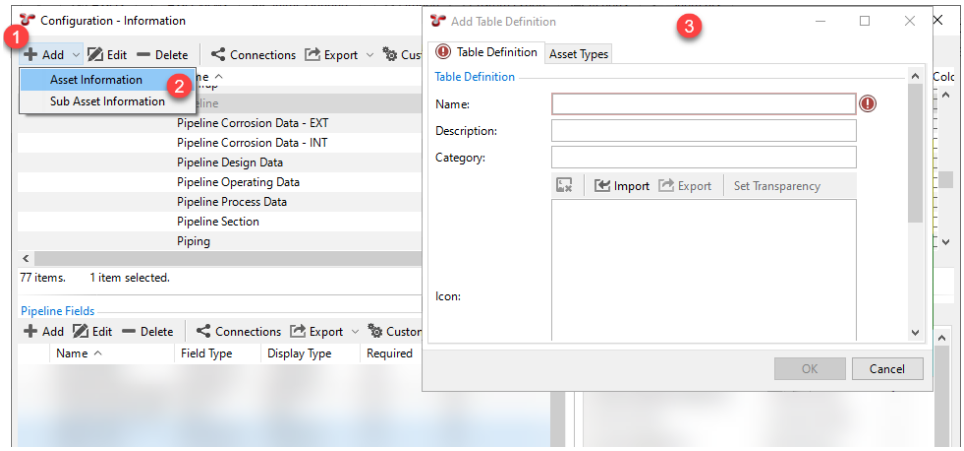
8.2.2.1.1 Create AIG/Sub AIG Forms

See the steps below for the basic process of creating a new AIG or sub AIG form:

1. Under *Configuration* → *Assets* → *Information*, click **Add** at the top of the **Configuration - Information** dialog 1.

2. Select whether you want to create a new AIG or a sub AIG form 2.

   The **Add Table Definition** dialog appears. The title of the dialog reflects that form data is stored in tables in NEXUS IC.

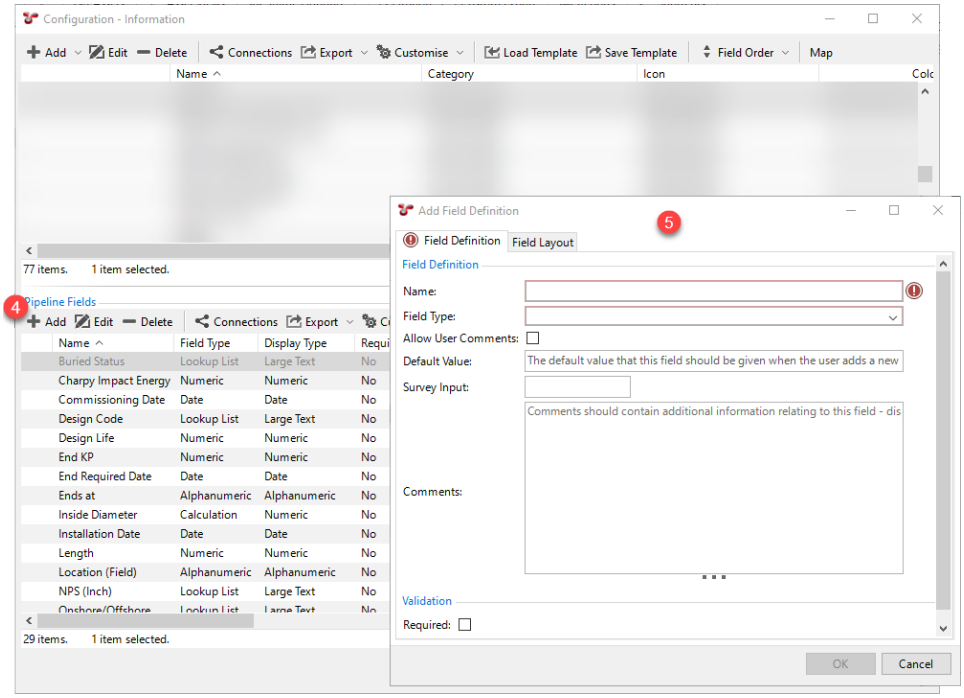


3. Specify the main table parameters in the **Add Table Definition** dialog 3. For more information, see *Add/Edit Table Definition Dialog*.

> **Note**
>
> When you create the table for the first time, not all tabs are visible in the dialog. Save the table, select it and click **Edit** to return to the dialog with all the tabs visible.

4. Click **OK**.
5. Add new fields to the table by choosing **Add** from the bottom toolbar of the **Configuration - Information** dialog 4.

The **Add Field Definition** dialog appears.



> **Note**
>
> When you create the field for the first time, not all tabs are visible in the dialog. Save the field, select it and click **Edit** to return to the dialog with all the tabs visible.

6. Specify the main field parameters in the **Add/Edit Field Definition** dialog 5.

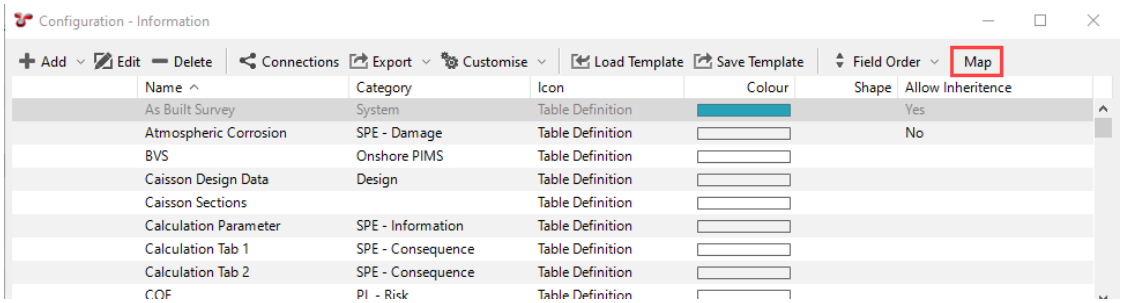
   In this dialog, you can define the main properties of the field, configure its layout, assign functions, set up workflow rules and anomaly triggers, and so on. For more information, see *Add/Edit Field Definition Dialog*, *Set Up Anomaly Triggers* and *Set Up Workflow Rules*.

7. Click **OK**.

8.2.2.1.2 View Dependency Map

The dependency map is a visual representation of an Asset Information Group (AIG), Event Type's, or global table's dependencies.

You can access the dependency map by choosing **Map** in the toolbar of the configuration dialogs when configuring AIGs (see *Configure Asset Information Groups*), event types (see *Configure Event Types*) or global tables (see *Configure Global Tables*).

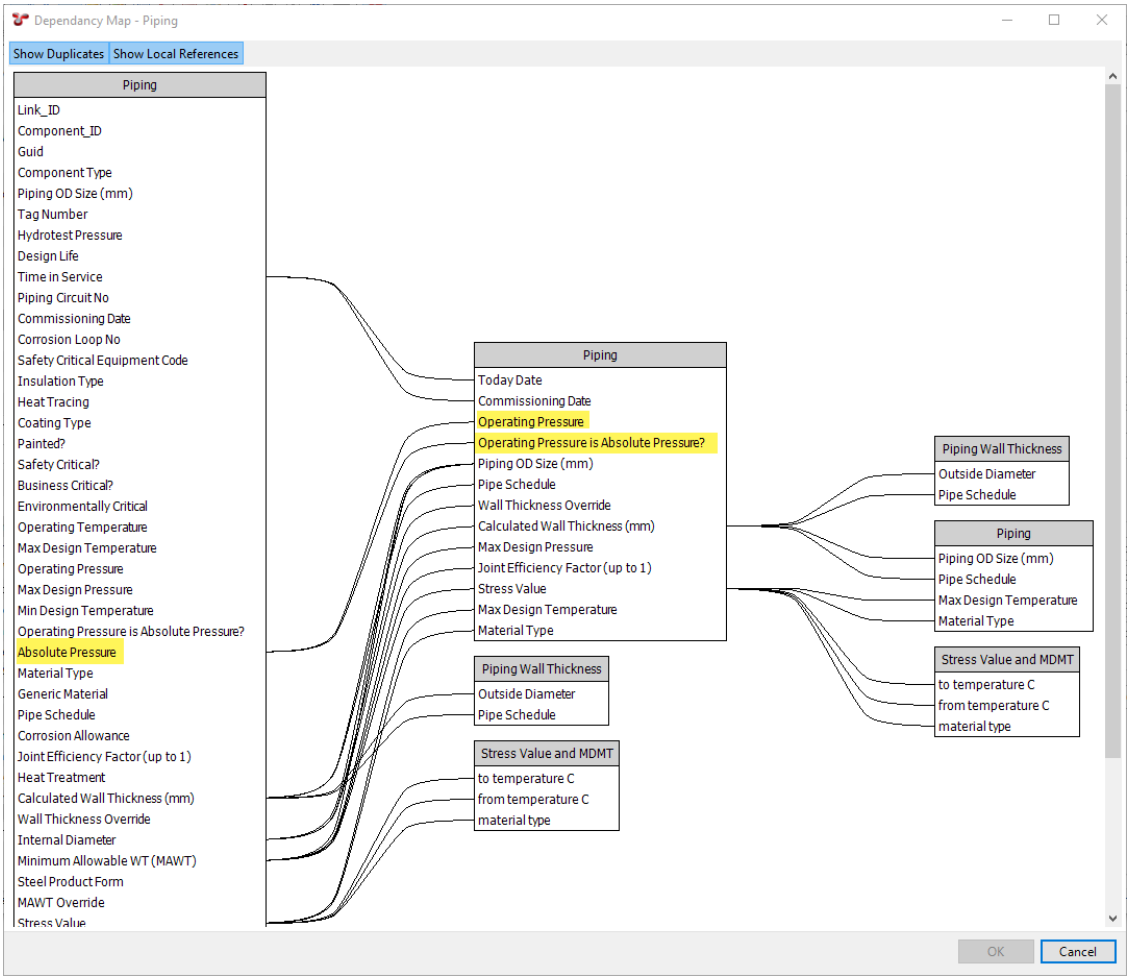


The map is represented as a series of interlinked fields grouped in columns, each column representing the AIG/Event Type/Global Table to which the fields belong.

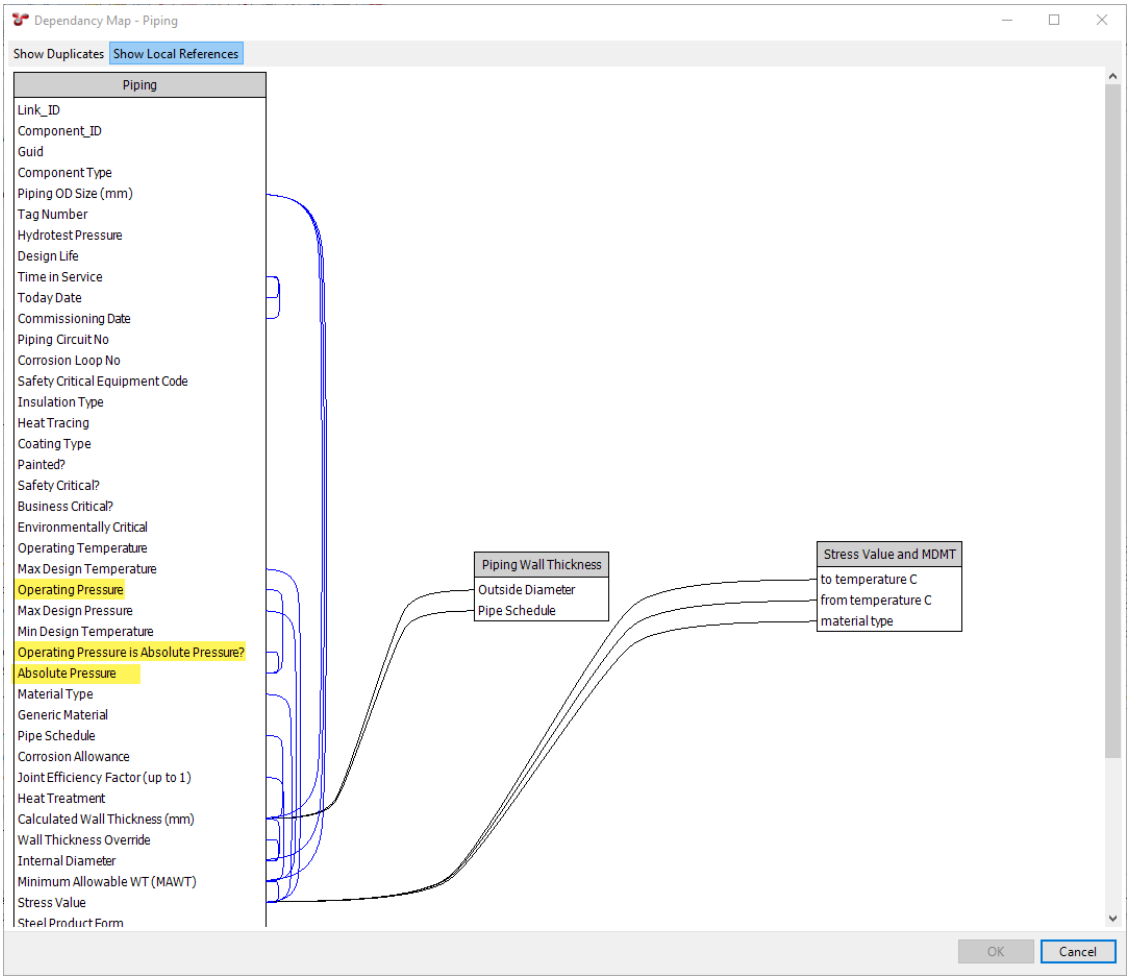
The map is hierarchically arranged from left to right, with the target AIG/Event Type/Global Table located in the left-most column, and its dependencies and sub-dependencies located to the right.

You can also toggle the view using the following buttons at the top of the dialog:

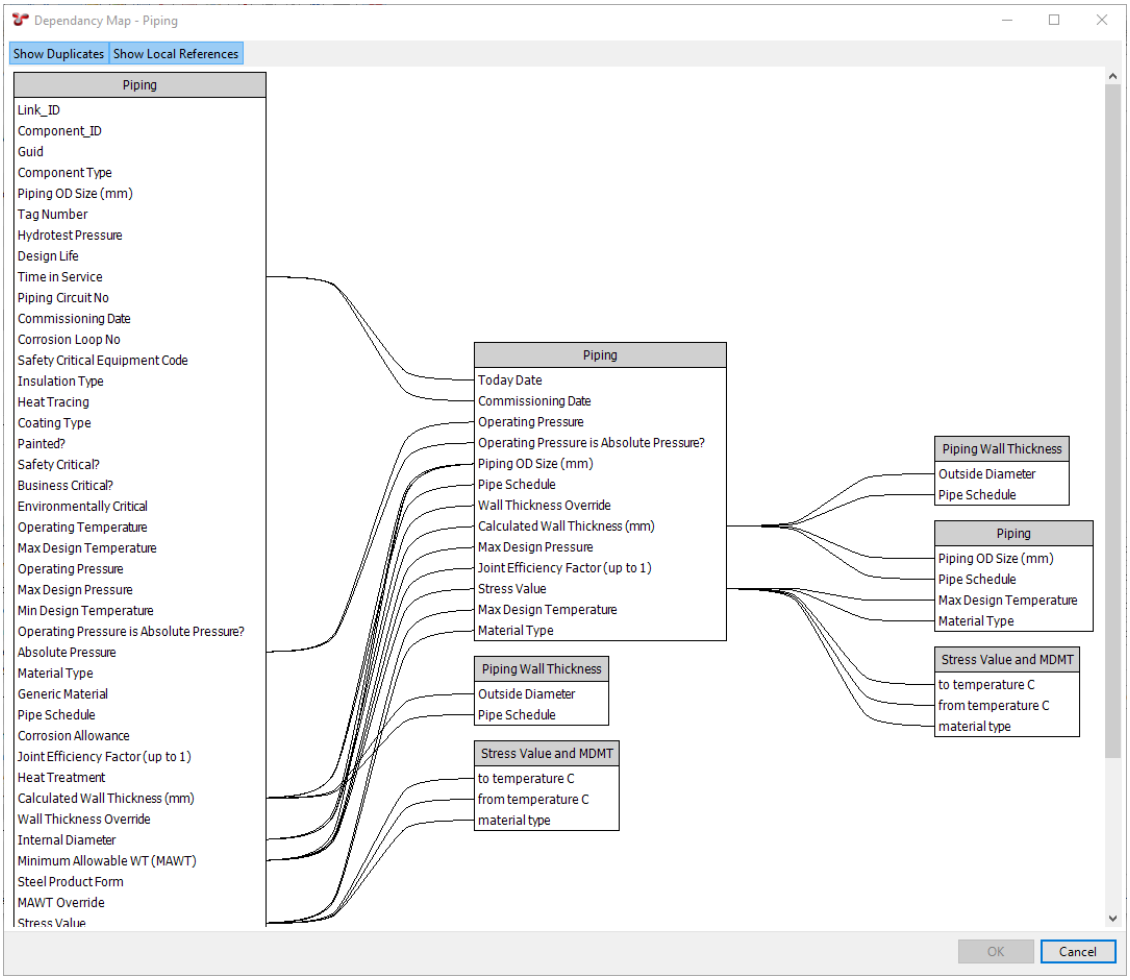
- **Show Duplicates**: If this button is switched on, and a field has a reference to another field in the same AIG/Event Type/Global Table, the field and the AIG/Event Type/Global Table will be displayed again in a separate column. If you switch this button off, the fields will be displayed only once and any self-referential dependencies will be displayed as a closed loop in a single column. For example, if you have a field called **Absolute Pressure** in the **Piping** AIG, which has references to two other fields from the same **Piping** AIG, the dependency map is displayed as follows:
  - **Show Duplicates** button **ON**:



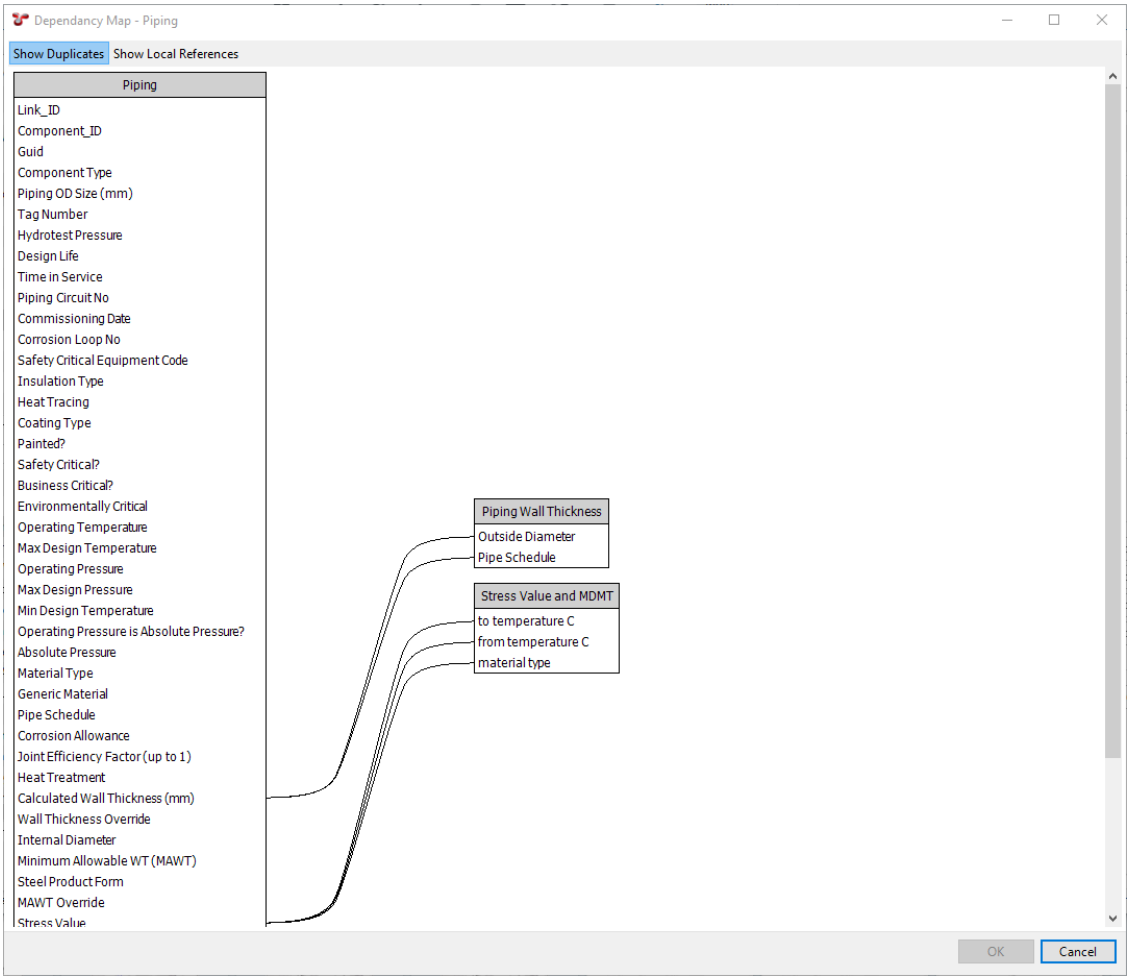
– **Show Duplicates** button **OFF**:



- **Show Local References**: If this button is switched on, and a field has a reference to another field within the same AIG/Event Type/Global Table, this dependency will be displayed on the map. If you switch this button off, these self-referential dependencies will not be displayed at all. See how the example mentioned above is displayed when toggling this button on or off:
  - **Show Local References** button **ON**:



– **Show Local References** button **OFF**:



8.2.2.1.3 Example

For an example about how to add a new global table lookup field to an existing AIG, see *Example: Set Up Global Lookup Field*. For an example about how you can use a global table as a global table link in an AIG, see *Example: Assign Global Table Link to AIG*.

8.2.2.1.3.1 Set Up Anomaly Triggers

You can set up anomaly triggers for fields in an Asset Information Group (AIG) or an event form. When an anomaly trigger is violated, a yellow exclamation mark ( ) will appear next to the field.

> **Note**
>
> You can also set up asset-specific anomaly triggers. For more information, see *Set Up Anomaly Triggers*

for Assets.

To set up a generic anomaly trigger for a field, proceed as follows:

1. Start editing the required field in either of the following ways:
   - In case of an AIG field, choose *Configuration* → *Assets* → *Information* from the main menu, select the relevant AIG form in the top of the dialog and double-click the required field from the bottom of the dialog or select it and choose **Edit**.
   - In case of field in an event form, choose *Configuration* → *Events* → *Event Types* from the main menu, select the relevant event type in the top of the dialog and double-click the required field from the bottom of the dialog or select it and choose **Edit**.
2. In the **Edit Field Definition** dialog (see *Add/Edit Field Definition Dialog*), go the the **Anomaly Triggers** tab.
3. Choose **Add** to create a new anomaly trigger, or, if you want to change an existing anomaly trigger, select it and choose **Edit**.
4. Enter data as follows:

Field/Check Name	Description
Type	Describe the case when the anomaly should be triggered.
Error Message	If you want to set up an error message to be shown when the anomaly is triggered, you can define its text here.
Enabled	Tick this checkbox to activate the trigger. In this case, the value of the event field will be checked against this trigger. If this checkbox is not ticked, the trigger is ignored.
Date From/Date To	You can optionally specify a date range for an anomaly trigger. If you specify only *Date From*, the trigger will apply only to event data from that date forward. If you set only *Date To*, the trigger will apply only to event data till that date or earlier. If you set both, the trigger will apply only to event data within the specified range. In this way, you can change triggers to reflect new conditions, without causing spurious warnings on historical data. For example, if you decrease the operating pressure of an asset, this might decrease the minimum allowable wall thickness. Rather than editing the existing anomaly trigger, you can set a "To" date on that old trigger, and add a new trigger with a "From" date.
Lower Bound	Specify a constant value. If the field's value is below this constant value, the anomaly will be triggered.
Lower Bound (Field)	Specify a field whose value should be compared to the value of this field. If the current field's value is below the value of the field that you specify here, the anomaly will be triggered. For example, if this field is *Measured Wall Thickness*, the system might trigger an anomaly if its value is less than the value of the *Minimum Allowable Wall Thickness*.
Upper Bound	Specify a constant value. If the field's value is above this constant value, the anomaly will be triggered.
Upper Bound (Field)	Specify a field whose value should be compared to the value of this field. If the current field's value is above the value of the field that you specify here, the anomaly will be triggered. For example, if this field is *Measured Wall Thickness*, the system might trigger an anomaly if its value is more than the value of the *Maximum Allowable Wall Thickness*.
Include Boundary	Controls whether exact matches cause the anomaly to be triggered. For example, if you have set a trigger to "Fail when inside Upper/Lower bounds", your lower bound is 1 and your upper bound is 9, your selection in this field determines whether the anomaly is triggered if the value is "1 < x < 9" or if it is "1 <= x <= 9". If you select *Yes*, the anomaly is triggered also if the value of the field is equal to the upper or lower bounds.
Code	Specifies the code that indicates the type of the anomaly (see *Code*).
Severity	You can set several triggers on a single field, with a variety of different codes and/or severities (see *Severity*). If that anomaly trigger is violated on an event field, a finding of that code and severity will automatically be created. Severities let you equate dissimilar problems, for example, you can decide that a problem in one field is of the same severity as a problem in a different field.

5. Click **OK** to save your changes.

Note

- For *Lookup List* fields, the comparison is performed based on the lookup list item's value, not its comment. For example, if you have a lookup list titled *Anode Depletion*, and its first entry has value "25" and comment "0 to 25% depleted", NEXUS will use

the "25" for purposes of determining whether an anomaly should be triggered.

- For *Yes/No* fields, you can set the anomaly to be triggered on any combination of *Yes*, *No* or blank, however, you can't compare it to another field.
- If you delete an anomaly trigger, findings created from it won't be deleted. If you *want* to delete all findings created from an anomaly trigger, don't delete the anomaly trigger. Instead, modify it so that no data will be marked as anomalous (for example, you can set it to only flag data between -2 and -1 on a field with no negative values), then run the anomaly triggers functionality. *Then*, as a second step, you can delete the anomaly trigger.

See also

- *Run Anomaly Triggers*
- *Set Up Anomaly Triggers for Assets*
- *Add/Edit Field Definition Dialog*

8.2.2.1.3.2 Example: Set Up Global Lookup Field

The example below shows how you can set up a global lookup field on an Asset Information Group (AIG) form. In this example, we create a global lookup field for the **Outside Diameter (mm)** field in an asset information group (AIG) called *Pipeline* and we want the value of this field to be determined based on the following:

- The value of another AIG field called **NPS (Inch)**
- The reference values specified in a global table, which contains a series of data for the possible combinations of outside diameter and nominal pipeline size (NPS) data of a pipeline.

8.2.2.1.3.3 Prerequisites

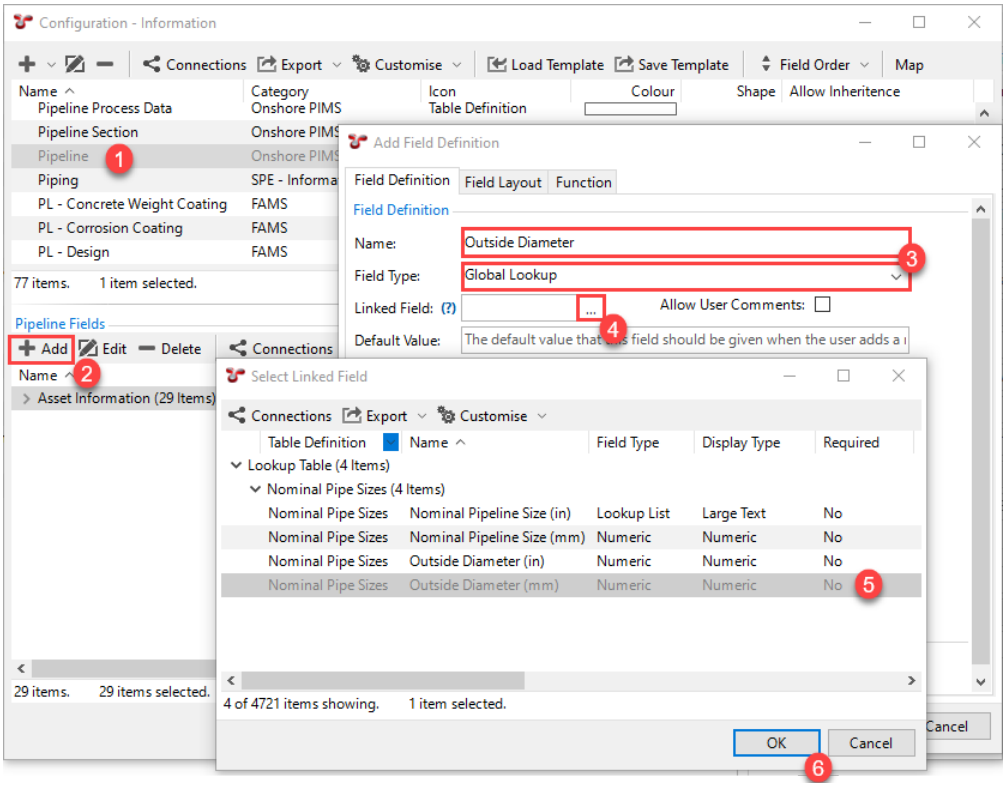
- Before configuring the AIG field, you must construct the global table that contains the reference values for outside diameter and NPS data. For a guide on how to set up the global table for this example, see *Example: Configure Global Table for Global Table Link*.
- You have created the AIG form *Pipeline*, which already contains the **NPS (Inch)** field.

8.2.2.1.3.4 Process

1. Under *Configuration* → *Assets* → *Information*, select the *Pipeline* AIG to which you want to add the new field (1).
2. Choose **Add** (2) from the bottom toolbar to add a new field for outside diameter.
3. Enter the name of the field and in the **Field Type** field, select *Global Lookup* (3).

   As soon as you select the field type, the **Function** tab appears in the dialog.
4. In the **Linked Field** field, click ... to select the global table field whose value you want to return to this field (4). In this case, it will be the *Outside Diameter (mm)* field in the *Nominal Pipe Sizes* lookup table (5).
5. Click **OK** (6).

See the image below for the steps above:

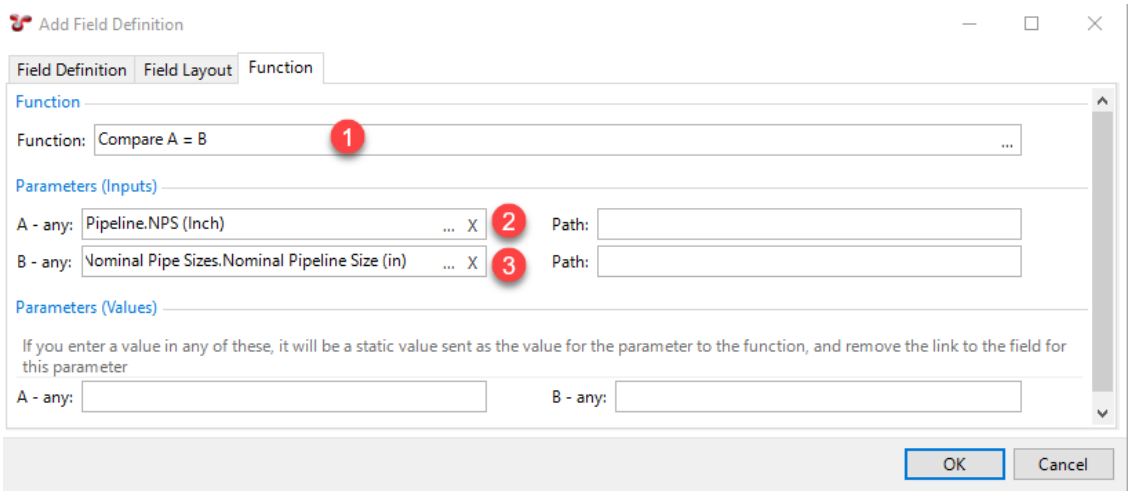


6. On the **Functions** tab, set up the function as follows:

   a. In the **Function** field, select the system function *Compare A = B*. 1

   b. Under *Parameters (Input)*, in the **A - any** field, click ⋯ to select the *NPS (Inch)* field under the *Pipeline* AIG. 2

   c. Under *Parameters (Input)*, in the **B - any** field, click ⋯ to select the *Nominal Pipeline Size (in)* field under the *Nominal Pipe Sizes* lookup table. 3



This function ensures that when the user enters a value in the **NPS (Inch)** field of the *Pipeline* AIG,

the system calculates the value of the **Outside Diameter (mm)** field as follows:

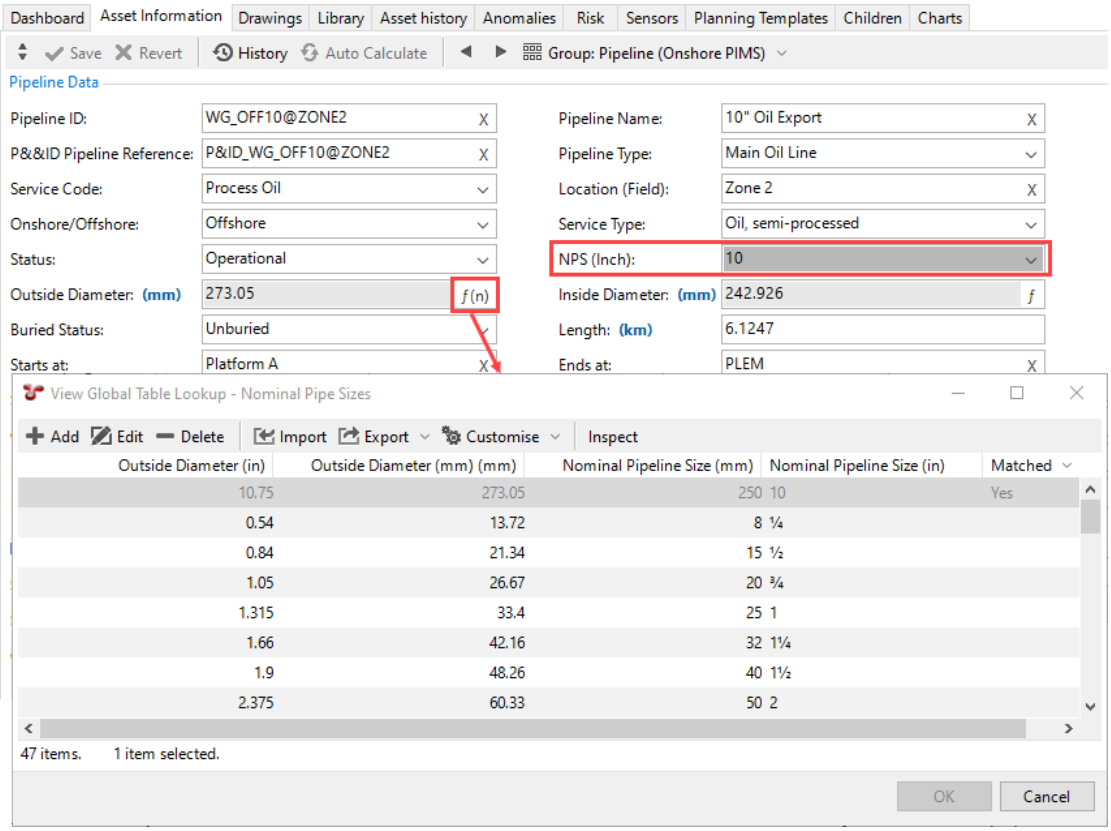
1. It retrieves the value of the **NPS (Inch)** AIG field ("A" value in the function).
2. It compares this value with the values of the **Nominal Pipeline Size (in)** field in the **Nominal Pipe Sizes** global table ("B" value in the function).
3. If there's a match, that is, it finds a Nominal Pipeline Size (in) value in the global table that is equal to the AIG field value, the function returns *Yes*.
4. In this case, the value of the **Outside Diameter (mm)** field in the corresponding row of the **Nominal Pipe Sizes** global table will be retrieved and output to the **Outside Diameter (mm)** field in the AIG form.

7. Click **OK**.

8.2.2.1.3.5 Result

The value of the **Outside Diameter (mm)** field is calculated and appears on the *Pipeline* AIG based on the value of the **NPS (Inch)** field. When clicking in the **Outside Diameter (mm)** field, the **NPS (Inch)** is highlighted in dark grey colour to show that it's a dependent field.

You can check the global table based on which the value was determined when you click on the f(n) icon in the **Outside Diameter (mm)** field. In the **Matched** column, you can see in which row of the global table the match was found. To check the function behind the calculation, click **Inspect** in the **View Global Table Lookup** dialog that opened.



8.2.2.1.3.6 Example: Assign Global Table Link to AIG

The example below shows how you can use a global table as a global table link in an Asset Information Group (AIG).

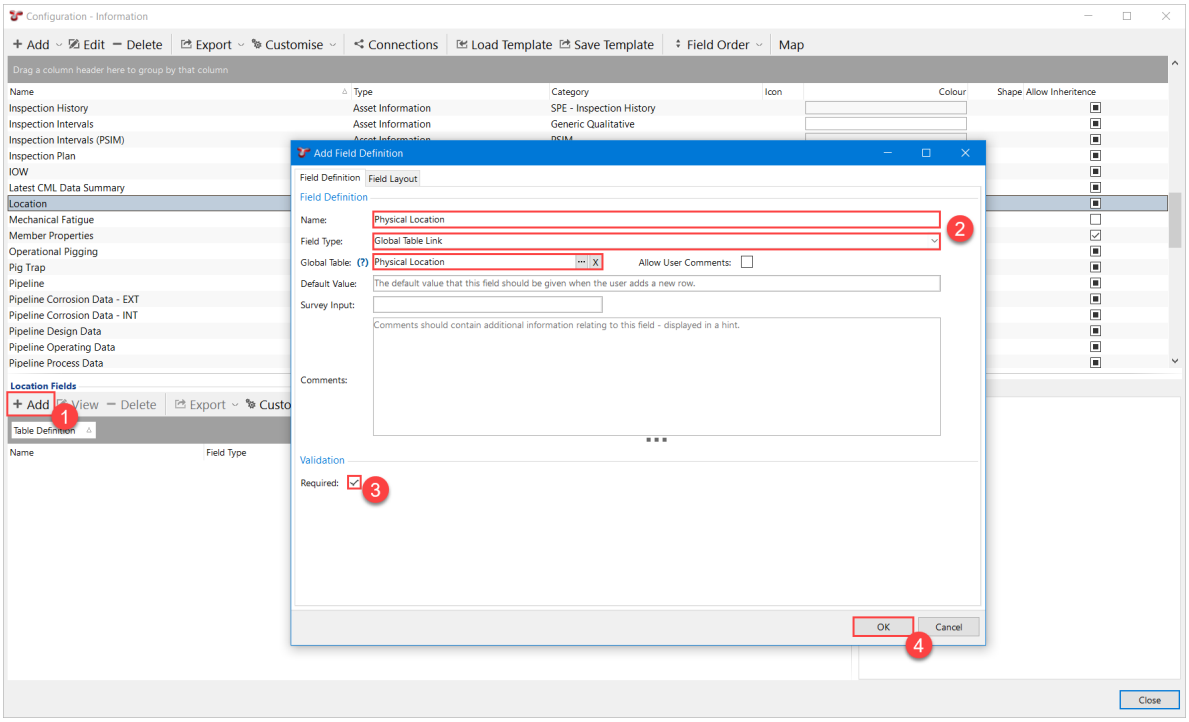
8.2.2.1.3.7 Prerequisites

Before implementing a global table link in an AIG, you must construct a global table adequate for your purposes. This involves creating fields that relate to field data in such a way that each form field can be selected to progressively narrow the selection of values until the user is presented with a final value, or a filtered group of values to select from. The final value will be displayed in the AIG.

For a guide on how to set up the global table for this example, see *Example: Configure Global Table for Global Table Link*.

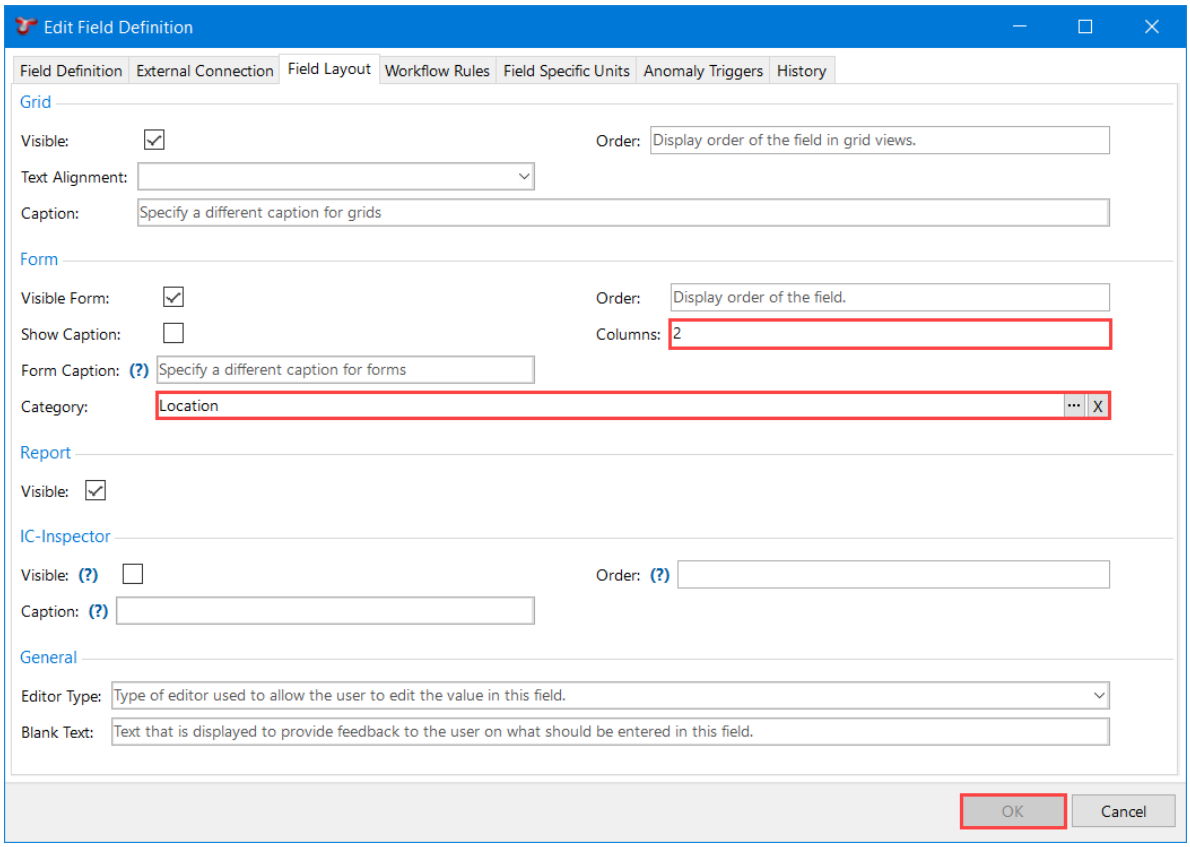
8.2.2.1.3.8 Process

1. Create a new AIG field definition as follows:
   a. Under *Configuration* → *Assets* → *Information*, select the AIG to which you want to add the new field and choose **Add** (1) from the bottom toolbar.
   b. In the **Field Type** field, select *Global Table Link* (2).
   c. In the *Global Table* field, select your global table.
   d. Tick the **Validation Required** checkbox (3).
   e. Click **OK** (4).

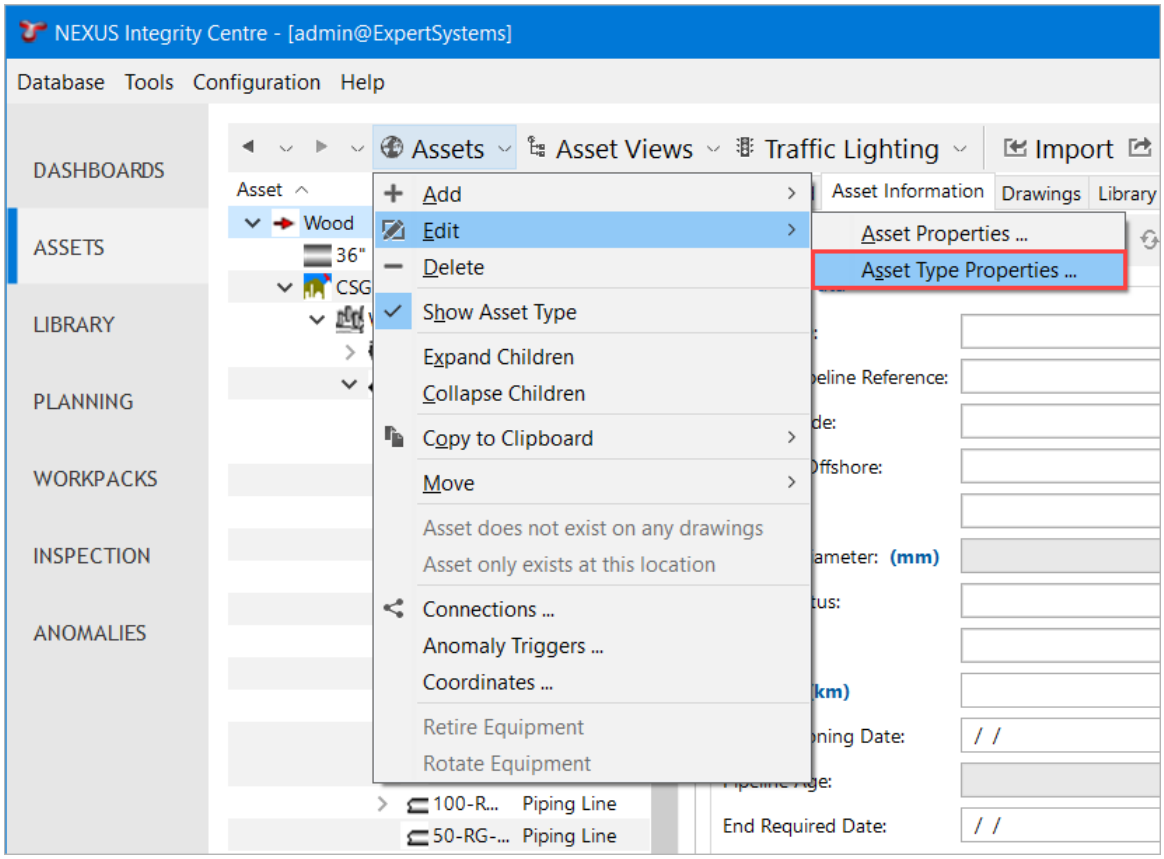


2. If you haven't already edited the field layout of the global table fields, you can do so from here.
    a. On the **Field Layout** tab, enter the number of columns you would like to display in the form in the **Columns** field.
    b. You can also untick **Show Caption** under *Form* to hide the label of the AIG field. The label above the form will match the category name.

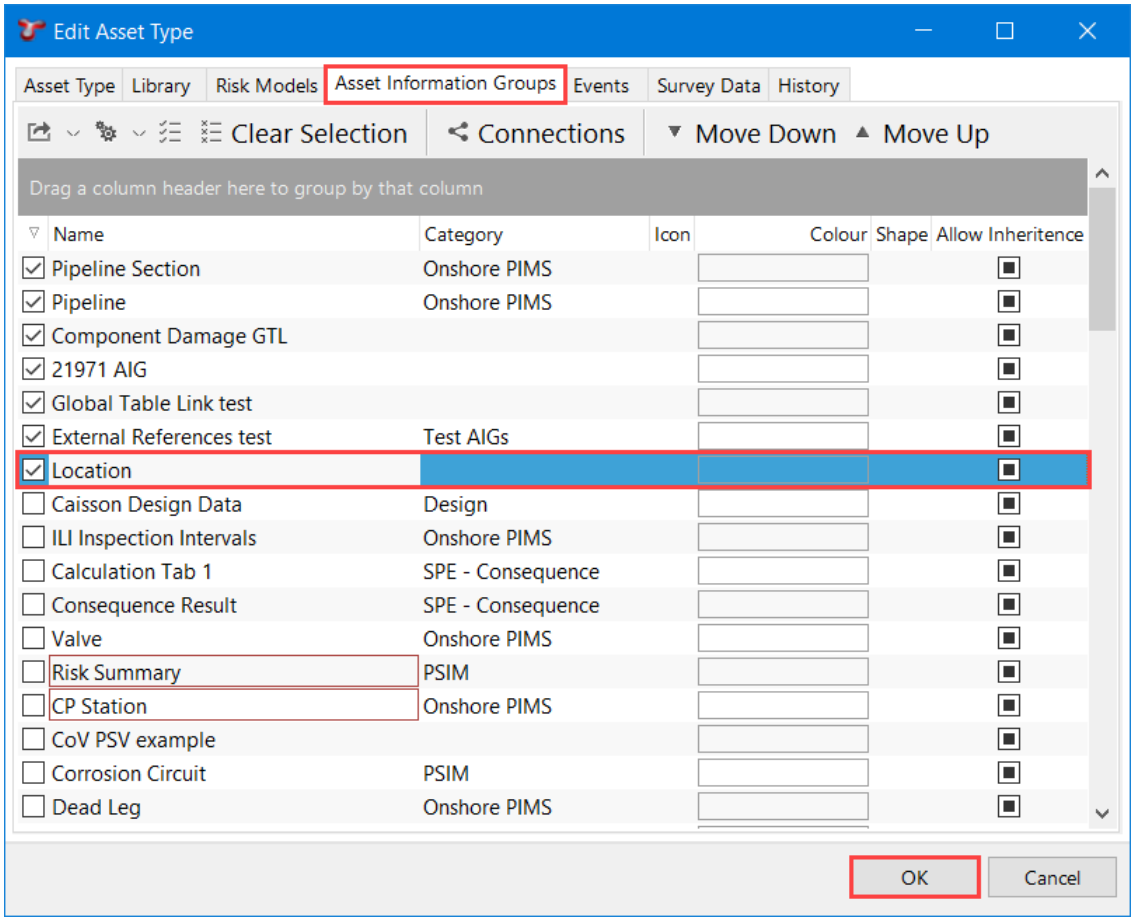
       In this example, we choose 2 columns.
    c. Create and apply a category that also has the number of columns set to 2, and is called *Location*.



3. On the **ASSETS** screen, select an asset of the asset type you want your AIG to be enabled on.
4. Choose *Assets* → *Edit* → *Asset Type Properties* from the toolbar.



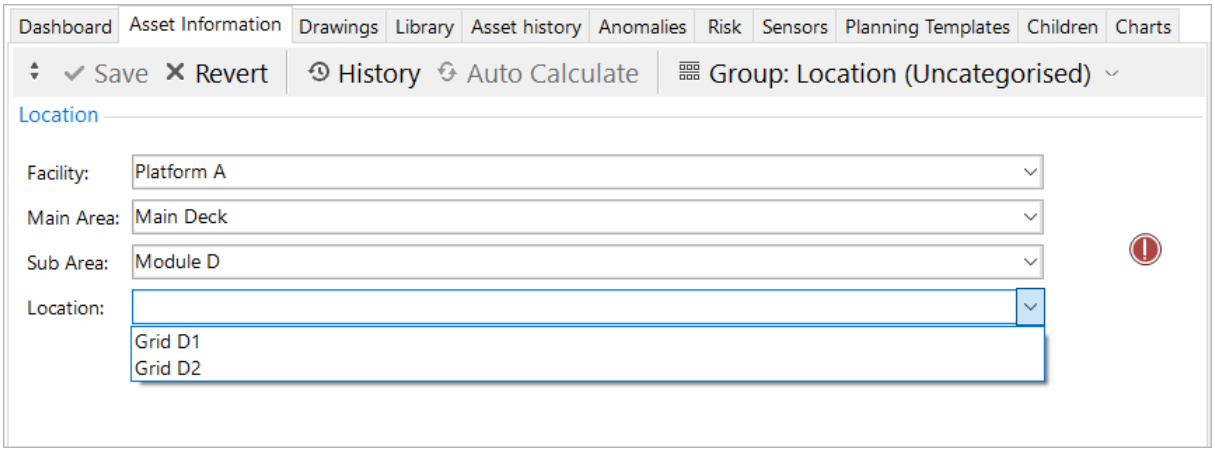
5. In the **Edit Asset Type** dialog, navigate to the **Asset Information Groups** tab and select your AIG in the list. You can select multiple rows.



5. On the **ASSETS** screen, select your asset again and on the **Asset Information** tab, select your AIG from the list of AIGs under the **Group: [AIG]** button.

8.2.2.1.3.9 Result

The AIG displays the questionnaire form with the global table fields. When you navigate through the form, the system finds a global table row by narrowing down the range of possible results that correspond to the combination of field values. In practice, this is similar to a questionnaire that progresses one question at a time, until the result field is shown. The screenshot below shows the questionnaire in a completed state. The result drop-down list contains the possible values according to the specified answers. Choosing a result stores a reference to it in the AIG.



8.2.2.2 Configure Asset Types

Under *Configuration* → *Assets* → *Types*, you can set up asset types as follows:

- Create asset types (see *Create an Asset Type*)
- Assign Asset Information Groups (AIGs) to asset types (see *Assign AIGs to an Asset Type*)
- Assign event definitions to asset types (see *Assign Event Types to Asset Type*)
- Assign survey data to asset types (see *Assign Survey Data to Asset Type*)
- Assign risk models to asset types (see *Assign Risk Models to Asset Type*)
- Assign library items to asset types (see *Assign Library Items to Asset Type*)

You must assign an asset type to each asset in the asset tree (see *Edit Assets and Asset Types*). The asset type determines what AIGs, event definitions, survey data groups, risk models or library items are applicable to particular assets.

> **Tip**
>
> You can also edit asset types and make assignments to it by choosing *Assets* → *Edit* → *Asset Type Properties* ... from the main toolbar on the **ASSETS** screen. It triggers the same **Edit Asset Type** dialog that is referenced below.

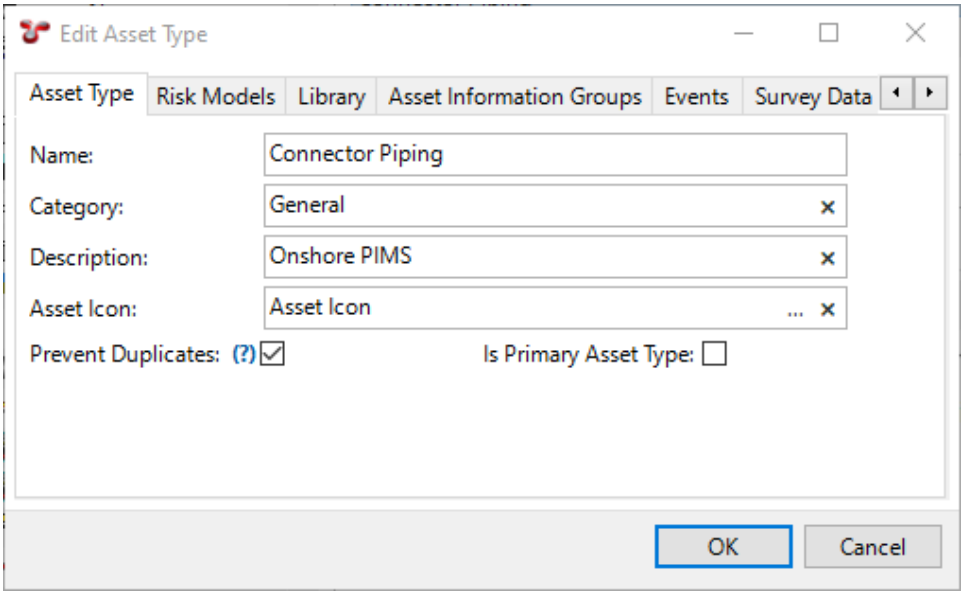
8.2.2.2.1 Create an Asset Type

To create a new asset type, proceed as follows:

1. Under *Configuration* → *Assets* → *Types*, click **Add** at the top of the **Configuration - Types** dialog.
2. Enter the following data:

Field/Check Name	Description
Name	A name that uniquely identifies the asset type.
Category	The category of the asset type if you want to group asset types into categories.
Description	You can optionally provide more descriptive information about the asset type. This can be a maximum of 100 characters.
Asset Icon	Icon (16×16 px) representing the asset type in the asset tree. Click the ellipsis (…) to select an icon. If none is selected, the default icon is used. **Tip**: When selecting an icon, you can click **Connections** to see which asset types already use the icon.
Prevent Duplicates	If ticked, assets of this type must have unique names. This means that you will not be able to create two assets with the same name under this asset type.
Is Primary Asset Type	Marks this asset type as a primary grouping category. This setting can be used for reporting, dashboards and functions to organise and group assets.

3. Click **OK** to save your changes.



Result

The new asset type appears in the **Configuration - Types** dialog. When you edit it, additional tabs become available for assigning AIGs, event types, survey data, risk models and library items.

8.2.2.2.2 Assign AIGs to an Asset Type

If you assign an AIG to an asset type and you select an asset with that asset type in the asset tree, then that AIG will be available for editing under the **Groups** toolbar option on the **Asset Information** tab.

To assign an AIG to the asset type, proceed as follows:

1. Under *Configuration* → *Assets* → *Types*, select the relevant asset type.
2. Choose **Edit** to launch the **Edit Asset Type** dialog.
3. On the **Asset Information Groups** tab, choose + **Include**.
4. Select the required AIG from the list and click **OK**.
5. Click **OK** in the **Edit Asset Type** dialog.

8.2.2.2.3 Assign Event Types to Asset Type

If you assign an event type (see *Configure Event Types*) to an asset type, then, on the **INSPECTION** screen, you can create events only with that event type for the particular asset with that asset type. For example, on the **Event Listing** tab, when you click **Add Event**, only the assigned event types will be available for selection when you create a new event. Also, you can import only events with the assigned event types.

To assign an event type to the asset type, proceed as follows:

1. Under *Configuration* → *Assets* → *Types*, select the relevant asset type.
2. Choose **Edit** to launch the **Edit Asset Type** dialog.
3. On the **Events** tab, choose + **Include**.
4. Select the required events from the list and click **OK**.
5. Click **OK** in the **Edit Asset Type** dialog.

8.2.2.2.4 Assign Survey Data to Asset Type

If you assign a survey data form (see *Configure Event Types*) to an asset type, then survey data of that type can be logged against assets of that type.

To assign a survey data form to an asset type, proceed as follows:

1. Under *Configuration* → *Assets* → *Types*, select the relevant asset type.
2. Choose **Edit** to launch the **Edit Asset Type** dialog.
3. On the **Survey Data** tab, choose + **Include**.
4. Select the required survey data form from the list and click **OK**.
5. Click **OK** in the **Edit Asset Type** dialog.

8.2.2.2.5 Assign Risk Models to Asset Type

If you assign risk models to an asset type, then you can assign only those risk models to assets with that particular asset type. That is, on the **Risk** tab, when you click **Assign to <name of asset>**, you can choose only from the risk models that have been assigned to that asset type. For more information, see *Assign Risk Models*.

To assign a risk model to the asset type, proceed as follows:

1. Under *Configuration* → *Assets* → *Types*, select the relevant asset type.
2. Choose **Edit** to launch the **Edit Asset Type** dialog.
3. On the **Risk Models** tab, select the required risk models from the list. You can choose **Select All** to select all items in the list or **Clear Selection** to remove a selection.
4. Click **OK** in the **Edit Asset Type** dialog.

8.2.2.2.6 Assign Library Items to Asset Type

If you assign a library item to an asset type and you select an asset with that asset type in the asset tree, then the assigned library items will be available on the **Library** tab for that asset.

To assign a library item to the asset type, proceed as follows:

1. Under *Configuration* → *Assets* → *Types*, select the relevant asset type.
2. Choose **Edit** to launch the **Edit Asset Type** dialog.
3. On the **Library** tab, choose **Add**.
4. In the **Add Library** dialog, specify the main properties and upload the required library item. For detailed information, see *Add/Edit Library Dialog*.
5. Click **OK** in the **Edit Asset Type** dialog.

For more information about managing library items, see *Library Items*.

See also

- *Edit Assets and Asset Types*

8.2.2.3 Configure Features

So that some features can work properly, NEXUS IC needs to know where to get data from for specific purposes. To ensure this, you must define the source Asset Information Group (AIG) fields that NEXUS can use to get information for the following usages:

Usage	Description
As Built - Order, **As Built - Easting**, **As Built - Northing**	Sub AIG fields used by the *Map* feature to show an as-built pipeline track.
Asset - Abbreviation	This field is now redundant but may be used in the future. Leave it blank.
Asset - Serial Number	Used to connect NEXUS IC assets to elements in a 3D drawing.
Asset - Tag	This field is used to store QR code data. When IC-Inspector scans a QR code or bar code, the task list will be filtered to show only tasks that contain the scanned code.
Coordinates - Datum, **Coordinates - UTM Zone**	Used by the *Map* feature to fetch real-world maps from OpenStreetMap, ESRI, and so on.
DVR - Relative Folder:	Used by your video recorder to specify the relative folder to record video into for each asset. For more information, see *Specify Project Path for Recording*.
Feature - Start, **Feature - End**, **Feature - Name**, **Feature - Category**	These fields are now redundant but may be used in the future. Leave them blank.
Pipeline Section - KP - Start, **Pipeline Section - KP - End**	Parameters required for the Pipeline View chart.

These usages are predelivered and cannot be modified.

To assign source AIG fields to these usages, proceed as follows:

1. Navigate to *Configuration* → *Assets* → *Features*.
2. Select the required usage in the list and click **Edit**.
3. Select the relevant AIG field from the dialog and click **OK**.

8.2.2.4 Configure Sensors

Under *Configuration* → *Assets* → *Sensors*, you configure sensor data forms.

Sensor data is recorded against assets, at a series of points in time (for example, once per hour). (This feature was known as monitored data in NEXUS IC 5.)

You can maintain sensor data forms from the **Configuration - Sensors** dialog as follows:

- In the **top** half of this dialog, you can add, edit and delete sensor forms. You can use the standard toolbar functions for maintaining the forms (see *Using the Grid*). In addition, you can:
  - Use the **Field Order** button to move a field up or down in the form or grid. For example, if you want to place a field between two other fields in the form, select **Form ...** from the drop-down list, and in the **Form Field Order** dialog, you can move the field with the **Move Up** or **Move Down** buttons available in the toolbar.
  - Check the dependency map using the **Map** button (see *View Dependency Map*).
- In the **bottom** half, you can add, edit or delete fields within the sensor data forms and use the standard toolbar functions for maintaining the fields within the forms (see *Using the Grid*). You can also review how fields appear in the form or grid layouts.

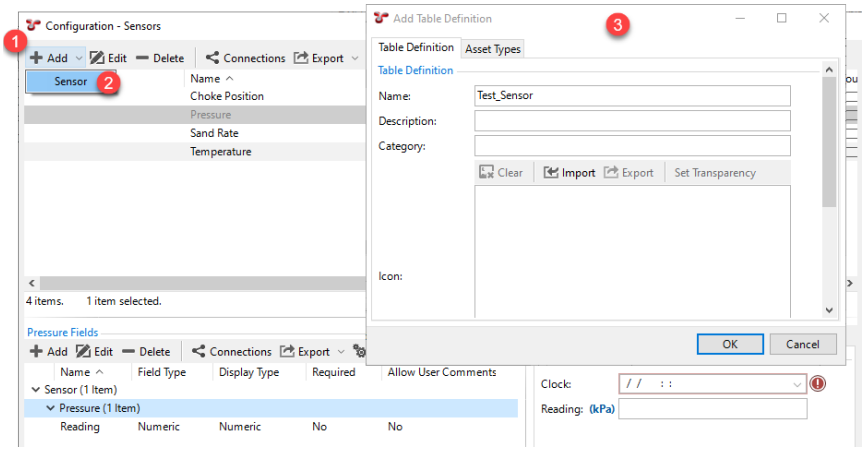
  Note that the **Clock** field is part of each sensor data form by default. Typically, a sensor will only have a single numeric field configured. However, if your sensor data type has more than one field, then the Sparkline chart shown on the sensors grid will display the data from the field that is ordered first. See *Sensors* for more information on the Sensor Sparkline chart.

8.2.2.4.1 Create Sensor Data Forms

See the steps below for the basic process of creating a new sensor data form:

1. Under *Configuration* → *Assets* → *Sensors*, click *Add* → *Sensor* at the top of the **Configuration - Information** dialog (1).

   The **Add Table Definition** dialog appears. The title of the dialog reflects that form data is stored in tables in NEXUS IC.

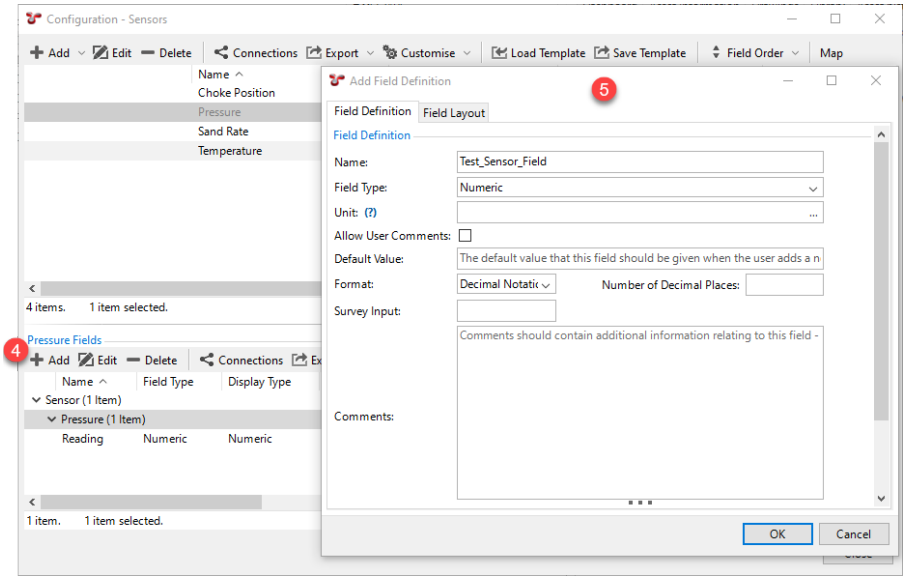


2. Specify the main table parameters in the **Add Table Definition** dialog (3). For more information, see *Add/Edit Table Definition Dialog*.

> **Note**
>
> When you create the table for the first time, not all tabs are visible in the dialog. Save the table, select it and click **Edit** to return to the dialog with all the tabs visible.

3. Click **OK**.
4. Add new fields to the table by choosing **Add** from the bottom toolbar of the **Configuration - Information** dialog (4).

   The **Add Field Definition** dialog appears.



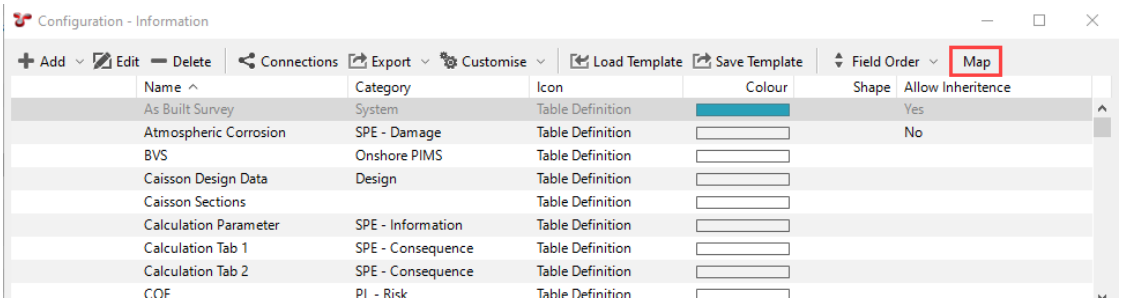
> **Note**
>
> When you create the field for the first time, not all tabs are visible in the dialog. Save the field, select it and click **Edit** to return to the dialog with all the tabs visible.

5. Specify the main field parameters in the **Add Field Definition** dialog 5. For more information, see *Add/Edit Field Definition Dialog*.
6. Click **OK**.

8.2.2.4.2 View Dependency Map

The dependency map is a visual representation of an Asset Information Group (AIG), Event Type's, or global table's dependencies.

You can access the dependency map by choosing **Map** in the toolbar of the configuration dialogs when configuring AIGs (see *Configure Asset Information Groups*), event types (see *Configure Event Types*) or global tables (see *Configure Global Tables*).

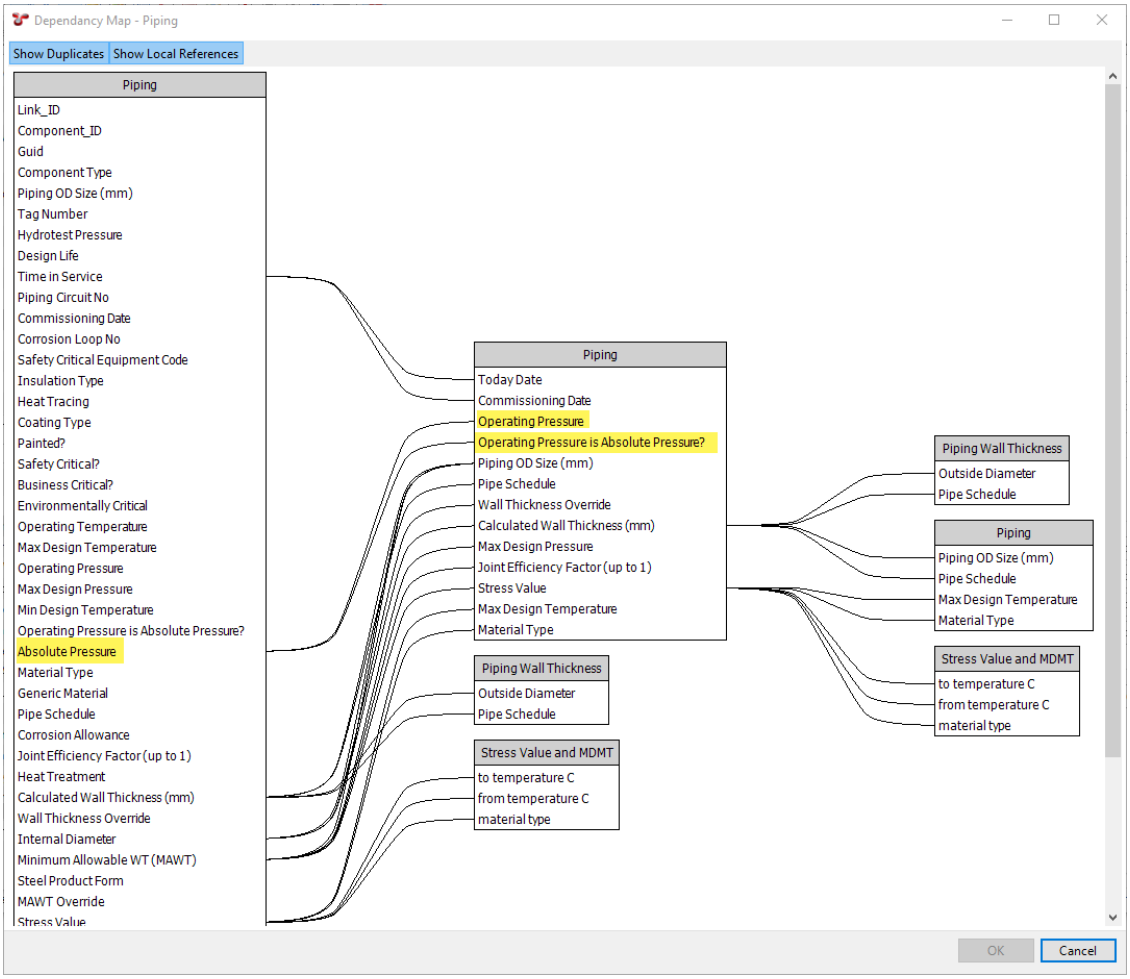


The map is represented as a series of interlinked fields grouped in columns, each column representing the AIG/Event Type/Global Table to which the fields belong.

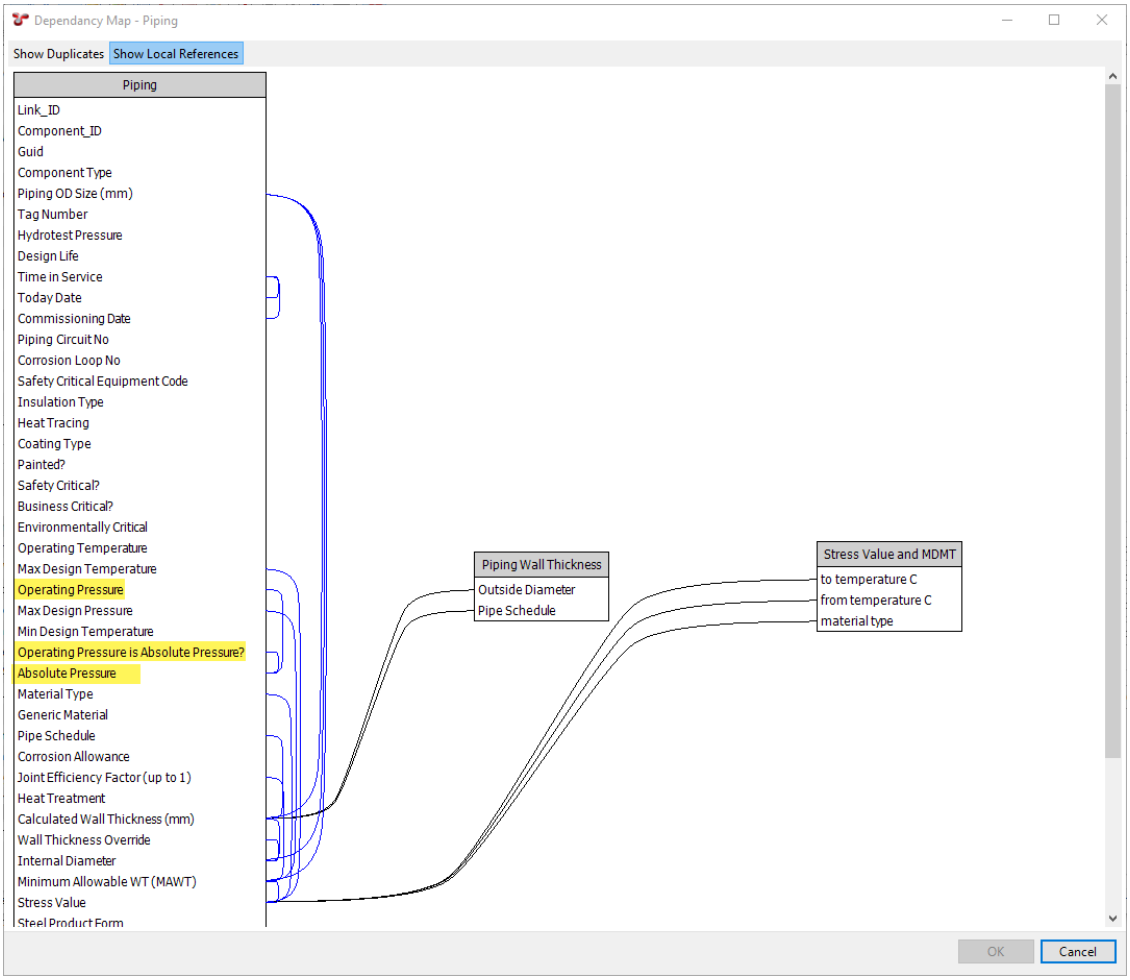
The map is hierarchically arranged from left to right, with the target AIG/Event Type/Global Table located in the left-most column, and its dependencies and sub-dependencies located to the right.

You can also toggle the view using the following buttons at the top of the dialog:

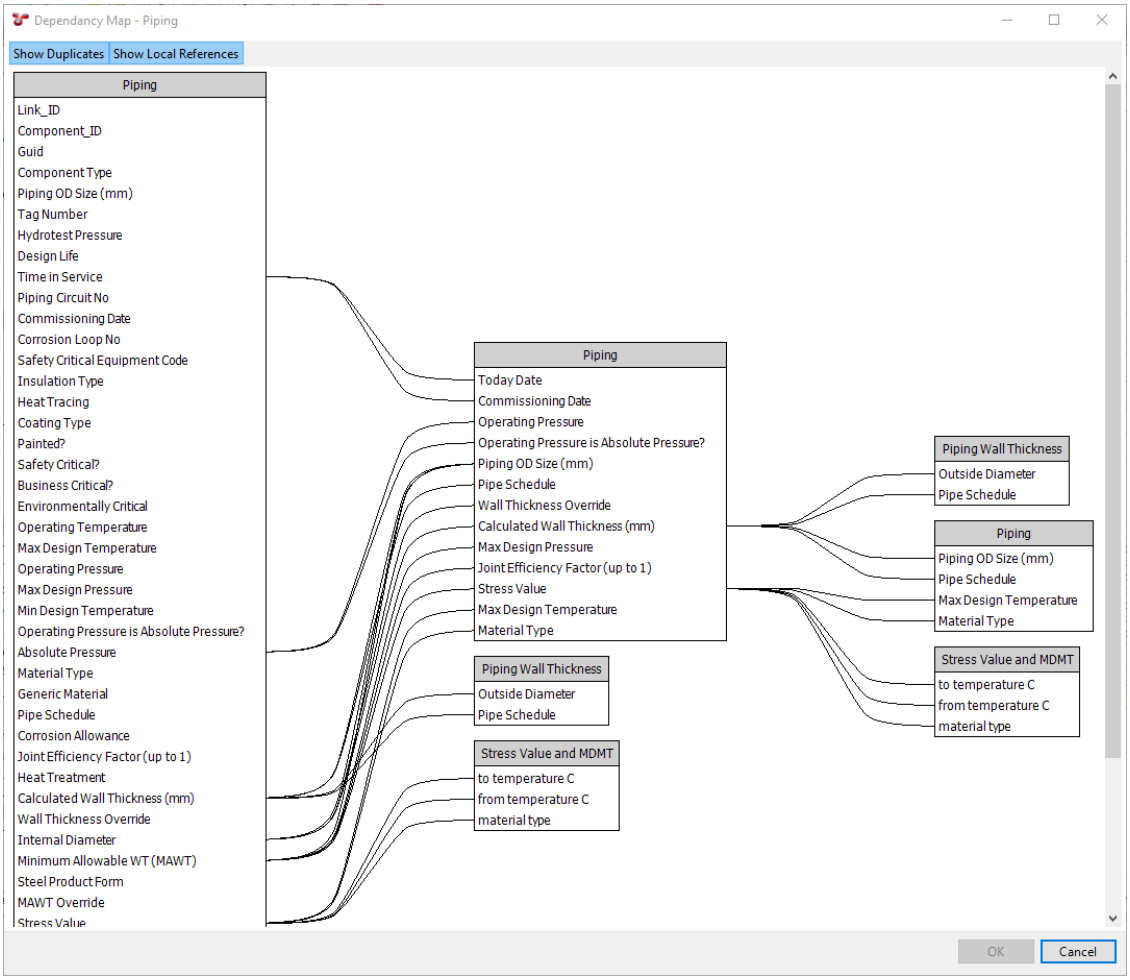
- **Show Duplicates**: If this button is switched on, and a field has a reference to another field in the same AIG/Event Type/Global Table, the field and the AIG/Event Type/Global Table will be displayed again in a separate column. If you switch this button off, the fields will be displayed only once and any self-referential dependencies will be displayed as a closed loop in a single column. For example, if you have a field called **Absolute Pressure** in the **Piping** AIG, which has references to two other fields from the same **Piping** AIG, the dependency map is displayed as follows:
  - **Show Duplicates** button **ON**:



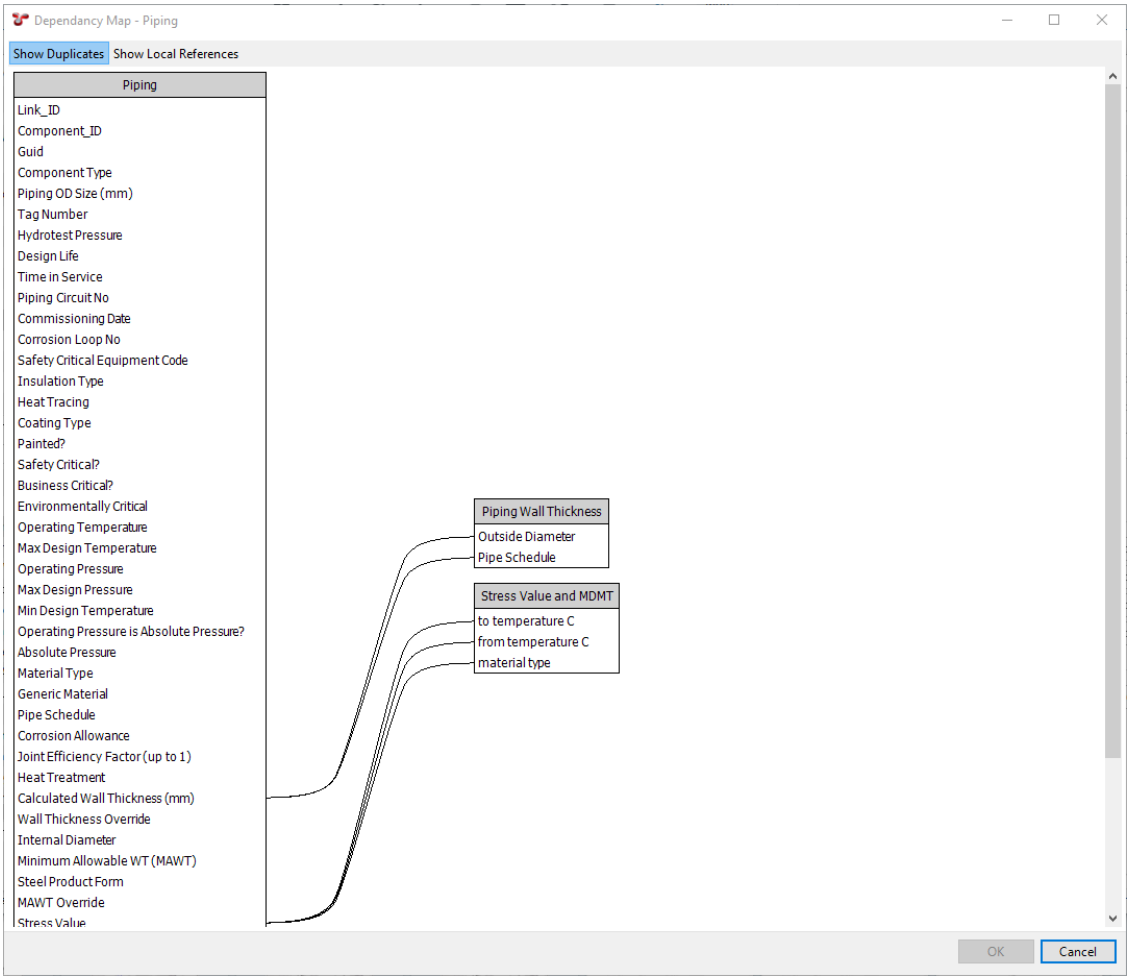
  - **Show Duplicates** button **OFF**:



- **Show Local References**: If this button is switched on, and a field has a reference to another field within the same AIG/Event Type/Global Table, this dependency will be displayed on the map. If you switch this button off, these self-referential dependencies will not be displayed at all. See how the example mentioned above is displayed when toggling this button on or off:
  - **Show Local References** button **ON**:



– **Show Local References** button **OFF**:



8.2.2.5 Configure Risk Charts

The first step of setting up a risk model is configuring a risk chart, where the risk results can be displayed on. You create risk charts under *Configuration → Assets → Risk Charts*.

One chart can be used by several risk models (see *risk models*).

Risk matrixes are displayed on the **ASSETS** screen, on the **Risk** tab (see *Risk*).

8.2.2.5.1 Set Up a Risk Chart

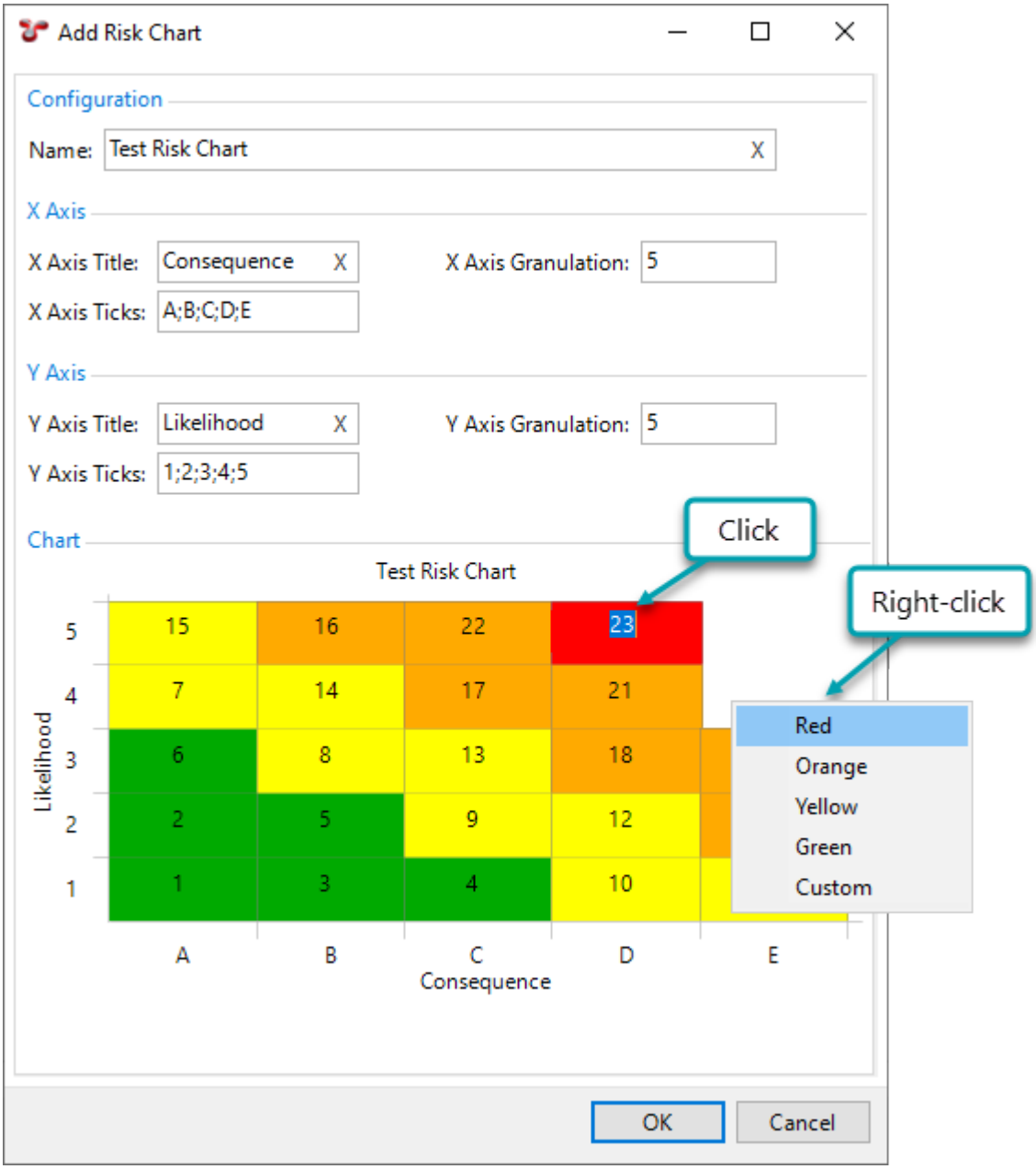
The following example shows the steps of setting up a new risk chart:

1. Under *Configuration → Assets → Risk Charts*, click **Add** at the top of the **Configuration - Risk Charts** dialog.
2. In the **Add Risk Chart** dialog, enter a name that uniquely identifies the risk chart.
3. Specify the X and Y axis parameters as follows:

Field Name	Description
X Axis Title	Specifies the title of the X axis.
X Axis Granulation	Indicates to how many squares you want to split up the X axis (width).
X Axis Ticks	Indicates the name of each square on the X axis. Enter the values separated by semicolon. For example, if your risk chart is 5x5, your X axis ticks can be defined as "A;B;C;D;E", or "Negligible;Mild;Moderate;Major;Severe", whatever your risk model requires.
Y Axis Title	Specifies the title of the Y axis.
Y Axis Granulation	Indicates to how many squares you want to split up the Y axis (height).
Y Axis Ticks	Indicates the name of each square on the Y axis. Enter the values separated by semicolon. For example, if your risk chart is 5x5, your Y axis ticks can be defined as "1;2;3;4;5", or "None;Low;Medium;High;Extreme", whatever your risk model requires.

4. Under *Chart*, set up the risk colours and numbers as follows:

   - Right-click a cell to set the colour. Choose a predefined colour or choose *Custom* to get a colour picker dialog.
   - Click within the cell to enter a whole number risk value. The higher the number, the more severe the risk is.



See also

Configure Risk Models

8.2.2.6 Configure Risk Models

The Risk technology within NEXUS IC provides a powerful framework for configuring formalised risk assessment and RBI methodologies (for example, API 581 BRD, DNV-RP-G101, AS 2885.1 and AS 4360) or creating custom risk models of any level of complexity, including corporate risk models, internally workshopped models and models tailored to specific issues or situations.

You create and manage risk models under *Configuration* → *Assets* → *Risk Models*.

Once you have created a risk model, you can assign it to asset types (see *Assign Risk Models to Asset Type* and *Assign Asset Types to a Risk Model*) and then to individual assets (see *Assign Risk Models*).

To identify which assets are using a particular risk model, select the risk model and click **Connections**.

See the following sections for more details:

- *Risk Model Hierarchy*
- *Set Up Risk Models*
- *Assign Asset Types to a Risk Model*

8.2.2.6.1 Risk Model Hierarchy

Risk models are structured hierarchically.

The final risk value is calculated from *n* Categories. Each Category value is calculated from *n Factors*, and each Factor value is calculated from *n* Calculations, Pass Thrus, Values and Factors.

Each level is displayed in the hierarchy tree in the lower section of the **Risk Models** screen and can be expanded or collapsed as required.

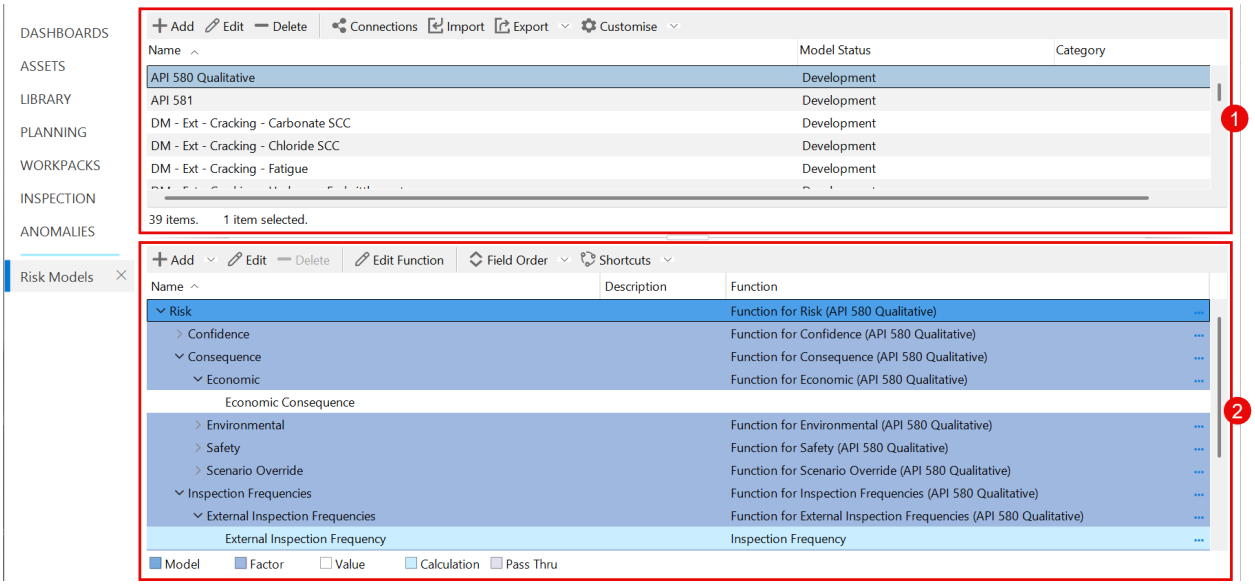
A risk model is made up of three top-level categories:

Risk Model Category	Description
Risk	Contains the logic used to determine the final risk value. Under this node, you can add Factors, and below Factors, you can add Calculations, Pass Thrus, Values and additional Factors. For each Factor, you set up a function and ultimately, the function assigned to the main Risk element combines all the factor functions beneath it.
X Value	Determines the position of the risk value on the X axis of the risk chart.
Y Value	Determines the position of the risk value on the Y axis of the risk chart.

For detailed information about setting up a risk model, see the process below.

8.2.2.6.2 Set Up Risk Models

You configure risk models on the **Risk Models** screen, which is available under *Configuration → Assets → Risk Models*.



The screen contains two main sections:

1 You use the standard grid toolbar (see *Using the Grid*) in the upper section of the screen to create, edit, delete, import and export risk models, manage assignments and view connected assets. Choosing **Add** or **Edit** opens the **Add/Edit Risk Model** dialog (see *Add/Edit Risk Model Dialog*).

2 You use the standard grid toolbar (see *Using the Grid*) in the lower section of the screen to configure the structure and logic of the selected risk model by adding and managing Factors, Calculations, Pass Thrus and Values. Choosing **Add** or **Edit** opens the **Add/Edit Model Element** dialog (see *Add/Edit Model Element Dialog*).

For detailed procedures, see:

- *Create Risk Models*
- *Update Risk Models*

8.2.2.6.2.1 Create Risk Models

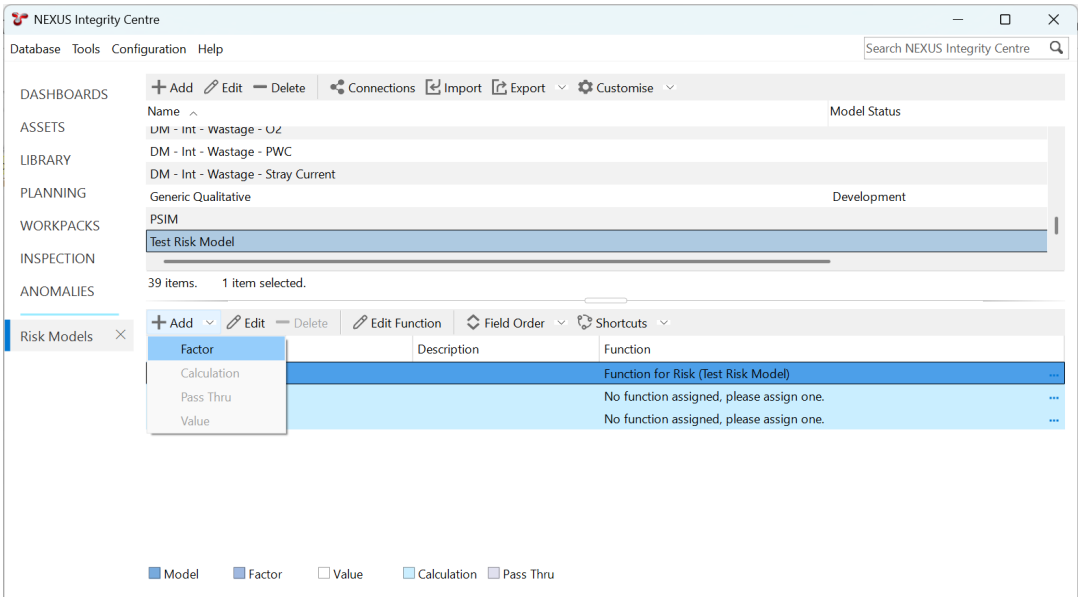
8.2.2.6.2.2 Prerequisites

You have defined a risk chart that will be used by the risk model (see *Configure Risk Charts*).

8.2.2.6.2.3 Process

1. Go to *Configuration* → *Assets* → *Risk Models* and click **Add** at the top of the **Risk Models** screen.
2. In the **Add Risk Model** dialog, specify the main parameters of the risk model. For more information, see *Add/Edit Risk Model Dialog*.
3. In the lower section of the **Risk Models** screen, set up the three main risk model categories:
    a. Configure the **Risk** category, which contains the logic used to determine the final risk value.

1. Create at least one *factor* under the **Risk** node by selecting the node and choosing *Add* → *Factor*.



2. Under each factor, create child elements used to determine the factor value. To do that, use one of the following methods:

   - Select the factor and choose the required child type from under the **Add** + toolbar button.

     You can create the following types of children under a factor:

     – Another **factor**

     – A **pass thru**: You can select a field from an Asset Information Group (AIG) form and have its value passed through to the risk model.

     – A **value**: You can directly determine a specific value to be used in the risk model.

     – A **calculation**: You define a function for determining the value for the risk model.

   - Add a risk model element by copying an existing field from an AIG. To do this, select the factor and choose *Shortcuts* → *Copy from...* from the toolbar or *Risk* → *Copy from...* from the factor's context menu (right-click), then select the required AIG field.

     Note

     The system copies the field definition data and field layout from the selected AIG field. Function configuration and workflow rules are not copied.

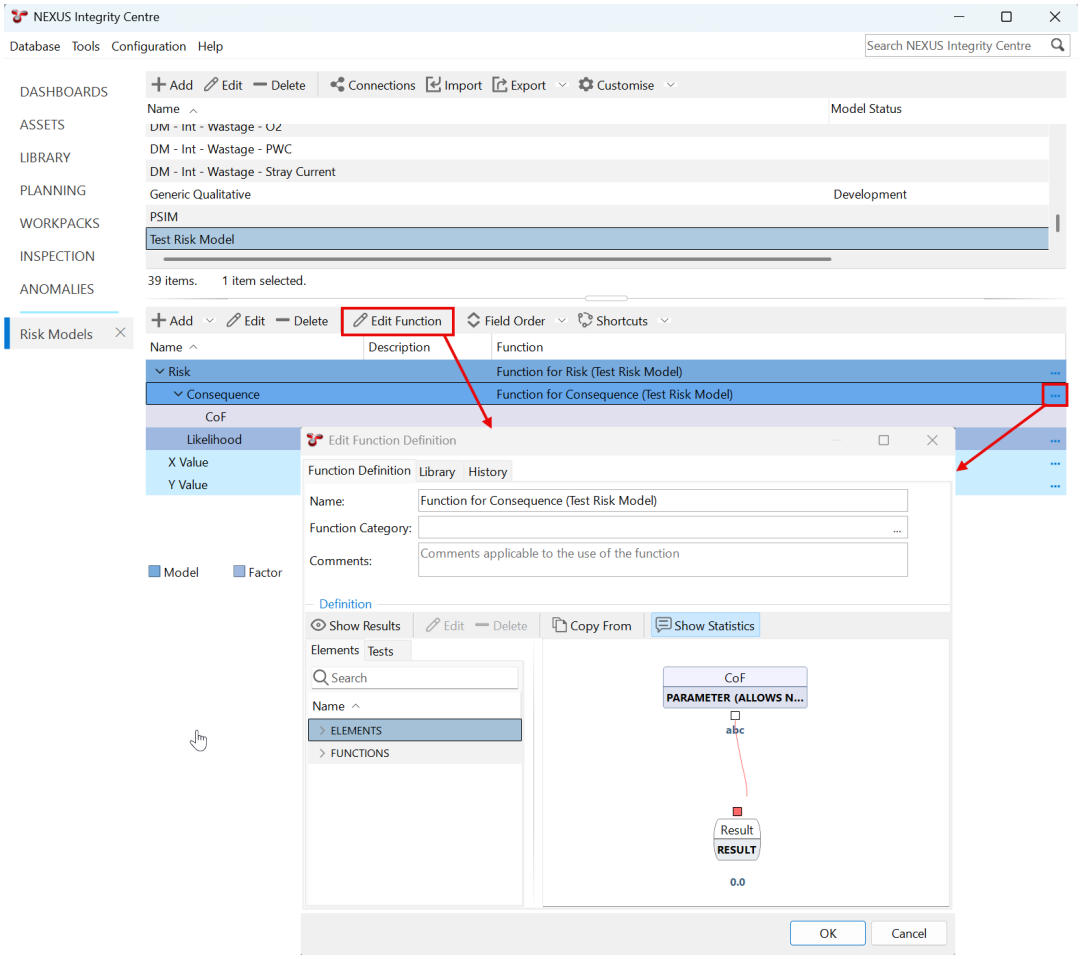
   After creating an element, you can edit it to update its parameters (see *Update Risk Models*).

3. When a child element is added under a factor, a function is automatically assigned to the factor. To ensure the factor value is calculated correctly, edit the function using one of the following methods:

   - Click the function and select ... at the end of the row.

- Select the function and choose **Edit Function** from the toolbar.

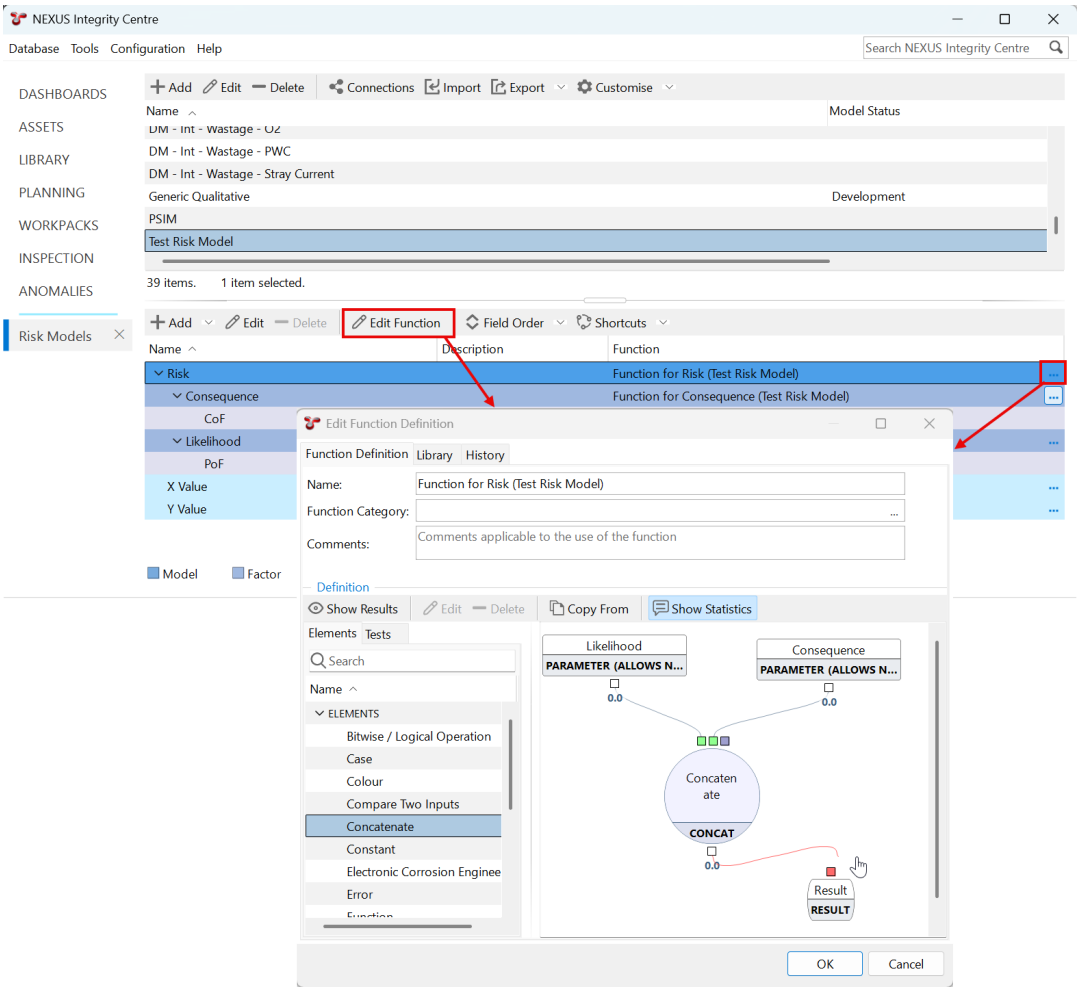
Ensure that you set up the connection between the function elements, for example:



4. After configuring all factors under the **Risk** node, configure the function of the main **Risk** node using one of the following methods:

   - Click the **Risk** function and select ... at the end of the row.
   - Select the **Risk** function and choose **Edit Function** from the toolbar.

   Ensure that you set up the connection between the function elements, for example:

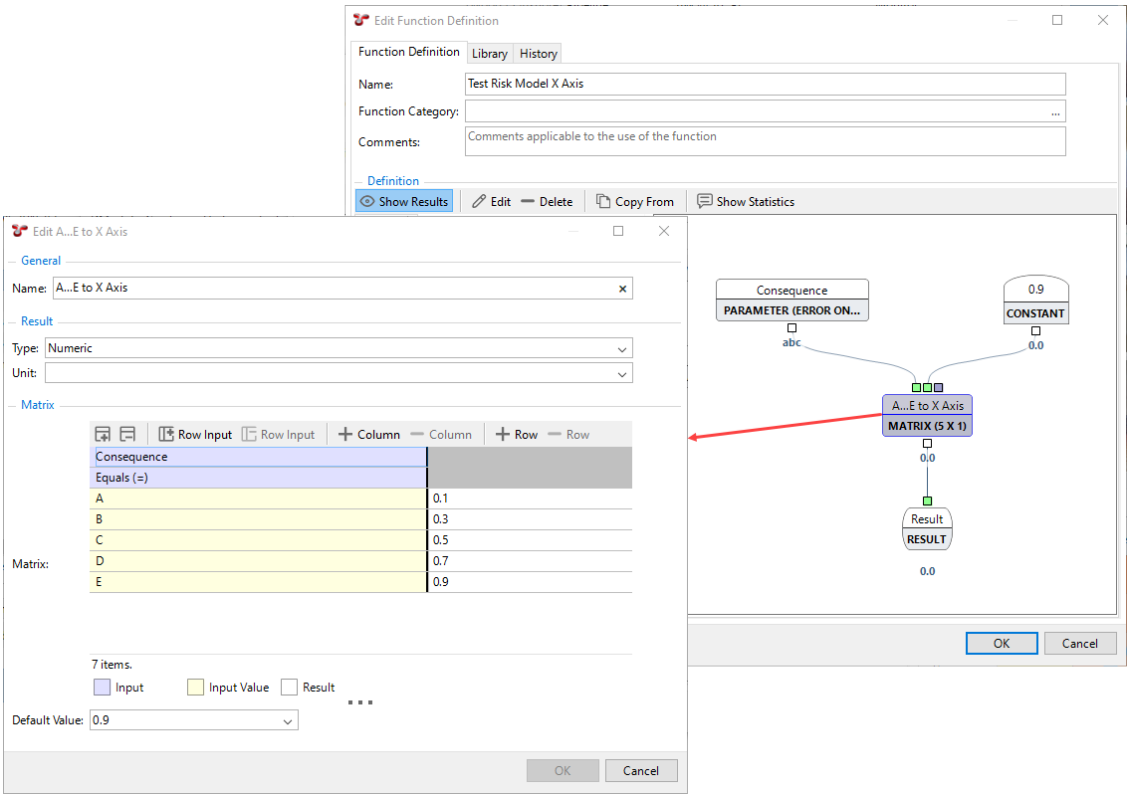


b. Configure the **X Value** category.

The **X Value** category determines the position of the risk value on the X axis of the risk chart. Edit the row and assign a function that returns a value between **0** and **1**.

- **0** positions the value at the far left of the axis.
- **1** positions the value at the far right of the axis.

For example, if based on your risk chart, you have the Consequence values A, B, C, D, E on your X axis, you can configure the function as follows:



c. Configure the **Y Value** category.

   The **Y Value** category determines the position of the risk value on the Y axis of the risk chart. Edit the row and assign a function that returns a value between **0** and **1**.

   - **0** positions the value at the bottom of the Y axis.
   - **1** positions the value at the top of the axis.

8.2.2.6.2.4 Update Risk Models

Once you have created a risk model, you can update it on the **Risk Models** screen (*Configuration* → *Assets* → *Risk Models*).

8.2.2.6.2.5 Edit Properties and Assignments

To edit the properties and assignments of a risk model:

1. Select the required risk model in the upper section of the screen.
2. Choose **Edit** from the top toolbar.

The **Edit Risk Model** dialog allows you to:

- Update the basic properties of the risk model, such as its name, chart, model status and category.
- Assign or remove asset types.
- Add or remove library items associated with the risk model.

For more information, see *Add/Edit Risk Model Dialog*.

8.2.2.6.2.6 Manage Risk Model Elements

To update the structure and logic of a risk model, select the required risk model in the upper section of the screen and use the lower section of the screen to manage its elements:

8.2.2.6.2.7 Adding Elements

To add an element, select the parent factor and choose **Add** , then select the required element type.

Alternatively, right-click the factor and use the **Add** option from the context menu.

8.2.2.6.2.8 Creating Elements from AIG Fields

To create an element based on an existing AIG field:

1. Select the required factor.
2. Choose *Shortcuts* → *Copy from...* from the toolbar or *Risk* → *Copy from...* from the context menu.
3. Select the required AIG field.

The system copies the field definition and field layout from the selected AIG field. Function configuration and workflow rules are not copied.

8.2.2.6.2.9 Editing Elements

To edit an element:

1. Select the element in the hierarchy.
2. Choose **Edit** from the toolbar, or right-click the element and choose **Edit**.

This opens the **Edit Model Element** dialog, where you can modify the element's properties.

For more information, see *Add/Edit Model Element Dialog*.

8.2.2.6.2.10 Removing Elements

To remove an element:

1. Select the element in the hierarchy.
2. Choose **Delete** from the toolbar, or right-click the element and choose **Delete**.

8.2.2.6.2.11 Editing Functions

Factors and Calculations can have functions assigned to them.

To modify a function:

1. Select the required element.
2. Choose **Edit Function** from the toolbar.

This opens the **Edit Function Definition** dialog, where you can review or modify the assigned function.

Note

When a child element is added under a factor, a function is automatically assigned to the factor. To ensure that the factor value is calculated, you must edit the function and configure the required connections between its elements.

For more information, see *Configure Functions*.

8.2.2.6.2.12 Changing Element Order

Risk model elements can be displayed in either of the following ways:

- In hierarchy grids, such as the risk model hierarchy displayed on the **Risk Models** screen and on the **Summary** tab of the risk assessment editor (available when editing a risk model from the **Risk** tab of the **ASSETS**, **PLANNING** or **WORKPACK** screens).
- In forms displayed within the risk assessment editor. Factors that contain editable fields are displayed as tabs, and the child elements of those factors are displayed as fields within forms.

The display order of elements can be configured separately for grids and forms:

- To change the display order of elements in hierarchy grids, select an element and choose *Field Order* → *Grid...*.
- To change the display order of elements in forms, select an element and choose *Field Order* → *Form...*.

The dialog displays all elements at the same hierarchy level as the selected element. Use **Move Up** and **Move Down** to adjust the order.

Changing the form order of factors changes the order of the factor tabs displayed in the risk assessment editor. Changing the form order of elements within a factor changes the order of the fields displayed within the corresponding form.

8.2.2.6.3 Assign Asset Types to a Risk Model

Asset type assignments determine which assets can use a risk model.

When assigning a risk model on the **Risk** tab of the **ASSETS** screen, users can select only risk models that have been assigned to the asset's type. For more information, see *Assign Risk Models*.

To assign asset types to a risk model:

1. Under *Configuration* → *Assets* → *Risk Models*, select the required risk model in the upper section of the screen.
2. Choose **Edit**.
3. Open the **Asset Types** tab.
4. Select the required asset types.
5. Click **OK**.

See also

- *Risk*
- *Assign Risk Models*
- *Configure Risk Charts*

- *Assign Risk Models to Asset Type*

8.2.3 Configure Planning Data

When you choose *Configuration → Planning* from the main menu of NEXUS IC, you can configure functions related to planning tasks or workpacks as described below.

8.2.3.1 Cost Codes

Define the list of cost codes that workpacks can be allocated to. When you edit a workpack on the **WORKPACKS** screen, the **Cost Code** field allows you to select from the values configured here.

Cost code allocation can be useful when integrating with an external Computerised Maintenance Management System (CMMS).

8.2.3.2 Schedule Types

You can optionally define a list of schedule types that can be assigned to planning tasks for grouping, filtering or reporting purposes.

8.2.3.3 Task Categories

Set up task categories to group tasks. If your database contains multiple types of data (for example, above-water and below-water inspections), you can create categories such as **Above water**, **Below water**, **ROV**, or **Diver**.

8.2.3.4 Task Status

Define a list of statuses that can be assigned to tasks for user-defined categorisation. For example, statuses may indicate why a task could not be completed, such as *item inaccessible*, *item non-existent* or *duplicate task*.

8.2.3.5 Workpack Groups

Create workpack groups to organise workpacks for filtering, searching or reporting. You can assign groups to individual workpacks on the *WORKPACKS Screen*.

8.2.3.6 Workpack Revisions

Define revisions that indicate the stage a workpack is in (for example, *Planning* or *Completed*). In this dialog, you can also:

- Assign a number to a specific workpack revision (**Level** field).
- Assign a colour to a specific workpack revision (useful when configuring chart or report templates).
- Set all workpacks with a given revision to read-only.
- Indicate whether you want the workpack with the specific revision to be updated by planning template changes.

By default, the grid on the *WORKPACKS Screen* is grouped by **Revision**.

8.2.4 Configure Events

When you choose *Configuration → Events* from the main menu of NEXUS IC, you can configure event-specific functions as described below:

- *Configure Event Types*
- *Configure Features*

- *Configure Mutually Exclusive Events*
- *Configure Remotely Operated Vehicles (ROVs)*
- *Configure Survey Sets*

8.2.4.1 Configure Event Types

Under *Configuration → Events → Event Types*, you can create and configure *event* forms. You can then use these forms to record event data.

You can create the following types of forms here:

Event Form Type	Description
Event	Events represent a single point in time and space, or a short range of time and/or space. For example, a form to capture details about an anode's current state would be an event.
Sub Event	A Sub Event appears within one of the other types of form, and can contain multiple records for a single instance of its owning form. For example, a CP Reading event form might have a sub event form on it for registering several readings; a Seabed Profile continuous event form might have a sub event form on it for recording a range of cross-profile depths. Sub Event types are not supported by IC-Inspector.
Survey Data	A Survey Data form captures information like location (Easting, Northing, and so on), KP, CP (for example, CP Reading, Field Gradient) and so on. Survey Data such as KP, Easting, Northing, Latitude, Longitude and Elevation is logged into a Survey Set. Each Event has a reference to a Survey Set. The positional data contained is retrieved from the Survey Set, matching on the Date Time Stamp in the Survey Set and the Date Time Stamp (Start Clock) of the event. Survey Set data is imported inherently with any *Import Events*. The inspection data import templates are formatted with the required columns. It is also possible to import Survey Set Data independent of event records. To edit individual survey data points, go to *Configuration → Events → Configure Survey Sets*.
Continuous Event	A Continuous Event is for capturing periodic data. For example, on a subsea pipeline inspection, you might capture seabed information every *n* metres. Continuous events do not normally appear in the *Event Listing*, unless you specifically filter for them.

You can maintain event forms from the **Configuration - Event Types** dialog as follows:

- In the **top** half of this dialog, you can add, edit and delete event forms. You can use the standard toolbar functions for maintaining the forms (see *Using the Grid*). In addition, you can:
  - Use the **Field Order** button to move a field up or down in the form or grid. For example, if you want to place a field between two other fields in the form, select **Form ...** from the drop-down list, and in the **Form Field Order** dialog, you can move the field with the **Move Up** or **Move Down** buttons available in the toolbar.

    Using the **IC-Inspector...** item under this button, you can also define the order of fields that appear on the *Event Details* screen in IC-Inspector.
  - Check the dependency map using the **Map** button (see *View Dependency Map*).
- In the **bottom** half, you can add, edit or delete fields within the forms and use the standard toolbar functions for maintaining the fields within the forms (see *Using the Grid*). You can also review how fields appear in the form or grid layouts and set up workflow rules and anomaly triggers for specific fields in the form.

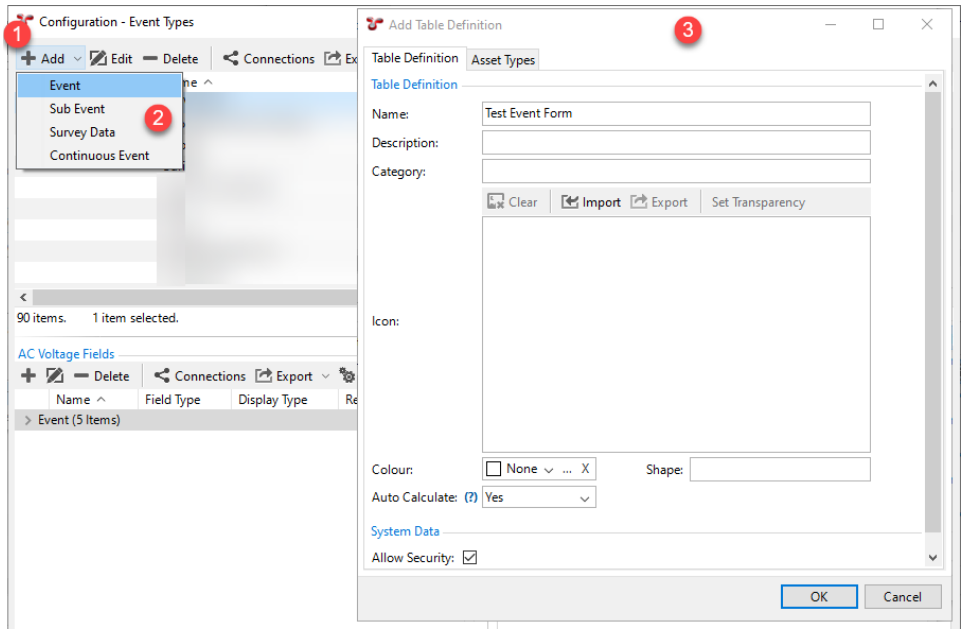
8.2.4.1.1 Create Event Forms

See the steps below for the basic process of creating a new event form:

1. Under *Configuration* → *Events* → *Event Types*, click **Add** at the top of the **Configuration - Information** dialog (1).

2. Select the type of event form that you want to create (2).

   The **Add Table Definition** dialog appears. The title of the dialog reflects that form data is stored in tables in NEXUS IC.



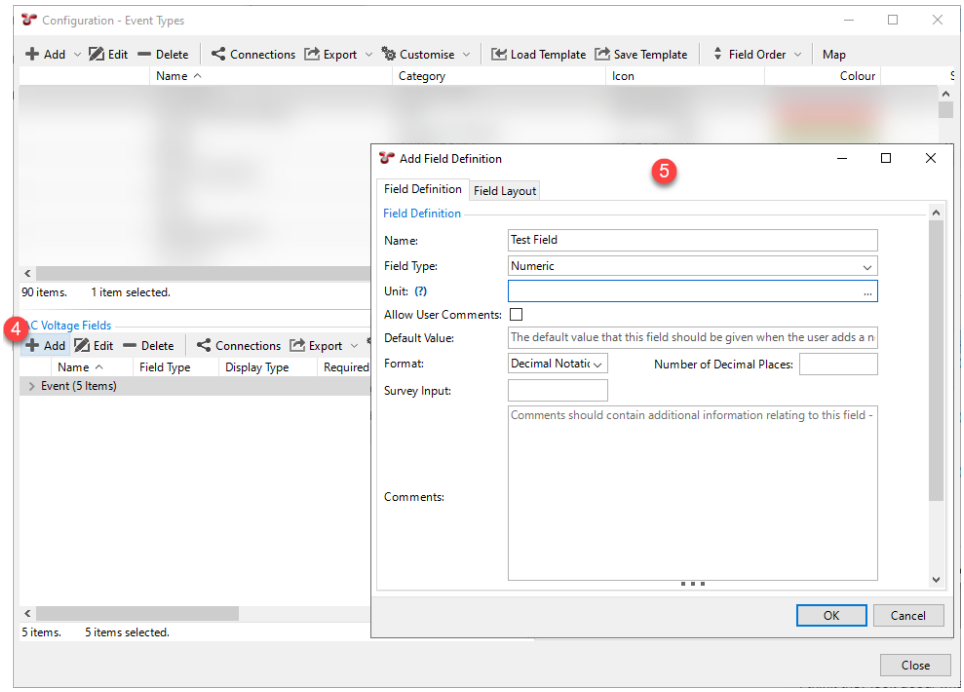
3. Specify the main table parameters in the **Add Table Definition** dialog (3). For more information, see *Add/Edit Table Definition Dialog*.

> **Note**
>
> When you create the table for the first time, not all tabs are visible in the dialog. Save the table, select it and click **Edit** to return to the dialog with all the tabs visible.

4. Click **OK**.

5. Add new fields to the table by choosing **Add** from the bottom toolbar of the **Configuration - Event Types** dialog (4).

   The **Add Field Definition** dialog appears.



Note

When you create the field for the first time, not all tabs are visible in the dialog. Save the field, select it and click **Edit** to return to the dialog with all the tabs visible.

6. Specify the main field parameters in the **Add/Edit Field Definition** dialog (5).

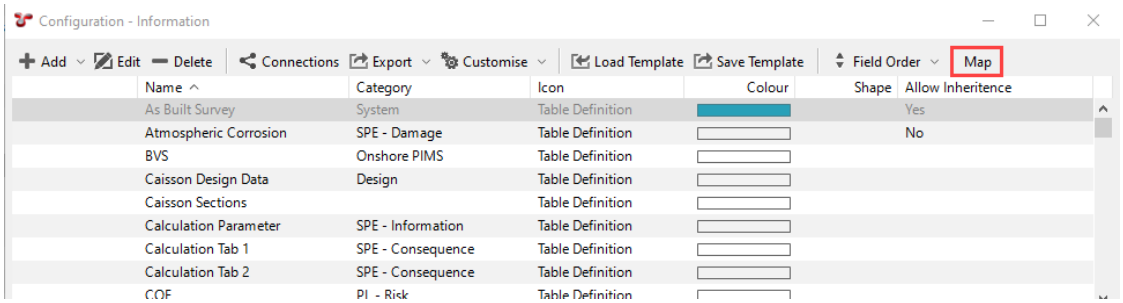
   In this dialog, you can define the main properties of the field, configure its layout, assign functions, set up workflow rules and anomaly triggers, and so on. For more information, see *Add/Edit Field Definition Dialog*.

7. Click **OK**.

8.2.4.1.2 View Dependency Map

The dependency map is a visual representation of an Asset Information Group (AIG), Event Type's, or global table's dependencies.

You can access the dependency map by choosing **Map** in the toolbar of the configuration dialogs when configuring AIGs (see *Configure Asset Information Groups*), event types (see *Configure Event Types*) or global tables (see *Configure Global Tables*).

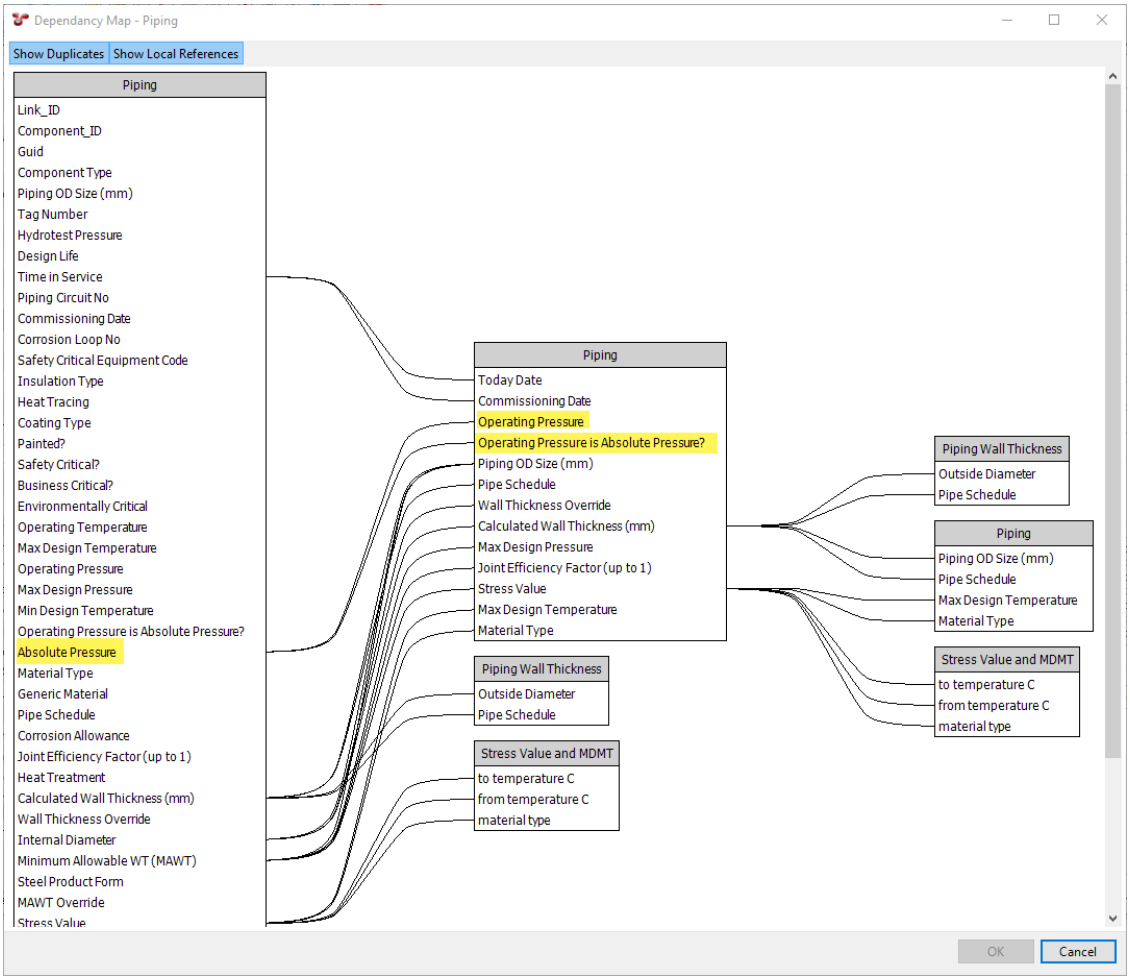


The map is represented as a series of interlinked fields grouped in columns, each column representing the AIG/Event Type/Global Table to which the fields belong.

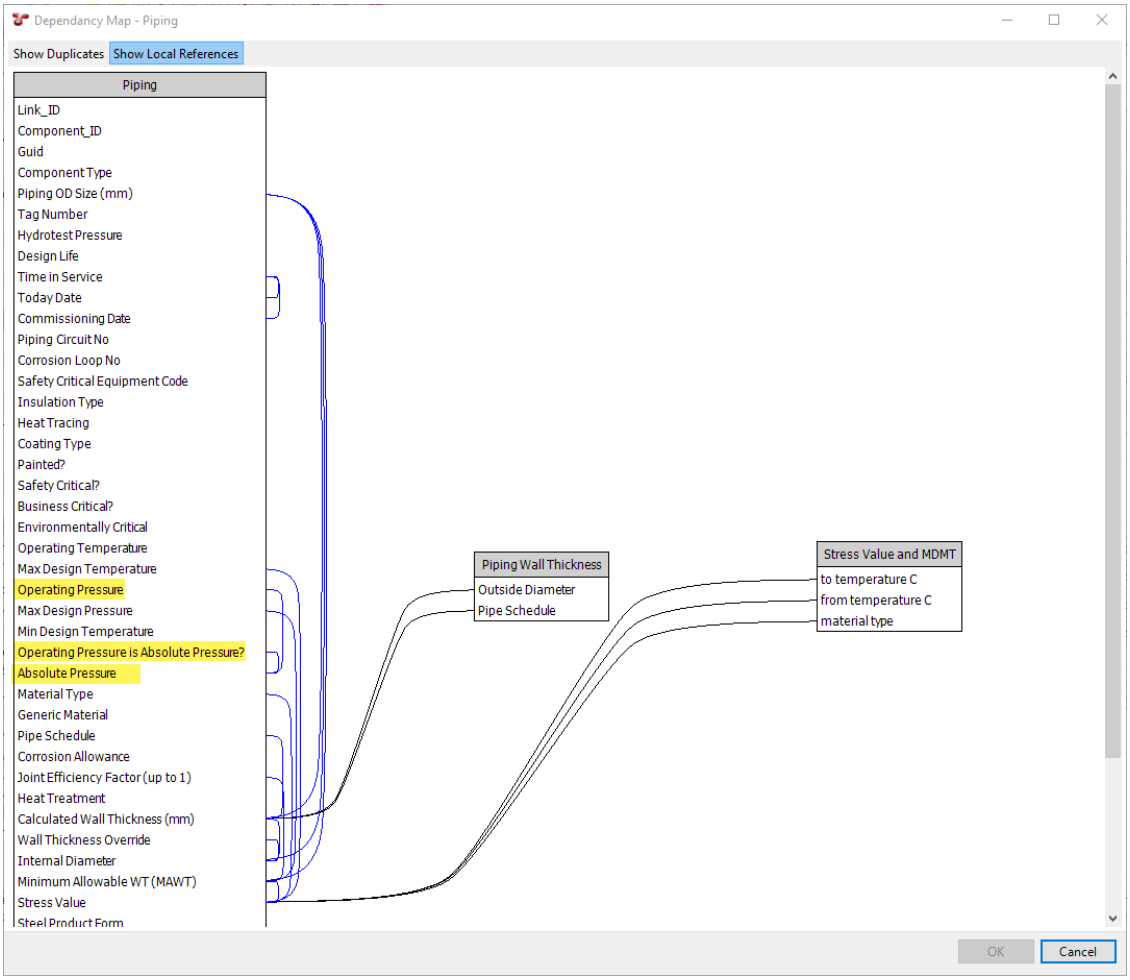
The map is hierarchically arranged from left to right, with the target AIG/Event Type/Global Table located in the left-most column, and its dependencies and sub-dependencies located to the right.

You can also toggle the view using the following buttons at the top of the dialog:

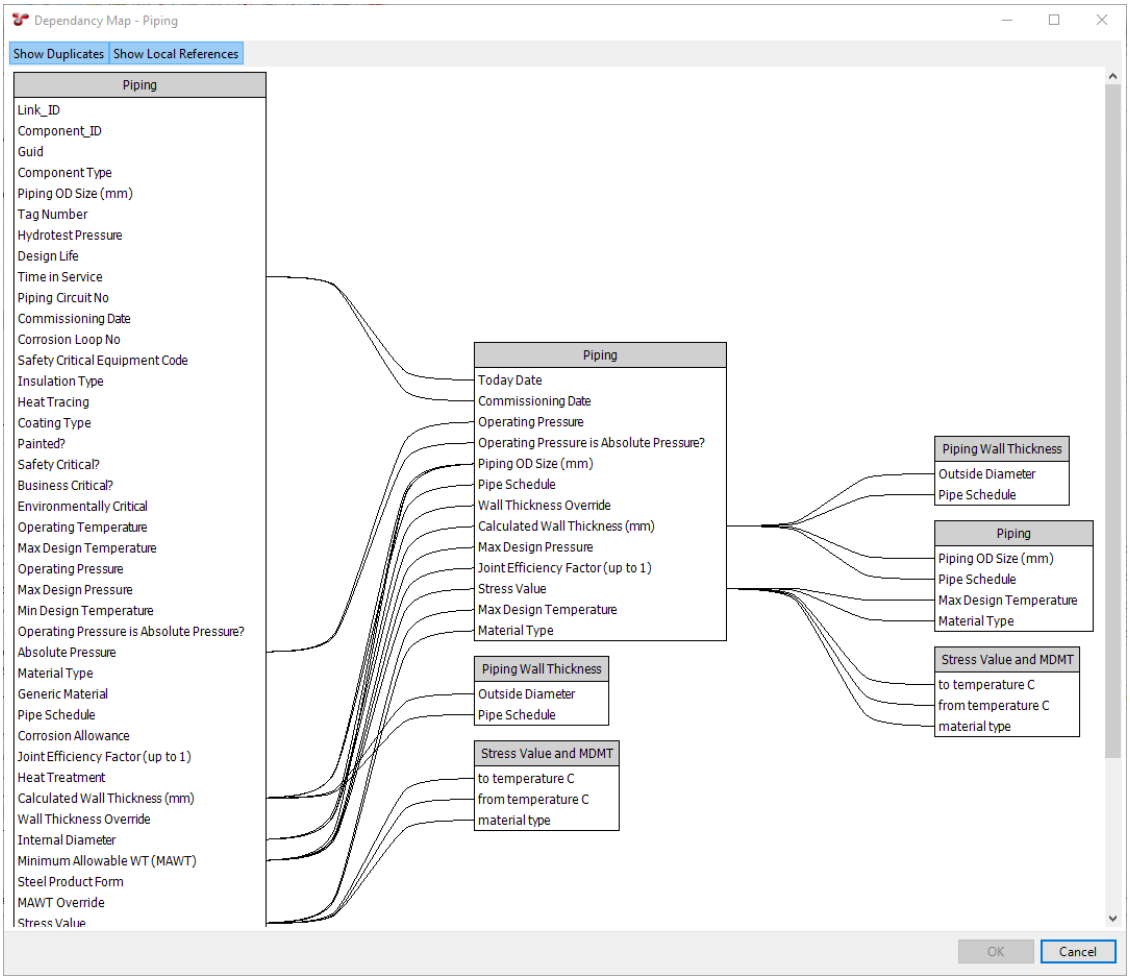
- **Show Duplicates**: If this button is switched on, and a field has a reference to another field in the same AIG/Event Type/Global Table, the field and the AIG/Event Type/Global Table will be displayed again in a separate column. If you switch this button off, the fields will be displayed only once and any self-referential dependencies will be displayed as a closed loop in a single column. For example, if you have a field called **Absolute Pressure** in the **Piping** AIG, which has references to two other fields from the same **Piping** AIG, the dependency map is displayed as follows:
  - **Show Duplicates** button **ON**:



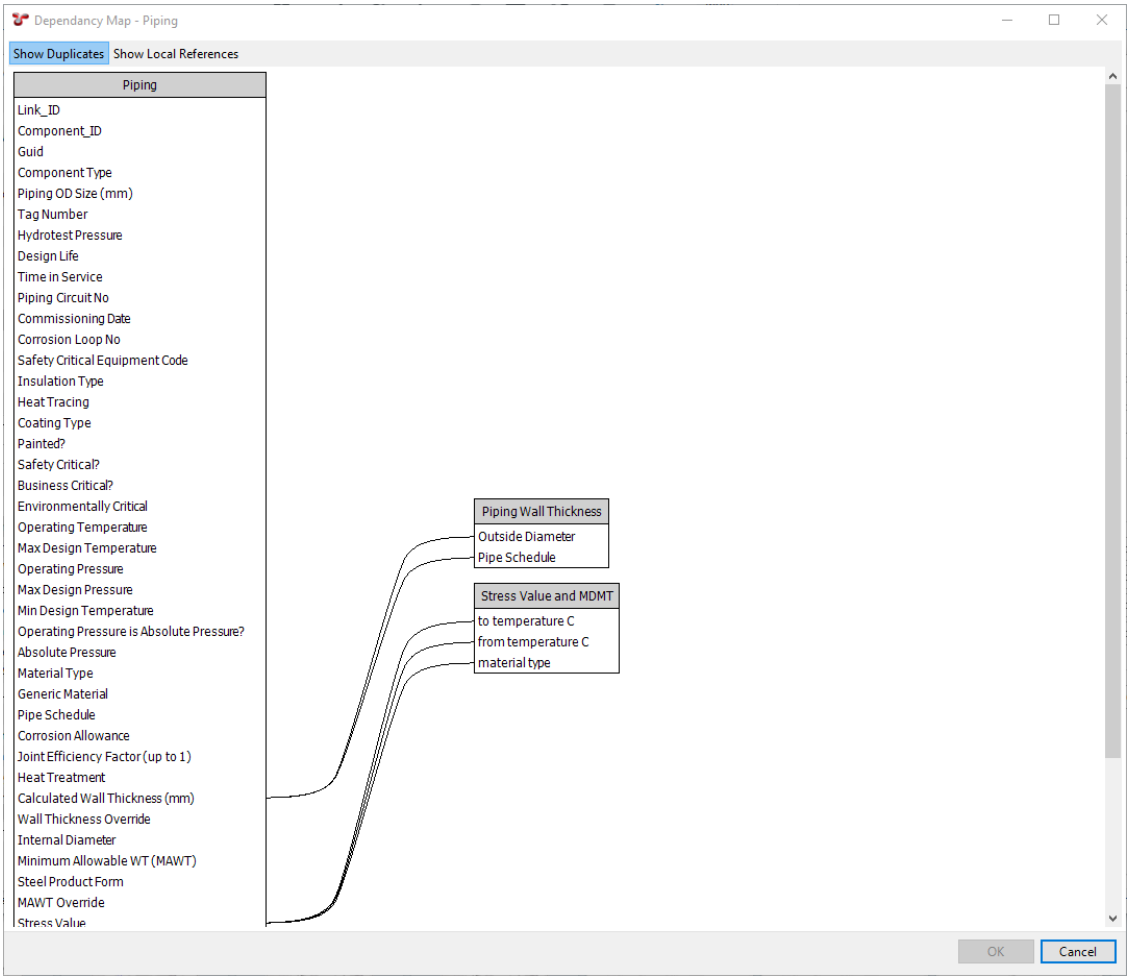
– **Show Duplicates** button **OFF**:



- **Show Local References**: If this button is switched on, and a field has a reference to another field within the same AIG/Event Type/Global Table, this dependency will be displayed on the map. If you switch this button off, these self-referential dependencies will not be displayed at all. See how the example mentioned above is displayed when toggling this button on or off:
  - **Show Local References** button **ON**:



– **Show Local References** button **OFF**:



See also

- *Enable Images with Graphical Markup for Event Fields*
- *Set Up Anomaly Triggers*
- *Set Up Workflow Rules*

8.2.4.1.2.1 Enable Images with Graphical Markup for Event Fields

You can display multimedia images in event forms. To do that, you must configure the relevant field in the event type as follows:

1. In the menu, go to *Configuration* → *Events* → *Event Types*.
2. Select the relevant event type in the top half of the dialog.

3. In the bottom half of the dialog, select an existing field or create a new field that will contain the image.
4. On the **Field Definition** tab, enter data as required (see *Add/Edit Field Definition Dialog*) and ensure that you enter data as follows:
   - Select the value *Table Link* in the **Field Type** field.
   - In the *Sub AIG/Event* field, select a sub-event that contains two numeric fields called X and Y.
5. On the **Field Layout** tab, in the **Editor Type** field, select how you want to create graphical markups on the image:
   - *Graphical Markup (Line)* - Choose this option if you would like to draw a series of line segments on the image (that is, as an open curve, good for representing cracks, scratches, and so on)
   - *Graphical Markup (Point)* - Choose this option if you want to draw points.
   - *Graphical Markup (Region)* - Choose this option if you would like to create a markup as a polygon (that is, a closed curve).

See also

- *Configure Event Types*
- *Edit Events*

8.2.4.2 Configure Features

Under *Configuration* → *Events* → *Features*, you can set which field is the source for various position information, used by the Pipeline View. Usually, you select Survey fields for the position fields. You can assign fields to the following usages:

Usage	Description
Position - KP	Populates the **Start - KP** and **End - KP** fields on the **INSPECTION** screen, and used in KP-based charts and pipeline charts.
Position - Easting	Populates the **Position - Easting** field on the **INSPECTION** screen, and used in the Pipeline View chart.
Position - Northing	Populates the **Position - Northing** field on the **INSPECTION** screen, and used in the Pipeline View chart.
Position - Depth	Populates the **Position - Depth** field on the **INSPECTION** screen, and used in the Pipeline View chart.
Position - Heading	Populates the **Position - Heading** field on the **INSPECTION** screen, and used in the Pipeline View chart.
Longitudinal Profile - Top of Pipe	Used in the Profile chart.
Longitudinal Profile - Bottom of Pipe	Used in the Profile chart.
Longitudinal Profile - Left Seabed	Used in the Profile chart.
Longitudinal Profile - Right Seabed	Used in the Profile chart.

These usages are predelivered and cannot be modified.

To assign source fields to these usages, proceed as follows:

1. Navigate to *Configuration* → *Events* → *Features*.
2. Select the required usage in the list and click **Edit**.
3. Select the relevant field from the dialog and click **OK**.

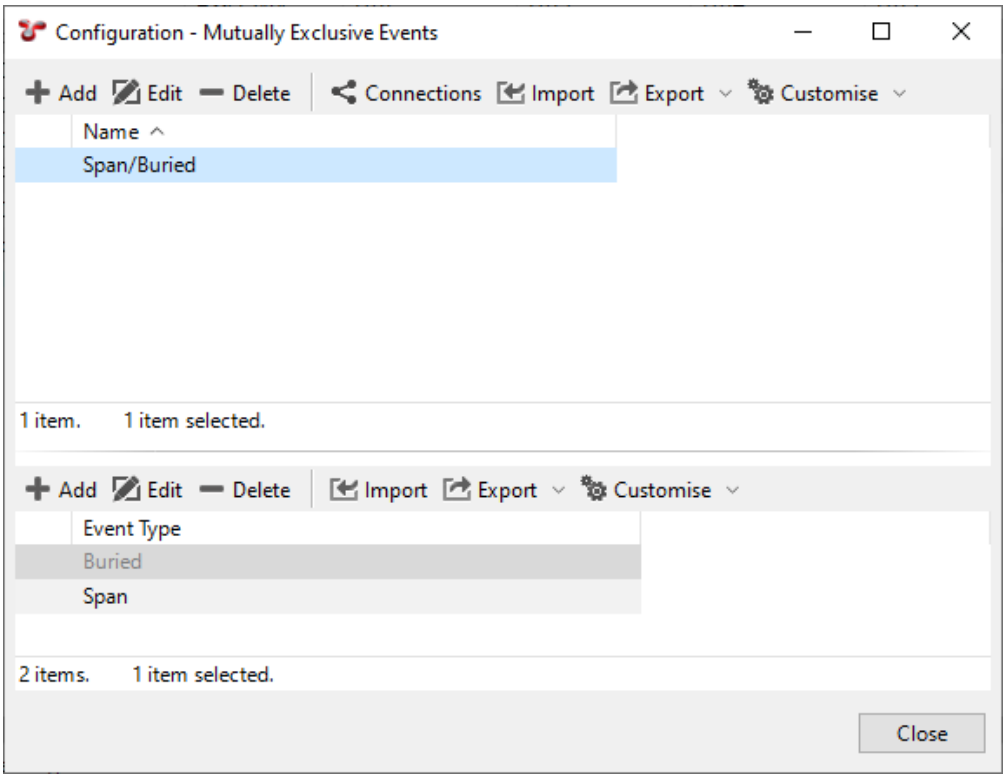
8.2.4.3 Configure Mutually Exclusive Events

Under *Configuration* → *Events* → *Mutually Exclusive Events*, you can specify groups of events that should not be allowed to run at the same time.

8.2.4.3.1 Example

You have a Span event and a Buried event. Where a pipeline is buried, it cannot be in a span; where a pipeline is in span, it cannot be buried. To represent this, you can do the following:

1. Create a Mutually Exclusive Group called *Span/Buried* by choosing **Add** in the top half of the **Configuration - Mutually Exclusive Events** dialog.
2. Within that group, add two event types for *Span* and *Buried* by selecting the group and choosing **Add** in the bottom half of the **Configuration - Mutually Exclusive Events** dialog.



Result

When you launch a Span event in IC-Inspection, if there is a Buried event running, it will be saved and closed. Similarly, if you launch a Buried event while a Span event is open, the Span event will be saved and closed.

8.2.4.4 Configure Remotely Operated Vehicles (ROVs)

Under *Configuration* → *Events* → *ROVs*, you can add, edit, or delete Remotely Operated Vehicles (ROVs).

ROVs are useful for simultaneous operations in IC-Inspection. Whenever you have (or might have) two ROVs in the water at once (or more generally, two separate sources of video at once, even if one or more of those sources is not actually a ROV), you should add a ROV for each source. A single multi-channel source, such as several cameras on one ROV should be represented by just one ROV.

Each ROV can be associated with one or more *survey sets*, which are in turn associated with events.

Then, when NEXUS IC plays back *video* for review, it can play the correct channels of video for that event. Similarly, the Pipeline View chart can show correct data.

8.2.4.5 Configure Survey Sets

Survey sets are used to group survey data associated with inspections. For example, you might create a survey set named *2018 Inspection Campaign* or *Pipeline A 2018 Inspection* to organise data collected during those periods. For more information, see *Survey Data Processing*.

To manage survey sets, navigate to *Configuration* → *Events* → *Survey Sets*. From the **Configuration - Survey Sets** dialog, you can:

- Add new survey sets
- Edit existing survey sets
- Delete survey sets

Standard toolbar buttons and grid functions are available in this dialog (see *Using the Grid*).

8.2.4.5.1 Create Survey Sets

In the **Configuration - Survey Sets** dialog, you can create survey sets in the following ways:

- **Add**: Click the *Add* button in the top toolbar and enter a name for the survey set. Optionally, select an *ROV* (or pig/diver) if the survey data was captured using a specific device. This is especially important for dual operations where multiple devices recorded survey or video data simultaneously.
- **Import**: Click the *Import* button to load survey data into the survey set (see *Import Events*). In the **Import Survey Data** dialog, click *Example* at the bottom to download a sample import sheet.

> **Note**
>
> For large datasets, importing from a text file (for example, tab-separated or comma-separated values) is typically faster than using Excel.

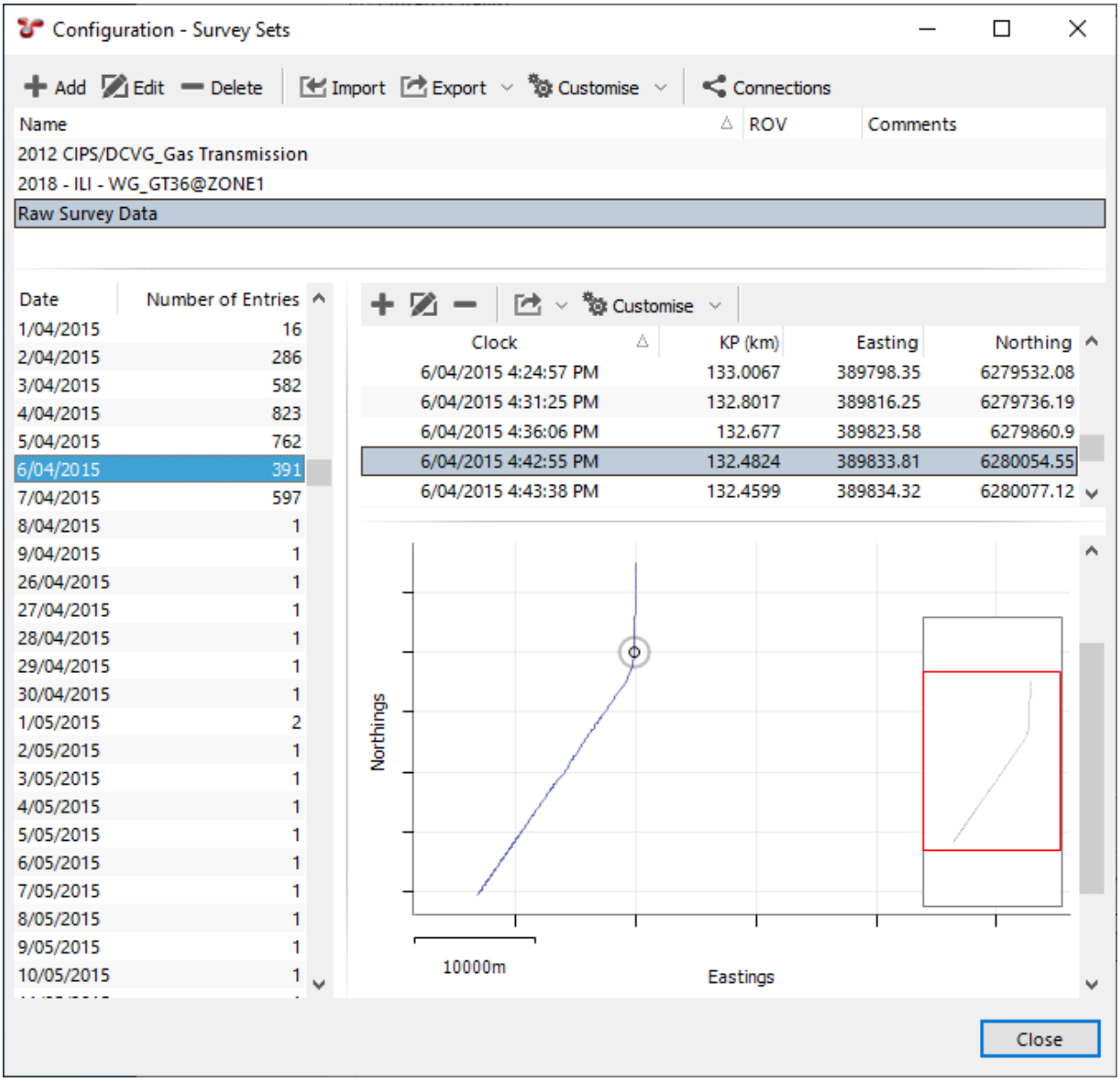
8.2.4.5.2 View/Maintain Survey Data in a Survey Set

In the bottom part of the dialog, you can see a list of dates when survey data was recorded. If you click on a day, you will see survey data logged on that day on the right-hand side. The grid listing each survey row is linked to the chart below, that is, if you click on a survey point in one, it will be highlighted in the other. You can multi-select, too.

From this part of the dialog, you can use the toolbar buttons to do the following:

- **Add**: Add a single survey row
- **Edit**: Modify selected survey rows
- **Delete**: Remove selected survey rows

- **Export**: Export all survey data entries for the given day



> **Note**
>
> Any events that were relying on those rows may not have valid survey data after your updates. If there is another row within the +3/-2 second threshold, the event will use that instead, but if not, the event may now simply have no Easting, Northing, and so on.

See also

Survey Data Processing

8.2.5 Configure Anomalies

When you choose *Configuration* → *Anomalies* from the main menu of NEXUS IC, you can configure functions related to anomalies as described below.

8.2.5.1 Checklists

This feature was designed to enable assigning checklists to findings, which could remind inspectors to carry out specific activities. This feature is currently not supported.

8.2.5.2 Codes

Under *Configuration* → *Anomalies* → *Codes*, you can define codes that identify the type of findings or anomalies, for example DB (Debris). For further classification, you can optionally assign anomaly categories to each code (see *Code Categories*).

You can also assign colours to individual codes, which can help visually distinguish them in charts or reports.

8.2.5.3 Code Categories

Under *Configuration* → *Anomalies* → *Code Categories*, you can set up anomaly code categories to group codes (see above). If your database contains different kinds of data, for example, some below-water and some above-water data, you can create one code category for "Above water" and another for "Below water". You can then assign these code categories to codes under *Configuration* → *Anomalies* → *Codes*.

8.2.5.4 Priorities

Under *Configuration* → *Anomalies* → *Priorities*, you can set up a list of priorities for classifying anomalies based on their priority, for example, "Level 5 - Extreme", . . . , "Level 1 - None".

8.2.5.5 Sets

Under *Configuration* → *Anomalies* → *Sets*, you can define sets for grouping anomalies, which can be useful for sorting, filtering or reporting as required.

8.2.5.6 Severities

Under *Configuration* → *Anomalies* → *Severities*, you can create a list of severities that can be assigned to anomalies and findings.

When you set up *anomaly triggers* on fields, you can assign a severity to it. You can set several triggers on a single field, with a variety of different severities. If that anomaly trigger is violated on an event field, a finding of that code and severity will automatically be created. Severities let you equate dissimilar problems, for example, you can decide that a problem in one field is of the same severity as a problem in a different field.

8.2.5.7 Status

Under *Configuration* → *Anomalies* → *Status*, you can define a list of statuses that can be assigned to anomalies. These statuses can reflect the current state of the anomaly, for example, "Rectified - Closed", "Not Anomalous - Closed", "Monitor" or "Temporary Repair".

You can also assign a level number or add a description to each status.

8.2.5.8 Action Status

Under *Configuration* → *Anomalies* → *Action Status*, you can define a list of statuses that can be assigned to specific actions associated with anomalies. This can reflect the current state of the action. The default action statuses are "Approved", "Assigned", "Completed", "Proposed", and "Rejected", but you can customise these to meet your needs.

You can also assign a level number to each status.

8.2.5.9 Action Types

Under *Configuration* → *Anomalies* → *Action Types*, you can set up action types that can be assigned to anomaly actions. From the same dialog, you can then link a specific *event type* to the action type. This enables creating a task for an anomaly action on the **ANOMALIES** screen. If an event type is linked to the action type of a specific action on the **Actions** tab, the menu option *Shortcuts* → *Assign Task* will be enabled for the specific anomaly action on this tab and you can assign tasks with that particular event type to the action.

If an anomaly action doesn't have an action type assigned to it, or its action type is not linked to an event type, you cannot assign tasks to it and the menu option will be disabled.

8.2.5.10 Finding Status

Under *Configuration* → *Anomalies* → *Finding Status*, you can define a list of internal statuses for findings to reflect their current state in the workflow. These statuses can be assigned when creating or editing findings (see *Add/Edit Finding Dialog*), which can be useful when reviewing findings on the **INSPECTION** or **ANOMALIES** screens.

For each status, you can also specify an order number. This defines the sequence of options in the dropdown when assigning a finding status. Lower numbers appear first in the list.

8.2.6 Configure Reports and Dashboards

When you choose *Configuration* → *Reports and Dashboards* from the main menu of NEXUS IC, you can set up report categories, report statuses and report templates as described below:

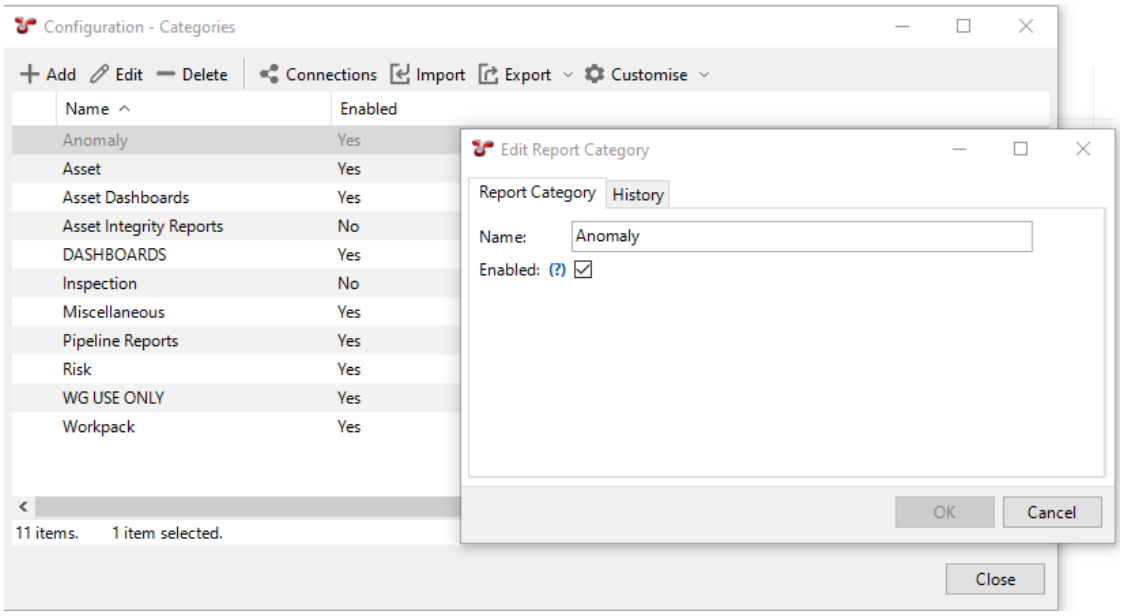
- *Configure Report Categories*
- *Configure Report Statuses*
- *Configure Report Templates*

See also

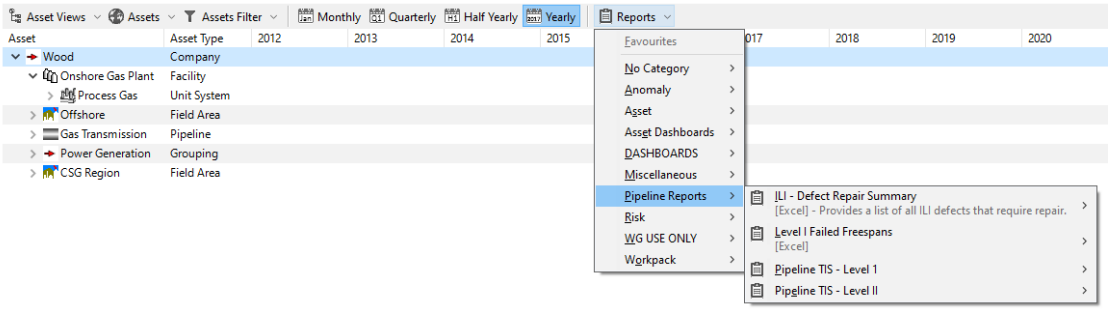
Dashboards and Reports

8.2.6.1 Configure Report Categories

Under *Configuration* → *Reports and Dashboards* → *Categories*, you can create, edit and delete report categories, which can then be assigned to report templates. Categories are a way of grouping report templates. You can also enable or disable report categories by ticking or unticking the **Enabled** checkbox in the **Add/Edit Report Category** dialog:



When you generate a report in NEXUS using the **Reports** toolbar button, the available report templates are grouped according to the categories assigned to them. Only enabled report categories are available:



> **Note**
>
> There are two special report categories: **No Category** (when a report has not been assigned to any categories) and **Favourites**. You can configure what appears in **Favourites** under *Database → Your Profile*.

8.2.6.2 Configure Report Statuses

Under *Configuration → Reports and Dashboards → Statuses*, you can create, edit and delete report statuses, which can then be assigned to report templates. Statuses can be used to indicate the progress of the report template, for example, "Work in Progress", "Final", and so on.

8.2.6.3 Configure Report Templates

Report templates define the structure and content of reports generated in NEXUS IC. They control both the presentation (headings, text, tables, drawings and other visual elements) and the data used to populate those elements.

You manage report templates under *Configuration → Reports and Dashboards → Templates*.

Report content is built from two core components:

- *Simple Sources*, which retrieve data from the database
- *Functions*, which support calculated or custom columns in the sources

You can create these components in any order. In practice, it is usually easiest to start with the visible report structure (layout and elements), then add the required sources beneath them, and finally create any functions needed by those sources. This top-down approach makes it easier to shape the report as users will see it.

See below for more information:

- *Create/Edit Report Templates*
- *Set Up Styles for Report Templates*
- *Set Up Schedules for Report Templates*
- *Set a Report Template as a Dashboard*

8.2.6.3.1 Create/Edit Report Templates

The following steps describe the typical workflow for creating or maintaining a report template.

1. Choose *Configuration → Reports and Dashboards → Templates* from the menu.

   In the **Configuration - Templates** dialog, you can:

   - Add, edit or delete report templates, or customise the grid view (see *Using the Grid*)
   - Load a previously saved report template

     If the template already exists in the database, loading it will overwrite the existing template rather than creating a copy. The same applies to any related items saved in the file, such as functions or asset information fields.

   - Save the report template and related details to a *.report* file

     NEXUS IC scans for all items related to the template (for example functions, asset information forms, event definitions, chart templates and lookup tables) and displays them as dependencies. You can select which of these are included in the saved file.

   - Set up schedules for report templates (SaaS-only feature). See *Set Up Schedules for Report Templates*.
   - Generate the report in RTF, HTML, Excel or PDF format
   - Mark a report template as a dashboard. See *Set a Report Template as a Dashboard*.
   - Define common styles applied across all report templates. See *Set Up Styles for Report Templates*.

2. Create or open a template:

   - To create a new template, choose **Add**

- To edit an existing template, double-click it or select it and choose **Edit**

3. In the **Add/Edit Report Template** dialog, define the main template properties. For details, see *Add/Edit Report Template Dialog*.
4. Under the *Template Definition* section of the dialog, maintain the report layout as required:
   - To define the actual size and layout of the report output, double-click the top **Report Layout** node on the right-hand side of the dialog and select whether the required size is A3 or A4 and if the layout should be portrait or landscape. This setting is used until you change the layout in a sub-element, for example, in a page break.
   - To add a new element, select it from the *Available Elements* screen area and either drag and drop it to the required location under the *Report Layout* node, or choose **Add**, which will insert the element above the node that was selected in the *Report Layout* structure. For detailed information about the available elements, see *Elements* and *Sources*.
   - To edit the parameters of an element, either double-click it, or select it and choose **Edit**.
   - To move an element in the *Report Layout* structure, either drag and drop it, or select it and use the **Move Up/Move Down** options from the toolbar.
   - You can retrieve elements from other reports and add them to your report layout by choosing the **Retrieve Element** toolbar button and selecting the element from the required report template.

   Note

   Most visual elements require a source element to retrieve data. The source must be included in the **Report Layout** structure and placed in the same element group as the visual element that uses it.

5. To configure report selection parameters, click **Parameters**.

   These parameters appear in the selection dialog when generating the report. They are defined in simple sources by using filters with user parameters. From the **Parameters** dialog, you can control how these parameters appear to users, including:

   - Order
   - Field labels
   - Field widths

6. Generate a test report using **Generate**.

   When generating a report from the **Add/Edit Report Template** dialog, selection parameters are not displayed. To generate the report with selection parameters, use **Generate** from the **Configuration - Templates** dialog instead.

7. Click **OK** to save the report template and close the dialog.

8.2.6.3.2 Set Up Styles for Report Templates

Styles control the visual appearance of reports, including fonts, colours, spacing and borders. Styles are shared across all report templates in the **Configuration - Templates** dialog.

You manage styles using the **Styles** dialog, where you can add new styles, edit existing ones, delete user-defined styles and import or export styles using the toolbar buttons.

To manage styles:

1. In the **Configuration - Templates** dialog, click **Styles**.

   The **Styles** dialog opens listing all default and user-defined styles. Some styles are tied to specific report elements, for example headings, table rows, footers or the table of contents, while others define general formatting such as background colours.

   You can restore the delivered default styles at any time using the **Defaults** toolbar button.

2. Use one of the following methods to work with styles:

   - Click **Add** to create a new style.
   - Select one or more styles and either double-click them or click **Edit** to modify them.
   - Select a user-defined style and click **Delete** to remove it.
   - Click **Import** to load styles from an external file.
   - Click **Export** to save selected styles for reuse elsewhere.

3. When adding or editing a style, modify the properties as required. You can update various attributes, such as font, colours, spacing, padding, alignment or borders.

4. Click **OK** to save your changes.

Many styles are applied automatically to specific report elements where appropriate. For example:

- *Table Heading* is applied to table headings, including category bands
- *Table Event Rows* is applied to even-numbered data rows

For pivot tables, the following styles are applied automatically if they exist:

- *Table Heading* for headings
- *Table Row Odd* and *Table Row Even* for odd and even rows
- *Number* for cells that contain numbers
- *Total* for total cells
- *Total Number* for total cells that contain numbers

Styles are applied to report elements **additively**, meaning default styles are applied first, then overwritten where element styles are embedded in the content field.

Note

- Excel reports ignore many style settings and rely on Excel's own formatting. Excel does not respect the Default Style, but does respect the embedded Style selection in the content.
- In an RTF report, if a NEXUS style name matches the name of a style used by default in Word or defined in a *.dotx* Word template file, the generated text will appear using that Word style. You can then use Word's styling tools to modify it once the report has been generated.
- Orientation settings other than Normal are poorly supported by some web browsers. Chrome and Safari are known to render them correctly For RTF reports, Word draws vertical text correctly, but may calculate incorrect text dimensions, which can result in awkward text wrapping.

For an example of changing styles, see *3. Change the style of the headings.*

8.2.6.3.2.1 Style Prefix

You can use style prefixes to apply different table styles to specific tables. This applies to data tables, vertical tables and pivot tables.

A set of predefined table styles is supplied and can be reused or modified. If you want to use a different style for specific tables, you can:

1. Create a new style with a prefix.
2. In the table's properties, enter that prefix in the **Style Prefix** field.

During report generation, the prefixed styles are used for that specific table instead of the default table styles.

For an example of how to create and apply a style prefix, see *4. Create a new style for even rows.*

8.2.6.3.3 Set Up Schedules for Report Templates

If your database is hosted on a Wood Cloud server, you will see the **Schedules** toolbar button. Here you can configure scheduled reports to automatically run periodically, sending the output to users by email.

8.2.6.3.3.1 Add A New Scheduled Report

To create a new scheduled report, proceed as follows:

1. In the **Configuration - Templates** dialog, click **Schedules** to bring up the **Scheduled Reports** dialog.
2. In this dialog, click **Add** to add a new scheduled report.
3. In the dialog that appears, enter data as follows:

Field	Description
Name	You must specify a name for the scheduled report.
Report	Select the report template based on which you want to generate the scheduled reports.
Enabled	Tick this checkbox to ensure enabling the scheduled report generation. If you untick this checkbox, no scheduled reports will be generated until you enable it again.
Recipients	Add one or more recipients as a comma-separated list.
Run As	Select the name of the person that the report will be generated under.
Include Date/Time in Filename	To include the date and time of generation in the report filename, select the *Include Date/Time in Filename* checkbox. To leave it out from the filename, leave it deselected. Example: • Without Date/Time: *test.rtf* • With Date/Time: *2025-10-02 1012 test.rtf*
Format	Select the output format for the generated report. All formats are sent to recipients as email attachments, except **HTML (embedded)**, which is inserted directly into the body of the email. • **RTF** - Generates the report as a Rich Text Format (.rtf) file attached to the email. • **HTML (embedded)** - Generates the report as HTML and embeds the content directly within the email body (not as an attachment). • **HTML (attached)** - Generates the report as an HTML file attached to the email. • **Excel** - Generates the report as a Microsoft Excel (.xlsx) spreadsheet attached to the email. • **PDF** - Generates the report as a PDF file attached to the email.
Start	Specify the date and time when the scheduled report should be generated first.
Repeat	Select the frequency for generating the scheduled report. **Note**: The system calculates future report dates based on the Start date and the selected frequency. For example: • If the Start date is 1 January and the frequency is monthly, the next report will be generated on 1 February. • If the Start date is 31 January and the frequency is monthly, the report will be generated on the last day of each relevant month, such as 28 February, 31 March, 30 April, and so on. • If the frequency is quarterly and the Start date is 31 March, the report will run on the last day of each quarter, with the next report generated on 30 June.
Function	The **Function** dialog allows you to select a function to determine the report generation's behaviour upon being called at the scheduled time. The function will return either a *Yes* or *No* as its result. If *Yes*, the report is generated and the job is marked as completed. If *No*, the report is not generated, and the job is also marked as completed. The function must not have any parameters.

4. Click **OK**.

8.2.6.3.3.2 Regenerate Last Report Run

If you want to regenerate the report on an ad hoc basis before the next scheduled run-time, choose the **Clear Last Run** toolbar button in the **Scheduled Reports** dialog. This will generate the report again without affecting the original schedule. The *Last Run Time* value will be updated with the current date and time but the *Next Run Time* value remains unchanged.

8.2.6.3.4 Set a Report Template as a Dashboard

You can mark a particular report template as a dashboard report in the following ways:

- If you want the report template to be available as a dashboard on the **DASHBOARD** screen, edit the template from the **Configuration - Templates** dialog and tick the **Dashboard Report** checkbox. In this case, Section Heading, Multimedia Thumbnails and Table of Contents types will be marked with a sign to indicate that these elements will not be displayed in a dashboard template.
- If you want the report template to be available as an asset dashboard on the **Dashboard** tab of the **ASSETS** screen, edit the template from the **Configuration - Templates** dialog and tick the **Asset Dashboard** checkbox. In this case, each time you view an asset on the **ASSETS** screen, with the **Dashboard** tab visible, your selected dashboard template will be available for selection and the dashboard that you selected last will be executed. Ensure that the template you use does not take long to execute, else, every time you change assets with the **Dashboard** tab visible, you need to wait for the dashboard to be generated. Also, in order for a dashboard report to reflect the selected asset in the asset hierarchy, it needs to have a simple source (see *Sources*) in it, which retrieves VN_ID from a user input parameter.

See also

- *Elements*
- *Sources*
- *Configure Reports and Dashboards*
- *Example: Set Up Anomaly Summary Report Template*
- *Example: Set Up Asset Integrity Report Template*
- *Example: Set Up Workpack Report Template*

8.2.6.3.4.1 Elements

Elements appear in the bottom left part of the **Add/Edit Report Template** dialog under the **ELEMENTS** node. These are the visual elements of the report, which actually appear in the report output, with the exception of the Element Group.

You can edit the parameters of elements either by double-clicking them in the **Report Layout** structure or by selecting them and choosing **Edit** from the toolbar.

See below for a detailed description of each element:

Chart Template

This element allows you to insert preconfigured chart templates (see *Chart Template*) in your report template.

When you configure this element, make settings as follows:

- You must select a source. You can only select sources that have been added to the Report Layout structure and if the chart template is part of an element group, the source must be included in the same element group.

- Select the chart template that you want to include. The available chart templates in the drop-down list are determined by the system by checking which chart template refers to the table that you selected as a source above. You can only select from those chart templates that have a reference to the Source that you selected (for example, they use data from that table for one of their axes).
- Select whether you want to display a caption in front of the chart template in the report.
- Specify the width and height of the chart template as you want it to appear in the report.

> **Note**
>
> If you have a chart with a legend, and the legend can appear in a single row at the bottom of the chart, it will be displayed there. If it cannot fit in a single row and it takes less then a third of the available width, it will appear on the right-hand side of the chart. That is, if you set a relatively narrow chart width (less than 400 or so, depending on the length of text in the legend items), the legend may not appear at all.

For an example about how to use chart templates, see *Add Page Break, Charts of Templates*.

Comments

This element has no effect on the output report. It is intended for use by report designers to document the report template itself.

Drawing Details

This element allows you to insert library items or drawings in your report template.

When you configure this element, make settings as follows:

- You must select a source. You can only select sources that have been added to the Report Layout structure and if the drawing details element is part of an element group, the source must be included in the same element group. For this element, you typically select the *Library* or *Drawing* table.
- In the **Caption Field** field, select the field from which you want to retrieve the text under the drawing. This can be *Name* from the Library table, or may be a function column.
- If you select **Automatically Rotate for Page**, the system will rotate the library item to fit the layout of the report. For instance, if the report page has a portrait layout but the library item, which is a PDF document, has a landscape layout, the system will rotate the library item to fit the portrait layout of the report page.
- Under **View Options** (*Layers*), you can specify whether you want to display layers or traffic lights on the drawings.
  - If you select *Display All Layers* or *Display Layers Linked to Assets in Asset Source*, additional selection fields are displayed:
    - You must select the **Asset Source** from which layer data should be retrieved. You can only select sources that have been added to the Report Layout structure and if the drawing details element is part of an element group, the source must be included in the same element group. Typically, the source that you select here should be linked to the **Asset** table.
    - In the **Asset Field**, **Name Field** and **Colour Field** fields, you specify the fields within that Source to be used for the Asset (for example, the Component_ID), the Name (such as Asset.Name, or any other field that will be meaningful), and optionally the Colour.
  - If you select *Display Traffic Lights on Layers*, you can select a preconfigured traffic light, whose colours can be displayed on the layers of the drawing.

Note

- If your library item includes multiple pages (for example, a PDF document), only the first page of this library item will be inserted in the report.
- Using layers or traffic lighting on layers in your drawings doesn't work with relative assets. It only works with specifically selected assets in your layers.

For an example of using this report template element, see *Add Drawing Details and Extended Simple Source with Filters*.

Element Group

Element groups are used to repeat data for a series of records or to group sections of a report. For example, you can use element groups to tabulate anomalies for a series of workpacks. You can also use **Conditions** in an element group to make the group and all its contents only appear if the conditions are matched.

When you edit an element group, you have the following options in the **Edit Element Group** dialog:

Field/Checkbox Name	Description
Name	We recommend that you specify a name that reflects the content of the element group.
Allow Excluding Group from Export	If selected, then when the report is being generated, the user will have the option to exclude the output contained within this group to the report. For example, you may set up an element group that outputs all Isometrics data for an asset. This typically takes some time to export, so the user can choose NOT to include the Isometrics in the generation of the report output.
Source	If you're using the element group to repeat data, or you want to specify conditions for it, you'll need to select a source for it, which must be a source inserted *outside* the element group. Sources inserted inside the element group can be used only by the elements within the element group.
Sort Column/Sort Order	Allows you to set up sorting data based on a specific column in the source table and specify if you want the order to be ascending or descending. When there are multiple values for a group, those values will be displayed in the order specified. For example, if your source is "Workpack", you are sorting based on "Workpack.Name", and you have workpacks "2017 Inspection", "2018 Inspection" and "2019 Inspection", then they will be displayed in that order in your report regardless of the order they might have in the underlying database table. If you select the **Repeat Elements** checkbox, the repeated elements will appear in the order specified in the Element Group. However, if the checkbox is not selected but the field is used in a Paragraph or Heading element, the field's multiple values will all be displayed at that point in the Paragraph or Heading in the order specified in the Element Group. If the field has a single value, sort order is irrelevant.
Repeat Elements	If selected, all the report elements within this element group will be run once for each row in the source.
Action	This field appears if the **Repeat Elements** checkbox is selected. This allows you to control how elements are repeated based on the rows in the source. You can set up repeating the elements for all the rows or only if there are no rows in the source, or choose to set up conditions for repeating reporting elements only if specific conditions are met or not met.
Conditions	This field appears if you selected either of the options with conditions in the **Action** field. Click the ... button to add, edit or delete conditions. Conditions can be on a field in the source, or on the number of rows in the source, or the index of the row. You can also compare row values (=. <, >, <=, >=, <>, contains) to a constant value.

You can drop elements, including Simple Sources, into the Element Group. On the **Filters** tab of a Simple Source within an Element Group, you can choose *Group* as a parameter, which will compare the field you have selected to the value in the current row of the Element Group's Source.

> **Tip**
>
> You can use the Element Group element to make it easier to copy a group of elements to another part of this report template. Once you have added the required elements to the element group, you can use the **Copy** toolbar button to copy the group and then the **Paste** button to insert it to the report template structure.

You can find several examples of using Element Groups in the following worked examples:

- *Example: Set Up Anomaly Summary Report Template*
- *Example: Set Up Asset Integrity Report Template*
- *Example: Set Up Workpack Report Template*

For an example of using a looping Element Group, see *Create Simple Source with Filters and Looping Element Group*.

Multimedia Thumbnails

This element allows you to insert multimedia thumbnails in your report template.

When you configure this element, make settings as follows:

- You must select a source. You can only select sources that have been added to the Report Layout structure and if the multimedia thumbnail is part of an element group, the source must be included in the same element group. For this element, you typically select the *Multimedia* table.
- In the **Caption Field** field, select *Name* to ensure that the caption text is retrieved from the *Name* field of the *Multimedia* table. You may also select a function column that returns details about the event type and event number.
- In the **Repository Field**, specify the field that contains the image in the database. For the *Multimedia* table, select *Image* in this field.
- In the **Columns** field, specify in how many columns you want images to be displayed.
- Select whether you want to display a caption above the image in the report.
- Specify the width and height of the image as you want it to appear in the report. The aspect ratio of the thumbnails reflects the thumbnail dimensions you enter. In order to maintain the aspect ratio of images, only set one dimension, Width or Height, and leave the other dimension as 0 or blank.

> **Note**
>
> - Multimedia Thumbnails are not supported in *Dashboard* reports.
> - When you put a multimedia thumbnail element in your report template, an additional selection parameter is added automatically. This is useful when you set up multiple columns to display images in the output but you have less images in the last row then the number of columns. In this case, you can select the **Merge Last Row to Centre Images for Multiple Columns** checkbox to merge the last row of the columns and display the images in the centre of the page.

For an example of using this report template element, see *Add Multimedia Thumbnails with Element Group, Page Break, Section Heading*.

Page Break

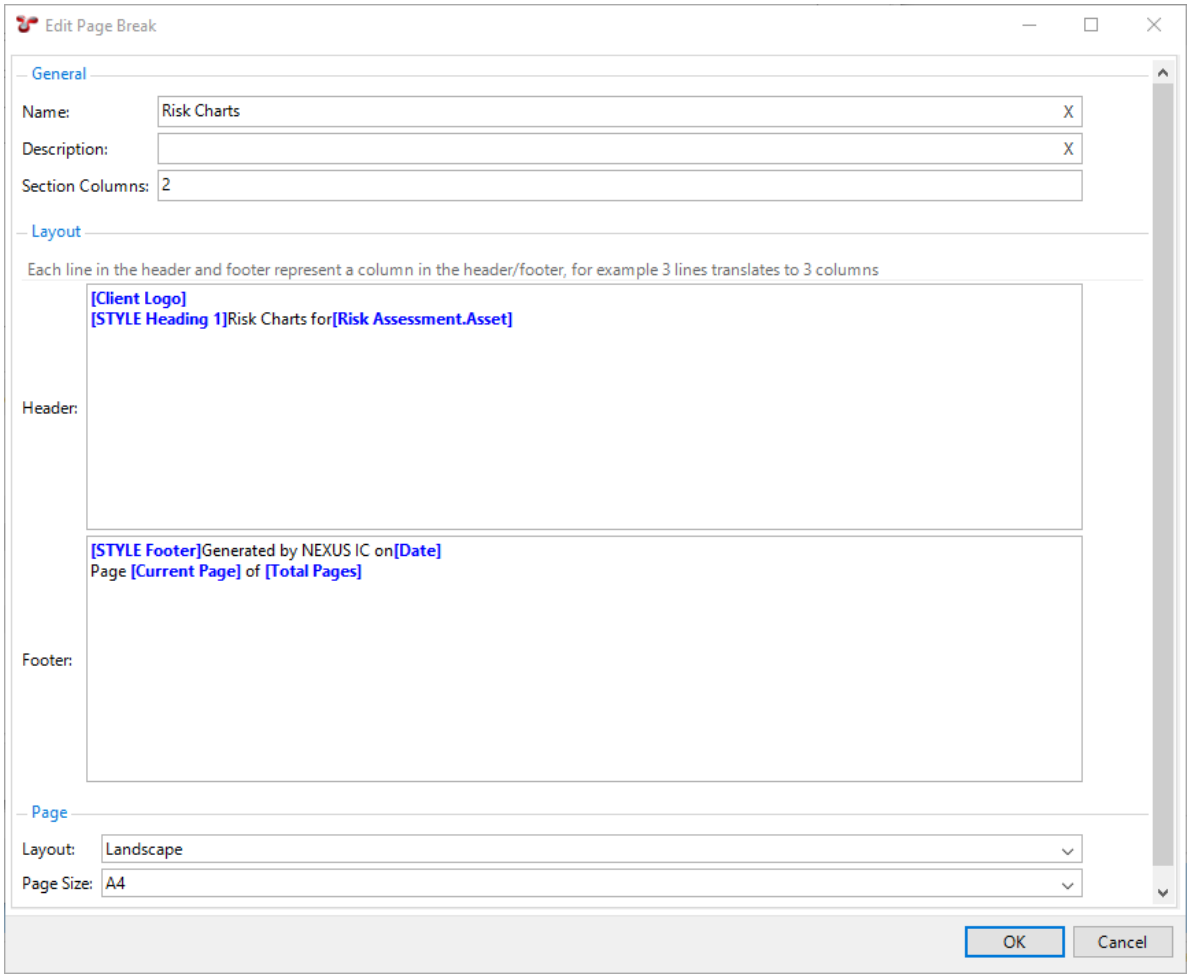
With the Page Break element, you can force the upcoming elements to a new page in RTF or PDF outputs, or to a new worksheet in Excel, and in addition, you can make the following settings for the layout of the report below the element:

- You can define in how many columns you want data to be displayed.
- You can define a header and a footer for the pages below that. You can right-click to select from a predefined set of system fields, database fields or style settings to be inserted. Note that in the HTML output, only the header is considered.
- You can specify the layout (landscape or portrait) and the size (A3 and A4).
- For an Excel output, you can define the title of the new worksheet by specifying it as the name of the page break. If you put a field in [square brackets] in the page break's Name, the field will be substituted with its value in the usual way. This is particularly useful if the page break is inside an element group with the **Repeat Elements** option enabled; you can enter the value for this particular repeat as the page break name.

Settings that you make here persist until the next Page Break or Section Break element.

For example, you want risk charts to be displayed in a new page in RTF and you want them to be displayed in two columns. You want to use a header and a footer with specific settings and you want the page layout to be landscape. You make settings as follows:

1. Before the relevant Risk Chart element, add or edit the Page Break element in the **Report Layout** structure.
2. In the **Edit Page Break** dialog, make settings as follows:



- You enter the name *Risk Charts*, which will not be visible in the RTF, HTML or PDF output, but this name will used for the new worksheet in the Excel output.
- Since you want to display the risk charts in two columns, enter *2* in the **Section Columns** field.
- In the **Header** section, you want to display header data in two columns, thus, you create 2 rows for that, one for each column:
  - In the first column, you want to add the company logo, so you right-click and select **Client Logo** from the **System Fields** drop-down list.
  - In the second column, you want to add a title "Risk Charts for <Asset>", where <Asset> is a variable and contains the Asset name and location. You want this to appear with the style that you defined for *Heading 1*. Thus, you add a new row and you right-click to select **Heading 1** from the **Set Style** drop-down list. You then enter "Risk Charts for" and right-click to select *Database Fields* → *Risk Assessment* → *Asset*.
- In the **Footer** section, you want to display footer data also in two columns, thus, you create 2 rows for that, one for each column:
  - In the first column, you want to see when and by whom the report was generated. For this, you want to apply the style that you defined for *Footer*. Thus, you right-click and select **Footer** from the **Set Style** drop-down list. You then enter "Generated by NEXUS IC on" and right-click to select **Date** from the **System Fields** drop-down list.
  - In the second column, you want to display the current page number out of the total number of pages.. For this, you add a new row and enter "Page [Current Page] of [Total Pages]", where you choose [Current Page] and [Total Pages] from the **System Fields** drop-down list available by right-clicking.
- In the **Layout** field, select *Landscape*.

3. Click **OK** to apply the changes.

Result

When you generate the output, the new page will look in the RTF output as follows:

Pivot Table

Pivot tables are conceptually similar to pivot tables in Excel. They aggregate data from many rows of a data source into just a few rows, according to the rules you set up. For example, you can add a table that shows how many tasks are in each of your workpacks, you can even break the table up by task completion, and so on.

When you create or edit a pivot table, you have the following options on the **Properties** tab of the **Edit Pivot Table** dialog:

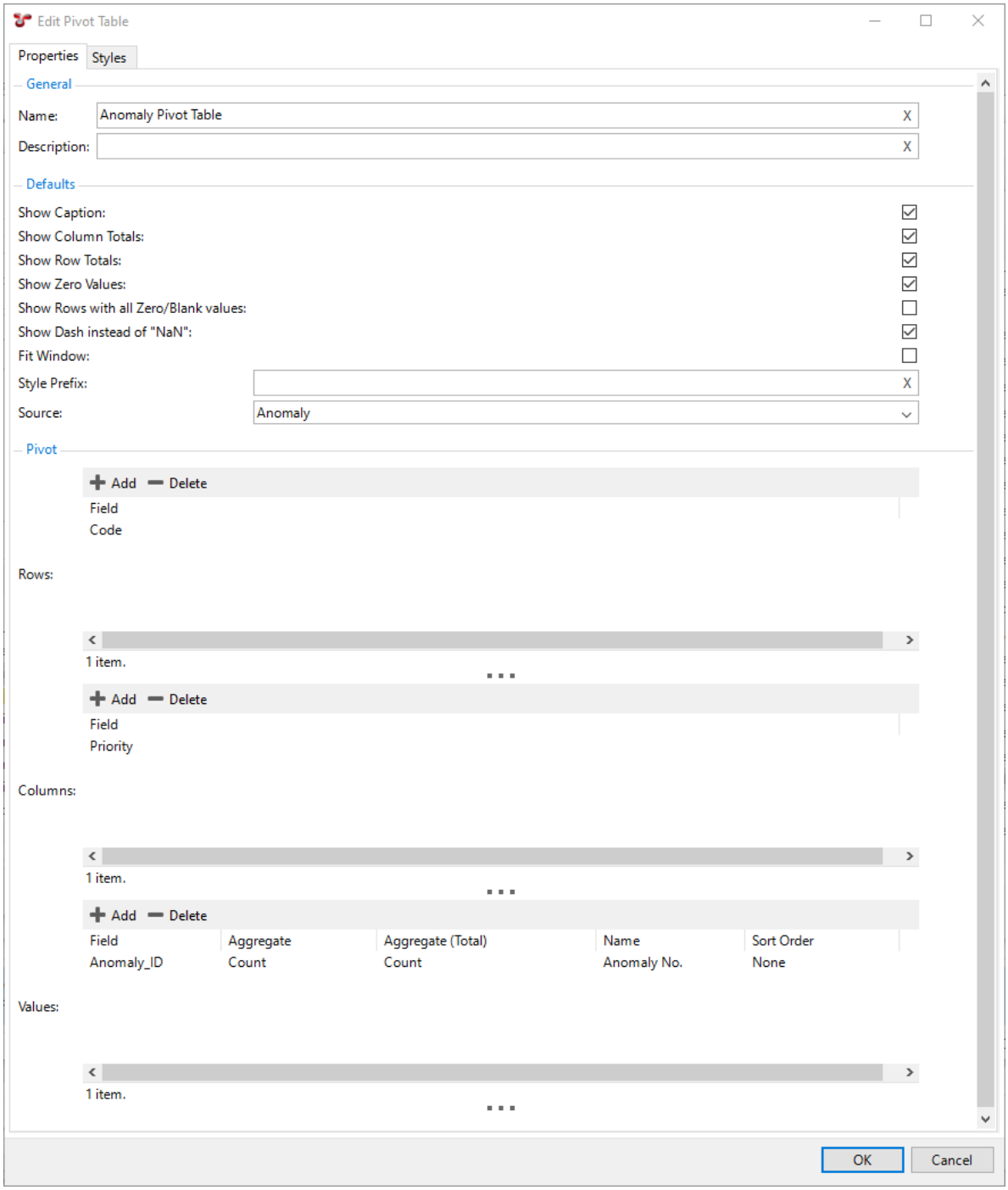
Field/Checkbo Name	Description
Name	We recommend that you specify a name that reflects the content of the pivot table. To customize the table name in your rendered report, you can right-click in the **Name** field and choose fields from the drop-down menu that appears. If the **Show Caption** checkbox is selected, the selected fields will be incorporated into the title of the table. This is especially useful when the table is inside an element group with the **Repeat Elements** option enabled, as you can include the value for that particular repeat in the table name.
Description	You can provide additional information about the pivot table in this field. This content will appear in the **Description** column of the **Configuration - Templates** dialog.
Show Caption	If you select this checkbox, the table's name will be shown above the table in the generated report.
Show Column Totals	Enabling this option adds an extra row at the bottom of the table showing the aggregate of values in each column.
Show Row Totals	Enabling this option adds an extra column with the aggregate of each row. If you have several Values, it will add several columns, one showing the aggregate of each.
Show Zero Values	By default, this option is enabled and zero values are shown in the output. If you disable this option, any values that would have shown "0" will be replaced with a blank. This makes it easy to spot data in a sparsely populated grid.
Show Rows with All Zero/Blank Values	By default, this option enabled and if a row contains "0" value or no value at all, it will be shown in the output. If you disable this option, these rows will be hidden. This limits the pivot table to only rows which have aggregate data.
Show Dash Instead of "NaN"	By default, this option is enabled and if a cell has a value that is "Not a Number" ("NaN"), a dash will be shown in that cell. If disabled, the output will appear as "NaN".
Fit Window	If you select this checkbox, NEXUS will limit the width of the table generated to fit the width of the page in RTF or PDF file or the browser window in HTML. However, if you deselect this checkbox, the table will be as narrow or as wide as is necessary to display all the data. Note that Microsoft Word's RTF reader may not respect this setting properly. To ensure proper formatting, save the document in .docx format by clicking "Save As" in Word.
Style Prefix	This field allows you to define a *Style Prefix*.
Source	Select the source which the pivot table should retrieve data from. You can only select sources that have been added to the Report Layout structure and if the pivot table is part of an element group, the source must be included in the same element group. Selecting a source for a pivot table is mandatory. You can also have a more complex source: for example, if you only wanted to see incomplete tasks, you would put a filter in your Simple Source for *Is Completed* not equal to true. If you wanted to use a single Simple Source to show both *all* tasks and *all completed* tasks, then instead of filtering the Simple Source, you would add an extra *field* to it, with a function that returns 1 if the task is complete and 0 if it is not. Then you would add a Values row to Sum that function.
Rows	In this screen area, you add the fields based on which you want to group the rows of your table. The values of these fields will appear then in the left-hand side column of the pivot table. Choose **Add** to add a new field row and select a field from the drop-down list. The available fields are the fields from the database table that you selected as a source. For example, if you wanted to see how many tasks were in each workpack, you would set up a Simple Source on the *Task* table, and under **Rows**, you would choose *Workpack* as the Row field to pivot on. If you wanted that broken up by task completion, you would choose *Workpack* and *Is Completed* as Rows. The table would then contain two rows for each workpack that had both complete and incomplete tasks. Adding field rows to a pivot table is mandatory.
Columns	Optionally, you can break down data into additional categories and display them in separate columns. For example, you have a pivot table for Anomalies where you have a row for each anomaly ID and you calculate the number of anomalies for each anomaly code in each row. You want to split this data and see the count separately for the different closed-out statuses of the anomaly, which can be either 'Open' or 'Closed'. In this case, you add the field *Closed Out* in this **Column** area and in the output, you will see two columns: *Open* and *Closed*, with the total number of anomalies for each closed-out status displayed separately in two different columns.
Values	In this screen area, you define the main criteria based on which the system should calculate the

The **Styles** tab lets you set conditional *Styles* for this table. In your Conditions, set Field to [Column Name], Comparison to Contains, and Value to the column name. This is because as far as the pivot table is concerned, it's not using the underlying data source column — it's using a new pivot table column with a similar name.

Example

You want to create a pivot table for Anomalies, where you want to see the number of anomalies for each anomaly code. You also want to see the number of anomalies broken down based on the priority of the anomalies and you want to see the total number of anomalies for each anomaly code and each priority. In this case, you make settings in the **Edit Pivot Table** dialog as follows:

- You tick the **Show Row Totals** and **Show Column Totals** checkboxes.
- You select the **Anomaly** table as a source.
- You add a row field for anomaly codes (**Code**).
- You add the column field **Priority**.
- You add a Value entry for the field **Anomaly_ID** and select *Count* for both Aggregate values.



In this case, the pivot table in the report output appears as follows:

Anomaly Pivot Table

Code	(blank)	High	Low	Medium	Anomaly No.
(blank)	0	1	1	0	2
AW	0	0	2	1	3
CC	0	0	1	1	2
CD	2	0	0	0	2
COR	0	0	0	1	1
CR	0	0	0	1	1
ESDV	0	1	0	0	1
FD	0	1	0	0	1
WT	0	0	0	1	1
Total	2	3	4	5	14

For further examples of using pivot tables, see *Example: Set Up Workpack Report Template*.

Risk Chart

This element allows you to insert preconfigured risk charts in your report template.

When you configure this element, make settings as follows:

- You must select a source. You can only select sources that have been added to the Report Layout structure and if the risk chart is part of an element group, the source must be included in the same element group. Note the following:
  - Most often, you use the **Risk Assessment** table as a source for your risk models.
  - You can also use the **Anomaly** table, in which case, each anomaly's risk score is used to place it on the diagram. Anomalies do not have a Likelihood or Consequence to give them an X/Y position on the diagram, they only have a risk score. So if your diagram has several squares with the same risk score (as is usually the case), your anomalies will be placed in the left-most such square. That is, risk-assessed assets are placed in a particular square, but anomalies are merely placed in a particular band. To make this risk model work, you must have made the following settings:
    * You must have specified the risk chart in the **Anomaly Risk Chart** field on the **Database** tab under *Database → Properties*.
    * You must have set up the **System - Anomaly - Risk Score** function that calculates the risk score for each anomaly.

    For more information, see *Set Up Anomaly Risk Matrix*.
- Select whether you want to display a caption in front of the risk chart in the report.
- Select the **Show Count** checkbox if you want to show the number of risk results in each square that has risk results. If you do not select this option, you will only see a dot in each square that has one or more risk results.
- Specify the width and height of the risk chart as you want it to appear in the report.

For an example of using risk charts, see *Add Risk Charts with Element Group, Page Break, Section Heading*.

Section Break

Similar to Page Break above, but it does not force a new page and does not let you choose paper size and orientation.

Section Heading

This element lets you set up headings in your report. You can configure section headings as follows:

- In the **Name** field, enter the name of the section heading to identify the heading within the **Report Layout** structure. This text does not appear in the actual report output.
- Right-click within the **Content** field to insert a list of fields and styles, or simply type text. This will appear as the actual section heading text in the report output.
- Select the **Include in Table of Contents** checkbox to have this section heading appear in the Table of Contents.
- In the **Default Style** field, select the preconfigured style that you want to apply for the section heading. For more information about the preconfigured styles, see *Styles*.

Section headings are applicable only for RTF, HTML and PDF outputs. Section Headings are not supported in *Dashboard* reports, you can use a Text (Paragraph) element instead.

You can find several examples of using Section Headings in the following worked examples:

- *Example: Set Up Anomaly Summary Report Template*
- *Example: Set Up Asset Integrity Report Template*
- *Example: Set Up Workpack Report Template*

Table of Contents

The Table of Contents element inserts a hyperlinked Table of Contents in the report output. In HTML outputs, any section headings will appear with "Top of report" hyperlink.

To configure the appearance of table headings, use the elements starting with *TOC* in your generic report style configurations (see *Styles*).

This element is applicable only to RTF and HTML outputs. Table of Contents elements are not supported in *Dashboard* reports.

> **Note**
>
> In the RTF output, you must right-click and update the table of contents to ensure that page numbers appear correctly.

For an example of using this report template element, see *Insert Table of Contents, Verify Output*.

Table of Data

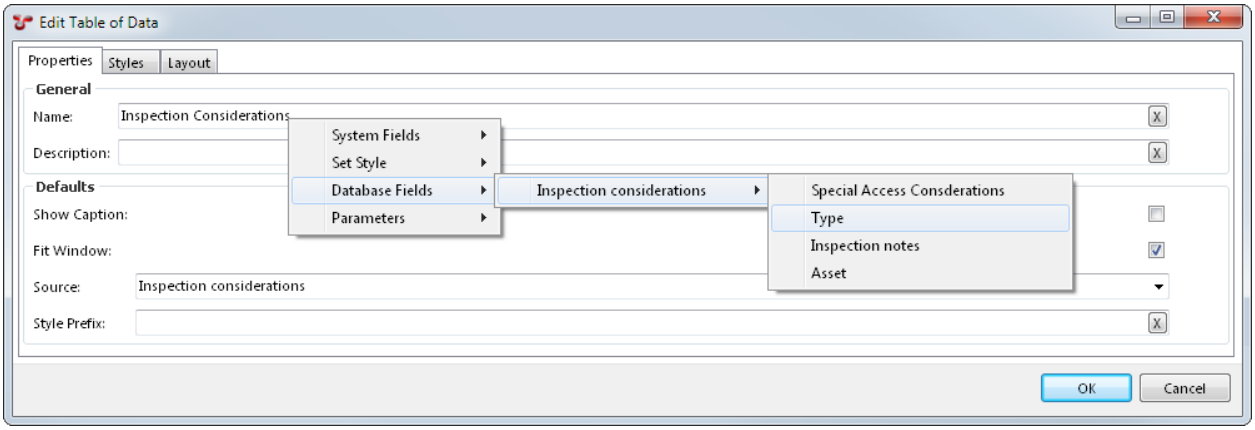
The Table of Data element outputs a simple table with columns and rows and retrieves data from a Source assigned to it.

When you create or edit a table of data, you have the following options in the **Edit Table of Data** dialog:

Properties

Field/Checkbox Name	Description
Name	We recommend that you specify a name that reflects the content of the table of data. To customise the table name in your rendered report, you can right-click in the **Name** field and choose fields from the drop-down menu that appears. If the **Show Caption** checkbox is selected, the selected fields will be incorporated into the title of the table. This is especially useful when the table is inside an element group with the **Repeat Elements** option enabled, as you can include the value for that particular repeat in the table name.
Description	You can provide additional information about the table of data in this field. This content will appear in the **Description** column of the **Configuration - Templates** dialog.
Show Caption	If selected, the table's name is shown above the table in the report. The caption is only displayed when the table itself is displayed. If the table's source contains no rows, the caption is hidden unless **Show Table if Empty** is selected.
Fit Window	If you select this checkbox, NEXUS will limit the width of the table generated to fit the width of the page in the RTF or PDF file or the browser window in HTML. However, If you deselect this checkbox, the table will be as narrow or as wide as is necessary to display all the data. Note that Microsoft Word's RTF reader may not respect this setting properly. To ensure proper formatting, save the document in .docx format by clicking "Save As" in Word.
Hide Columns with No Values	If you select this checkbox, any column that is entirely empty will be omitted from the output report.
Merge Cells for Rows with Equal Values	If you select this checkbox, the report output will minimise repetition of information by merging any adjacent matching cells in the table. If you don't select it, adjacent matching cells will not be merged. Note that this setting is ignored in Excel outputs.
Show Table if Empty	If selected, the table is displayed even when the selected source contains no rows. Column headers are shown without data. If deselected, the table is omitted entirely when the source has no rows.
Style Prefix	This field allows you to define a *Style Prefix*.
Source	Select the source which the table of data should retrieve data from. You can only select sources that have been added to the Report Layout structure and if the table of data is part of an element group, the source must be included in the same element group. If you click **OK** after selecting a Source, a drop-down arrow appears next to the Table of Data. This shows the Simple Source you have attached to the table. This is the same object as the Simple Source shown elsewhere in the tree. If you change one instance of the simple source, it will make changes to the other. If the Simple Source is connected to several tables, for example, Drawing Details, Chart Templates, or Risk Charts, making changes to any one will make changes to all.

The following image shows the right-click option available from the **Name** field:



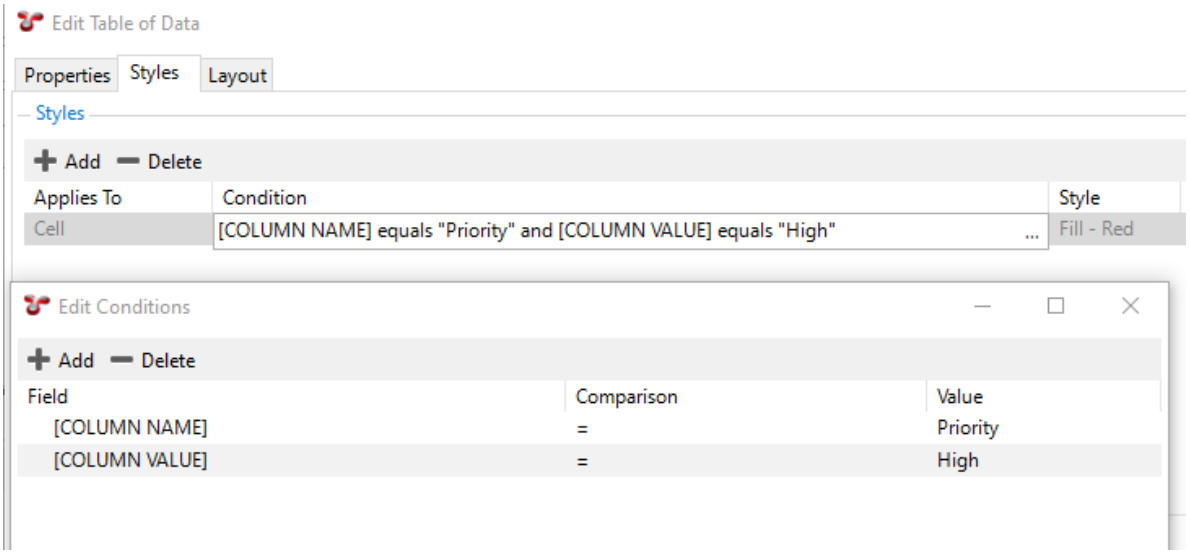
Styles

You can use this tab to highlight table cells or rows, use particular fonts, sizes or colours, change spacing, and to change the lines used to draw the table. You can choose a style here to be used when particular conditions are matched. You can also add a legend to explain what a special formatting refers to, which will appear under the table.

A style can be applied to a row or to a cell. If you want it to apply to a cell, be sure to set your condition to include "[COLUMN NAME] equals" in addition to the value you actually want to filter on, in order to restrict the filter to just that cell.

For example, you want to highlight cells where the **Priority** column value is *High* with red colour. In this case, you do the following:

1. On the **Styles** tab page, click **Add**.
2. In the **Applies To** column, select *Cell* from the drop-down list.
3. Double-click in the **Conditions** column and click the ellipsis ..., which opens the **Edit Conditions** dialog.
4. Add two conditions, one for the *COLUMN NAME* field that equals to *Priority* and one for the *COLUMN VALUE* field that equals to *High*:



5. Click **OK**.
6. Back on the **Styles** tab, in the **Style** column, select the *Fill - Red* style.

7. In the **Legend Label** column, enter *High Priority Anomalies*. The red colour and this text will be added as a legend at the bottom of the table.
8. Click **OK**.

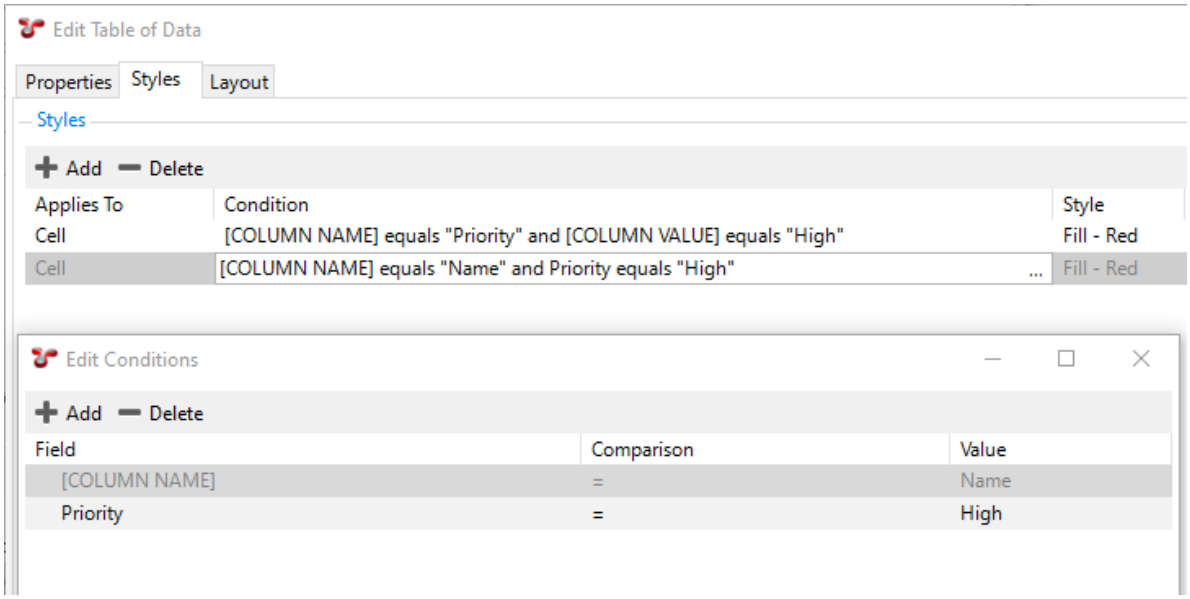
Result

When you generate the output, in the **Priority** column, cells with the value *High* will be highlighted by red:

Anomaly Table

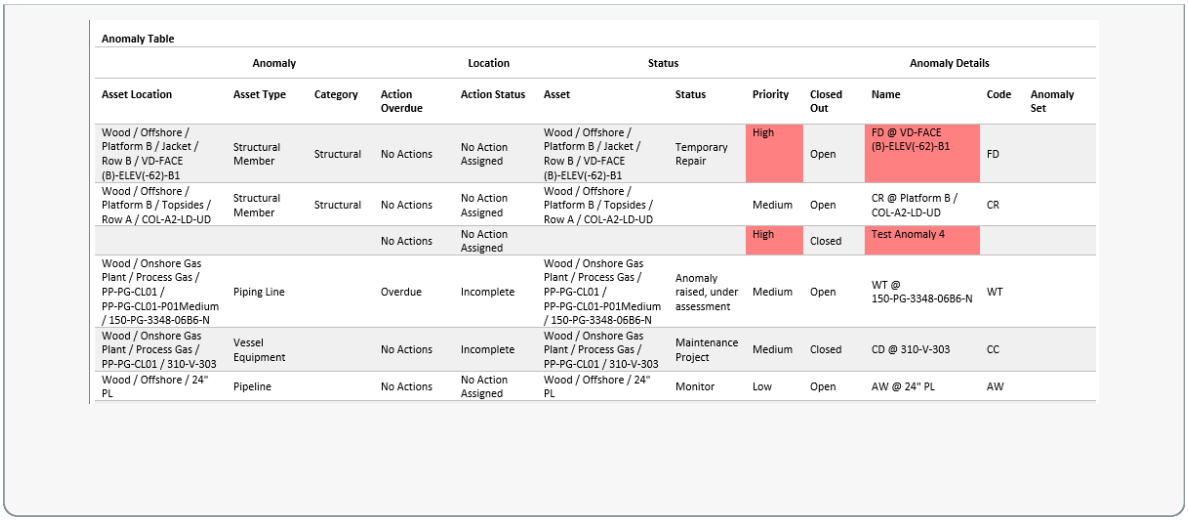
	Anomaly				Location	Status			Anomaly Details		
Asset Location	**Asset Type**	**Category**	**Action Overdue**	**Action Status**	**Asset**	**Status**	**Priority**	**Closed Out**	**Name**	**Code**	**Anomaly Set**
Wood / Offshore / Platform B / Jacket / Row B / VD-FACE (B)-ELEV(-62)-B1	Structural Member	Structural	No Actions	No Action Assigned	Wood / Offshore / Platform B / Jacket / Row B / VD-FACE (B)-ELEV(-62)-B1	Temporary Repair	High	Open	FD @ VD-FACE (B)-ELEV(-62)-B1	FD	
Wood / Offshore / Platform B / Topsides / Row A / COL-A2-LD-UD	Structural Member	Structural	No Actions	No Action Assigned	Wood / Offshore / Platform B / Topsides / Row A / COL-A2-LD-UD		Medium	Open	CR @ Platform B / COL-A2-LD-UD	CR	
			No Actions	No Action Assigned			High	Closed	Test Anomaly 4		
Wood / Onshore Gas Plant / Process Gas / PP-PG-CL01 / PP-PG-CL01-P01Medium / 150-PG-3348-06B6-N	Piping Line		Overdue	Incomplete	Wood / Onshore Gas Plant / Process Gas / PP-PG-CL01 / PP-PG-CL01-P01Medium / 150-PG-3348-06B6-N	Anomaly raised, under assessment	Medium	Open	WT @ 150-PG-3348-06B6-N	WT	
Wood / Onshore Gas Plant / Process Gas / PP-PG-CL01 / 310-V-303	Vessel Equipment		No Actions	Incomplete	Wood / Onshore Gas Plant / Process Gas / PP-PG-CL01 / 310-V-303	Maintenance Project	Medium	Closed	CD @ 310-V-303	CC	
Wood / Offshore / 24" PL	Pipeline		No Actions	No Action Assigned	Wood / Offshore / 24" PL	Monitor	Low	Open	AW @ 24" PL	AW	

9. Let's say that you also want to highlight the **Asset Name** cell for the items that have the **Priority** value *High*. In this case, follow the process above except that you create one condition for the *COLUMN NAME* field that equals to *Name* and one for the **Priority** field that equals to *High*:



Result

In this case, when you generate the output, the corresponding *Name* cell will be highlighted with red too:



Anomaly Table

Anomaly				Location	Status				Anomaly Details		
Asset Location	Asset Type	Category	Action Overdue	Action Status	Asset	Status	Priority	Closed Out	Name	Code	Anomaly Set
Wood / Offshore / Platform B / Jacket / Row B / VD-FACE (B)-ELEV(-62)-B1	Structural Member	Structural	No Actions	No Action Assigned	Wood / Offshore / Platform B / Jacket / Row B / VD-FACE (B)-ELEV(-62)-B1	Temporary Repair	High	Open	FD @ VD-FACE (B)-ELEV(-62)-B1	FD	
Wood / Offshore / Platform B / Topsides / Row A / COL-A2-LD-UD	Structural Member	Structural	No Actions	No Action Assigned	Wood / Offshore / Platform B / Topsides / Row A / COL-A2-LD-UD		Medium	Open	CR @ Platform B / COL-A2-LD-UD	CR	
			No Actions	No Action Assigned			High	Closed	Test Anomaly 4		
Wood / Onshore Gas Plant / Process Gas / PP-PG-CL01 / PP-PG-CL01-P01Medium / 150-PG-3348-06B6-N	Piping Line		Overdue	Incomplete	Wood / Onshore Gas Plant / Process Gas / PP-PG-CL01 / PP-PG-CL01-P01Medium / 150-PG-3348-06B6-N	Anomaly raised, under assessment	Medium	Open	WT @ 150-PG-3348-06B6-N	WT	
Wood / Onshore Gas Plant / Process Gas / PP-PG-CL01 / 310-V-303	Vessel Equipment		No Actions	Incomplete	Wood / Onshore Gas Plant / Process Gas / PP-PG-CL01 / 310-V-303	Maintenance Project	Medium	Closed	CD @ 310-V-303	CC	
Wood / Offshore / 24" PL	Pipeline		No Actions	No Action Assigned	Wood / Offshore / 24" PL	Monitor	Low	Open	AW @ 24" PL	AW	

Note

To add/edit/delete styles that you can apply, go back to the **Configuration - Templates** dialog and choose the *Styles* toolbar button.

Layout

The top half of this tab lists all the columns that will be included in the table. You can do the following here:

- Choose which columns are visible in the report by selecting the relevant row and choosing **Include** in the toolbar. To hide the column, choose **Exclude**. The **Include** column indicates whether the column is visible.
- Assign columns to a category. To add a category, double-click the relevant cell in the **Category** column and enter your text. If you place several columns in the same category, they will be grouped together and the category headers will be visible in the generated report. Note that categories are only considered in the HTML, RTF and PDF outputs, they are ignored in the Excel output.
- Define the alignment of content within the cell for each column. To set the alignment, double-click the relevant cell in the **Alignment** column and select the required value from the dropdown list.
- If the **Show Data** button is set to **All Data**, NEXUS will display data from the table specified in this table's source, complete with any extra columns you may have added. This can give context and make it easier to understand what the final generated table will look like.

Caution

If the table contains many rows, this may take up to 5 seconds. After this time, NEXUS will stop fetching additional rows, and will display only the rows that it has fetched.

The bottom part of the tab shows how the columns will be displayed in the output. You can perform the following actions here:

- Drag and drop column headings to reorder them in your table.
- Click on one or more column headings to sort by that column. Shift-click a column to add it; Ctrl-click a column to subtract it from the set of columns we'll sort on. Click or shift-click a column a second time to change sort direction.

- You can change the width of columns by hovering the mouse over the right edge of the column header, and then either double-clicking or by clicking and dragging the column to a new width. This will change the column widths in the generated report.

For an example of using this report template element, see *Create Table of Data for Anomaly List, Apply Styles*.

Text (Paragraph)

Text entered in the **Content** field will be displayed as text in the report output. You can enter your text directly or you can use the right-click menu to insert:

- System fields, such as date, logo, image, and so on
- Database fields, which you can choose from a single source that the element can access (that is, the source has been added to the *Report Layout* structure and is in the same element group)
- Styles to be applied to the paragraph text. If you insert a style element, any text that appears after that element will have that specific style applied until the next style element. By default, the **Body** style will be applied. For more information about the preconfigured styles, see *Style*).

Note that some styles are only applicable to specific output types, for example, heading styles are only applicable to RTF, HTML and PDF outputs, but not to Excel outputs.

For examples of using this report template element, see *Example: Set Up Workpack Report Template*.

Vertical Table

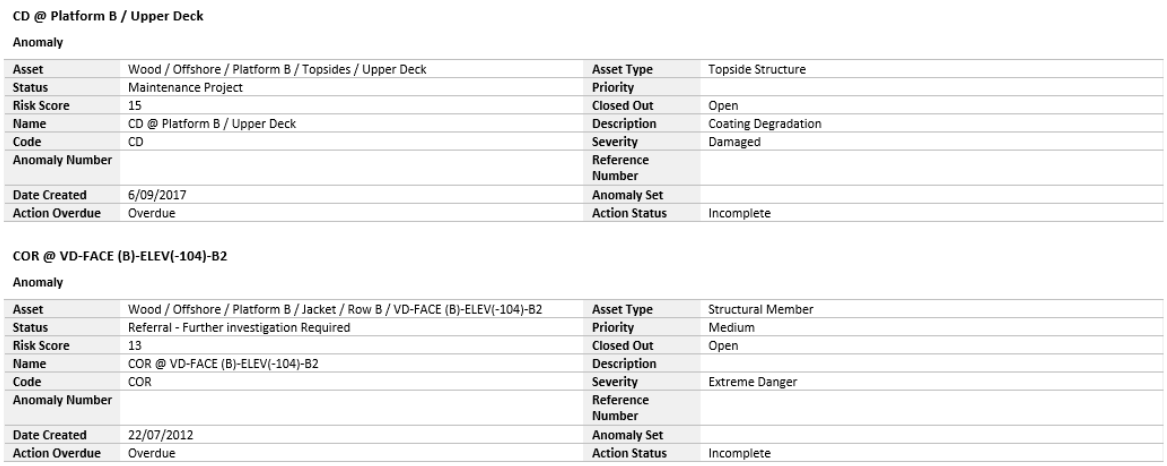
The Vertical Table element is similar to the Table of Data element, but rotated by 90 degrees. In a Vertical Table, the left-most column contains the 'column headers'.

Vertical Tables are useful when you have a single record with lots of fields in it, for example, a checklist item or an event definition with lots of fields.

The settings for a Vertical Table are the same as the settings for a Table of Data element. For more information, see the description of the Table of Data element above. The only difference is that in the case of a Vertical Table, you can set the width of the header column by setting a **Header Width (%)** value, which determines the percentage of the header column width as compared to the width of the whole table.

Entering 2 or more **Number of Header Columns** arranges the output fields in a form-like layout. This is most commonly used when you are outputting the details of a single record.

In the example below, the Vertical Table is included in an element group that loops on each anomaly. The Vertical Table has a single source assigned, which is filtered on the Anomaly ID field of the Anomaly table and the number of header columns is set to two:



CD @ Platform B / Upper Deck

Anomaly

Asset	Wood / Offshore / Platform B / Topsides / Upper Deck	**Asset Type**	Topside Structure
Status	Maintenance Project	**Priority**	
Risk Score	15	**Closed Out**	Open
Name	CD @ Platform B / Upper Deck	**Description**	Coating Degradation
Code	CD	**Severity**	Damaged
Anomaly Number		**Reference Number**	
Date Created	6/09/2017	**Anomaly Set**	
Action Overdue	Overdue	**Action Status**	Incomplete

COR @ VD-FACE (B)-ELEV(-104)-B2

Anomaly

Asset	Wood / Offshore / Platform B / Jacket / Row B / VD-FACE (B)-ELEV(-104)-B2	**Asset Type**	Structural Member
Status	Referral - Further investigation Required	**Priority**	Medium
Risk Score	13	**Closed Out**	Open
Name	COR @ VD-FACE (B)-ELEV(-104)-B2	**Description**	
Code	COR	**Severity**	Extreme Danger
Anomaly Number		**Reference Number**	
Date Created	22/07/2012	**Anomaly Set**	
Action Overdue	Overdue	**Action Status**	Incomplete

For an example of using this report template element, see *Create Section Heading, Vertical Table with Extended Simple Source*.

See also

- *Configure Report Templates*
- *Sources*
- *Configure Reports and Dashboards*
- *Example: Set Up Anomaly Summary Report Template*
- *Example: Set Up Asset Integrity Report Template*
- *Example: Set Up Workpack Report Template*

8.2.6.3.4.2 Sources

Sources appear in the bottom left part of the **Add/Edit Report Template** dialog under the **SOURCES** node. Sources are the links between the database data and the visual elements.

Most of the visual elements in the report require a source element to retrieve data from. To ensure that a visual element can retrieve data from a source element, the source element must be added to the *Report Layout* structure and it must be in the same element group.

You can edit the parameters of sources either by double-clicking them in the *Report Layout* structure or by selecting them and choosing **Edit** from the toolbar.

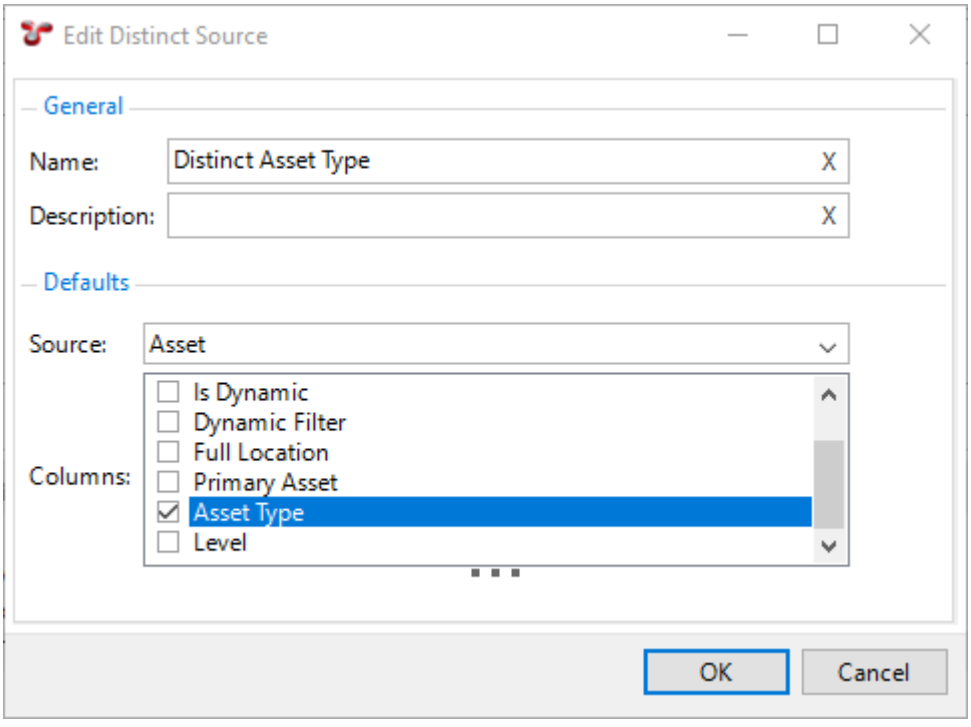
> **Note**
>
> A source without a parent source or table will be displayed with a question mark indicator over its icon. This is an easy way to identify sources that have not been set up or are no longer in use.

Distinct Source

Sometimes, you want only a subset of a table's rows, showing each value, or a combination of values, just once. In this case, you create a distinct source that references a simple source.

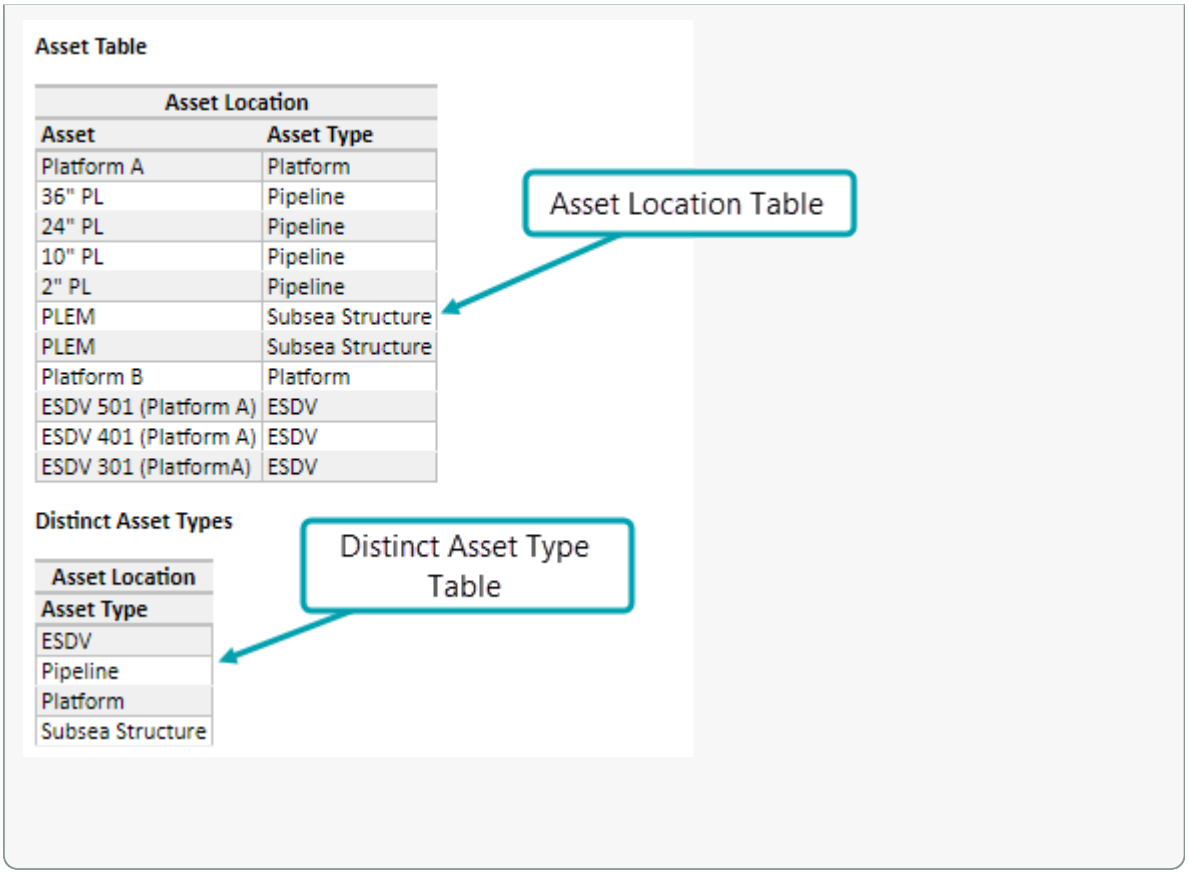
For example, you want a table with a list of asset types that are actually in use, but this might be different from the full list from the Asset Location table. In this case, you proceed as follows:

1. Create a Simple Source and set its table to *Asset Location*.
2. Create a Distinct Source and make the following settings:
   - Set its Source to your simple source.
   - Select the *Asset Type* column.



3. Create a Table of Data and set its source to your distinct source.

> **Result**
>
> The Distinct Source returns one row for each value of asset type found in the Asset Location table.



Tip

Another way of grouping rows is using a pivot table.

Parameter Source

If you want to use parameters specified by the user in headings, text, and so on, add a Parameter Source. You don't need one of these to use parameters in simple source filters.

Simple Source

Simple sources are the most frequently used sources in report templates. Each single source must be linked to a table, which you can do on the **Properties** tab of the **Edit Simple Source** dialog. The table you choose will depend on the data you want to show, for example, if you want to display GVI event data, you choose your GVI event table. If you want to display data about events overall, you would choose the Event table.

Optionally, you can add additional fields to the source or set up filters as required (see below for more information).

Manage Fields

In addition to the fields that are included in the selected source table, you can add additional fields to the source, which can be a field from another table, or a new field that contains the result of a function. You can do that on the **Fields** tab of the **Edit Simple Source** dialog. The **Fields** tab shows all the fields in the selected source table (visible when the **Show Local Columns** button is selected), plus, any extra fields that you have added.

To add a new field, proceed as follows:

1. On the **Fields** tab of the **Edit Simple Source** dialog, choose **Add**.
2. In the toolbar, choose **Input** and select one of the following options:
   - *Field...*, if you want to add a new field from another table. This adds a new field with the type *Simple Column (Existing Field)*.
   - *Function...*, if you want to add a new field that contains the result of a function. This adds a new field with the type *Function (Result from a Function)*.
3. From the dialog that pops up, select the field or function as required.
4. Click **OK** to save your changes.

You can delete only fields that you have added, you cannot delete local fields from the selected source table.

Set Up Filters

You can set up filters for the simple source on the **Filters** tab of the **Edit Simple Source** dialog. This allows you to control which rows are returned from the table.

To set up a filter for a simple source, on the **Filter** tab of the **Edit Simple Source** dialog, proceed as follows:

1. In the **Fields** column, select the field based on which you want to set up your filter:
   - If you want to use a field from the local source table, select the field from the drop-down list.
   - If you want to use a field from another table, choose ... to pick the field you want from any table.
2. In the **Comparison** and **Not** columns, select the operation that you want to perform for filtering.

Operator	Description
=	Use this operator if you want the value of the field to be exactly the same as the value you select in the **Value** column. If you want to test whether a key is null, just use '=' as the comparison, and leave the value blank.
<, >, <= and >=	These operators are only meaningful for numeric and whole number types.
`Is Child Of`	This is a special operator that is only available if you selected the *VN_ID* field of the *Asset Location* table. *VN_ID* is the unique identifier of an asset in the hierarchy. If you select this field with the *Is Child Of* operator, and as a Value, you select an asset in the hierarchy, then the simple source returns the asset together with all its children in that hierarchy.
`in`	This operator is similar to = (equal), however, in this case, you can multiselect items in the **Value** column, that is, you can pick several items that the field can be equal to.
`like`	This is basically a "contains" operator and is relevant only for alphanumeric fields. If you use this operator, then in the **Value** column, you can use '%' (percent) to match several unknown characters, and '_' (underscore) to match a single unknown character. For example, if you specify *_VI*, it would match 'GVI' and 'CVI'; if you enter *PL %*, it would match 'PL Anode', 'PL Damage', and so on.

   If you select the checkbox in the **Not** column in conjunction with the selected operator, the opposite function of the operator will be used for filtering. For example, if you select the checkbox in the **Not** column and you select the = operator in the **Comparison** column, the system will filter for the values that are NOT equal to the selected value.
3. In the **Parameters** column, specify how you want the values for the filter to be selected. You have the following options:

Parameter	Description
None	This option allows you to immediately select the value from the **Value** column of this dialog.
User	If you select this option, the user will be able to select the value from a dialog upon executing the report. The field that you selected will be a selection field and the user must select a value for that before the actual report output is generated. if you choose '=' for your Comparison, the user will be able to choose one item; if you choose 'in', the user will be able to choose several items.
Group	This option has meaning only if this Simple Source is inside an Element Group. If you choose this option, then this filter will pick its value from the Simple Source used for the Element Group.

4. In the **Value** column, assign a value to your filter as required. If this is a string or a numeric or a whole number field, you can simply type a value in. If your filter field is a key to another table, you can use the ⋯ to pick a value.

   For example, in the *Event* table, the fields *Asset*, *Event Type*, *Survey Set* and *Workpack* are keys to other tables. If your source table is *Event*, and your filter is on the *Workpack* field, clicking the ⋯ button will bring up a list of workpacks to pick from.

5. In the **Actions** column, you can add additional filters or remove filters as required by choosing the + or - button respectively.

6. If required, you can connect your filters by grouping them and using the **All** or **Any** connectors. If you have multiple filters, you'll see a drop-down list at the left and you can choose one of the following options:

   - If you select *All*, then all the filter criteria must be met for data to be returned.
   - If you select *Any*, then if any criterion is met, data will be returned. (*All* and *Any* are equivalent to SQL's *AND* and *OR*.)

   You can construct more complex combinations by grouping rows. To do that, use the Shift and/or Ctrl keys on the keyboard, click filters to multi-select and click **Group**. The rows you selected will be joined together into a group with their own *Any/All* filter, and that group will be connected to other groups with a separate Any/All connector. By choosing your grouping and choosing *Any/All* as appropriate, you can construct any logical expression you desire.

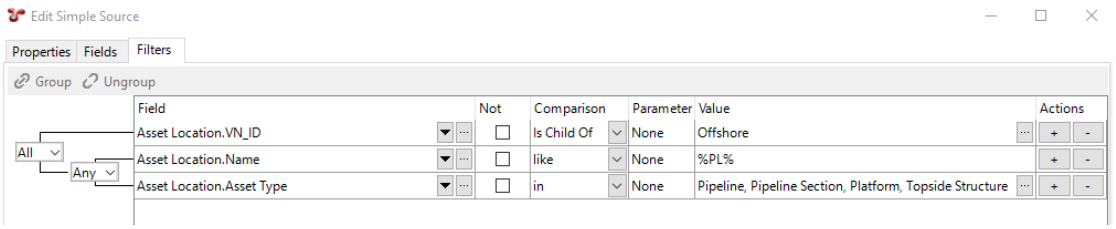
   You can ungroup rows by selecting a row within a group and clicking **Ungroup**.

Example

You want the simple source to return assets within the *Asset Location* table, which fulfil the following conditions:

- In the asset hierarchy, they are under the *Offshore* node **AND**
  - They either have the characters *PL* in their asset name **OR**
  - They have the asset type *Pipeline*, *Pipeline Section*, *Platform* or *Topside Structure*

In this case, you create the filters as shown below:



That is, you create the filters as follows:

1. You create a filter for the field *VN_ID* within the *Asset Location* table, with Comparison *Is Child Of* and Value *Offshore*.
2. You add a filter for the field *Name* within the *Asset Location* table, with Comparison *like* and Value *%PL%*.
3. You add a filter for the field *Asset Type* within the *Asset Location* table, with Comparison *in* and Values *Pipeline*, *Pipeline Section*, *Platform* or *Topside Structure*.
4. You group the filters for *VN_ID* and *Asset Type* (select them and choose **Group**) and set their connectors to *Any*. You leave their connection to the first filter with the connector *All*.

Special Fields

There are special fields that can be useful for reports run using the **Reports** toolbar button from specific screens in NEXUS IC:

Screen	Special Field
ASSETS	*VN_ID*
LIBRARY	*Library_ID*
PLANNING	*VN_ID*
WORKPACKS	*Workpack_ID*
INSPECTION	*Header_ID* or *Finding_ID* (depending on what is visible)
ANOMALY	*Anomaly_ID*

If you select one of these special fields when you set up the filter for your source and you select the *User* parameter option, then when a user runs your report template from the appropriate screen, the currently selected item will be pre-populated into the parameter in the report generation dialog.

For example, if you set up a report template with the *Anomaly_ID* field, then when the user runs your template from the **ANOMALY** screen, the currently selected anomaly will be automatically selected in the report generation dialog.

Union Source

A Union Source lets you join together results from several other Sources, much like SQL's UNION ALL. In the Union Source, select the sources you'd like to pull data from. Only columns that are common to all selected sources will be passed through to any element that consumes the Union Source. So if you chose two tables, both of which had a *Name* column, your Union Source would have a *Name* column.

Note

When configuring a Union Source, ensure that every source being unioned is named differently, otherwise when saving and loading a report template, the sources within the Union Source will not all be retained.

See also

- *Configure Report Templates*

- *Elements*
- *Configure Reports and Dashboards*
- *Example: Set Up Anomaly Summary Report Template*
- *Example: Set Up Asset Integrity Report Template*
- *Example: Set Up Workpack Report Template*

8.2.6.3.4.3 Example: Set Up Anomaly Summary Report Template

In this example, we create a report template called "Anomaly Summary", which demonstrates the usage of the following report template elements:

- Report layout with header and footer
- Table of data with specific formatting and styles
- Section breaks and page breaks
- Chart templates
- Table of Contents

This example guides you through the following steps:

1. *Create Template, Set Layout, Add Header, Footer, Title*
2. *Create Table of Data for Anomaly List, Apply Styles*
3. *Create Table of Data for Anomaly Actions, Use Style Prefix*
4. *Add Page Break, Charts of Templates*
5. *Insert Table of Contents, Verify Output*

8.2.6.3.4.4 Create Template, Set Layout, Add Header, Footer, Title

As a first step, you create the report template, set up its size and layout, create a Section Break to define header and footer and add a Section Heading to add a title. See the detailed steps below:

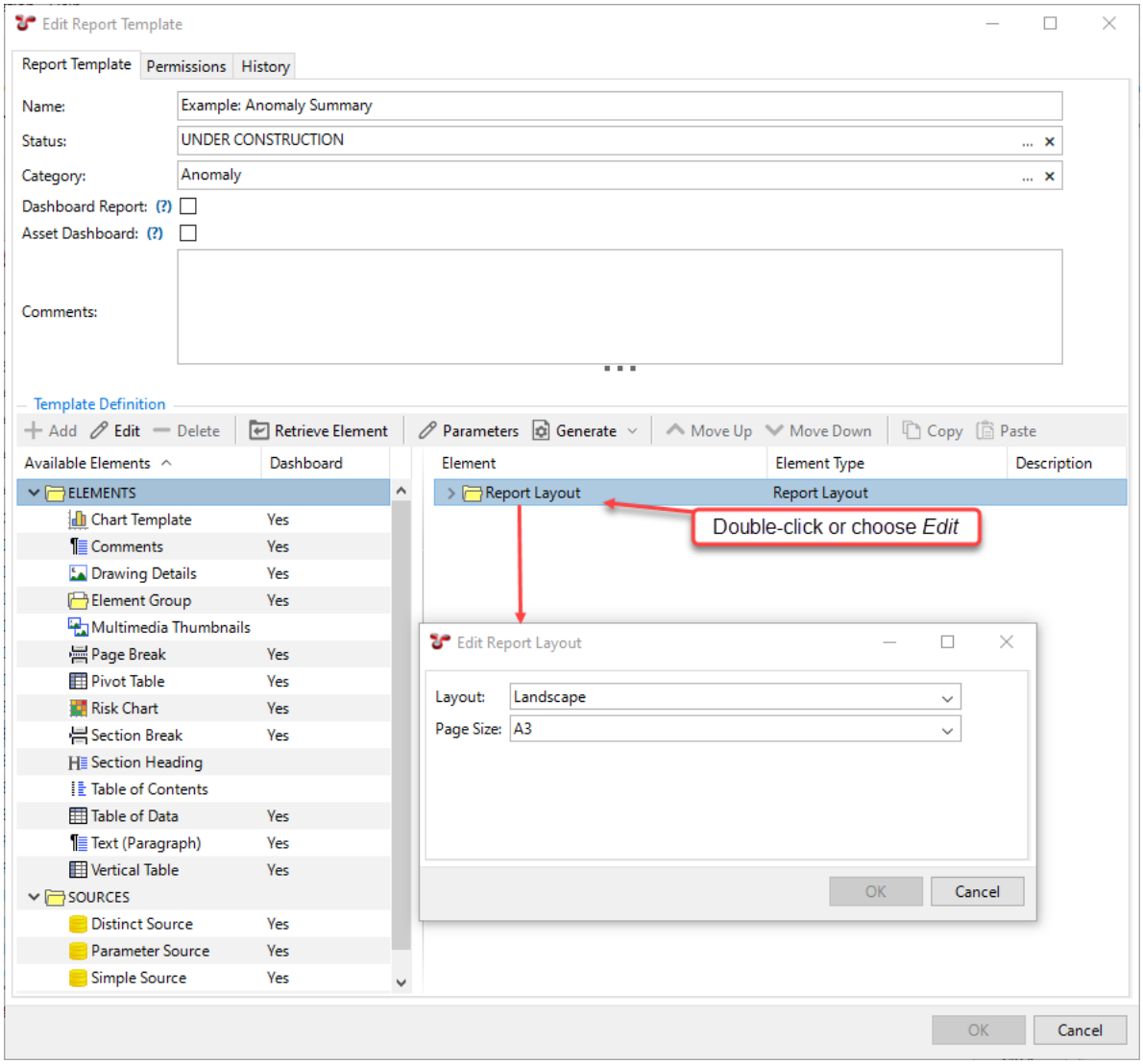
1. *Create a new report template and specify the report layout.*
2. *Insert a Section Break to set up the header and footer of the report.*
3. *Add a level-1 Section Heading.*

8.2.6.3.4.5 Process

8.2.6.3.4.6 1. Create a new report template and specify the report layout.

1. In NEXUS IC, choose *Configuration* → *Reports and Dashboards* → *Templates* from the menu.
2. Choose **Add** to create a new report template.
3. In the top half of the **Add Report Template** dialog, specify the name, status and category of the report as follows:
   - **Name**: Enter *Example: Anomaly Summary*
   - **Status** (optional): Select from the list of preconfigured statuses (see *Configure Report Statuses*), for example, *Under Construction*.
   - **Category** (optional): Select from the list of preconfigured categories (see *Configure Report Categories*), for example, *Anomaly*.

4. Under the *Template Definition* section of the dialog, configure the size and layout of the report by double-clicking the top **Report Layout** node on the right-hand side of the dialog. In this example, we select layout *Landscape* and page size *A3*.



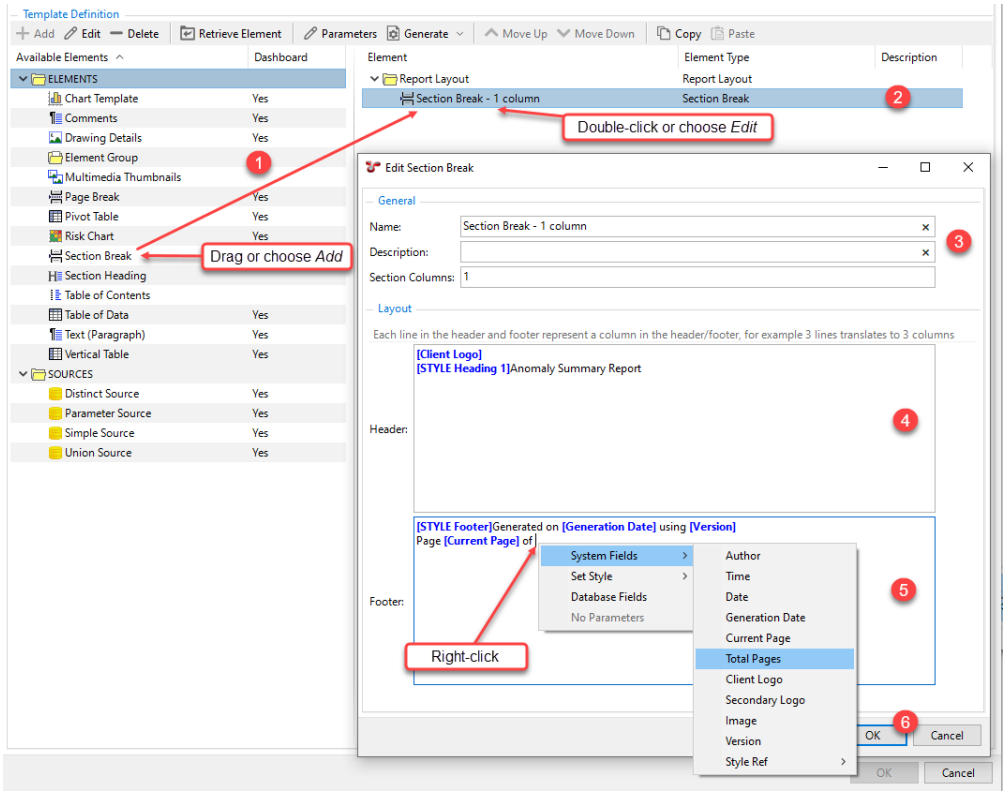
Note

This size and layout settings will prevail until the next page break element, where you can overwrite these settings.

8.2.6.3.4.7 2. Insert a Section Break to set up the header and footer of the report.

You want to add a logo and the name of the report in the header of the report (2 columns) and in the footer, you want to add the generation date and software version in one column and the current page number in the second column. To do this, follow the steps below:

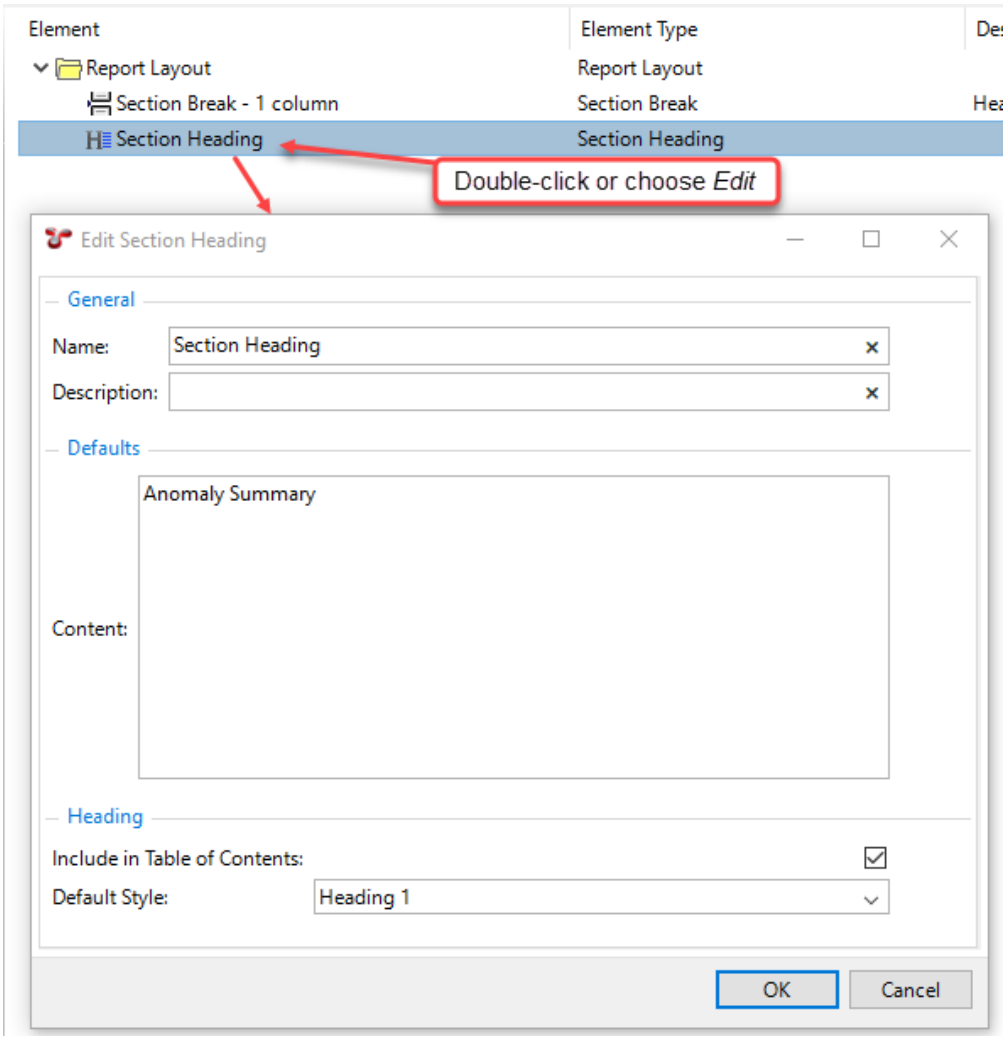
1. Under the *Template Definition* section of the **Add Report Template** dialog, select the **Section Break** element from under the **ELEMENTS** node and drag it under the **Report Layout** node on the right-hand side of the dialog. Alternatively, you can select the element and choose **Add** from the toolbar. 1
2. Double-click the **Section Break** element that you have inserted under **Report Layout** or select it and choose **Edit**. 2
3. Enter a name and description as required and leave the value *1* for Section Column. 3
4. In the header, you want the logo in one column and the title of the report in another column, thus, in the **Header** area of the dialog you enter 2 rows 4:
   a. Right-click in the editor area of **Header** and choose *System Fields* → *Client Logo*.
   b. Press **Enter** to create a new row.
   c. You want to style the text of the report title with the predefined style *Heading 1*, so right-click and choose *Set Style* → *Heading 1*.
   d. Enter the name of the report *Anomaly Summary Report*.
5. In the footer, you want the generation date and software version in one column and the current page number out of the total page in the second column, thus, in the **Footer** area of the dialog you enter 2 rows 5:
   a. In the editor area of **Footer**, right-click to select the predefined *Footer* style and select *Set Style* → *Footer*.
   b. Enter *Generated on*.
   c. Right-click and select *System Fields* → *Generation Date*.
   d. Enter *using*.
   e. Right-click and select *System Fields* → *Version*.
   f. Press **Enter** to create a new row and enter *Page*.
   g. Right-click and select *System Fields* → *Current Page*.
6. Click **OK**. 6



8.2.6.3.4.8 3. Add a level-1 Section Heading.

To add a main title to the report, with Heading 1 style, proceed as follows:

1. Add a **Section Heading** element to the **Report Layout** structure (see insertion methods above).
2. Double-click the element in the structure to edit it.
3. Enter a name that identifies the element in the structure. This text does not appear in the actual report output.
4. Enter the text of the heading that you want to see in the output in the **Content** field. This time, we just want to use the heading *Anomaly Summary*, but you can use right-click in this field if you want to add a variable.
5. Select the **Include in Table of Contents** checkbox to have this section heading appear in the Table of Contents.
6. In the **Default Style** field, select **Heading 1**, which is a preconfigured style that can be applied for level-1 section headings. If required, you can set up your own style and apply that instead (see *Styles*).
7. Click **OK**.



Proceed to Next Step

8.2.6.3.4.9 Create Table of Data for Anomaly List, Apply Styles

In this step, you create a Table of Data that lists our anomalies. For that, you create the following:

- An Element Group to include all the tables for anomalies
- A level-2 Section Heading to be included in the output before the table
- A Simple Source for the **Anomaly** system table, from which the Table of Data can retrieve data
- The actual table of data for the Anomaly List applying different styles to it

See the detailed steps below:

1. *Insert an Element Group for the anomaly tables.*
2. *Insert a level-2 Section Heading for the list of anomalies.*
3. *Insert a Simple Source for Anomalies.*

4. *Insert a Table of Data element for Anomaly Listing.*
5. *Apply a colour to specific rows of the table.*
6. *Apply a colour to specific cells of the table.*

8.2.6.3.4.10 Prerequisites

You have completed the following step:

- *Create Template, Set Layout, Add Header, Footer, Title*

8.2.6.3.4.11 Process

8.2.6.3.4.12 1. Insert an Element Group for the anomaly tables.

This element will contain the anomaly tables that we're going to create.

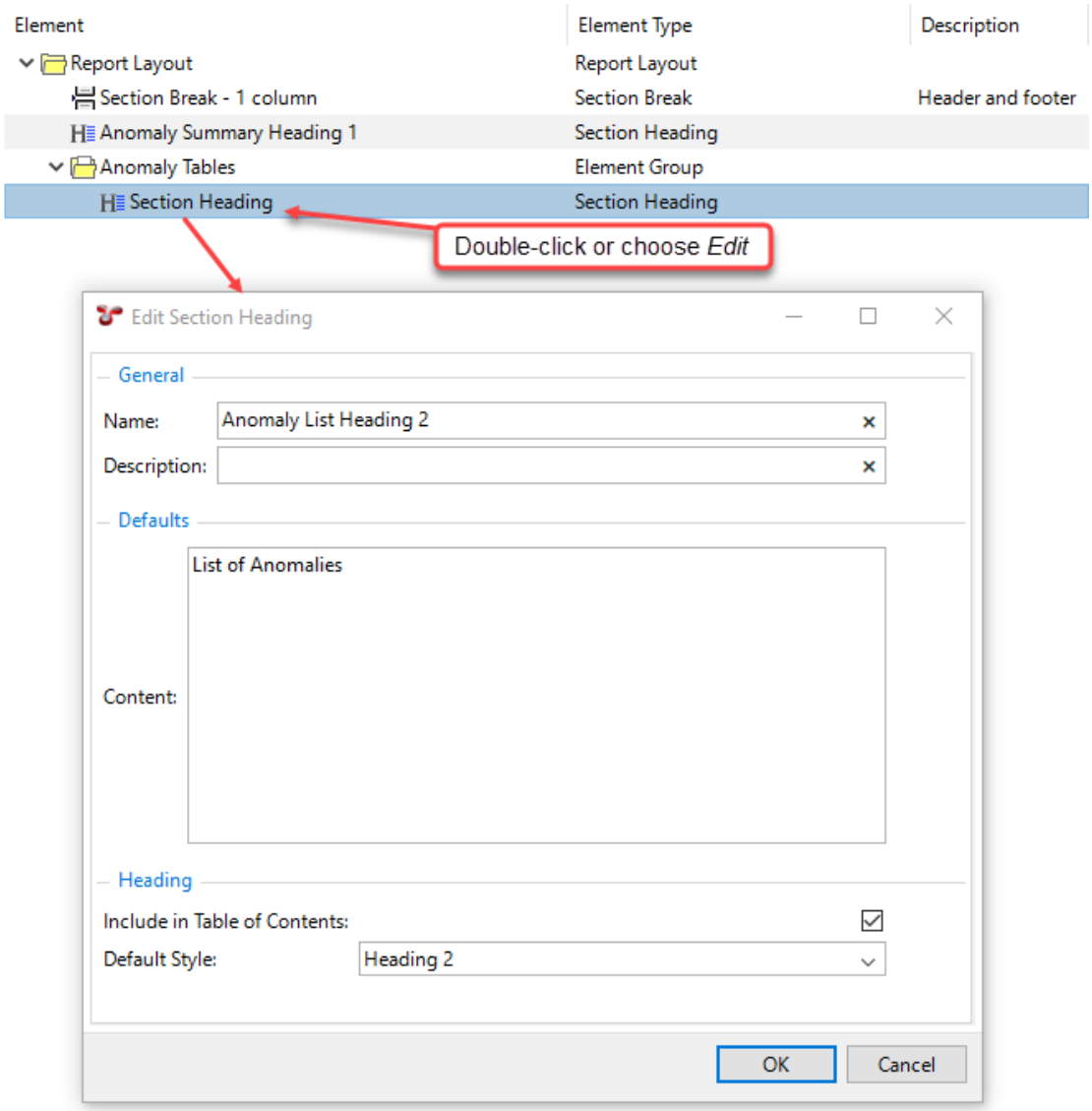
1. Add an **Element Group** element to the **Report Layout** structure (see insertion methods in previous steps).

> **Tip**
>
> If the element is not inserted to the right location in the element structure, use the **Move Up** or **Move Down** buttons in the toolbar to move them to the correct place.

2. Double-click the element in the structure to edit it.
3. Enter the name *Anomaly Tables*, which will identify the element in the structure. You do not need to make other settings for the element group right now.
4. Click **OK**.

8.2.6.3.4.13 2. Insert a level-2 Section Heading for the list of anomalies.

1. Add a **Section Heading** element to the **Report Layout** structure so that it is included within the **Anomaly Tables** element group.
2. Double-click the element in the structure to edit it.
3. Enter a name that identifies the element in the structure, for example, *Anomaly List Heading 2*. This text does not appear in the actual report output.
4. Enter the text of the heading that you want to see in the output in the **Content** field. This time, we just want to use the heading *List of Anomalies*, but you can use right-click in this field if you want to add a variable.
5. Select the **Include in Table of Contents** checkbox to have this section heading appear in the Table of Contents.
6. In the **Default Style** field, select **Heading 2**, which is a preconfigured style that can be applied for level-2 section headings. If required, you can set up your own style and apply that instead (see *Styles*).
7. Click **OK**.



8.2.6.3.4.14 3. Insert a Simple Source for Anomalies.

This simple source will be used as the data source for the anomaly list Table of Data that we are going to create.

1. Add a **Simple Source** element to the **Report Layout** structure so that it is included within the **Anomaly Tables** element group. The **Simple Source** element is located under the **SOURCES** node within the **Template Definition** section of the dialog. 1

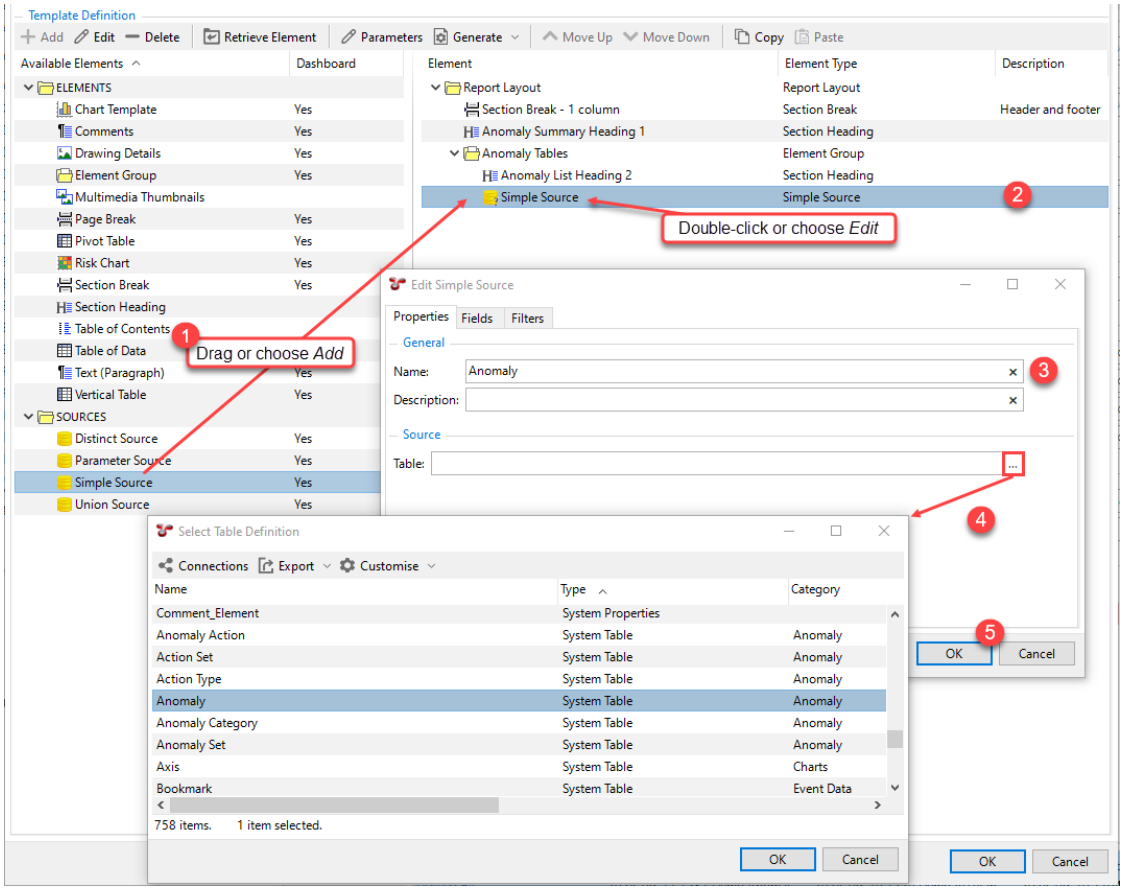
> **Note**
>
> You must insert the simple source within the element group, else, you cannot refer to it from the other elements of the element group.

2. Double-click the Simple Source element in the structure to edit it. 2

3. Specify the name *Anomaly** for the simple source. 3

4. In the **Table** field, click the ellipsis ... to select the System Table **Anomaly**. 4

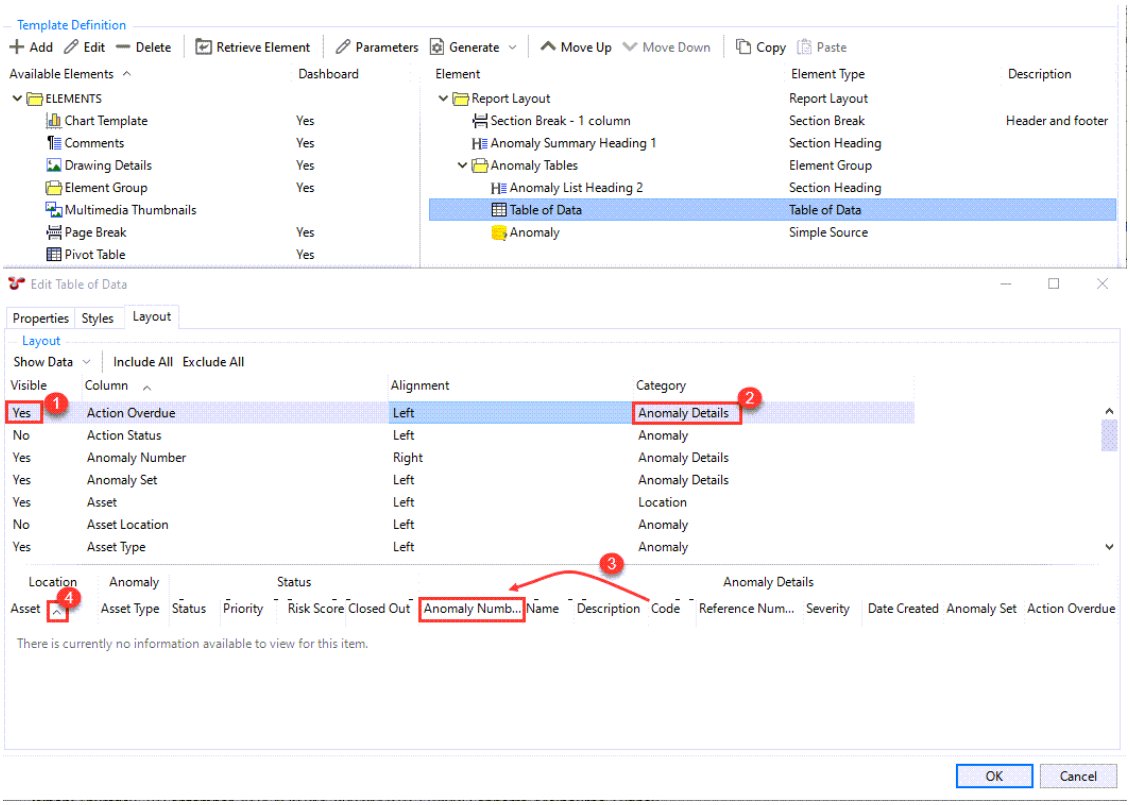
5. Click **OK**. 5



8.2.6.3.4.15 4. Insert a Table of Data element for Anomaly Listing.

1. Add a **Table of Data** element to the **Report Layout** structure so that it is included within the **Anomaly Tables** element group and it is below the Section Heading element.
2. Double-click the element in the structure to edit it.
3. On the **Properties** tab, make settings as follows:
   - **Name**: Enter *Anomaly Listing*
   - **Description**: Enter a descriptive text, such as *List of anomalies from Anomaly table*
   - Tick the following checkboxes:
     - **Show Caption**
     - **Fit Window**
     - **Hide Columns with No Values**
   - **Source**: Select the **Anomaly** source from the drop-down list. The available values in this field are retrieved from the sources that have been created under the current element group.
4. On the **Layout** tab, make settings for the column visibility, the category into which a column is assigned to and the layout as follows:

- Change the visibility of the **Action Overdue** column to *Yes* and the **Assigned To** column to *No* by changing the respective values in the **Visible** column. This will ensure that the table will include the **Action Overdue** column, but it will not include the **Assigned To** column in the output. 1
- Change the category of the **Action Overdue** column to **Anomaly Details**. You can do that by directly overwriting the current value in the **Category** column. This will change the category in the layout of the table in the RTF and HTML output. Categories are not visible in the Excel output. 2
- At the bottom of the tab, you can see the layout of the table as it will appear in the output. Drag the **Anomaly Number** column before the **Name** column so that it appears as the first column within the **Anomaly Details** category. 3
- Click the **Asset** column title. You can see that an arrow appears next to the column title. It indicates that the rows of the table will be sorted based on the values of the **Asset** column. 4



5. Click **OK**.

8.2.6.3.4.16 5. Apply a colour to specific rows of the table.

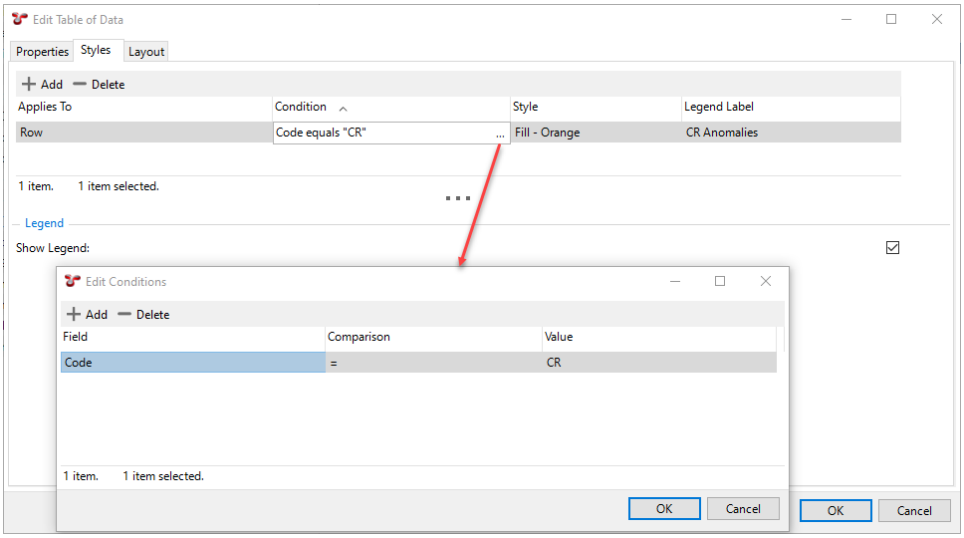
In the table of data, you want to highlight each row that contains an anomaly with the code *CR (Crack)* with orange colour. To do that, proceed as follows:

1. Double-click the Table of Data element in the structure to edit it again.
2. Go to the **Styles** tab.
3. Choose **Add**.
4. In the **Applies To** column, select *Row*.

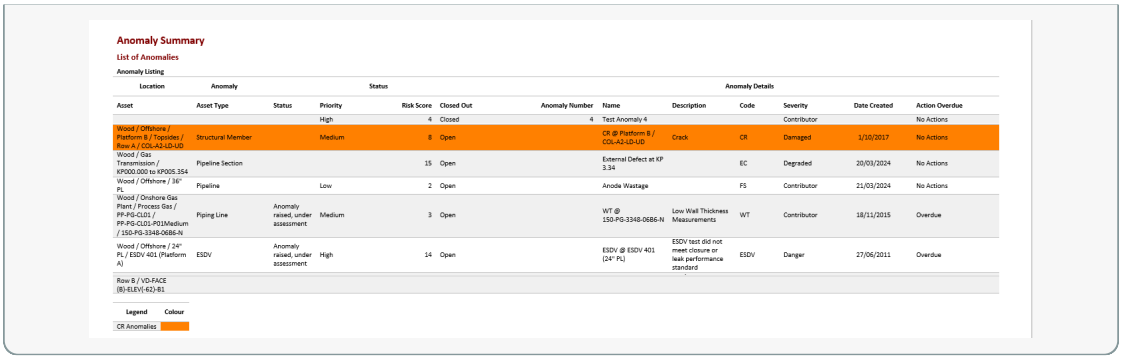
5. Double-click in the **Conditions** column and click the ellipsis [...], which opens the **Edit Conditions** dialog.
6. In that dialog, choose **Add**.
7. Double-click in the respective columns to make the following settings:
   - **Field** column: Select the *Code* field
   - **Comparison** column: Select =
   - **Value** column: Click the ellipsis [...] and select *CR* (*Crack*).
8. Click **OK**.
9. Back on the **Styles** tab, in the **Style** column, select *Fill – Orange* to change the colour of the row to orange.

> **Note**
>
> The available styles are preconfigured. You can adjust or create new styles as described in *Set Up Styles for Report Templates*

10. In the **Legend Label** column, enter *CR Anomalies*. The orange colour and this text will be added as a legend at the bottom of the table.
11. Click **OK**.



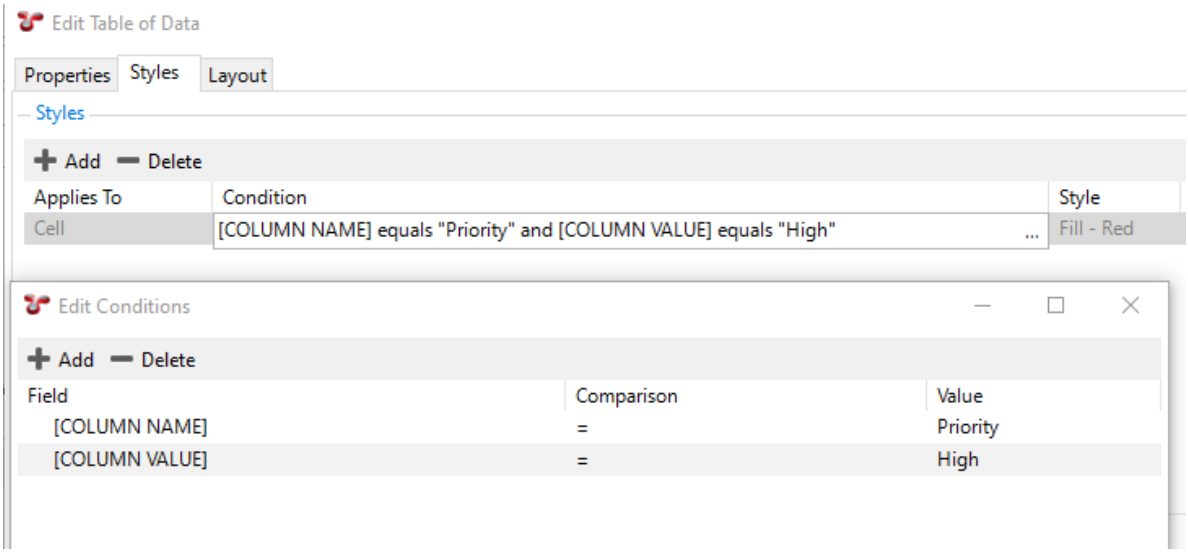
> **Result**
>
> In the output, the row of the anomaly with the code CR is now highlighted with orange colour and a legend is added at the bottom of the table:



8.2.6.3.4.17 6. Apply a colour to specific cells of the table.

Now, we want to highlight cells where the **Priority** column value is *High* with red colour. Still in the **Edit Table of Data** dialog for the **Anomaly Listing** table of data, proceed as follows:

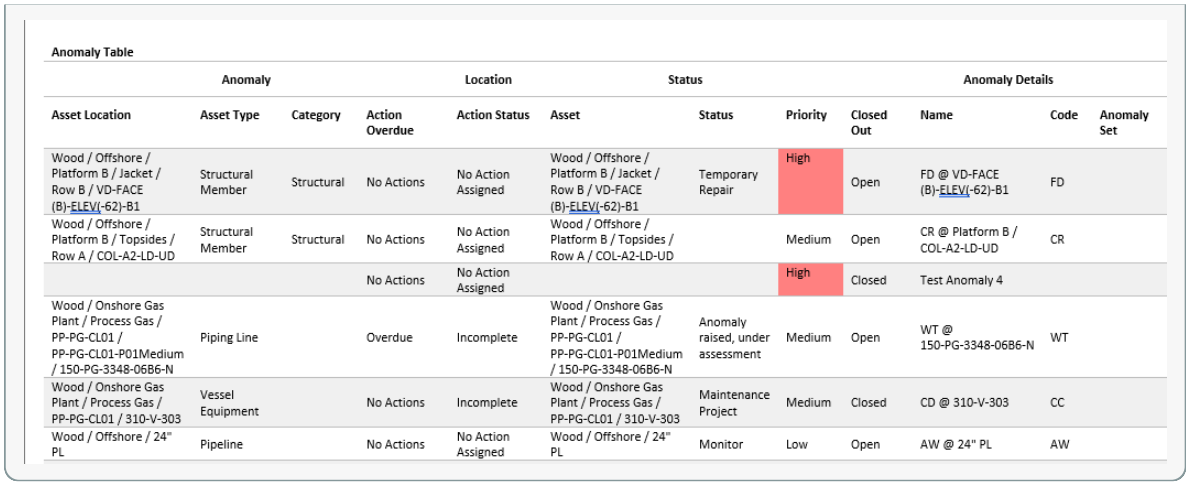
1. On the **Styles** tab page, click **Add**.
2. In the **Applies To** column, select *Cell* from the drop-down list.
3. Double-click in the **Conditions** column and click the ellipsis ..., which opens the **Edit Conditions** dialog.
4. Add two conditions, one for the *COLUMN NAME* field that equals to *Priority* and one for the *COLUMN VALUE* field that equals to *High*:



5. Click **OK**.
6. Back on the **Styles** tab, in the **Style** column, select the *Fill - Red* style.
7. In the **Legend Label** column, enter *High Priority Anomalies*. The red colour and this text will be added as a legend at the bottom of the table.
8. Click **OK**.

Result

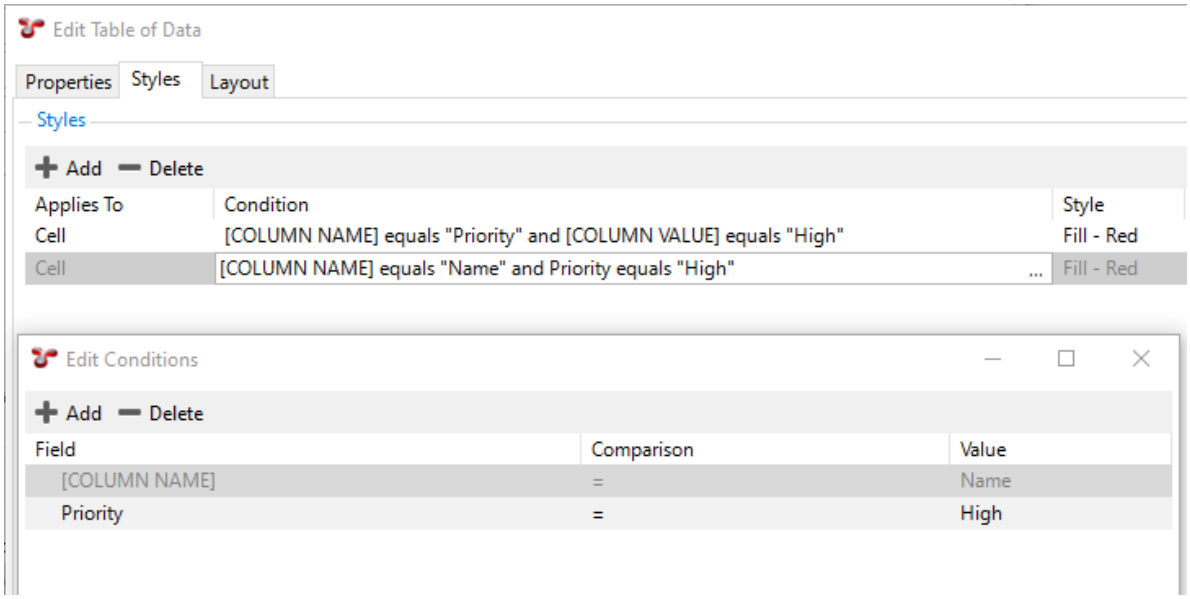
When you generate the output, in the **Priority** column, cells with the value *High* will be highlighted by red:



Anomaly Table

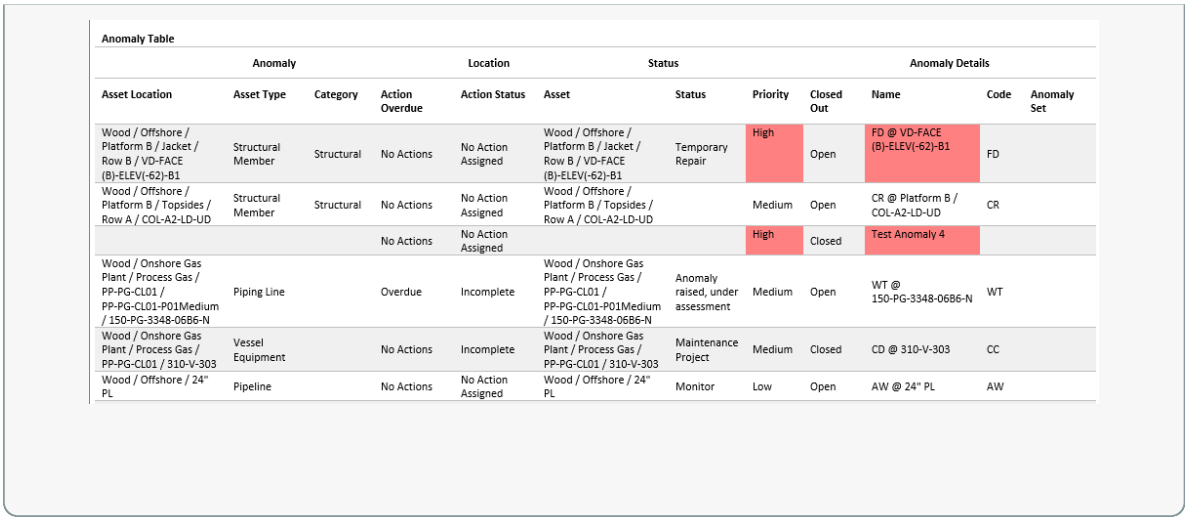
Anomaly					Location		Status		Anomaly Details		
Asset Location	Asset Type	Category	Action Overdue	Action Status	Asset	Status	Priority	Closed Out	Name	Code	Anomaly Set
Wood / Offshore / Platform B / Jacket / Row B / VD-FACE (B)-ELEV(-62)-B1	Structural Member	Structural	No Actions	No Action Assigned	Wood / Offshore / Platform B / Jacket / Row B / VD-FACE (B)-ELEV(-62)-B1	Temporary Repair	High	Open	FD @ VD-FACE (B)-ELEV(-62)-B1	FD	
Wood / Offshore / Platform B / Topsides / Row A / COL-A2-LD-UD	Structural Member	Structural	No Actions	No Action Assigned	Wood / Offshore / Platform B / Topsides / Row A / COL-A2-LD-UD		Medium	Open	CR @ Platform B / COL-A2-LD-UD	CR	
			No Actions	No Action Assigned			High	Closed	Test Anomaly 4		
Wood / Onshore Gas Plant / Process Gas / PP-PG-CL01 / PP-PG-CL01-P01Medium / 150-PG-3348-06B6-N	Piping Line		Overdue	Incomplete	Wood / Onshore Gas Plant / Process Gas / PP-PG-CL01 / PP-PG-CL01-P01Medium / 150-PG-3348-06B6-N	Anomaly raised, under assessment	Medium	Open	WT @ 150-PG-3348-06B6-N	WT	
Wood / Onshore Gas Plant / Process Gas / PP-PG-CL01 / 310-V-303	Vessel Equipment		No Actions	Incomplete	Wood / Onshore Gas Plant / Process Gas / PP-PG-CL01 / 310-V-303	Maintenance Project	Medium	Closed	CD @ 310-V-303	CC	
Wood / Offshore / 24" PL	Pipeline		No Actions	No Action Assigned	Wood / Offshore / 24" PL	Monitor	Low	Open	AW @ 24" PL	AW	

9. Let's say that you also want to highlight the **Asset Name** cell for the items that have the **Priority** value *High*. In this case, follow the process above except that you create one condition for the *COLUMN NAME* field that equals to *Name* and one for the **Priority** field that equals to *High*:



Result

In this case, when you generate the output, the corresponding *Name* cell will be highlighted with red too:



Anomaly Table

Anomaly					Location	Status			Anomaly Details		
Asset Location	Asset Type	Category	Action Overdue	Action Status	Asset	Status	Priority	Closed Out	Name	Code	Anomaly Set
Wood / Offshore / Platform B / Jacket / Row B / VD-FACE (B)-ELEV(-62)-B1	Structural Member	Structural	No Actions	No Action Assigned	Wood / Offshore / Platform B / Jacket / Row B / VD-FACE (B)-ELEV(-62)-B1	Temporary Repair	High	Open	FD @ VD-FACE (B)-ELEV(-62)-B1	FD	
Wood / Offshore / Platform B / Topsides / Row A / COL-A2-LD-UD	Structural Member	Structural	No Actions	No Action Assigned	Wood / Offshore / Platform B / Topsides / Row A / COL-A2-LD-UD		Medium	Open	CR @ Platform B / COL-A2-LD-UD	CR	
			No Actions	No Action Assigned			High	Closed	Test Anomaly 4		
Wood / Onshore Gas Plant / Process Gas / PP-PG-CL01 / PP-PG-CL01-P01Medium / 150-PG-3348-06B6-N	Piping Line		Overdue	Incomplete	Wood / Onshore Gas Plant / Process Gas / PP-PG-CL01 / PP-PG-CL01-P01Medium / 150-PG-3348-06B6-N	Anomaly raised, under assessment	Medium	Open	WT @ 150-PG-3348-06B6-N	WT	
Wood / Onshore Gas Plant / Process Gas / PP-PG-CL01 / 310-V-303	Vessel Equipment		No Actions	Incomplete	Wood / Onshore Gas Plant / Process Gas / PP-PG-CL01 / 310-V-303	Maintenance Project	Medium	Closed	CD @ 310-V-303	CC	
Wood / Offshore / 24" PL	Pipeline		No Actions	No Action Assigned	Wood / Offshore / 24" PL	Monitor	Low	Open	AW @ 24" PL	AW	

Note

To add/edit/delete styles that you can apply, go back to the **Configuration - Templates** dialog and choose the *Styles* toolbar button.

Proceed to Next Step

8.2.6.3.4.18 Create Table of Data for Anomaly Actions, Use Style Prefix

In this step, you create a Table of Data to list the anomaly actions and you want to use a Style Prefix to apply a specific colour to even rows.

For that, you create the following:

- A level-2 Section Heading to be included in the output before the table
- A Simple Source for the **Anomaly Actions** system table, from which the Table of Data can retrieve data
- The actual table of data for the Anomaly Actions applying a Style Prefix to it

See the detailed steps below:

1. *Insert a level-2 Section Heading for the list of anomaly actions.*
2. *Insert a Simple Source for Anomaly Actions.*
3. *Insert a Table of Data element for Anomaly Actions.*
4. *Create a new style for even rows.*
5. *Apply the New style prefix to your Table of Data.*

8.2.6.3.4.19 Prerequisites

You have completed the following steps:

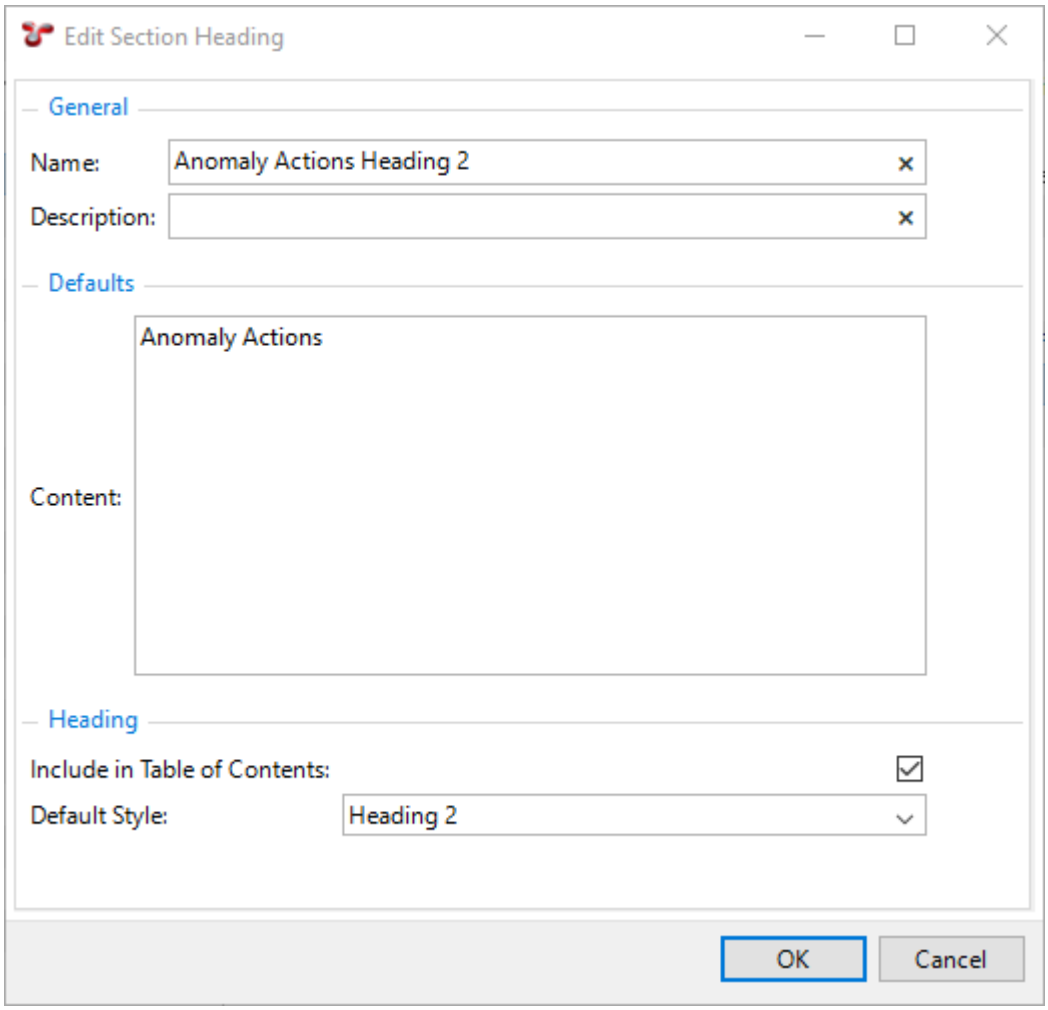
- *Create Template, Set Layout, Add Header, Footer, Title*
- *Create Table of Data for Anomaly List, Apply Styles*

8.2.6.3.4.20 Process

In this example, you work in the same **Anomaly Tables** Element Group that you have created in the previous step.

8.2.6.3.4.21 1. Insert a level-2 Section Heading for the list of anomaly actions.

1. Add a **Section Heading** element to the **Report Layout** structure so that it is included within the **Anomaly Tables** element group.
2. Double-click the element in the structure to edit it.
3. Enter a name that identifies the element in the structure, for example, *Anomaly List Heading 2*. This text does not appear in the actual report output.
4. Enter the text of the heading that you want to see in the output in the **Content** field. This time, we just want to use the heading *Anomaly Actions*, but you can use right-click in this field if you want to add a variable.
5. Select the **Include in Table of Contents** checkbox to have this section heading appear in the Table of Contents.
6. In the **Default Style** field, select **Heading 2**, which is a preconfigured style that can be applied for level-2 section headings. If required, you can set up your own style and apply that instead (see *Styles*).
7. Click **OK**.



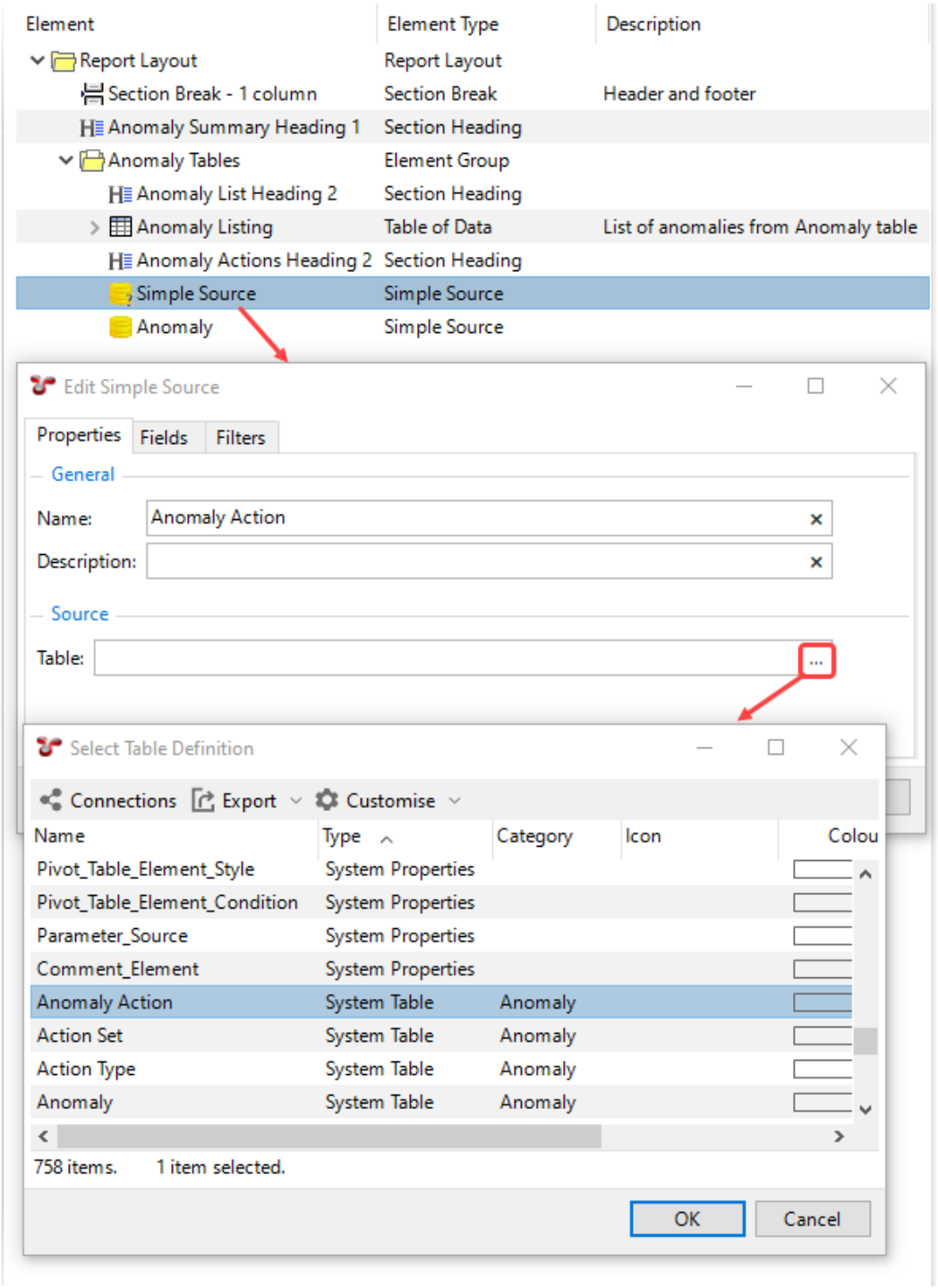
8.2.6.3.4.22 2. Insert a Simple Source for Anomaly Actions.

This simple source will be used as the data source for the anomaly actions Table of Data that we are going to create.

1. Add a **Simple Source** element to the **Report Layout** structure so that it is included within the **Anomaly Tables** element group. The **Simple Source** element is located under the **SOURCES** node within the **Template Definition** section of the dialog.

> **Note**
>
> You must insert the simple source within the element group, else, you cannot refer to it from the other elements of the element group.

2. Double-click the Simple Source element in the structure to edit it.
3. Specify the name *Anomaly Action** for the simple source.
4. In the **Table** field, click the ellipsis ... to select the System Table **Anomaly Action**.
5. Click **OK**.

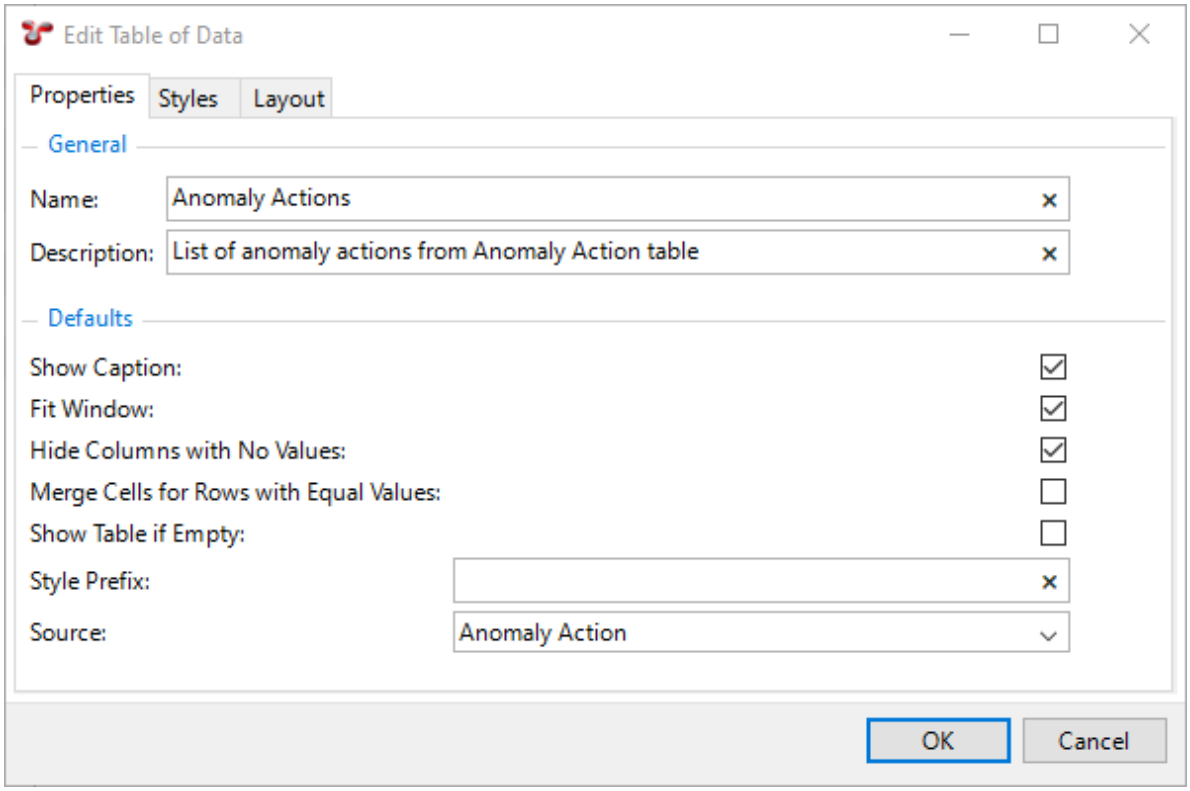


8.2.6.3.4.23 3. Insert a Table of Data element for Anomaly Actions.

1. Add a **Table of Data** element to the **Report Layout** structure so that it is included within the **Anomaly Tables** element group and it is below the Section Heading element that you created for Anomaly Actions.
2. Double-click the element in the structure to edit it.
3. On the **Properties** tab, make settings as follows:

- **Name**: Enter *Anomaly Actions*
- **Description**: Enter a descriptive text, such as *List of anomaly actions from Anomaly Action table*
- Tick the following checkboxes:
  - **Show Caption**
  - **Fit Window**
  - **Hide Columns with No Values**
- **Source**: Select the **Anomaly Action** source from the drop-down list. The available values in this field are retrieved from the sources that have been created under the current element group.

4. On the **Layout** tab, you can hide columns or rearrange the layout as required, see the previous example for more information.
5. Click **OK**.



8.2.6.3.4.24 4. Create a new style for even rows.

The default colour for odd rows is white and for even rows, it is grey. In this example, you want to change the colour of even rows to light blue. To do that, follow the steps below:

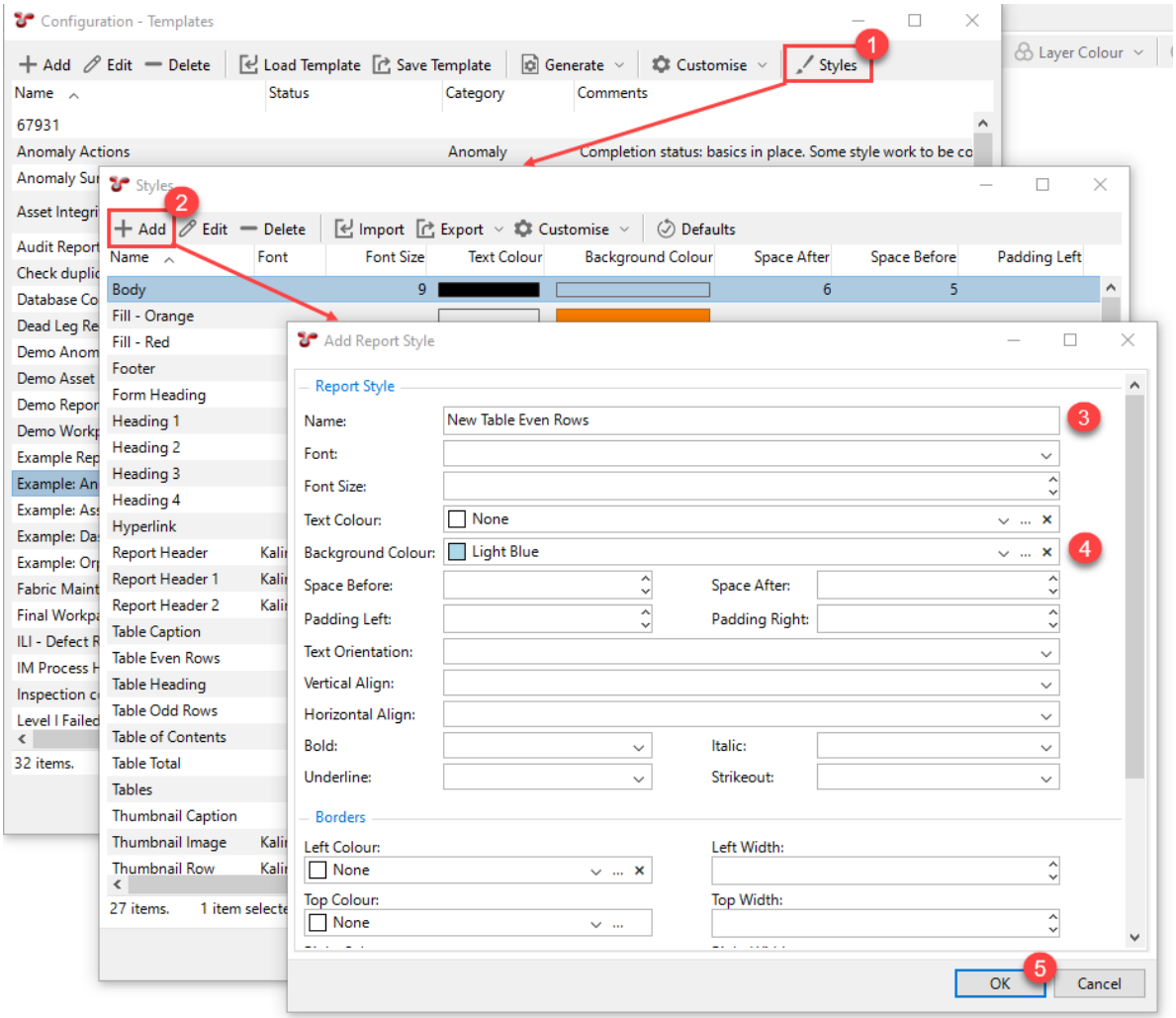
1. Click **OK** to save your changes to the report template and go back to the **Configuration - Templates** dialog.
2. Choose the **Styles** toolbar button. 1
3. Choose **Add** to define a new style for even rows. 2
4. Specify a name, which includes the name of the default style plus a prefix, for example, “New Table Even Rows”. 3

In this case, the prefix is “New” and “Table Even Rows” is the same as the name of the default style.

5. In the properties of the “New Table Even Rows” style, change the **Background Colour** field value to a light blue colour. 4

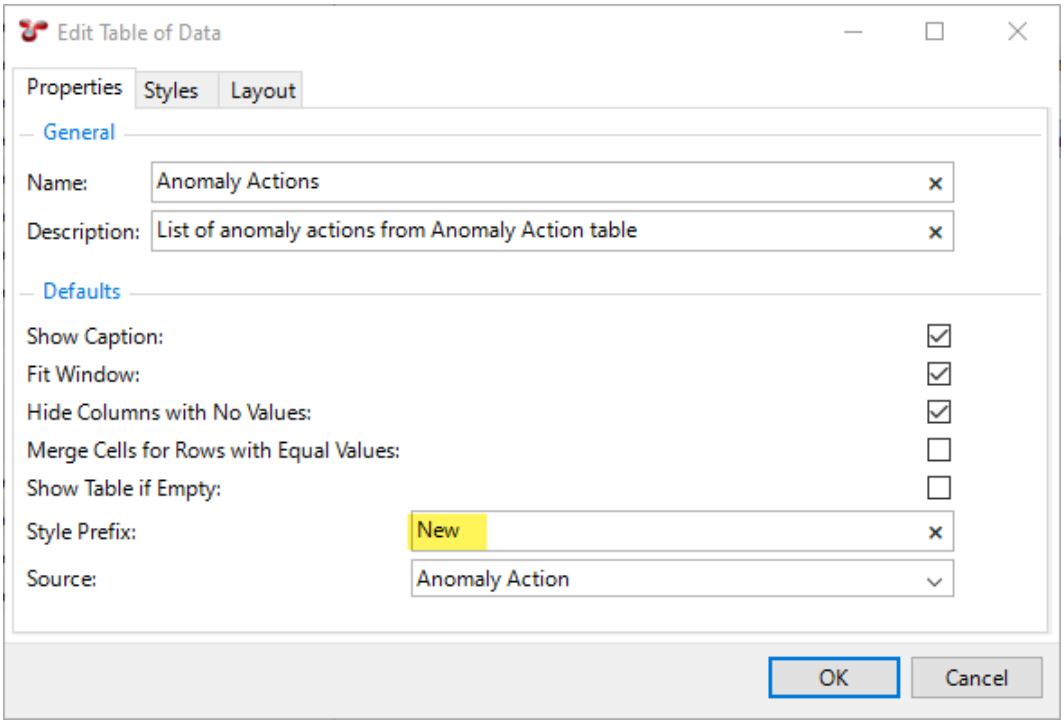
   If you do not change the other values, the default “Table Even Rows” style will be applied for the rest of the settings.

6. Click **OK**. 5



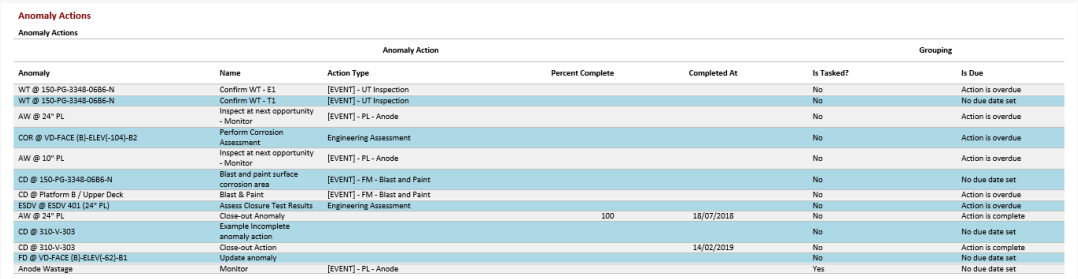
8.2.6.3.4.25 5. Apply the New style prefix to your Table of Data.

1. Double-click your report template to edit it again.
2. Edit the **Anomaly Actions** Table of Data, to which you want to apply the new style (double-click it or select it and choose **Edit**).
3. Enter **New** in the **Style Prefix** field.
4. Click **OK**.



Result

When you generate the output, it now contains the table with the new style:



Anomaly Actions

Anomaly Actions

		Anomaly Action				Grouping
Anomaly	Name	Action Type	Percent Complete	Completed At	Is Tasked?	Is Due
WT @ 150-PG-3348-06B6-N	Confirm WT - E1	[EVENT] - UT Inspection			No	Action is overdue
WT @ 150-PG-3348-06B6-N	Confirm WT - T1	[EVENT] - UT Inspection			No	No due date set
AW @ 24" PL	Inspect at next opportunity - Monitor	[EVENT] - PL - Anode			No	Action is overdue
COR @ VD-FACE (B)-ELEV(-104)-B2	Perform Corrosion Assessment	Engineering Assessment			No	Action is overdue
AW @ 10" PL	Inspect at next opportunity - Monitor	[EVENT] - PL - Anode			No	Action is overdue
CD @ 150-PG-3348-06B6-N	Blast and paint surface corrosion area	[EVENT] - FM - Blast and Paint			No	No due date set
CD @ Platform B / Upper Deck	Blast & Paint	[EVENT] - FM - Blast and Paint			No	Action is overdue
ESDV @ ESDV 401 (24" PL)	Assess Closure Test Results	Engineering Assessment			No	Action is overdue
AW @ 24" PL	Close-out Anomaly		100	18/07/2018	No	Action is complete
CD @ 310-V-303	Example Incomplete anomaly action				No	No due date set
CD @ 310-V-303	Close-out Action			14/02/2019	No	Action is complete
FD @ VD-FACE (B)-ELEV(-62)-B1	Update anomaly				No	No due date set
Anode Wastage	Monitor	[EVENT] - PL - Anode			Yes	No due date set

Proceed to Next Step

8.2.6.3.4.26 Add Page Break, Charts of Templates

In this step, you create a Charts of Templates that show data regarding your anomalies. You want to display the two charts next to each other, in two columns. For that, you create the following:

- An Element Group to include all the Chart Templates
- A level-2 Section Heading to be included in the output before the charts
- A Simple Source for the **Anomaly** system table, from which the Chart Templages can retrieve data
- The actual chart templates

See the detailed steps below:

1. *Insert an Element Group for the charts.*
2. *Add a Page Break element to place the charts on a new page and set up its layout.*
3. *Insert a level-2 Section Heading for the charts.*
4. *Insert a Simple Source for Anomalies.*
5. *Insert a Chart Template for Anomalies By Severity (by Year)*
6. *Insert a Chart Template for Anomalies -v- Code*

8.2.6.3.4.27 Prerequisites

You have completed the following steps:

- *Create Template, Set Layout, Add Header, Footer, Title*

8.2.6.3.4.28 Process

8.2.6.3.4.29 1. Insert an Element Group for the charts.

This element will contain the charts that we're going to create.

1. Add an **Element Group** element to the **Report Layout** structure. It should be on the same level as the element group you created for the table of data.

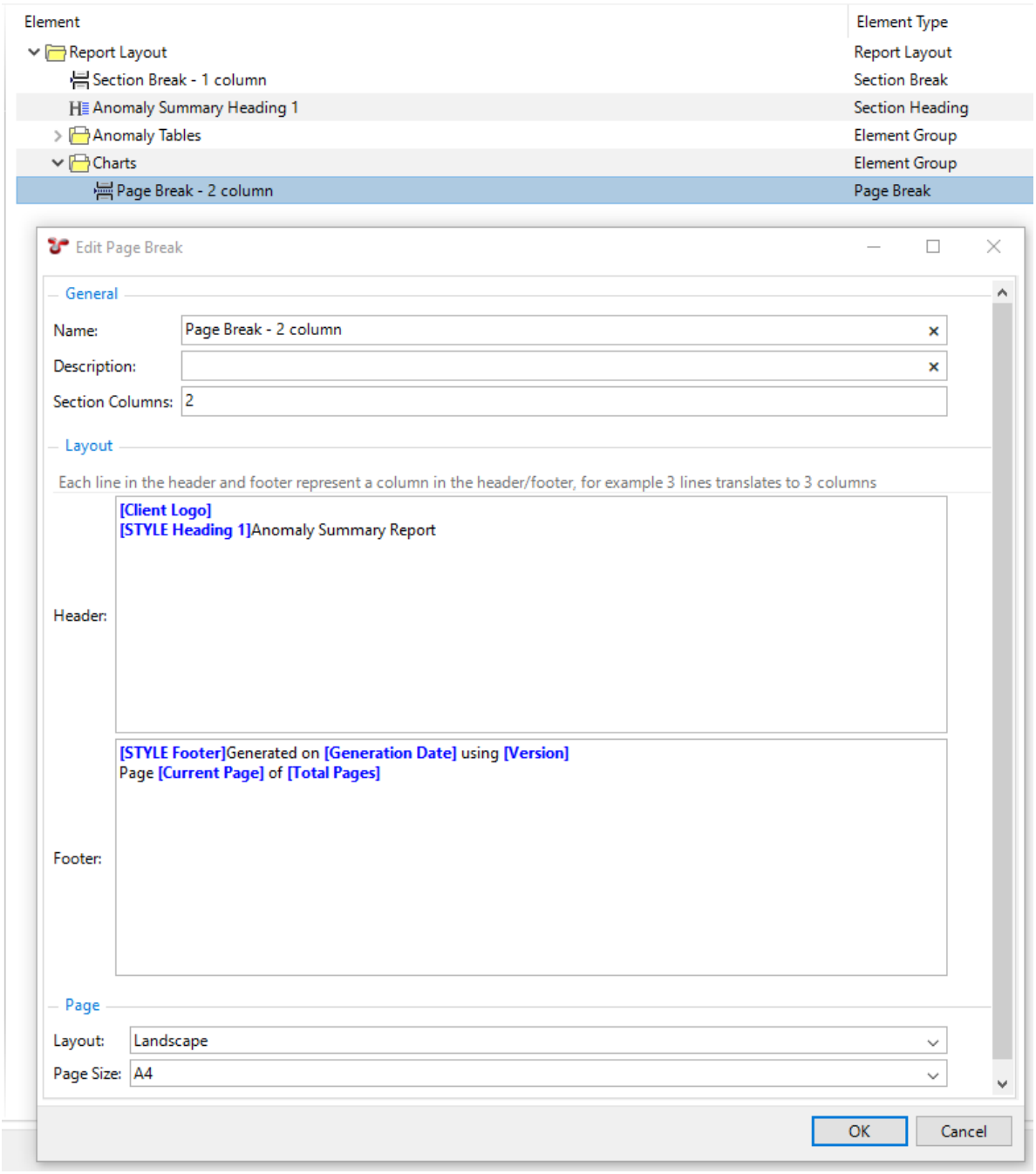
   > **Tip**
   >
   > If the element is not inserted to the right location in the element structure, use the **Move Up** or **Move Down** buttons in the toolbar to move them to the correct place.

2. Double-click the element in the structure to edit it.
3. Enter the name *Charts*, which will identify the element in the structure. You do not need to make other settings for the element group right now.
4. Click **OK**.

8.2.6.3.4.30 2. Add a Page Break element to place the charts on a new page and set up its layout.

You want the charts to appear on a new page and next to each other in two columns. To do that, proceed as follows:

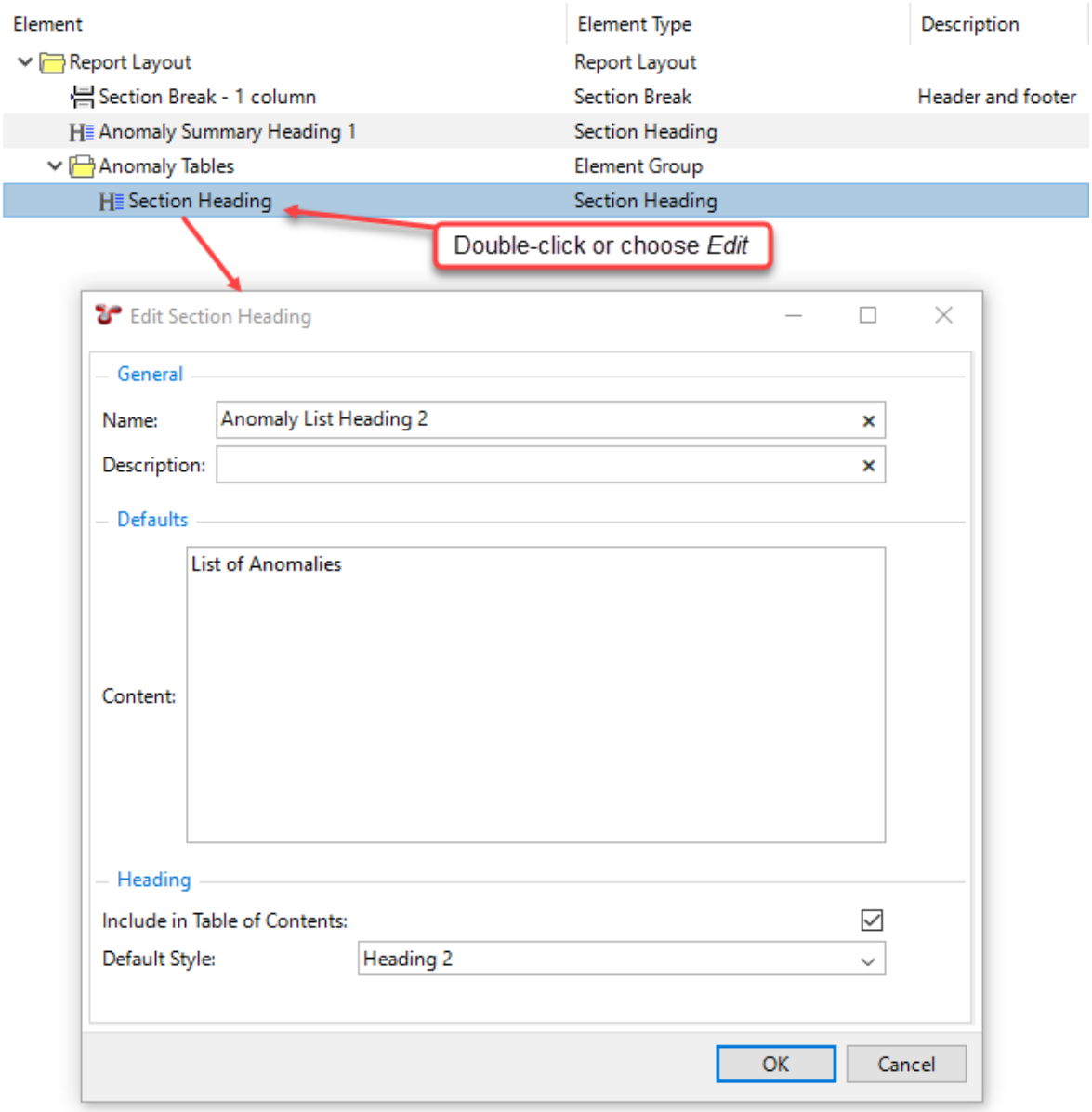
1. Add a **Page Break** element to the **Report Layout** structure so that it is included within the **Charts** element group.
2. Double-click the element in the structure to edit it.
3. Enter a name that identifies the element in the structure, for example, *Page Break - 2 column*.
4. In the **Section Columns** field, enter *2*.
5. In the **Header** and **Footer** fields, enter the same values that you used for the Section Break above, so that they are the same on the new page.
6. Under **Page**, select the *Landscape* for the **Layout** and *A4* for **Page Size**.
7. Click **OK**.



8.2.6.3.4.31 3. Insert a level-2 Section Heading for the charts.

1. Add a **Section Heading** element to the **Report Layout** structure so that it is included within the **Charts** element group.
2. Double-click the element in the structure to edit it.
3. Enter a name that identifies the element in the structure, for example, *Charts Heading 2*. This text does not appear in the actual report output.
4. Enter the text of the heading that you want to see in the output in the **Content** field. This time, we just want to use the heading *Anomaly Charts*, but you can use right-click in this field if you want to add a variable.

5. Select the **Include in Table of Contents** checkbox to have this section heading appear in the Table of Contents.
6. In the **Default Style** field, select **Heading 2**, which is a preconfigured style that can be applied for level-2 section headings. If required, you can set up your own style and apply that instead (see *Styles*).
7. Click **OK**.



8.2.6.3.4.32 4. Insert a Simple Source for Anomalies.

This simple source will be used as the data source for the chart templates that we are going to create. To do this, follow the same steps as described in *3. Insert a Simple Source for Anomalies.*, but insert the simple source within the **Charts** element group.

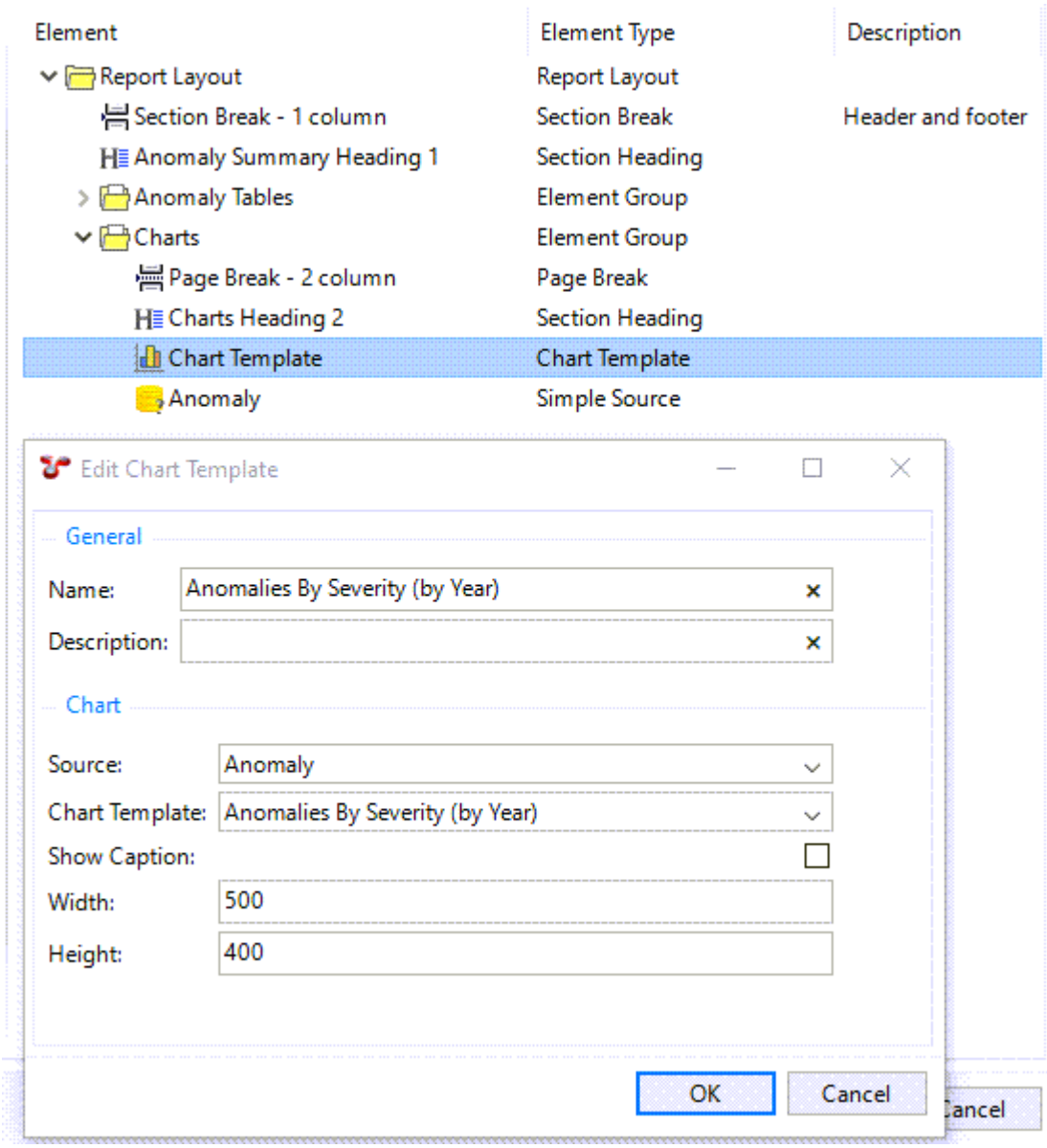
1. Add a **Simple Source** element to the **Report Layout** structure so that it is included within the **Charts** element group. The **Simple Source** element is located under the **SOURCES** node within the **Template Definition** section of the dialog.

> **Note**
>
> You must insert the simple source within the element group, else, you cannot refer to it from the other elements of the element group.

2. Double-click the Simple Source element in the structure to edit it.
3. Specify the name *Anomaly** for the simple source.
4. In the **Table** field, click the ellipsis ... to select the System Table **Anomaly**.
5. Click **OK**.

8.2.6.3.4.33 5. Insert a Chart Template for Anomalies By Severity (by Year)

1. Add a **Chart Template** element to the **Report Layout** structure so that it is included within the **Charts** element group.
2. Double-click the element in the structure to edit it.
3. Enter data as follows:
   - **Name**: Enter *Anomalies By Severity (by Year)* or any name that identifies the element in the structure.
   - **Source**: Select *Anomaly* source
   - **Chart Template**: Select *Anomalies By Severity (by Year)*. The available chart templates in the drop-down list are determined by the system by checking which chart templates refer to the table that you selected as a source above. You can only select from those chart templates that have a reference to the source that you selected (for example, they use data from that table for one of their axes).
   - **Width**: *500*
   - **Height**: *400*



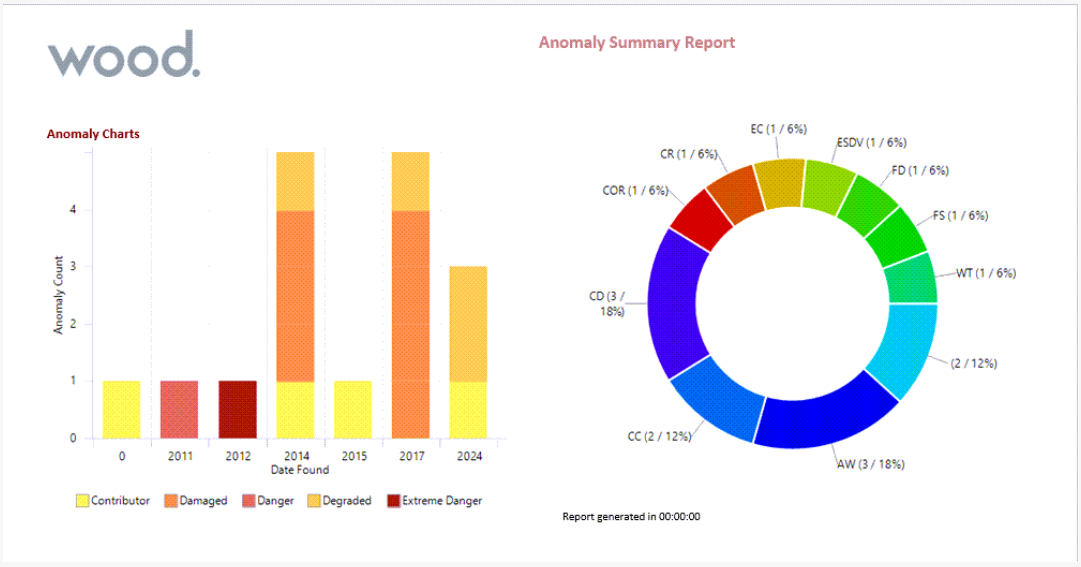
8.2.6.3.4.34 6. Insert a Chart Template for Anomalies -v- Code

Follow the same process as in the previous step to insert another chart template but with the following data:

- **Name**: Enter *Anomalies -v- Code* or any name that identifies the element in the structure.
- **Source**: Select *Anomaly* source
- **Chart Template**: Select *Anomalies -v- Code*.
- **Width**: *500*
- **Height**: *400*

Result

When you generate the output, you can see that the chart templates are inserted next to each other in two columns:



Proceed to Next Step

8.2.6.3.4.35 Insert Table of Contents, Verify Output

In this step, you insert a Table of Contents element and check if the output complies with your requirements.

See the detailed steps below:

1. *Insert a Table of Contents element.*
2. *Generate an output to check the final output of the report.*

8.2.6.3.4.36 Prerequisites

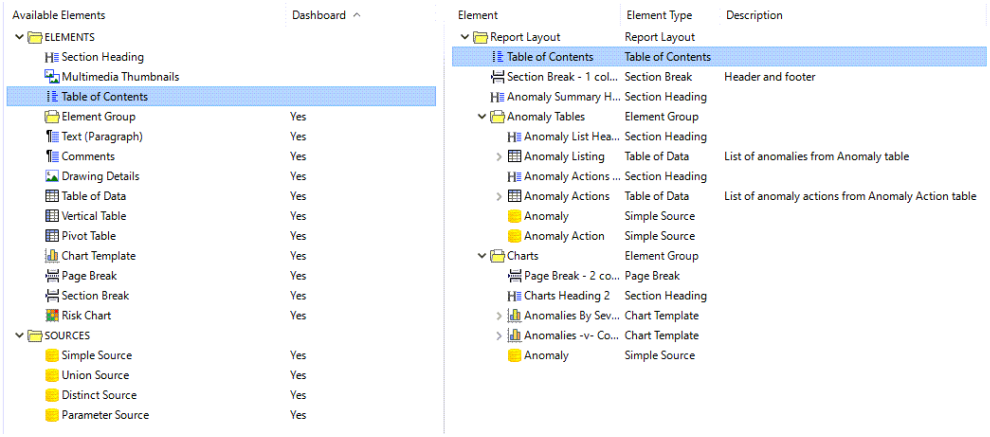
You have completed the following steps:

- *Create Template, Set Layout, Add Header, Footer, Title*
- *Create Table of Data for Anomaly List, Apply Styles*
- *Create Table of Data for Anomaly Actions, Use Style Prefix*
- *Add Page Break, Charts of Templates*

8.2.6.3.4.37 Process

8.2.6.3.4.38 1. Insert a Table of Contents element.

Drag the Table of Contents element or select it and choose **Add** to insert it in the **Report Layout** structure. Ensure that it is the first node within the structure:



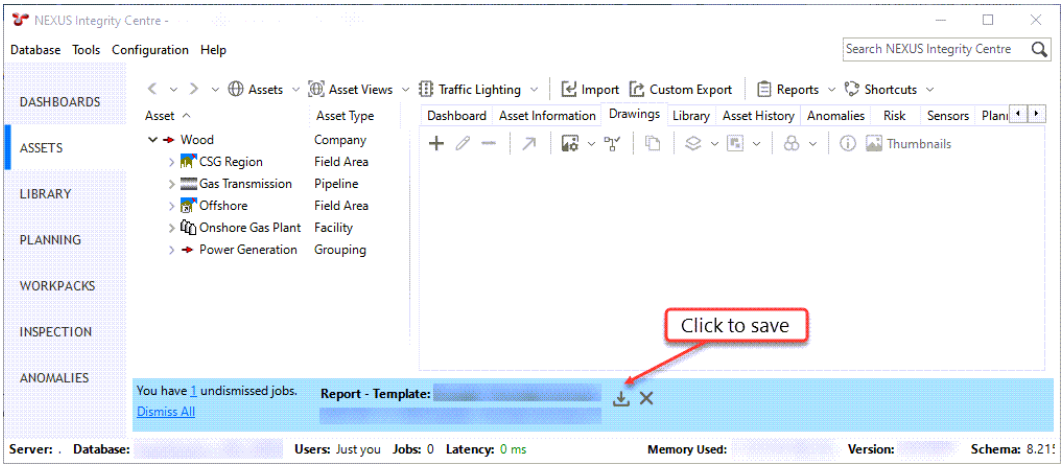
Note

- The Table of Contents element is applicable only to RTF and HTML outputs.
- The formatting of the Table of Contents element depends on your settings for the elements starting with *TOC* in your generic report style configurations (see *Styles*). You can adjust the look of each heading level as required. For example, for Heading 2 in the TOC, you edit the style TOC Heading 2 and add a left padding value “30”.
- In the RTF output, you must right-click and update the table of contents to ensure that page numbers appear correctly.

8.2.6.3.4.39 2. Generate an output to check the final output of the report.

To generate the output, proceed as follows:

1. In the **Edit Report Template** dialog, choose **OK** to close the dialog and save your changes.
2. Back in the **Configuration - Templates** dialog, select the report template and choose the **Generate** toolbar button.
3. Select the required output format from the drop-down, which can be either RTF, HTML, Microsoft Excel or PDF.
4. Select a report destination, which, in this case, will be **File**.
5. Choose **Commit**.
6. Close the **Configuration - Templates** dialog.
7. Wait until the report output is generated. The progress is indicated at the bottom of the main **NEXUS IC** screen.
8. Once the generation is complete, click the *Save* icon to download and save the report.



9. Select the destination and open the file.
10. If you generated an RTF output, right-click the Table of Contents and choose **Update Field** to ensure that page numbers appear correctly.
11. Review the report to verify it meets your expectations.

8.2.6.3.4.40 Example: Set Up Asset Integrity Report Template

In this example, we create a report template called “Asset Integrity Report”, which demonstrates the usage of the following report template elements:

- Element group with looping
- Simple source with filters, additional fields
- Vertical table
- Risk chart
- Multimedia
- Selection parameters

This example guides you through the following steps:

1. *Create Template, Set Layout, Add Title*
2. *Create Simple Source with Filters and Looping Element Group*
3. *Create Section Heading, Vertical Table with Extended Simple Source*
4. *Add Risk Charts with Element Group, Page Break, Section Heading*
5. *Add Multimedia Thumbnails with Element Group, Page Break, Section Heading*
6. *Insert Table of Contents, Configure Selection Parameters, Verify Output*

8.2.6.3.4.41 Create Template, Set Layout, Add Title

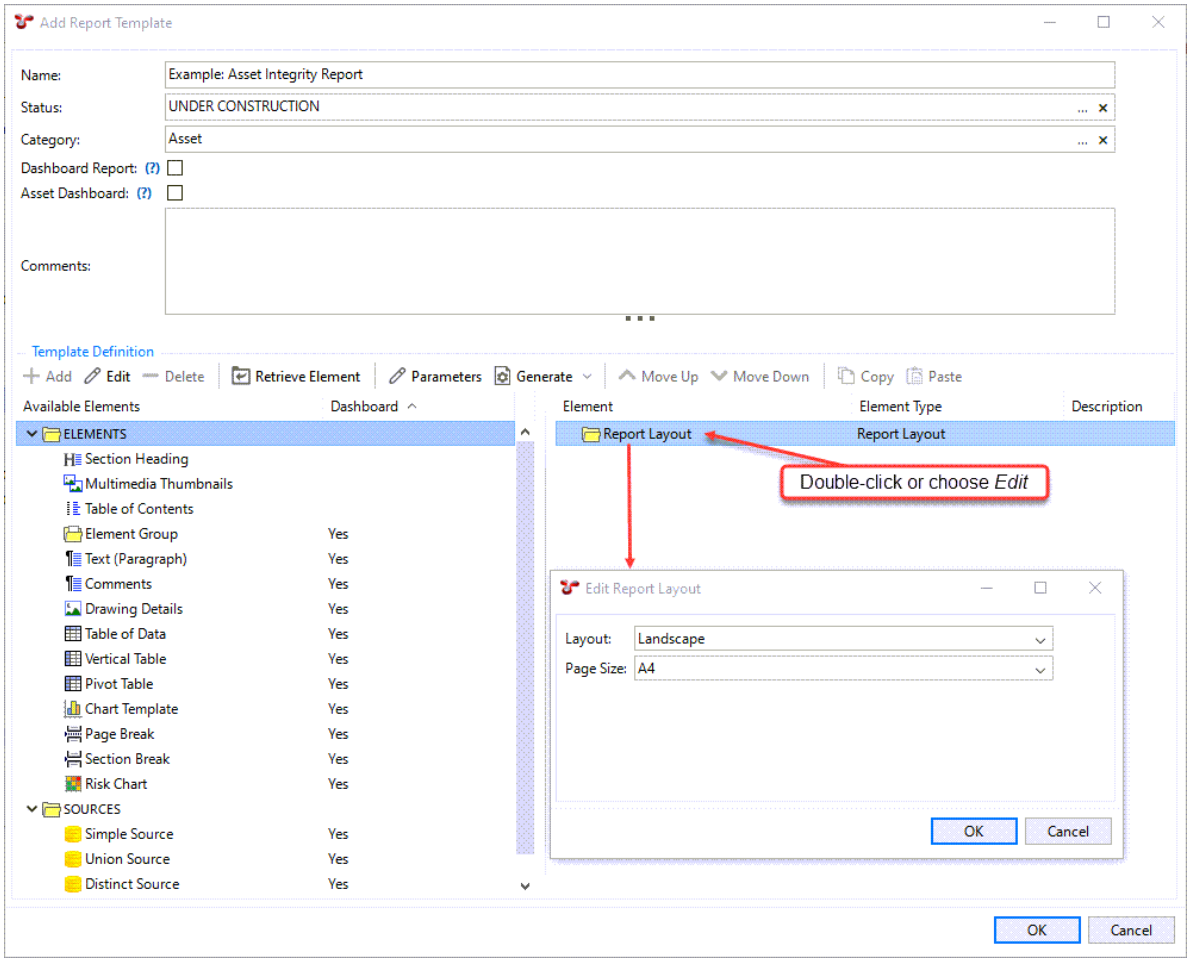
As a first step, you create the report template, set up its size and layout and add a Section Heading to add a title. See the detailed steps below:

1. *Create a new report template and specify the report layout.*
2. *Add a level-1 Section Heading.*

8.2.6.3.4.42 Process

8.2.6.3.4.43 1. Create a new report template and specify the report layout.

1. In NEXUS IC, choose *Configuration* → *Reports and Dashboards* → *Templates* from the menu.
2. Choose **Add** to create a new report template.
3. In the top half of the **Add Report Template** dialog, specify the name, status and category of the report as follows:
   - **Name**: Enter *Example: Asset Integrity Report*
   - **Status** (optional): Select from the list of preconfigured statuses (see *Configure Report Statuses*), for example, *Under Construction*.
   - **Category** (optional): Select from the list of preconfigured categories (see *Configure Report Categories*), for example, *Asset*.
4. Under the *Template Definition* section of the dialog, configure the size and layout of the report by double-clicking the top **Report Layout** node on the right-hand side of the dialog. In this example, we select layout *Landscape* and page size *A4*.
5. Choose **OK**.



> **Note**
>
> This size and layout settings will prevail until the next page break element, where you can overwrite these settings.

8.2.6.3.4.44 2. Add a level-1 Section Heading.

To add a main title to the report, with Heading 1 style, proceed as follows:

1. Add a **Section Heading** element to the **Report Layout** structure (drag it or select it and choose **Add**).
2. Double-click the element in the structure to edit it.
3. Enter a name that identifies the element in the structure. This text does not appear in the actual report output.
4. Enter the text of the heading that you want to see in the output in the **Content** field. This time, we just want to use the heading *Asset Integrity Report*, but you can use right-click in this field if you want to add a variable.
5. Select the **Include in Table of Contents** checkbox to have this section heading appear in the Table of Contents.
6. In the **Default Style** field, select **Heading 1**, which is a preconfigured style that can be applied for level-1 section headings. If required, you can set up your own style and apply that instead (see *Styles*).
7. Click **OK**.

Proceed to Next Step

8.2.6.3.4.45 Create Simple Source with Filters and Looping Element Group

In our Asset Integrity Report, we want to display some data from the Pipeline AIG for specific assets. For each relevant asset, we want to see a vertical table that shows these pipeline data.

For this, we need an element group that loops on assets and contains a vertical table that retrieves data from the Pipeline AIG. The vertical table will then be filled with pipeline data for each filtered asset one by one when the report is generated.

In this step, you create a looping element group, which is linked to a simple source that filters the relevant assets. You can then create the actual vertical table in the next step.

See the detailed steps below:

1. *Insert a simple source for Asset Location.*
2. *Add an asset tree filter to the Asset Location simple source.*
3. *Add filters for asset name and asset type.*
4. *Insert an element group that loops on assets.*

8.2.6.3.4.46 Prerequisites

You have completed the following step:

- *Create Template, Set Layout, Add Title*

8.2.6.3.4.47 Process

8.2.6.3.4.48 1. Insert a simple source for Asset Location.

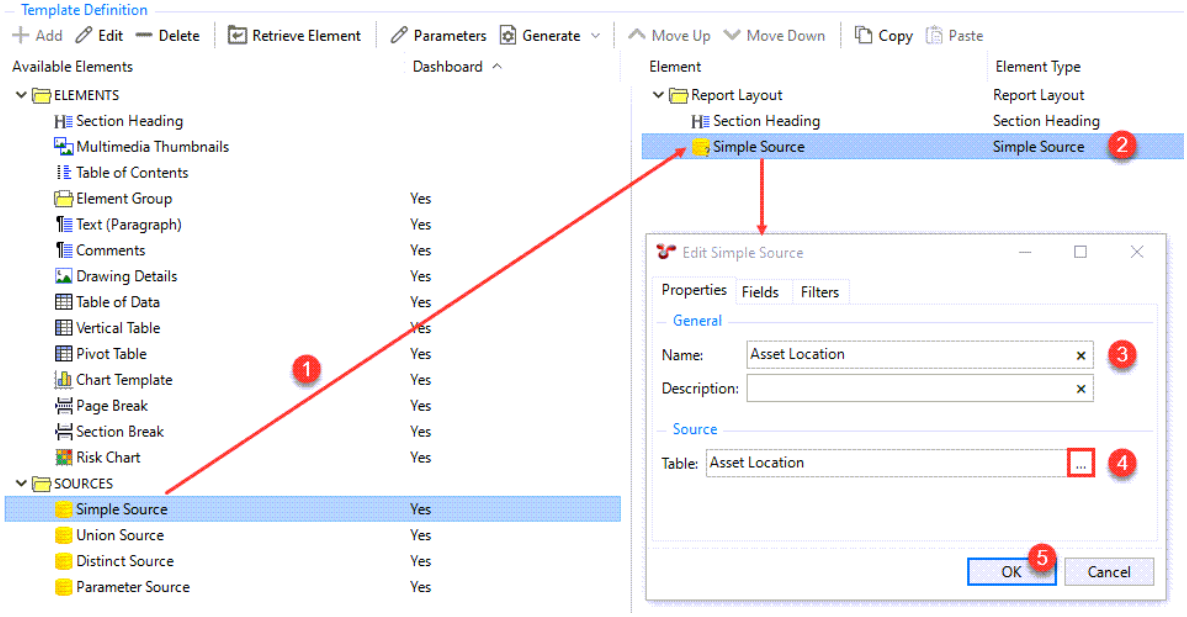
1. Add a **Simple Source** element to the **Report Layout** structure (drag or select it and choose **Add**). The **Simple Source** element is located under the **SOURCES** node within the **Template Definition** section of the dialog. 1

2. Double-click the Simple Source element in the structure to edit it.

3. On the **Properties** tab, specify the name **Asset Location** for the simple source.

4. In the **Table** field, click the ellipsis ... to select the System Table **Asset Location**.

5. Click **OK**.



8.2.6.3.4.49 2. Add an asset tree filter to the Asset Location simple source.

We want to allow the user to filter based on a specific branch of the asset tree. When generating the report, the user will see a selection dialog where they can select the required asset tree branch.

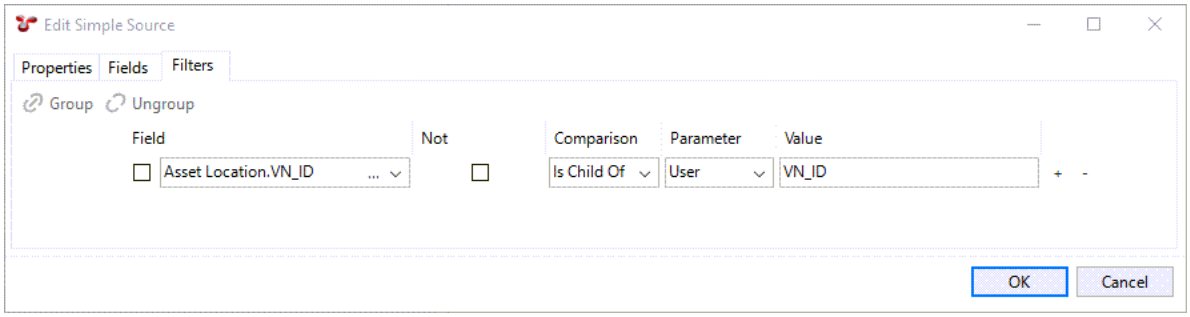
To do that, update the simple source as follows:

1. Double-click the **Asset Location** Simple Source and go to the **Filters** tab.
2. Under **Field**, use the drop-down list to select the **VN_ID** field.

> **Note**
>
> - The drop-down list includes all the fields from the Asset Location table that is linked to this simple source.
> - *VN_ID* is the unique identifier of an asset in the hierarchy. When you select this field, an additional value becomes available under **Comparison**, called *Is Child Of*.

3. Under **Comparison**, choose *Is Child Of*, which allows returning assets under a specific node within the asset tree.
4. Under **Parameter**, select *User*, which indicates that the user has to select the specific VN_ID value when generating the report.
5. Under **Value**, enter *VN_ID*.

6. Choose **OK**.



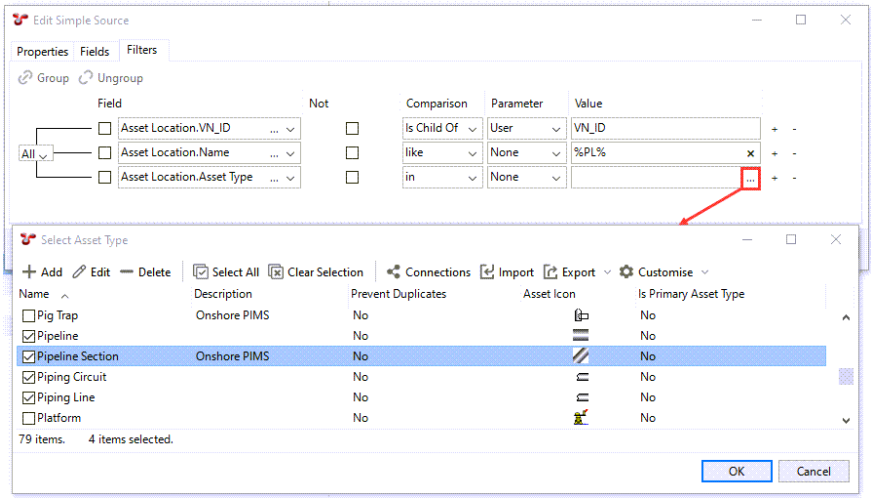
8.2.6.3.4.50 3. Add filters for asset name and asset type.

In addition to the filtering added to the Asset Location simple source above, we want to filter on assets that fulfill **either of** the following criteria:

- They have *PL* in their asset name
- They have the asset type *Pipeline*, *Pipeline Section*, *Piping Circuit* or *Piping Line*

1. Still on the **Filters** tab of the **Edit Simple Source** dialog, click the **+** (plus) sign at the end of the first filter to create a new filter.
2. Specify the following values for the filter:
   - **Field**: Since we want to filter assets that have *PL* in their asset name, select the *Name* field from the drop-down list.
   - **Comparison**: Select *Like*, which is a "contains" operator relevant for alphanumeric fields.
   - **Value**: Enter *%PL%*, which refers to any name that contains PL.

   We now have the second filter set up.
3. Click the **+** (plus) sign at the end of the second filter to create a new filter.
4. Specify the following values for the filter:
   - **Field**: Since we want to filter assets based on their asset type, select the *Asset Type* field from the drop-down list.
   - **Comparison**: Select *In*, which allows multiple selections for asset type, that is, this would return any asset that has either of the selected asset types.
   - **Value**: Use the ... ellipsis to select the asset types *Pipeline*, *Pipeline Section*, *Piping Circuit* and *Piping Line*.



We now have the third filter set up.

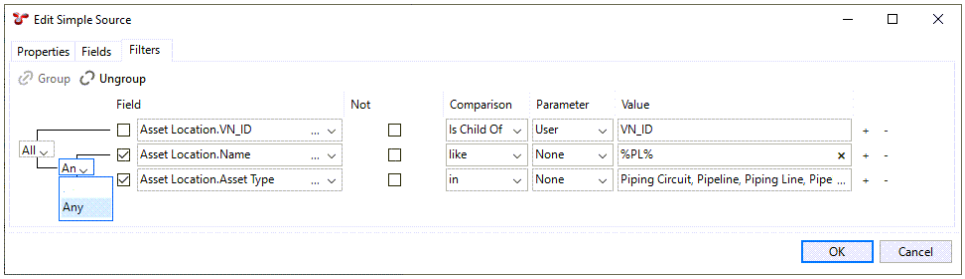
5. While we want the first filter for VN_ID to be always applied, at the same time, we want EITHER the second OR the third filter to be applied. That is, we want assets to be returned if either they have *PL* in their asset name, or they have the specified asset types. To make this possible, we need to group the second and third filter with an **Any** connector:

   a. Under **Field**, select the checkboxes next to the second and third filters. The **Group** and **Ungroup** toolbar buttons become available.

   b. Choose **Group**.

   c. A new grouping is created for these two filters, with a drop-down option. Select **Any**.

   d. Choose **OK**.



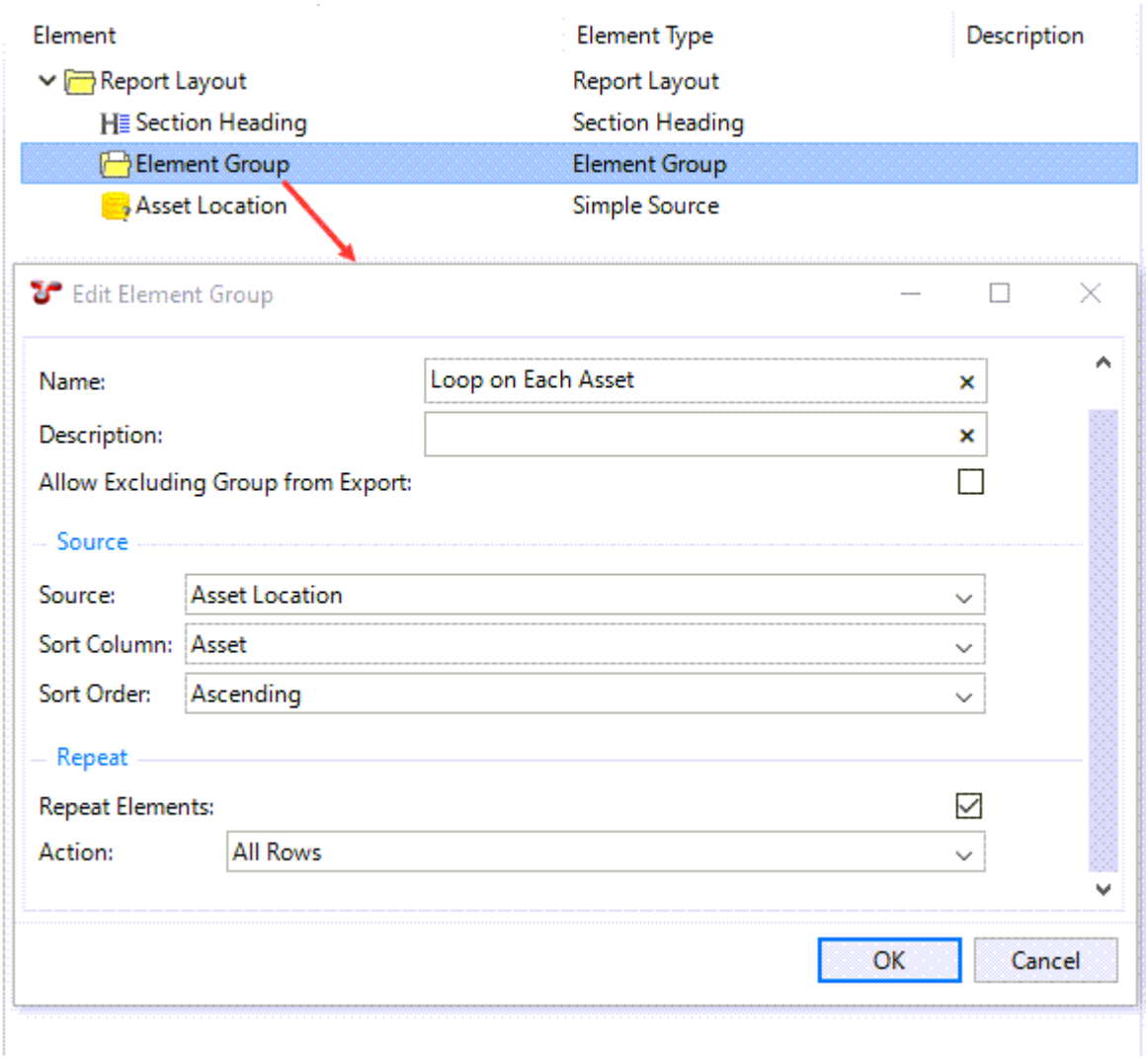
8.2.6.3.4.51 4. Insert an element group that loops on assets.

1. Add an **Element Group** element to the **Report Layout** structure right after the Section Heading.

> **Tip**
>
> If the element is not inserted to the right location in the element structure, use the **Move Up** or **Move Down** buttons in the toolbar to move them to the correct place.

2. Double-click the element in the structure to edit it.

3. Enter data as follows:
    - **Name**: Enter a descriptive name, such as *Loop on Each Asset*.
    - **Source**: Select the *Asset Location* source that you created in the previous step.
    - **Sourt Column**: Select, for example, *Asset*, which means that data will be sorted based on the **Asset** column of the **Asset Location** table.
    - **Sourt Order**: Select *Ascending*.
    - **Repeat Elements**: Tick the checkbox.
    - **Action**: Select *All Rows* to repeat elements for all the rows in the source.
4. Click **OK**.



Proceed to Next Step

8.2.6.3.4.52 Create Section Heading, Vertical Table with Extended Simple Source

In this step, you create a Vertical Table that retrieves data from a Simple Source linked to the *Pipeline* AIG and has additional fields added to it. Since the Vertical Table is in a looping element group, it will be repeated for each asset that the element group loops on. You also want to create a section heading that shows the asset full location as the title for each table.

For that, you create the following:

- A level-2 Section Heading to be included in the output before the tables and has a variable for the asset location in its content.
- A Simple Source that gets data from the **Pipeline** Asset Information table plus you add extra fields to it from other tables. The Vertical Table will retrieve data from this Simple Source.
- The actual vertical table

See the detailed steps below:

1. *Insert a Simple Source for Pipeline AIG and add an extra field.*
2. *Add an extra field to the Simple Source.*
3. *Insert a level-2 Section Heading for the vertical tables.*
4. *Insert a Vertical Table for pipeline data.*

8.2.6.3.4.53 Prerequisites

You have completed the following steps:

- *Create Template, Set Layout, Add Title*
- *Create Simple Source with Filters and Looping Element Group*

8.2.6.3.4.54 Process

In this example, you work in the **Loop on Each Asset** Element Group that you have created in the previous step.

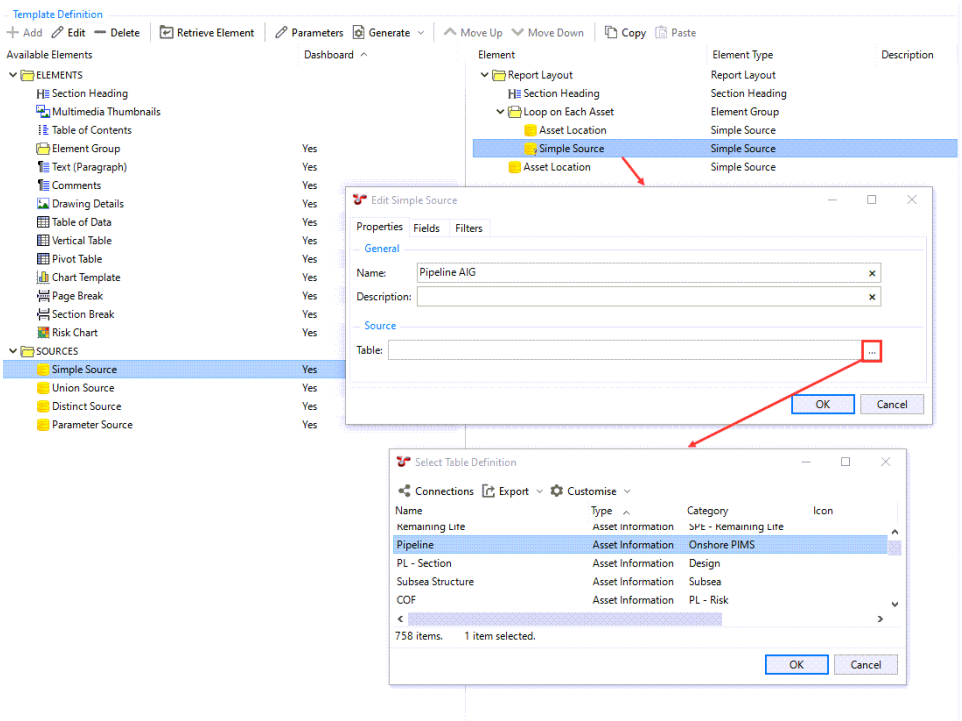
8.2.6.3.4.55 1. Insert a Simple Source for Pipeline AIG and add an extra field.

This Simple Source will be used as the data source for the Vertical Table that we are going to create. We link this Simple Source to the *Pipeline* Asset Information table, however, that table doesn't contain the Full Location field, which we want to show in the table as well as in the Section Heading for each table, so we need to extend the Simple Source with that field.

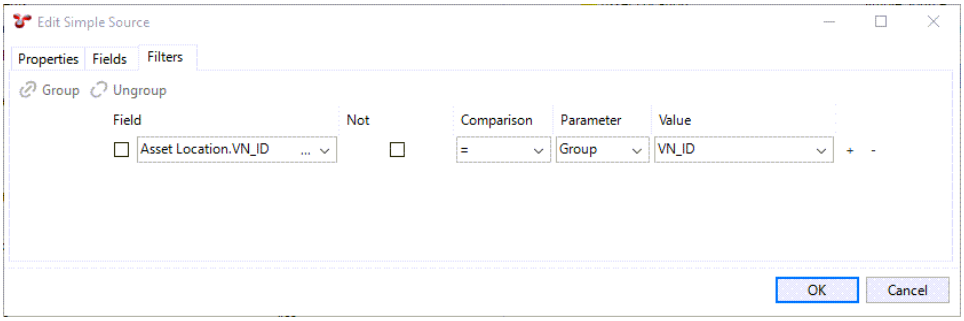
1. Add a **Simple Source** element to the **Report Layout** structure so that it is included within the **Loop on Each Asset** element group. The **Simple Source** element is located under the **SOURCES** node within the **Template Definition** section of the dialog.

   > **Note**
   >
   > You must insert the simple source within the element group, else, you cannot refer to it from the other elements of the element group.

2. Double-click the Simple Source element in the structure to edit it.
3. Specify the name *Pipeline AIG** for the simple source.
4. In the **Table** field, click the ellipsis … to select the Asset Information Table **Pipeline**.



5. On the **Filters** tab, add a filter for *VN_ID* similarly to the Simple Source you created for the Asset Location Element Group, but now, use the parameter *Group* to ensure that the VN_ID is determined from the Simple Source used for the Element Group, which was the Asset Location Simple Source.



8.2.6.3.4.56 2. Add an extra field to the Simple Source.

1. Still in the **Edit Simple Source** dialog, go to the **Fields** tab. (1)

   If the **Show Local Columns** button is enabled, you can see the list of all fields that the linked *Pipeline* table contains.

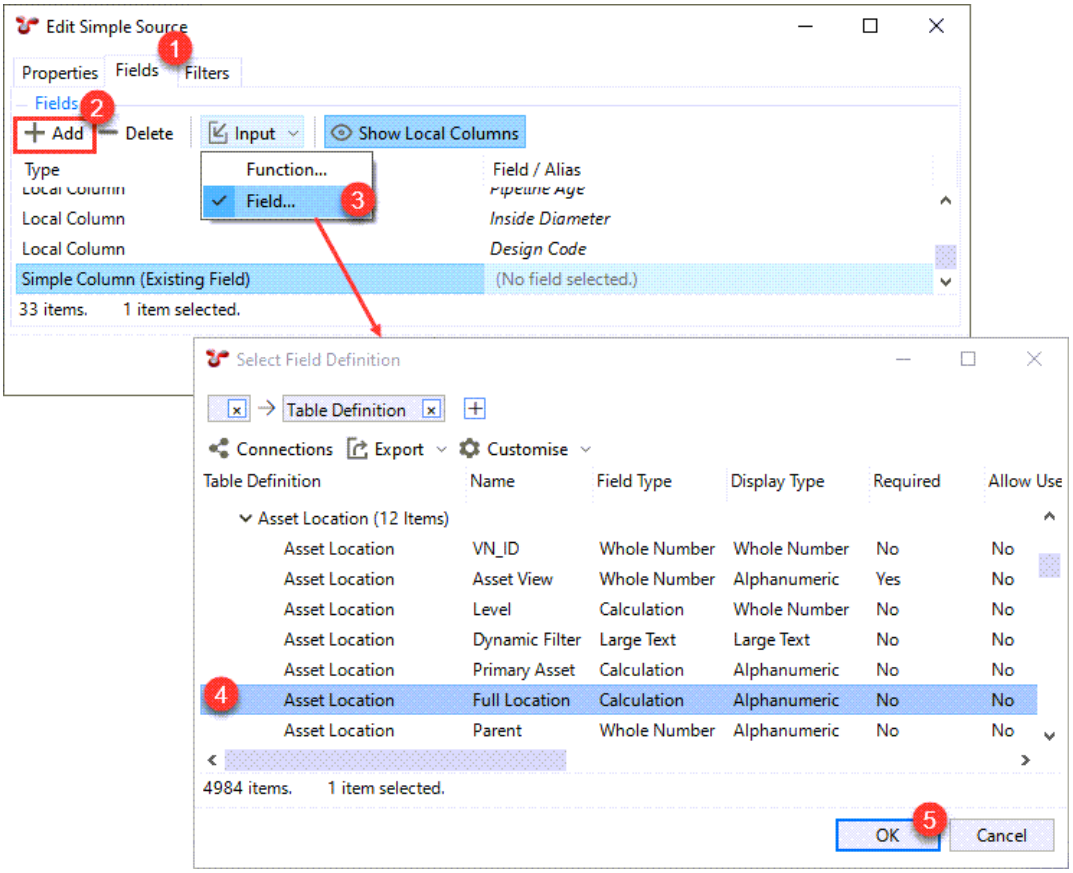
2. Click **Add** to add an extra field to the Simple Source. (2)

   You can see that a Simple Column entry has been added but with no field selected.

3. Right-click the row, or choose **Input** from the toolbar and choose **Field...**, which brings up a new dialog. (3)

4. Select the **Full Location** field under the **Asset Location** system table. (4)

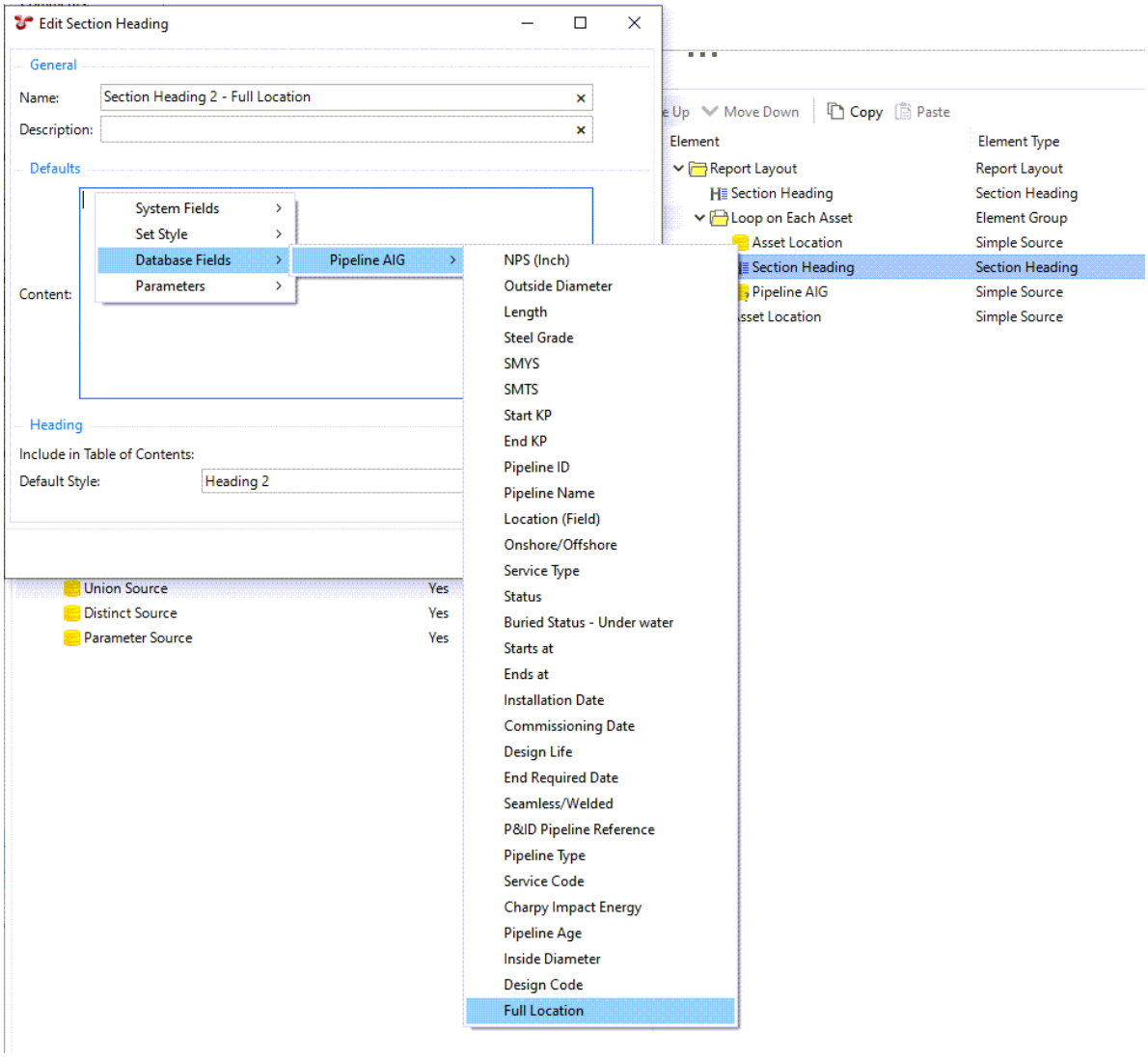
5. Click **OK**. (5)



8.2.6.3.4.57 3. Insert a level-2 Section Heading for the vertical tables.

You want to create a heading for each vertical table, which shows the Full Location value for each asset that the given vertical table is related to. Since you have added this field to the Simple Source you created in the previous step, you can refer to it from the Section Heading element.

1. Add a **Section Heading** element to the **Report Layout** structure so that it is included within the **Loop on Each Asset** element group.
2. Double-click the element in the structure to edit it.
3. Enter a name that identifies the element in the structure, for example, *Section Heading 2 - Full Location*. This text does not appear in the actual report output.
4. Right-click in the **Content** field and choose *Database Fields* → *Pipeline AIG* → *Full Location* to select the field that you have added to the Simple Source earlier.
5. Select the **Include in Table of Contents** checkbox to have this section heading appear in the Table of Contents.
6. In the **Default Style** field, select **Heading 2**, which is a preconfigured style that can be applied for level-2 section headings. If required, you can set up your own style and apply that instead (see *Styles*).
7. Click **OK**.

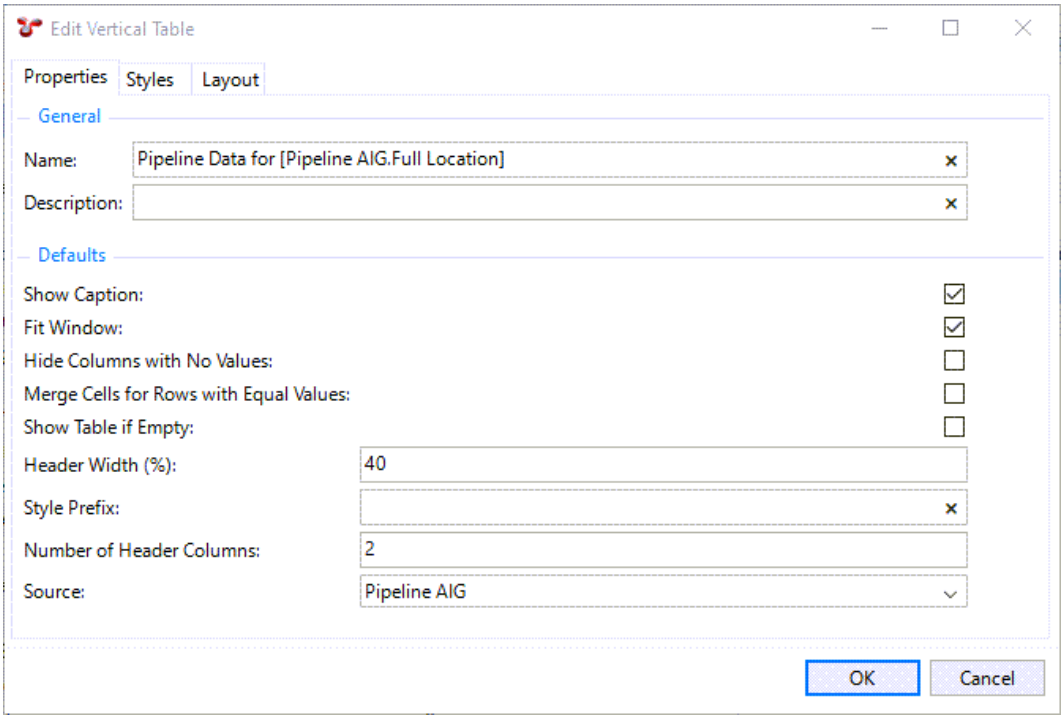


8.2.6.3.4.58 4. Insert a Vertical Table for pipeline data.

1. Add a **Vertical Table** element to the **Report Layout** structure so that it is included within the **Loop on Each Asset** element group and it is below the Section Heading element that you created in the previous step.
2. Double-click the element in the structure to edit it.
3. On the **Properties** tab, make settings as follows:
   - **Name**: Enter *Pipeline Data for* then right-click and select *Database Fields* → *Pipeline AIG* → *Full Location* so that the name of the table, which will be used as a caption, includes the full location of the asset to which the table is related to.
   - Tick the following checkboxes:
     - **Show Caption**
     - **Fit Window**
   - **Header Width (%)**: Enter *40*, which means that the width of the header column will be 40% of the width of the whole table width.

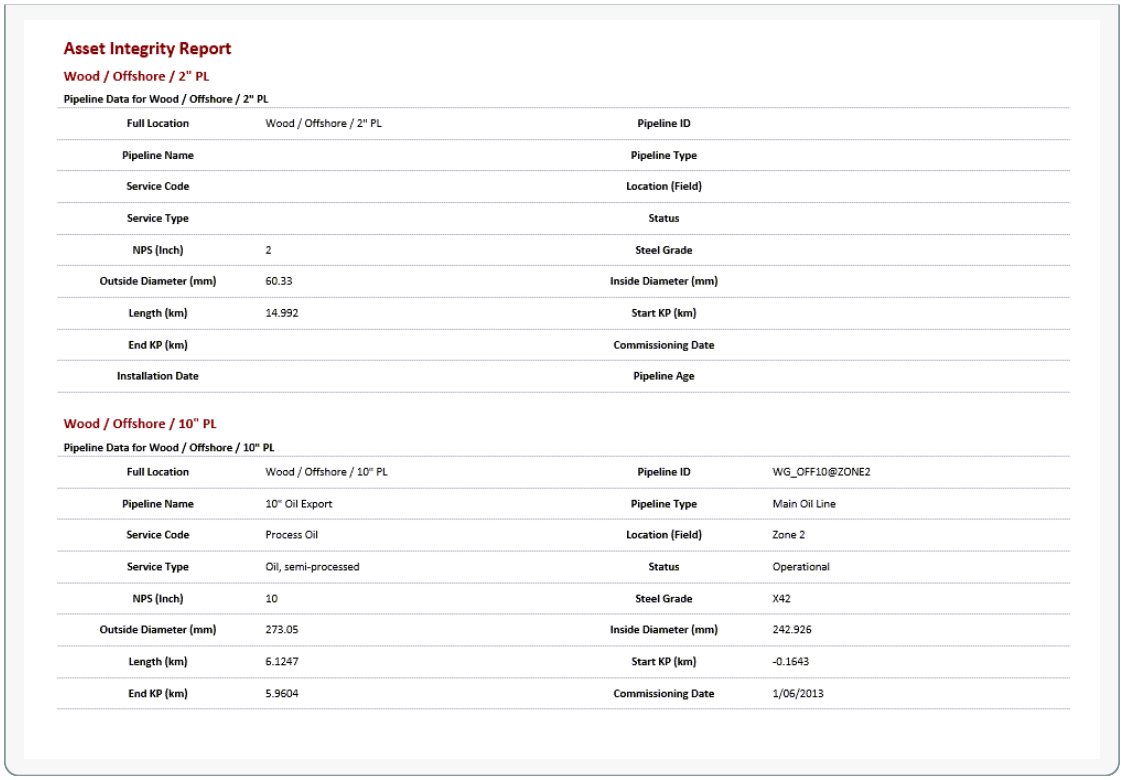
- **Number of Header Columns**: Enter *2*, so that the fields of the table are arranged in two columns. Using more columns is recommended when you have lots of fields to display.
- **Source**: Select the **Pipeline AIG** source from the drop-down list. The available values in this field are retrieved from the sources that have been created under the current element group.

4. On the **Layout** tab, you can hide columns or rearrange the layout as required.
5. Click **OK**.



Result

When you generate the output, you are prompted to select a branch in the asset tree and in the output, you can see that vertical tables are inserted for each relevant asset containing data from the **Pipeline** AIG as well as the extra *Full Location** field that you have added. Data is arranged in two columns and the headings and captions show the full location of the asset:



Asset Integrity Report

Wood / Offshore / 2" PL

Pipeline Data for Wood / Offshore / 2" PL

Full Location	Wood / Offshore / 2" PL	**Pipeline ID**	
Pipeline Name		**Pipeline Type**	
Service Code		**Location (Field)**	
Service Type		**Status**	
NPS (Inch)	2	**Steel Grade**	
Outside Diameter (mm)	60.33	**Inside Diameter (mm)**	
Length (km)	14.992	**Start KP (km)**	
End KP (km)		**Commissioning Date**	
Installation Date		**Pipeline Age**	

Wood / Offshore / 10" PL

Pipeline Data for Wood / Offshore / 10" PL

Full Location	Wood / Offshore / 10" PL	**Pipeline ID**	WG_OFF10@ZONE2
Pipeline Name	10" Oil Export	**Pipeline Type**	Main Oil Line
Service Code	Process Oil	**Location (Field)**	Zone 2
Service Type	Oil, semi-processed	**Status**	Operational
NPS (Inch)	10	**Steel Grade**	X42
Outside Diameter (mm)	273.05	**Inside Diameter (mm)**	242.926
Length (km)	6.1247	**Start KP (km)**	-0.1643
End KP (km)	5.9604	**Commissioning Date**	1/06/2013

Proceed to Next Step

8.2.6.3.4.59 Add Risk Charts with Element Group, Page Break, Section Heading

In the next part of the report, you want to include two risk charts based on different risk models and you want to include them next to each other on a new page. For that, you create the following:

- An Element Group to include all the Risk Charts
- A Page Break element with 2 columns
- A level-2 Section Heading to be included in the output before the risk charts
- A Simple Source for the **Risk Assessment** system table, filtering for Generic Qualitative risk models
- A Simple Source for the **Risk Assessment** system table, filtering for API 580 Qualitative risk models
- The actual crisk charts

See the detailed steps below:

1. *Insert an Element Group for the risk charts.*
2. *Add a Page Break element to place the charts on a new page and set up its layout.*
3. *Insert a level-2 Section Heading for the risk charts.*
4. *Insert a Simple Source for the Generic Qualitative Risk Model.*
5. *Insert a Simple Source for the API 580 Qualitative Risk Model.*
6. *Insert a Generic Qualitative Risk Model.*

7. Insert an API 580 Qualitative Risk Model.

8.2.6.3.4.60 Prerequisites

You have completed the following steps:

- *Create Template, Set Layout, Add Title*

8.2.6.3.4.61 Process

8.2.6.3.4.62 1. Insert an Element Group for the risk charts.

This element will contain the charts that we're going to create.

1. Add an **Element Group** element to the **Report Layout** structure. It should be on the same level as the element group you created for the looping element group.

> **Tip**
>
> If the element is not inserted to the right location in the element structure, use the **Move Up** or **Move Down** buttons in the toolbar to move them to the correct place.

2. Double-click the element in the structure to edit it.
3. Enter the name *Risk Charts*, which will identify the element in the structure. You do not need to make other settings for the element group right now.
4. Click **OK**.

8.2.6.3.4.63 2. Add a Page Break element to place the charts on a new page and set up its layout.

You want the risk charts to appear on a new page and next to each other in two columns. To do that, proceed as follows:

1. Add a **Page Break** element to the **Report Layout** structure so that it is included within the **Risk Charts** element group.
2. Double-click the element in the structure to edit it.
3. Enter a name that identifies the element in the structure, for example, *Page Break - 2 column*.
4. In the **Section Columns** field, enter *2*.
5. Under **Page**, select the *Landscape* for the **Layout** and *A4* for **Page Size**.
6. Click **OK**.

8.2.6.3.4.64 3. Insert a level-2 Section Heading for the risk charts.

1. Add a **Section Heading** element to the **Report Layout** structure so that it is included within the **Charts** element group.
2. Double-click the element in the structure to edit it.
3. Enter a name that identifies the element in the structure, for example, *Charts Heading 2*. This text does not appear in the actual report output.
4. Enter the text of the heading that you want to see in the output in the **Content** field. This time, we just want to use the heading *Risk Charts*, but you can use right-click in this field if you want to add a variable.
5. Select the **Include in Table of Contents** checkbox to have this section heading appear in the Table of Contents.

6. In the **Default Style** field, select **Heading 2**, which is a preconfigured style that can be applied for level-2 section headings. If required, you can set up your own style and apply that instead (see *Styles*).
7. Click **OK**.

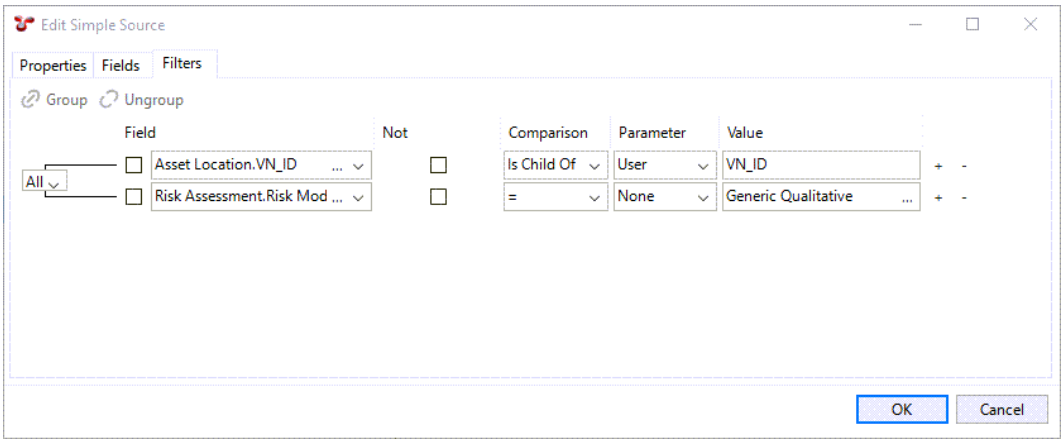
8.2.6.3.4.65 4. Insert a Simple Source for the Generic Qualitative Risk Model.

This simple source will be used as the data source for the Generic Qualitative risk model that we are going to create.

1. Add a **Simple Source** element to the **Report Layout** structure so that it is included within the **Risk Charts** element group. The **Simple Source** element is located under the **SOURCES** node within the **Template Definition** section of the dialog.

> **Note**
>
> You must insert the simple source within the element group, else, you cannot refer to it from the other elements of the element group.

2. Double-click the Simple Source element in the structure to edit it.
3. Specify the name *Risk Assessment Generic** for the simple source.
4. In the **Table** field, click the ellipsis ... to select the System Table **Risk Assessment**.
5. On the **Filters** tab, create 2 new filters:
   - A filter for user parameter VN_ID, in the same way as described in *2. Add an asset tree filter to the Asset Location simple source.*.
   - Another filter with the following data:
     - **Field**: *Risk Model*
     - **Comparison**: =
     - **Parameter**: *None*
     - **Value**: *Generic Qualitative*
6. Click **OK**.



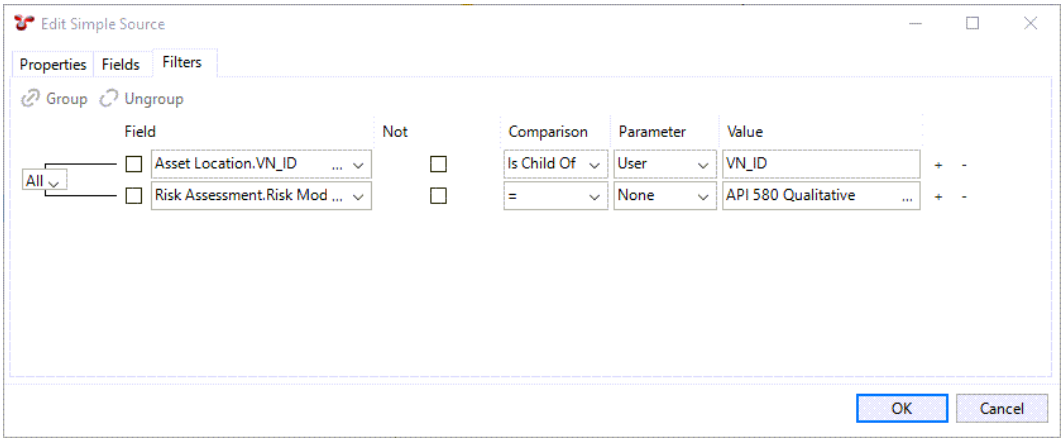
8.2.6.3.4.66 5. Insert a Simple Source for the API 580 Qualitative Risk Model.

This simple source will be used as the data source for the API 580 Qualitative risk model that we are going to create.

1. Add a **Simple Source** element to the **Report Layout** structure so that it is included within the **Risk Charts** element group. The **Simple Source** element is located under the **SOURCES** node within the **Template Definition** section of the dialog.

> **Note**
>
> You must insert the simple source within the element group, else, you cannot refer to it from the other elements of the element group.

2. Double-click the Simple Source element in the structure to edit it.
3. Specify the name *Risk Assessment API 580** for the simple source.
4. In the **Table** field, click the ellipsis ... to select the System Table **Risk Assessment**.
5. On the **Filters** tab, create 2 new filters:
   - A filter for user parameter VN_ID, in the same way as described in *2. Add an asset tree filter to the Asset Location simple source.*.
   - Another filter with the following data:
     - **Field**: *Risk Model*
     - **Comparison**: =
     - **Parameter**: *None*
     - **Value**: *API 580 Qualitative*
6. Click **OK**.

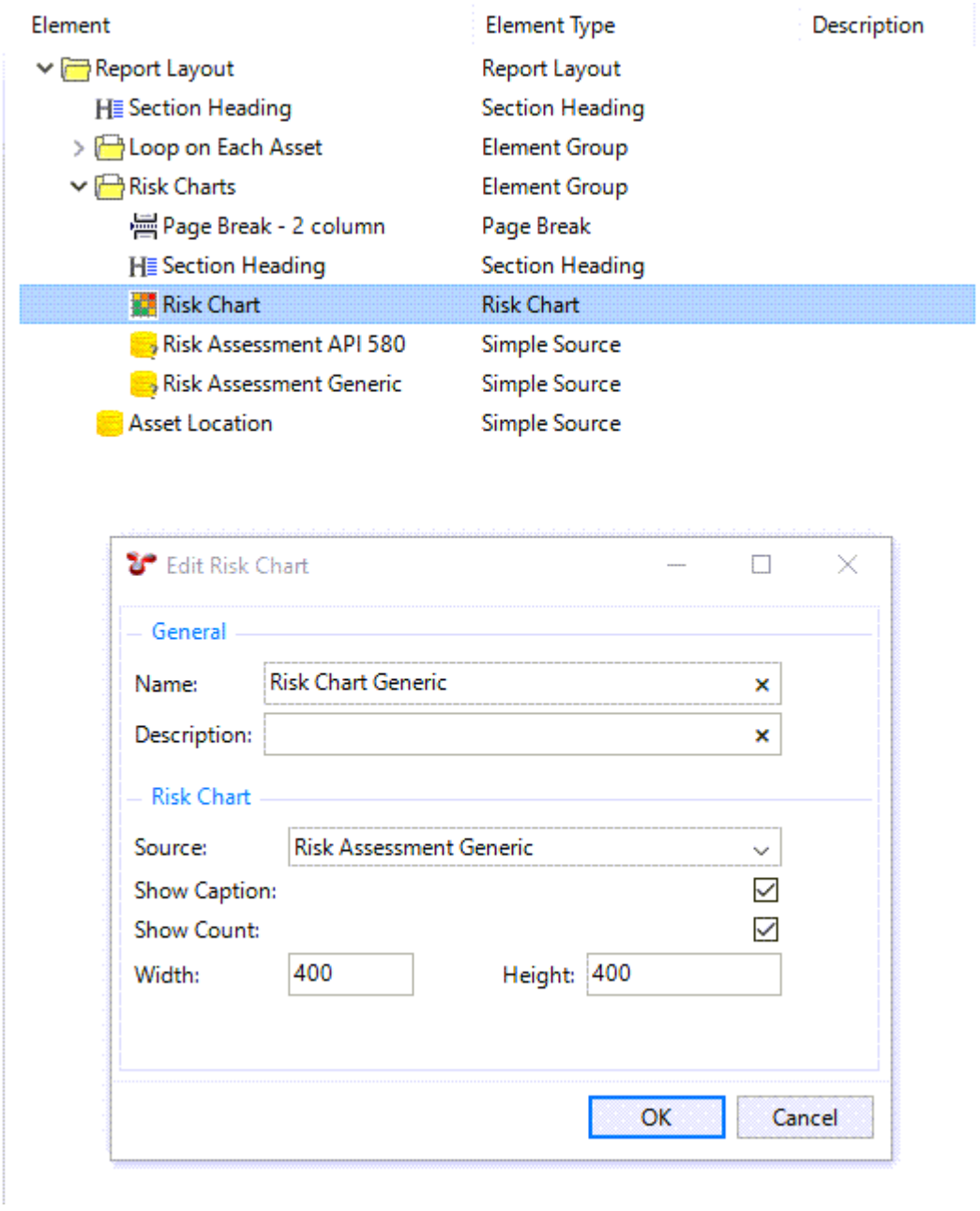


8.2.6.3.4.67 6. Insert a Generic Qualitative Risk Model.

1. Add a **Risk Model** element to the **Report Layout** structure so that it is included within the ** Risk Charts** element group.
2. Double-click the element in the structure to edit it.
3. Enter data as follows:
   - **Name**: Enter *Risk Chart Generic* or any name that identifies the element in the structure.

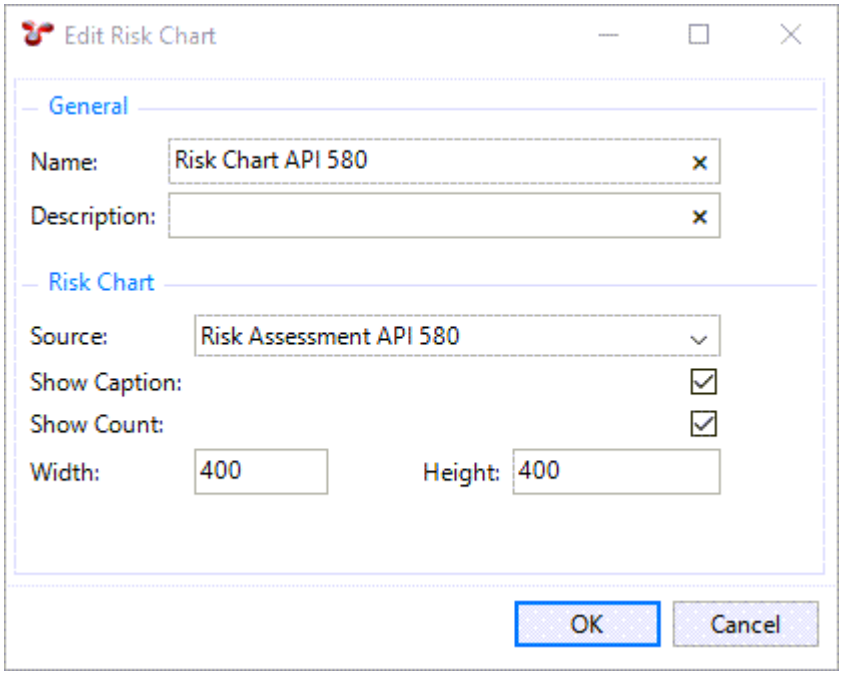
- **Source**: Select *Risk Chart Generic* source
- **Show Caption**: Tick to add the name of the risk chart as a caption
- **Show Count**: Tick to show the number of risk results in each square that has risk results.
- **Width**: *400*
- **Height**: *400*

4. Click **OK**.



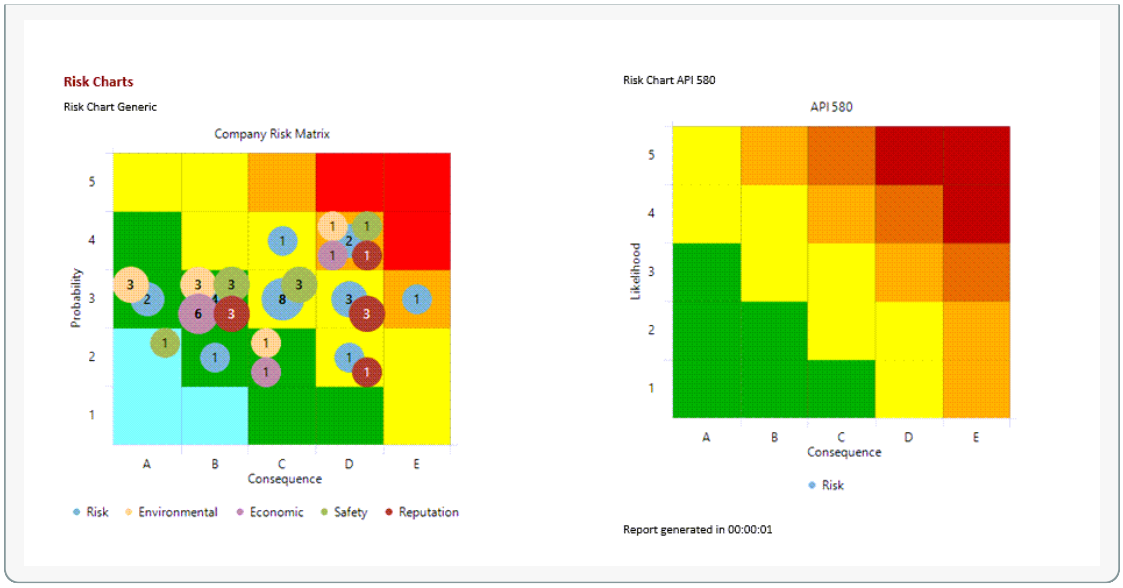
8.2.6.3.4.68 7. Insert an API 580 Qualitative Risk Model.

1. Add a **Risk Model** element to the **Report Layout** structure so that it is included within the ** Risk Charts** element group.
2. Double-click the element in the structure to edit it.
3. Enter data as follows:
   - **Name**: Enter *Risk Chart API 580* or any name that identifies the element in the structure.
   - **Source**: Select *Risk Chart API 580* source
   - **Show Caption**: Tick to add the name of the risk chart as a caption
   - **Show Count**: Tick to show the number of risk results in each square that has risk results.
   - **Width**: *400*
   - **Height**: *400*
4. Click **OK**.



Result

When you generate the output, you can see that the risk charts are inserted next to each other in two columns:



Proceed to Next Step

8.2.6.3.4.69 Add Multimedia Thumbnails with Element Group, Page Break, Section Heading

In this step, you add a Multimedia Thumbnails element to your report template, to insert the images associated with the relevant asset into the report. For that, you create the following:

- An Element Group to include the Multimedia Thumbnail element with a parameter that allows excluding this part of the report during report generation
- A Page Break element with 1 column
- A level-2 Section Heading to be included in the output before the images
- A Simple Source for the **Multimedia** system table
- The actual Multimedia Thumbnail element

See the detailed steps below:

1. *Insert an Element Group for the Multimedia Thumbnails.*
2. *Add a Page Break element to place the images on a new page and set up its layout.*
3. *Insert a level-2 Section Heading for the images.*
4. *Insert a Simple Source for Multimedia.*
5. *Insert a Multimedia Thumbnail element.*

8.2.6.3.4.70 Prerequisites

You have completed the following steps:

- *Create Template, Set Layout, Add Title*

8.2.6.3.4.71 Process

8.2.6.3.4.72 1. Insert an Element Group for the Multimedia Thumbnails.

1. Add an **Element Group** element to the **Report Layout** structure. It should be on the same level as the element groups you created for the other element groups.

> **Tip**
>
> If the element is not inserted to the right location in the element structure, use the **Move Up** or **Move Down** buttons in the toolbar to move them to the correct place.

2. Double-click the element in the structure to edit it.
3. Enter the name *Risk Charts*, which will identify the element in the structure.
4. Select the **Allow Excluding Group from Export** checkbox to enable a selection parameter during report generation. This allows users to exclude this element group from the report output when they start generating the report. This feature is particularly useful when you have numerous images that take a long time to generate, and you want to quickly review other parts of the report.
5. Click **OK**.

8.2.6.3.4.73 2. Add a Page Break element to place the images on a new page and set up its layout.

You want the multimedia thumbnails to appear on a new page. To do that, proceed as follows:

1. Add a **Page Break** element to the **Report Layout** structure so that it is included within the **Multimedia** element group.
2. Double-click the element in the structure to edit it.
3. Enter a name that identifies the element in the structure, for example, *Page Break - 1 column*.
4. In the **Section Columns** field, enter *1*.
5. Under **Page**, select the *Landscape* for the **Layout** and *A4* for **Page Size**.
6. Click **OK**.

8.2.6.3.4.74 3. Insert a level-2 Section Heading for the images.

1. Add a **Section Heading** element to the **Report Layout** structure so that it is included within the **Multimedia** element group.
2. Double-click the element in the structure to edit it.
3. Enter a name that identifies the element in the structure, for example, *Multimedia Heading 2*. This text does not appear in the actual report output.
4. Enter the text of the heading that you want to see in the output in the **Content** field. This time, we just want to use the heading *Images*.
5. Select the **Include in Table of Contents** checkbox to have this section heading appear in the Table of Contents.
6. In the **Default Style** field, select **Heading 2**, which is a preconfigured style that can be applied for level-2 section headings. If required, you can set up your own style and apply that instead (see *Styles*).
7. Click **OK**.

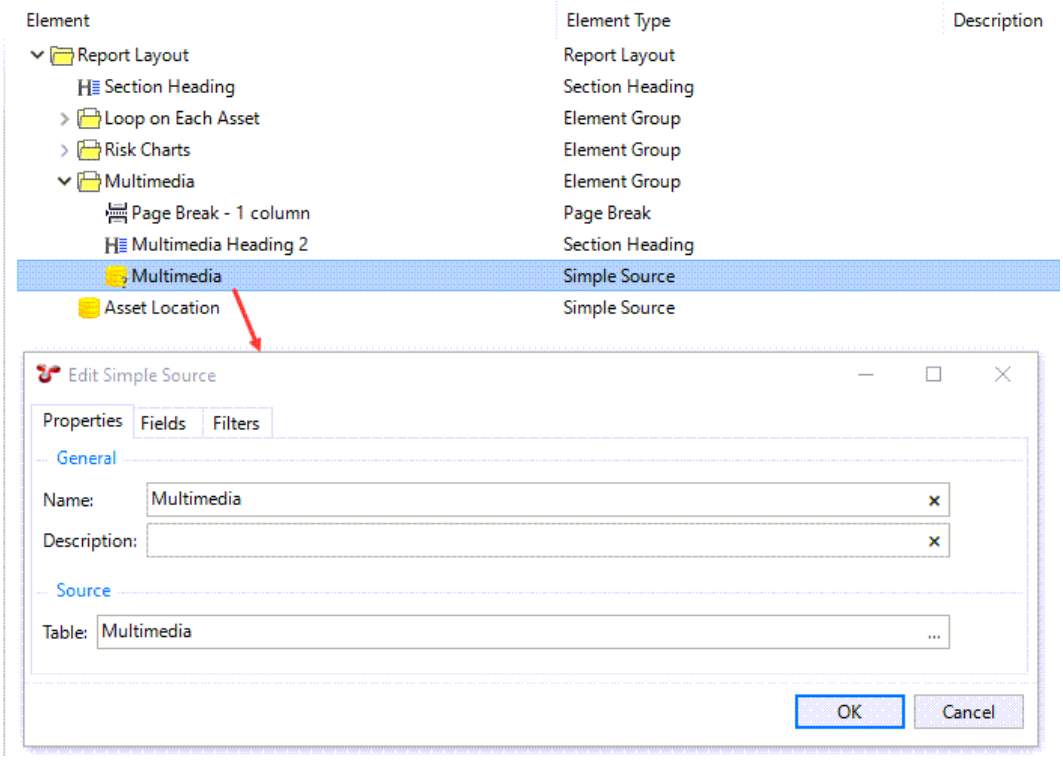
8.2.6.3.4.75 4. Insert a Simple Source for Multimedia.

This simple source will be used as the data source for the Multimedia Thumbnails element that we are going to create.

1. Add a **Simple Source** element to the **Report Layout** structure so that it is included within the **Multimedia** element group. The **Simple Source** element is located under the **SOURCES** node within the **Template Definition** section of the dialog.

> **Note**
>
> You must insert the simple source within the element group, else, you cannot refer to it from the other elements of the element group.

2. Double-click the Simple Source element in the structure to edit it.
3. Specify the name *Multimedia** for the simple source.
4. In the **Table** field, click the ellipsis ... to select the System Table **Multimedia**.
5. On the **Filters** tab, create a filter for user parameter VN_ID, following the same steps outlined in *2. Add an asset tree filter to the Asset Location simple source.*. This will allow the user to select the asset hierarchy branch for which they want to include the associated images in the report output.
6. Click **OK**.

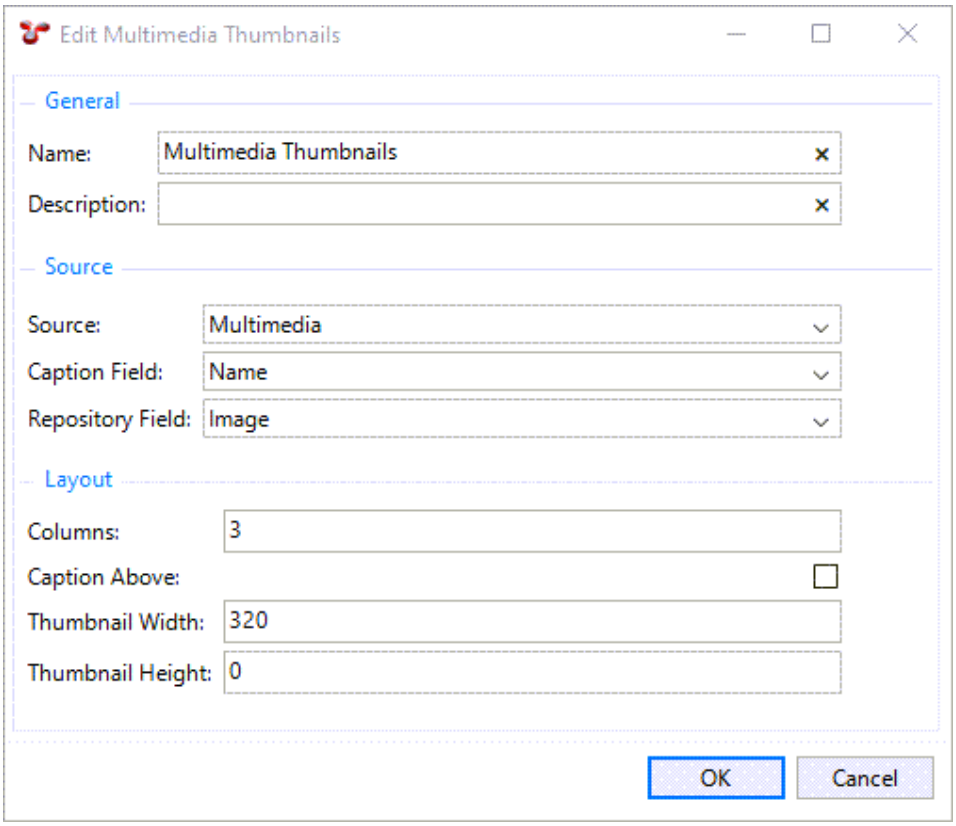


8.2.6.3.4.76 5. Insert a Multimedia Thumbnail element.

1. Add a **Multimedia Thumbnails** element to the **Report Layout** structure so that it is included within the **Multimedia** element group.
2. Double-click the element in the structure to edit it.
3. Enter data as follows:
   - **Name**: You can keep *Multimedia Thumbnails* or any name that identifies the element in the structure.
   - **Source**: Select *Multimedia* source
   - **Caption Field**: Select *Name*, which indicates that the caption text is retrieved from the *Name* field of the Multimedia table.

- **Repository Field**: Select *Image*, which is the field that contains the image in the database.
- **Columns**: Enter *3*, because we want to get the image thumbnails displayed in three columns in the report output.
- **Thumbnail Width**: Enter, for example, *320*
- **Thumbnail Height**: Leave it empty or *0*. To maintain the aspect ratio of images, only set one dimension.

4. Click **OK**.

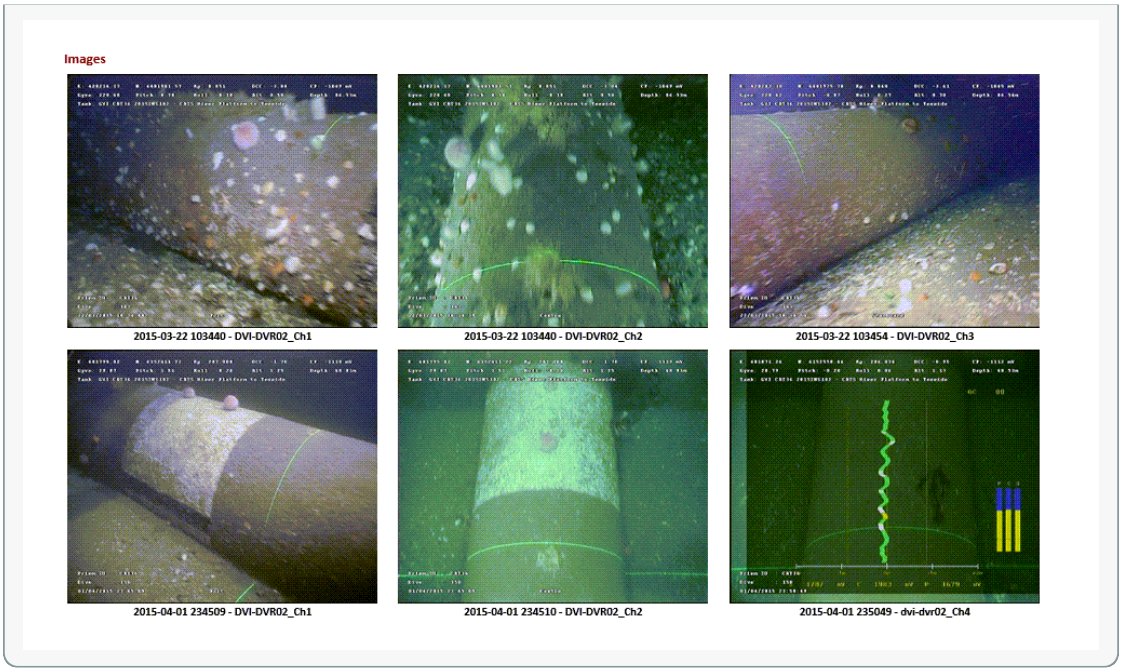


Note

When you put a multimedia thumbnail element in your report template, an additional selection parameter is added automatically. This is useful when you set up multiple columns to display images in the output but you have less images in the last row then the number of columns. In this case, you can select the **Merge Last Row to Centre Images for Multiple Columns** checkbox to merge the last row of the columns and display the images in the centre of the page.

Result

When you generate the output, you can see that multimedia thumbnails are inserted in three columns:



Proceed to Next Step

8.2.6.3.4.77 Insert Table of Contents, Configure Selection Parameters, Verify Output

In this step, you insert a Table of Contents element and check if the output complies with your requirements.

See the detailed steps below:

1. *Insert a Table of Contents element.*
2. *Configure Selection Parameters for Report Generation.*
3. *Generate an output to check the final output of the report.*

8.2.6.3.4.78 Prerequisites

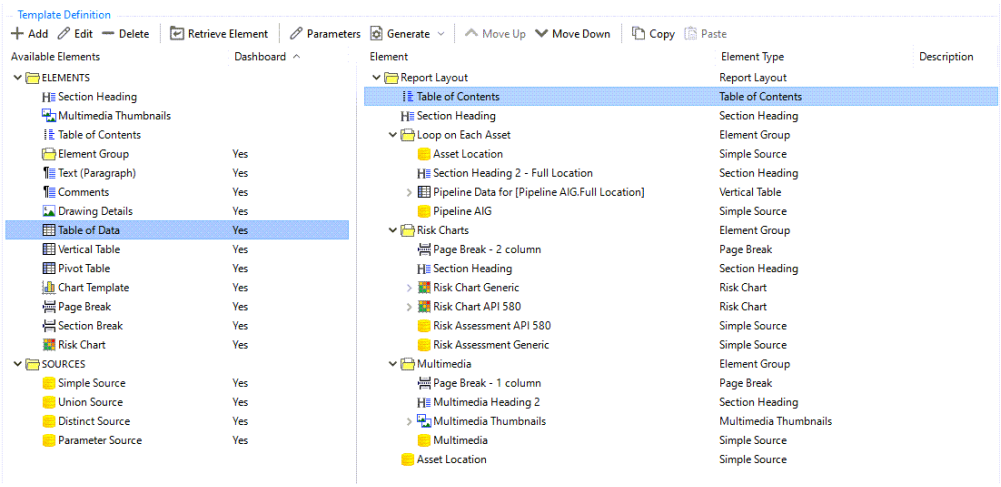
You have completed the following steps:

- *Create Template, Set Layout, Add Title*
- *Create Simple Source with Filters and Looping Element Group*
- *Create Section Heading, Vertical Table with Extended Simple Source*
- *Add Risk Charts with Element Group, Page Break, Section Heading*
- *Add Multimedia Thumbnails with Element Group, Page Break, Section Heading*

8.2.6.3.4.79 Process

8.2.6.3.4.80 1. Insert a Table of Contents element.

Drag the Table of Contents element or select it and choose **Add** to insert it in the **Report Layout** structure. Ensure that it is the first node within the structure:



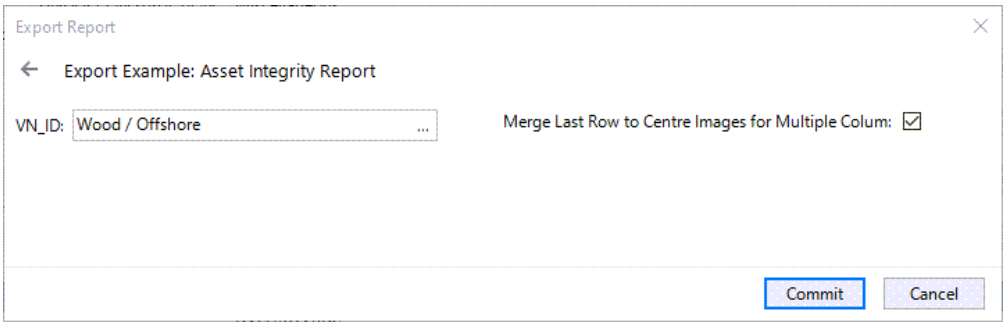
> **Note**
>
> - The Table of Contents element is applicable only to RTF and HTML outputs.
> - The formatting of the Table of Contents element depends on your settings for the elements starting with *TOC* in your generic report style configurations (see *Styles*). You can adjust the look of each heading level as required. For example, for Heading 2 in the TOC, you edit the style TOC Heading 2 and add a left padding value "30".
> - In the RTF output, you must right-click and update the table of contents to ensure that page numbers appear correctly.

8.2.6.3.4.81 2. Configure Selection Parameters for Report Generation.

While creating this report template, we created two user parameters. When generating the report, users are prompted to make selections for these parameters before the output is created:

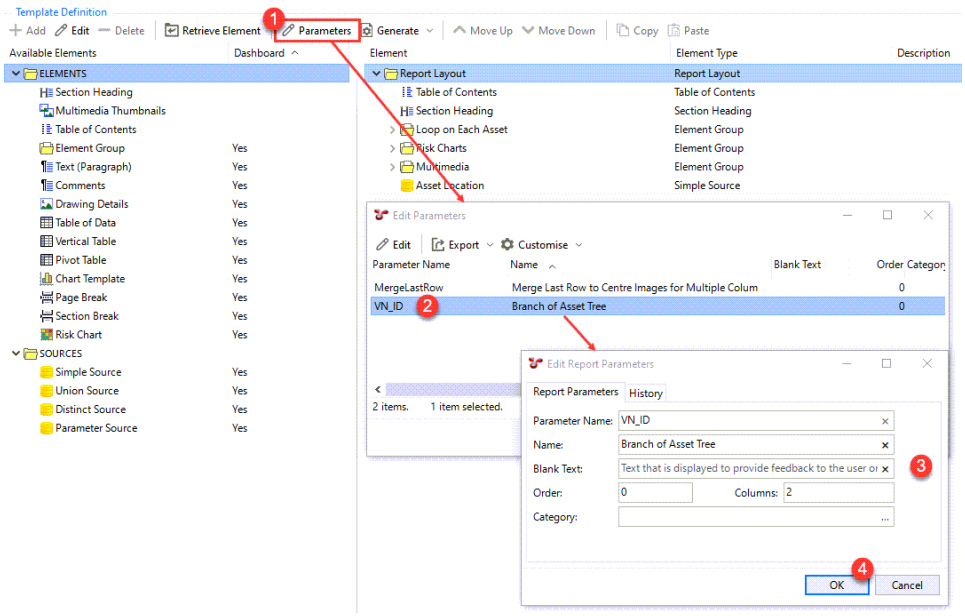
- We created filters with user parameter for the Asset Location VN_ID field when configuring some of the Simple Sources (for example, in step *2. Add an asset tree filter to the Asset Location simple source.*).
- We inserted a Multimedia Thumbnail element, which automatically adds the **Merge Last Row to Centre Images for Multiple Columns** checkbox to the selection parameters (see *5. Insert a Multimedia Thumbnail element.*).

When generating the report from the **Configuration - Templates** dialog, the following selection dialog is displayed before the output is created:



The field label **VN_ID** is not user-friendly, so we want to change this text, also, we want the fields to take the full 2-column width of the dialog and appear below each other. To do that, proceed as follows:

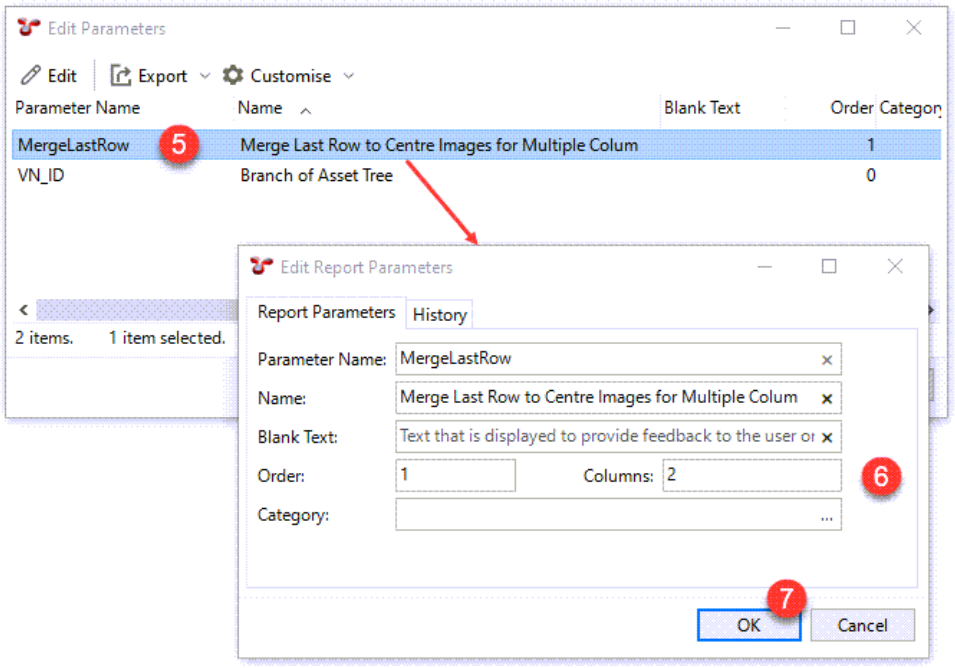
1. In the **Edit Report Template** dialog for our report template, choose **Parameters**. 1
2. In the **Edit Parameters** dialog, double-click the **VN_ID** row or select it and choose **Edit**. 2
3. In the **Edit Report Parameters** dialog, make settings as follows:
   - **Parameter Name**: This is an internal text to identify the parameter, so you can leave it as is.
   - **Name**: Enter the text that you want to display as a field label, for example, *Branch of Asset Tree*.
   - **Order**: You want this parameter to appear first, so you either leave it *0* and set *1* for the next parameter, or you enter *1* and set *2* for the next one.
   - **Columns**: The current setting is *1*, which means that the width of the field is 1-column within the 2-column dialog. You want the field to take the full width, so you change this value to *2*.
4. Click **OK**.



5. Back in the **Edit Parameters** dialog, double-click the **MergeLastRow** row or select it and choose **Edit**. 5

6. In the **Edit Report Parameters** dialog, you can leave the current texts as they are, just change the values of the following fields: 6

    - **Order**: You want this parameter to appear second, so you enter a larger number than the number you used for the previous parameter.
    - **Columns**: The current setting is *1*, which means that the width of the field is 1-column within the 2-column dialog. You want the field to take the full width, so you change this value to *2*.



7. Click **OK**.

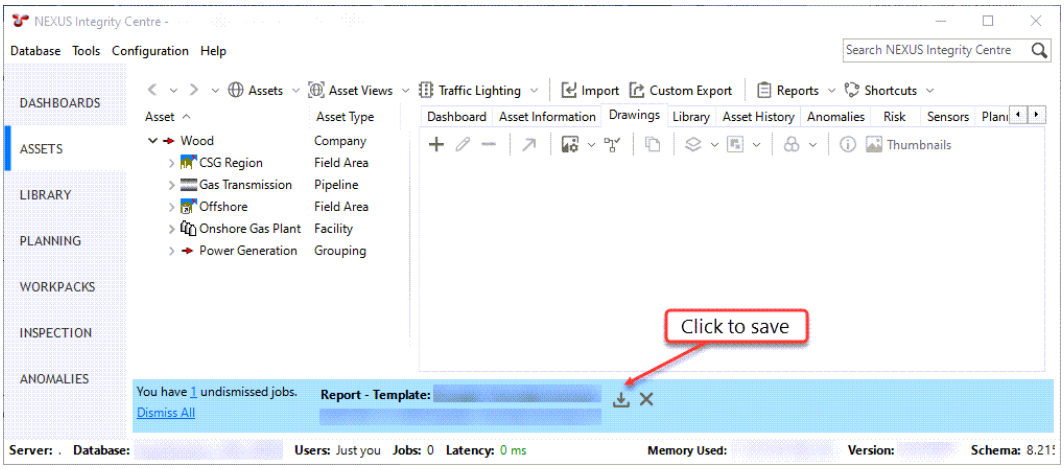
Result

When you generate the output, the updated selection parameters appear as follows:

8.2.6.3.4.82 3. Generate an output to check the final output of the report.

To generate the output, proceed as follows:

1. In the **Edit Report Template** dialog, choose **OK** to close the dialog and save your changes.
2. Back in the **Configuration - Templates** dialog, select the report template and choose the **Generate** toolbar button.
3. Select the required output format from the drop-down, which can be either RTF, HTML, Microsoft Excel or PDF.
4. Select a report destination, which, in this case, will be **File**.
5. Choose **Commit**.
6. Close the **Configuration - Templates** dialog.
7. Wait until the report output is generated. The progress is indicated at the bottom of the main **NEXUS IC** screen.
8. Once the generation is complete, click the *Save* icon to download and save the report.



9. Select the destination and open the file.
10. If you generated an RTF output, right-click the Table of Contents and choose **Update Field** to ensure that page numbers appear correctly.
11. Review the report to verify it meets your expectations.

8.2.6.3.4.83 Example: Set Up Workpack Report Template

In this example, we create a report template called “Workpack Report”, which demonstrates the usage of the following report template elements:

- Section Heading with style change
- Pivot Table
- Text (Paragraph)
- Table of Data with Distinct Source
- Drawing Details

This example guides you through the following steps:

1. *Create Template, Set Layout, Add Title and Change Heading Style*
2. *Add Pivot Table for Tasks with Text, Extended Simple Source with Filter*
3. *Add Pivot Table for Findings with Text, Simple Source with Filter*
4. *Add Table of Data for Event Types with Distinct Source*
5. *Add Drawing Details and Extended Simple Source with Filters*
6. *Insert Table of Contents, Verify Output*

8.2.6.3.4.84 Create Template, Set Layout, Add Title and Change Heading Style

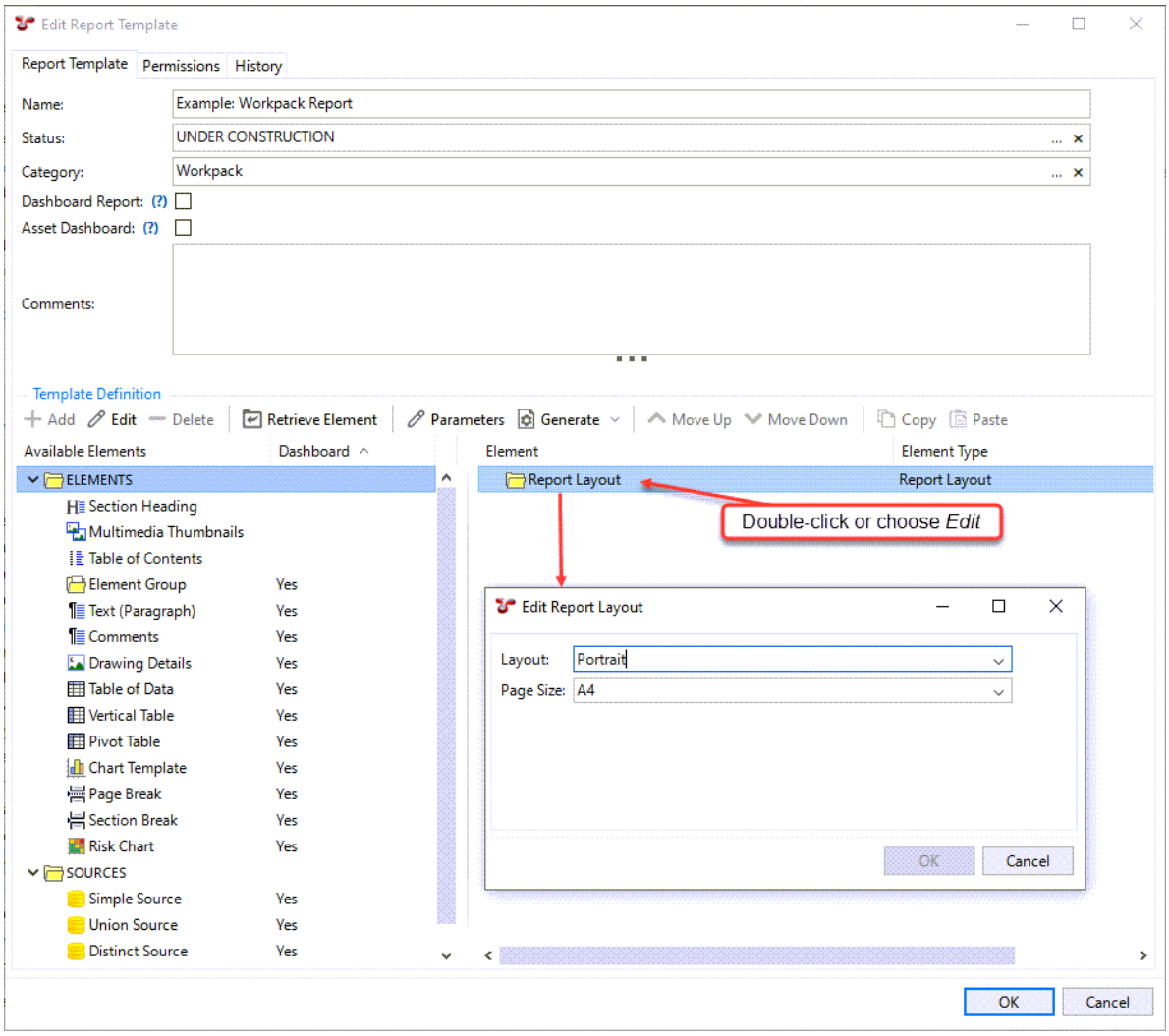
As a first step, you create the report template, set up its size and layout and insert a Section Heading to add a title. See the detailed steps below:

1. *Create a new report template and specify the report layout.*
2. *Add a level-1 Section Heading.*
3. *Change the style of the headings.*

8.2.6.3.4.85 Process

8.2.6.3.4.86 1. Create a new report template and specify the report layout.

1. In NEXUS IC, choose *Configuration* → *Reports and Dashboards* → *Templates* from the menu.
2. Choose **Add** to create a new report template.
3. In the top half of the **Add Report Template** dialog, specify the name, status and category of the report as follows:
   - **Name**: Enter *Example: Workpack Report*
   - **Status** (optional): Select from the list of preconfigured statuses (see *Configure Report Statuses*), for example, *Under Construction*.
   - **Category** (optional): Select from the list of preconfigured categories (see *Configure Report Categories*), for example, *Workpack*.
4. Under the *Template Definition* section of the dialog, configure the size and layout of the report by double-clicking the top **Report Layout** node on the right-hand side of the dialog. In this example, we select layout *Portrait* and page size *A4*.
5. Choose **OK**.



Note

This size and layout settings will prevail until the next page break element, where you can overwrite these settings.

8.2.6.3.4.87 2. Add a level-1 Section Heading.

To add a main title to the report, with Heading 1 style, proceed as follows:

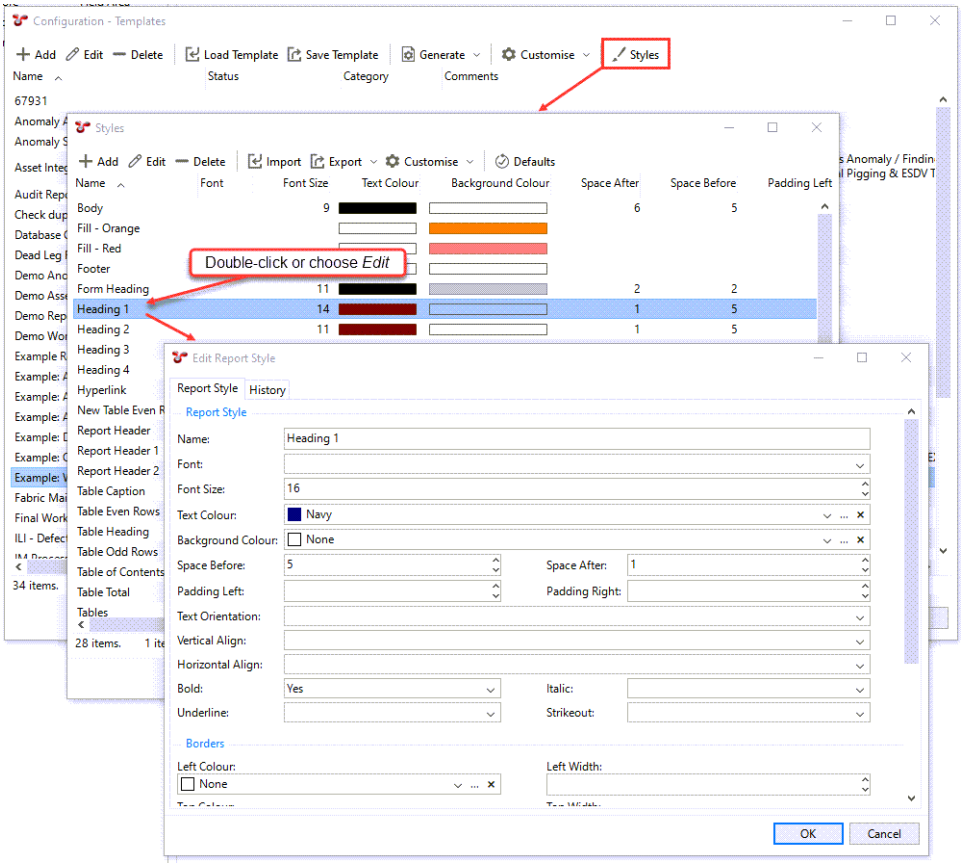
1. Add a **Section Heading** element to the **Report Layout** structure (drag it or select it and choose **Add**).
2. Double-click the element in the structure to edit it.
3. Enter a name that identifies the element in the structure. This text does not appear in the actual report output.
4. Enter the text of the heading that you want to see in the output in the **Content** field. This time, we just want to use the heading *Workpack Report*, but you can use right-click in this field if you want to add a variable.

5. Select the **Include in Table of Contents** checkbox to have this section heading appear in the Table of Contents.
6. In the **Default Style** field, select **Heading 1**, which is a preconfigured style that can be applied for level-1 section headings. If required, you can set up your own style and apply that instead (see *Styles*).
7. Click **OK**.

8.2.6.3.4.88 3. Change the style of the headings.

You want to change the appearance of the headings used in the report. You want to change the font size and font colour of Heading 1 and Heading 2.

1. Click **OK** to save your changes and close the **Add Report Template** dialog. This takes you back to the **Configuration - Templates** dialog.
2. Choose **Styles** from the toolbar. This opens the **Styles** dialog.
3. From the list of styles, double-click **Heading 1** or select it and choose **Edit**.
4. Change the **Font Size** value to *16*.
5. Change the **Text Colour** to another colour, for example, *Navy*.
6. Click **OK** to save your changes.



7. From the list of styles, double-click **Heading 2** or select it and choose **Edit**.
8. Change the **Font Size** value to *13*.
9. Change the **Text Colour** to another colour, for example, *Navy*.
10. Click **OK** to save your changes.

Result

The updated Heading 1 and Heading 2 styles are now applied to all the report templates in the **Configuration - Templates** dialog.

Proceed to Next Step

8.2.6.3.4.89 Add Pivot Table for Tasks with Text, Extended Simple Source with Filter

In the first part of the report, we want to insert a pivot table that shows the number of tasks by asset type and event type in a workpack selected by the user during report generation. We want to add a heading and a description before the table. To do that, we create the following elements:

- An Element Group to include the pivot table, text and heading
- A level-2 Section Heading
- A Text (Paragraph) element to include a description
- A Simple Source for the **Task** system table, which we extend with the *Asset Type* field and add a filter for Workpack ID as a user parameter.
- The actual Pivot Table

See the detailed steps below:

1. *Insert an Element Group.*
2. *Insert a level-2 Section Heading for the pivot table.*
3. *Insert a Simple Source for the Pivot Table.*
4. *Insert a Text (Paragraph) element for introduction.*
5. *Insert a Pivot Table for Tasks.*

8.2.6.3.4.90 Prerequisites

You have completed the following steps:

- *Create Template, Set Layout, Add Title and Change Heading Style*

8.2.6.3.4.91 Process

8.2.6.3.4.92 1. Insert an Element Group.

This element will contain the heading, text, pivot table and simple source that we are going to create for this section of the report.

1. Add an **Element Group** element to the **Report Layout** structure.
2. Double-click the element in the structure to edit it.
3. Enter the name *Tasks*, which will identify the element in the structure. You do not need to make other settings for the element group right now.
4. Click **OK**.

8.2.6.3.4.93 2. Insert a level-2 Section Heading for the pivot table.

1. Add a **Section Heading** element to the **Report Layout** structure so that it is included within the **Tasks** element group.
2. Double-click the element in the structure to edit it.
3. Enter a name that identifies the element in the structure, for example, *Task List Heading 2*. This text does not appear in the actual report output.
4. Enter the text of the heading that you want to see in the output in the **Content** field, for example, *Number of Tasks by Asset Type and Event Type*.
5. Select the **Include in Table of Contents** checkbox to have this section heading appear in the Table of Contents.
6. In the **Default Style** field, select **Heading 2**, which is a preconfigured style that can be applied for level-2 section headings. If required, you can set up your own style and apply that instead (see *Styles*).
7. Click **OK**.

8.2.6.3.4.94 3. Insert a Simple Source for the Pivot Table.

This simple source will be used as the data source for the pivot table that calculates the number of tasks by asset type and event type in a user-specified workpack. Since the **Task** system table that we are going to assign doesn't contain the **Asset Type** field, we will extend the simple source with that and we also set up a filter with a user parameter for Workpack ID. When generating the report, the user can then select the required workpack in a selection dialog.

1. Add a **Simple Source** element to the **Report Layout** structure so that it is included within the **Tasks** element group. The **Simple Source** element is located under the **SOURCES** node within the **Template Definition** section of the dialog.

> **Note**
>
> You must insert the simple source within the element group, else, you cannot refer to it from the other elements of the element group.

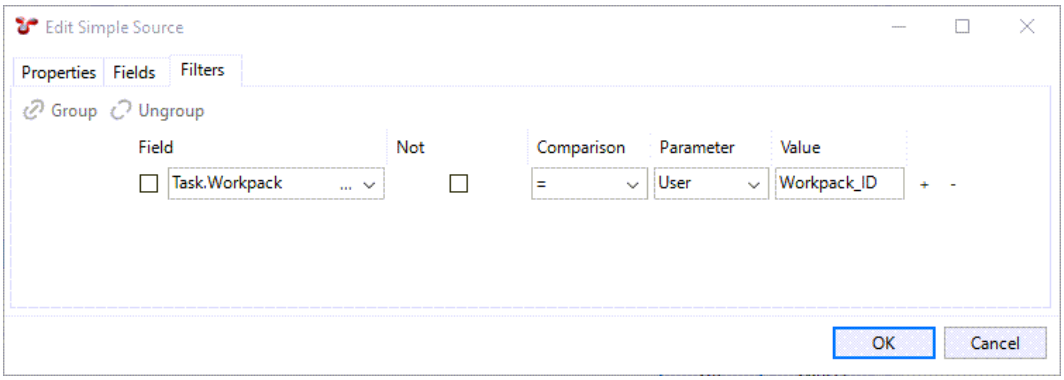
2. Double-click the Simple Source element in the structure to edit it.
3. Specify the name *Task Listing** for the simple source.
4. In the **Table** field, click the ellipsis … to select the System Table **Task**.
5. On the **Fields** tab, add an extra field as follows:
   a. Click **Add** to add an extra field to the Simple Source.

      You can see that a Simple Column entry has been added but with no field selected.

   b. Right-click the row, or choose **Input** from the toolbar and choose **Field…**, which brings up a new dialog.

   c. Select the **Asset Type** field under the **Asset Location** system table.
6. On the **Filters** tab, create a new filter with the following data:
   - **Field**: *Workpack* (available from the drop-down list since it's a field within the source)
   - **Comparison**: =
   - **Parameter**: *User*
   - **Value**: *Workpack_ID*

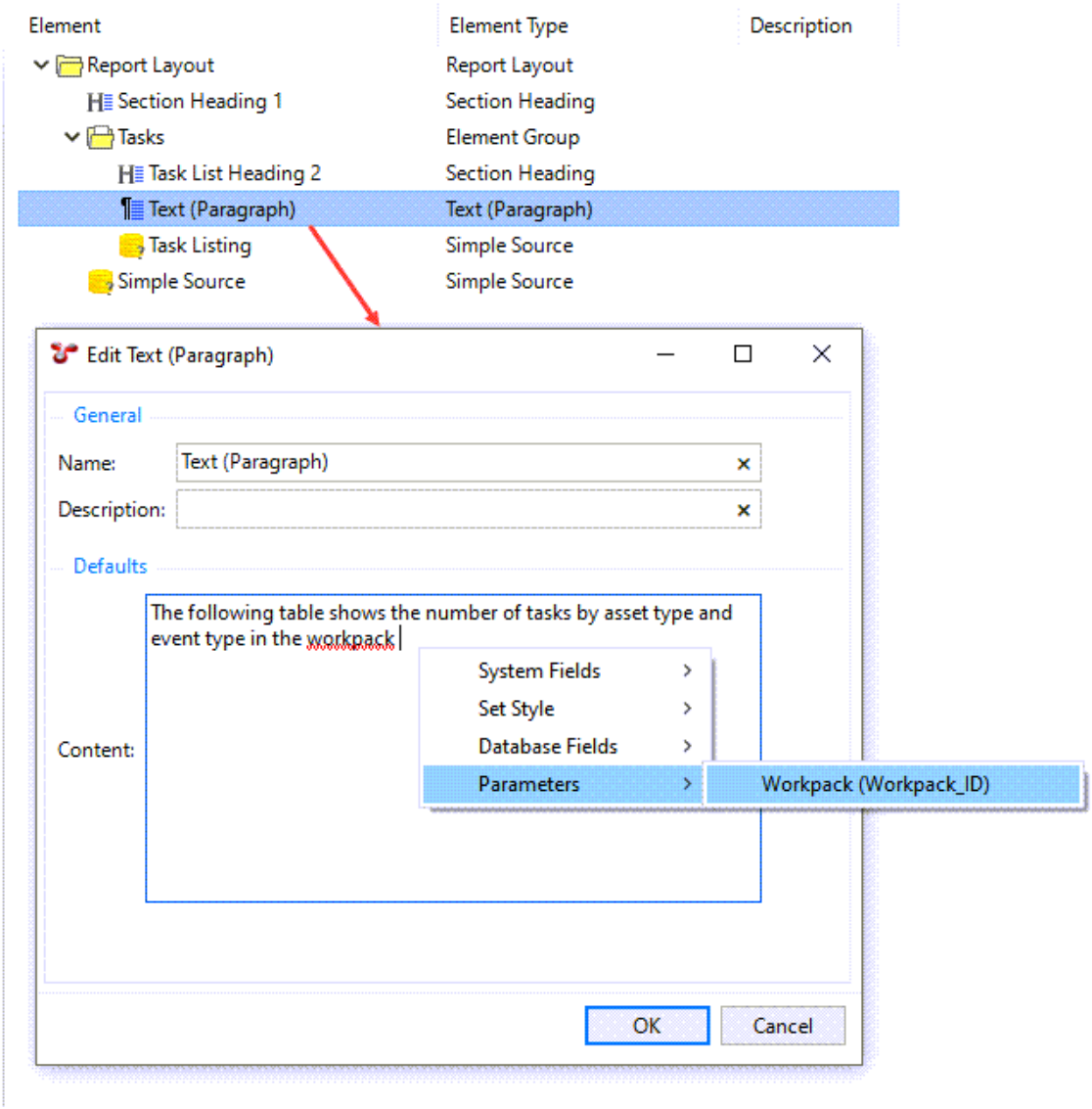
7. Click **OK**.



8.2.6.3.4.95 4. Insert a Text (Paragraph) element for introduction.

You want to insert an introductory text to the report before the pivot table. You want this text to include the workpack ID that the user selects when generating the report, thus, it has to be a variable. To do that, you add a **Text (Paragraph)** element as shown below:

1. Add a **Text (Paragraph)** element to the **Report Layout** structure so that it is included within the **Tasks** element group and it comes after the Section Heading element.
2. Double-click the new element in the structure to edit it.
3. In the **Content** field, enter text as follows:
   a. Enter *The following table shows the number of tasks by asset type and event type in the workpack .*
   b. Right-click and choose *Parameters → Workpack (Workpack_ID)* to select the user parameter that you have added to the Simple Source earlier.
4. Click **OK**.



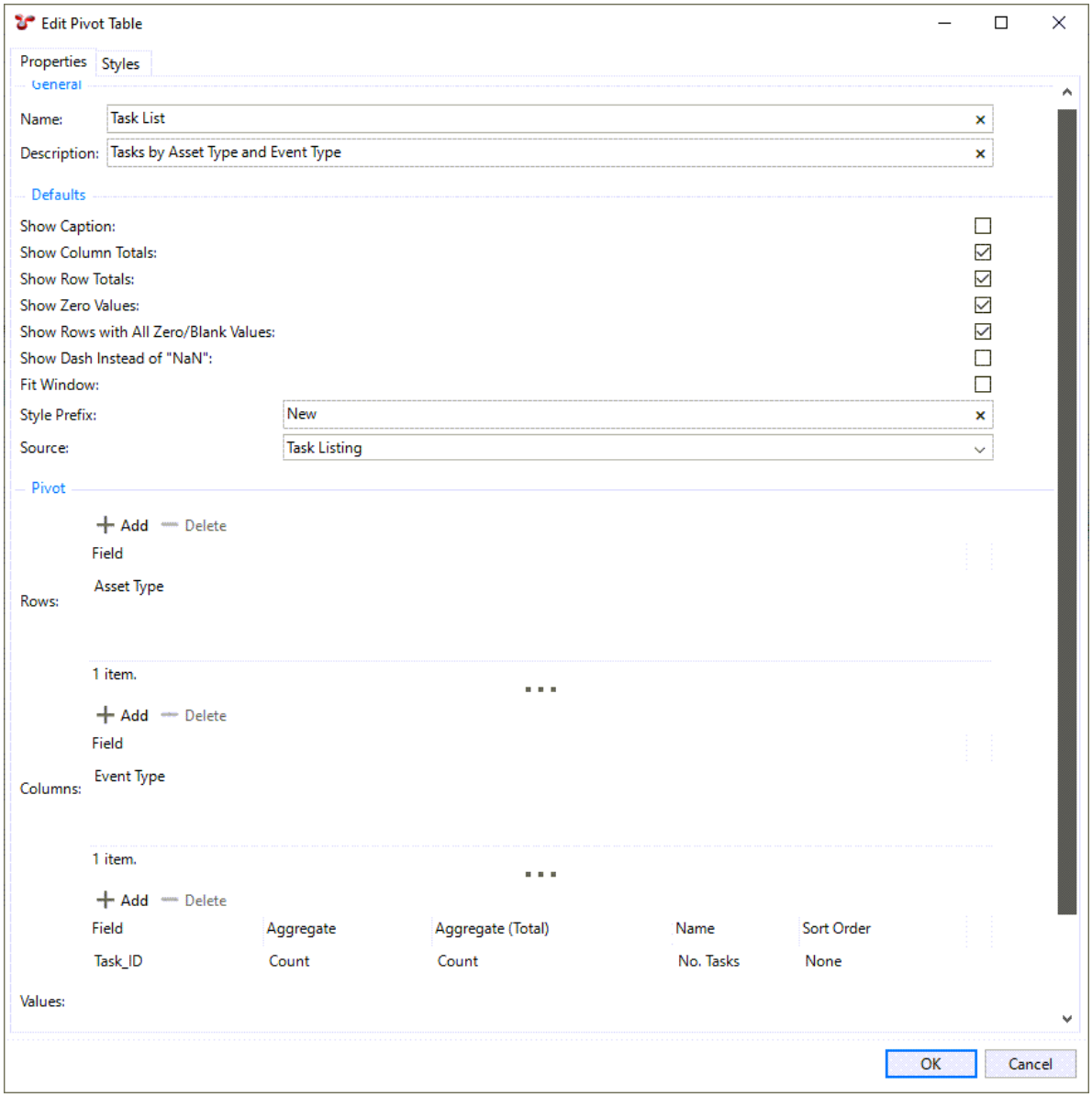
8.2.6.3.4.96 5. Insert a Pivot Table for Tasks.

We want the pivot table to show the number of tasks by asset type and event type in the workpack that the user selected.

1. Add a **Pivot Table** element to the **Report Layout** structure so that it is included within the **Tasks** element group.
2. Double-click the element in the structure to edit it.
3. In the top part of the **Edit Pivot Table** dialog, enter data as follows:
   - **Name**: Enter *Task List* or any name that identifies the element in the structure.
   - **Description**: *Tasks by Asset Type and Event Type*
   - **Show Caption**: Tick to add the name of the pivot table as a caption.
   - **Show Column Totals**: Tick to add a row that shows the total number for each column.
   - **Show Row Totals**: Tick to add a column that shows the total number for each row.
   - **Show Zero Values**: Tick to show values even if it is *0*. If you disable this option, any values that would have shown "0" will be replaced with a blank.

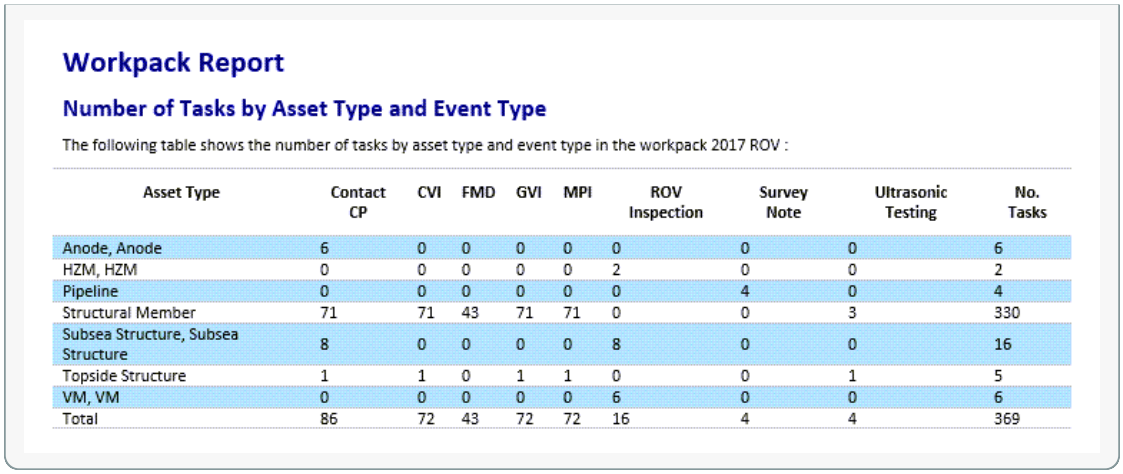
- **Show Rows with All Zero/Blank Values**: Tick so that if a row contains "0" value or no value at all, it will be shown in the output.
- **Style Prefix**: Enter *New* to use the style that you have set up in the example for Anomaly Summary Report, see *4. Create a new style for even rows.*.
- **Source**: Select *Task Listing*.

4. Under the **Pivot** section of the dialog, make settings as follows:
   a. In the **Rows** section, choose **Add**.
   b. Double-click in the new row that has been added and select *Asset Type*. The available fields in the drop-down list are retrieved from the Source that you have selected above. This setting determines that the rows of the pivot table will correspond to the values of the *Asset Type* field.
   c. In the **Column** section, choose **Add**.
   d. Double-click in the new row that has been added and select *Event Type*. This determines that the columns of the pivot table will correspond to the values of the *Event Type* field.
   e. In the **Values** section, we set up what we want to be calculated and based on which field. In our case, we want to **count** the number of tasks, so the field based on which we want to perform the calculation will be *Task_ID*, which is unique to each task record. Thus, make settings for the corresponding columns as follows:
      - **Field**: Select *Task_ID*.
      - **Aggregate**: Select *Count*.
      - **Aggregate (Total)**: Select *Count*.
      - **Name**: Enter *No. Tasks*. If you calculate row totals, this will be shown as the title of the column heading.
5. Click **OK**.



Result

When you generate the output, you can see that the pivot table has been inserted with the new style and shows the calculated number of tasks for each asset type and event type combination. The text above the pivot table shows the workpack ID that you selected when generating the report.



Workpack Report

Number of Tasks by Asset Type and Event Type

The following table shows the number of tasks by asset type and event type in the workpack 2017 ROV :

Asset Type	Contact CP	CVI	FMD	GVI	MPI	ROV Inspection	Survey Note	Ultrasonic Testing	No. Tasks
Anode, Anode	6	0	0	0	0	0	0	0	6
HZM, HZM	0	0	0	0	0	2	0	0	2
Pipeline	0	0	0	0	0	0	4	0	4
Structural Member	71	71	43	71	71	0	0	3	330
Subsea Structure, Subsea Structure	8	0	0	0	0	8	0	0	16
Topside Structure	1	1	0	1	1	0	0	1	5
VM, VM	0	0	0	0	0	6	0	0	6
Total	86	72	43	72	72	16	4	4	369

Proceed to Next Step

8.2.6.3.4.97 Add Pivot Table for Findings with Text, Simple Source with Filter

We now want to insert a pivot table that shows the number of findings by specific codes in a workpack selected by the user during report generation. We want to add a heading and a description before the table. To do that, we create the following elements:

- An Element Group for Findings, which will include the pivot table, text and heading. We will use this element group later for another findings-related element too.
- A level-2 Section Heading
- A Text (Paragraph) element to include a description
- A Simple Source for the **Finding** system table, to which we add a filter for Workpack ID as a user parameter.
- The actual Pivot Table

See the detailed steps below:

1. *Insert an Element Group.*
2. *Insert a level-2 Section Heading for the pivot table.*
3. *Insert a Simple Source for the Pivot Table.*
4. *Insert a Text (Paragraph) element for introduction.*
5. *Insert a Pivot Table for Findings.*

8.2.6.3.4.98 Prerequisites

You have completed the following steps:

- *Create Template, Set Layout, Add Title and Change Heading Style*

8.2.6.3.4.99 Process

8.2.6.3.4.100 1. Insert an Element Group.

This element will contain the heading, text, pivot table and simple source that we are going to create for this section of the report.

1. Add an **Element Group** element to the **Report Layout** structure. It should be on the same level as the element group you created for tasks.

> **Tip**
>
> If the element is not inserted to the right location in the element structure, use the **Move Up** or **Move Down** buttons in the toolbar to move them to the correct place.

2. Double-click the element in the structure to edit it.
3. Enter the name *Findings*, which will identify the element in the structure. You do not need to make other settings for the element group right now.
4. Click **OK**.

8.2.6.3.4.101 2. Insert a level-2 Section Heading for the pivot table.

1. Add a **Section Heading** element to the **Report Layout** structure so that it is included within the **Findings** element group.
2. Double-click the element in the structure to edit it.
3. Enter a name that identifies the element in the structure, for example, *Findings Heading 2*. This text does not appear in the actual report output.
4. Enter the text of the heading that you want to see in the output in the **Content** field, for example, *Number of Findings per Code*.
5. Select the **Include in Table of Contents** checkbox to have this section heading appear in the Table of Contents.
6. In the **Default Style** field, select **Heading 2**, which is a preconfigured style that can be applied for level-2 section headings. If required, you can set up your own style and apply that instead (see *Styles*).
7. Click **OK**.

8.2.6.3.4.102 3. Insert a Simple Source for the Pivot Table.

This simple source will be used as the data source for the pivot table that calculates the number of findings per code in a user-specified workpack. We also set up a filter with a user parameter for Workpack ID to allow users selecting the required workpack during report generation.

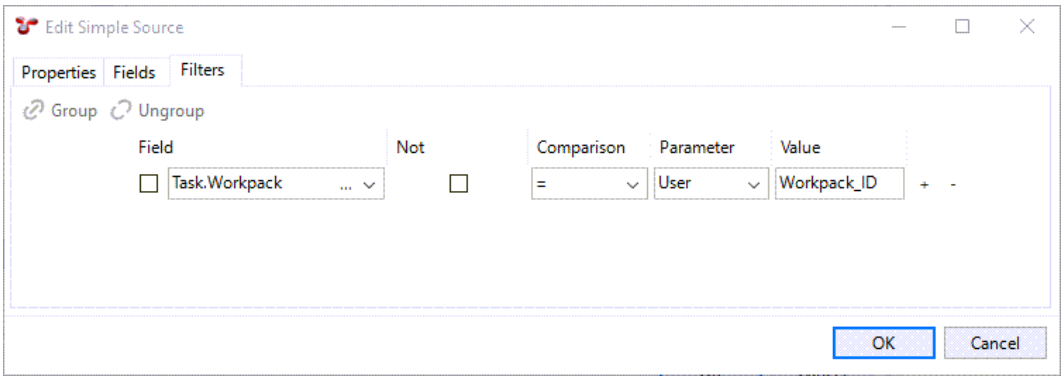
1. Add a **Simple Source** element to the **Report Layout** structure so that it is included within the **Findings** element group. The **Simple Source** element is located under the **SOURCES** node within the **Template Definition** section of the dialog.

> **Note**
>
> You must insert the simple source within the element group, else, you cannot refer to it from the other elements of the element group.

2. Double-click the Simple Source element in the structure to edit it.
3. Specify the name *Finding** for the simple source.
4. In the **Table** field, click the ellipsis … to select the System Table **Finding**.
5. On the **Filters** tab, create a new filter with the following data:
   - **Field**: *Workpack* (available from the drop-down list since it's a field within the source)
   - **Comparison**: =

- **Parameter**: *User*
- **Value**: *Workpack_ID*

6. Click **OK**.



8.2.6.3.4.103 4. Insert a Text (Paragraph) element for introduction.

You want to insert an introductory text to the report before the pivot table. You want this text to include the workpack ID that the user selects when generating the report, thus, it has to be a variable. To do that, you add a **Text (Paragraph)** element as shown below:

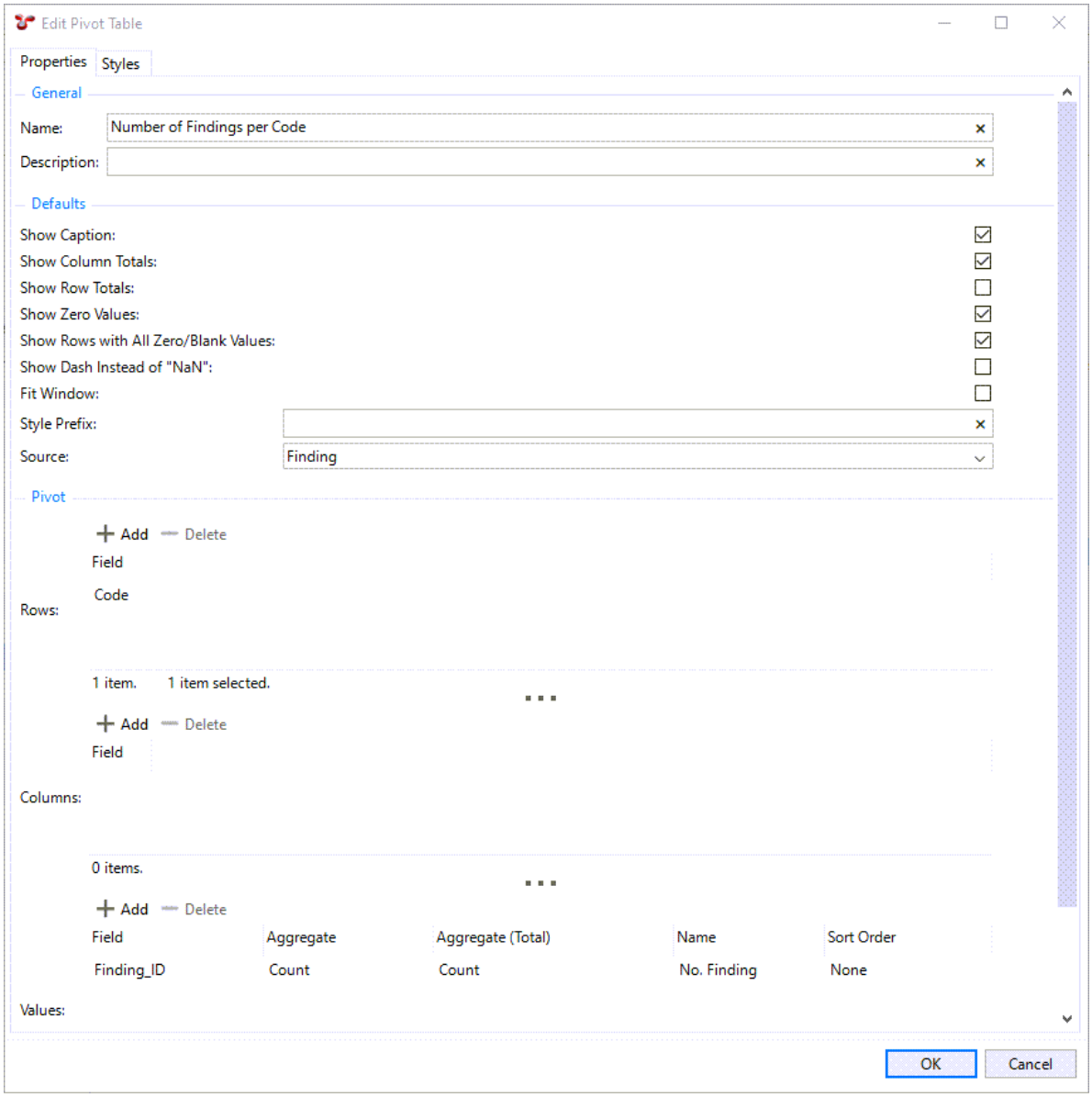
1. Add a **Text (Paragraph)** element to the **Report Layout** structure so that it is included within the **Findings** element group and it comes after the Section Heading element.
2. Double-click the new element in the structure to edit it.
3. In the **Content** field, enter text as follows:
   a. Enter *The following table shows the number of findings for each code within the workpack* .
   b. Right-click and choose *Parameters → Workpack (Workpack_ID)* to select the user parameter that you have added to the Simple Source earlier.
4. Click **OK**.

8.2.6.3.4.104 5. Insert a Pivot Table for Findings.

We want the pivot table to show the number of findings per codes in the workpack that the user selected.

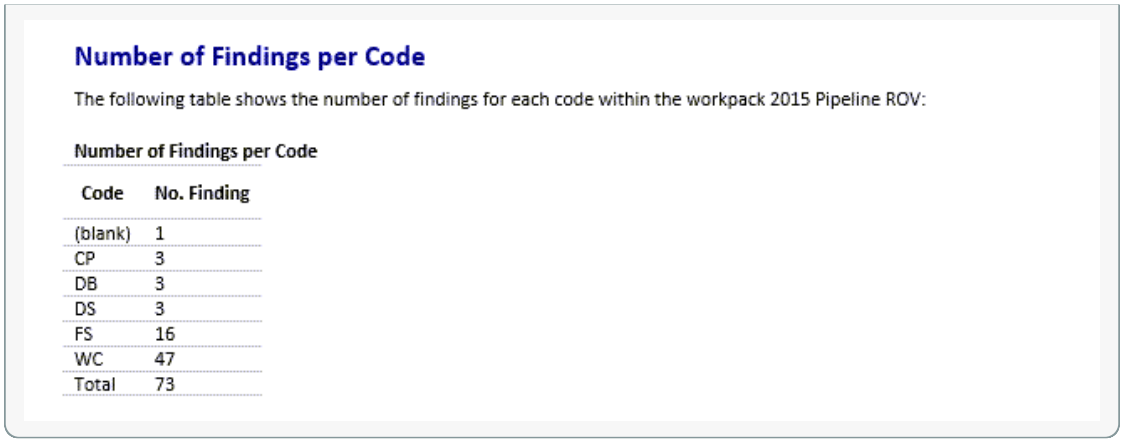
1. Add a **Pivot Table** element to the **Report Layout** structure so that it is included within the **Findings** element group.
2. Double-click the element in the structure to edit it.
3. In the top part of the **Edit Pivot Table** dialog, enter data as follows:
   - **Name**: Enter *Number of Findings per Code* or any name that identifies the element in the structure.
   - **Show Caption**: Tick to add the name of the pivot table as a caption.
   - **Show Column Totals**: Tick to add a row that shows the total number for each column.
   - **Show Zero Values**: Tick to show values even if it is *0*. If you disable this option, any values that would have shown “0” will be replaced with a blank.
   - **Show Rows with All Zero/Blank Values**: Tick so that if a row contains “0” value or no value at all, it will be shown in the output.
   - **Source**: Select *Finding*.

4. Under the **Pivot** section of the dialog, make settings as follows:
    a. In the **Rows** section, choose **Add**.
    b. Double-click in the new row that has been added and select *Code*. The available fields in the drop-down list are retrieved from the Source that you have selected above. This setting determines that the rows of the pivot table will correspond to the values of the *Code* field.
    c. In the **Values** section, we set up what we want to be calculated and based on which field. In our case, we want to **count** the number of findings, so the field based on which we want to perform the calculation will be *Finding_ID*, which is unique to each finding record. Thus, make settings for the corresponding columns as follows:
        - **Field**: Select *Task_ID*.
        - **Aggregate**: Select *Count*.
        - **Aggregate (Total)**: Select *Count*.
        - **Name**: Enter *No. Finding*. Since we now have only one parameter based on which we calculate the values (Code), this will be the title of the column that shows the numbers for each code.
5. Click **OK**.



Result

When you generate the output, you can see that the pivot table has been inserted and it shows the calculated number of findings for each code within the workpack. The text above the pivot table shows the workpack ID that you selected when generating the report.



Number of Findings per Code

The following table shows the number of findings for each code within the workpack 2015 Pipeline ROV:

Number of Findings per Code

Code	No. Finding
(blank)	1
CP	3
DB	3
DS	3
FS	16
WC	47
Total	73

Proceed to Next Step

8.2.6.3.4.105 Add Table of Data for Event Types with Distinct Source

In this step, we work in the same **Findings** Element Group as in the previous step, but now we want to create a table that lists all the event types that are related to the findings in a selected workpack. For this, we'll need a distinct source that returns the **Event Type** field values within the **Finding** Simple Source (created in the previous step). In this step, we create the following elements:

- A level-2 Section Heading
- A Text (Paragraph) element to include a description
- A Distinct Source
- The actual Table of Data

See the detailed steps below:

1. *Insert a level-2 Section Heading for the Table of Data.*
2. *Insert a Text (Paragraph) element for introduction.*
3. *Insert a Distinct Source for the Table of Data.*
4. *Insert a Table of Data for Event Types.*

8.2.6.3.4.106 Prerequisites

You have completed the following steps:

- *Create Template, Set Layout, Add Title and Change Heading Style*
- *Add Pivot Table for Findings with Text, Simple Source with Filter*

8.2.6.3.4.107 Process

8.2.6.3.4.108 1. Insert a level-2 Section Heading for the Table of Data.

1. Add a **Section Heading** element to the **Report Layout** structure so that it is included within the **Findings** element group.
2. Double-click the element in the structure to edit it.
3. Enter a name that identifies the element in the structure, for example, *Event Types Heading 2*. This text does not appear in the actual report output.

4. Enter the text of the heading that you want to see in the output in the **Content** field, for example, *Relevant Event Types*.
5. Select the **Include in Table of Contents** checkbox to have this section heading appear in the Table of Contents.
6. In the **Default Style** field, select **Heading 2**, which is a preconfigured style that can be applied for level-2 section headings. If required, you can set up your own style and apply that instead (see *Styles*).
7. Click **OK**.

8.2.6.3.4.109 2. Insert a Text (Paragraph) element for introduction.

You want to insert an introductory text to the report before the Table of Data. You want this text to include the workpack ID that the user selects when generating the report, thus, it has to be a variable. To do that, you add a **Text (Paragraph)** element as shown below:

1. Add a **Text (Paragraph)** element to the **Report Layout** structure so that it is included within the **Findings** element group and it comes after the Section Heading element.
2. Double-click the new element in the structure to edit it.
3. In the **Content** field, enter text as follows:
   a. Enter *See below the list of event types that are related to the findings in workpack .*
   b. Right-click and choose *Parameters → Workpack (Workpack_ID)* to select the user parameter that you have added to the **Finding** Simple Source earlier.
4. Click **OK**.

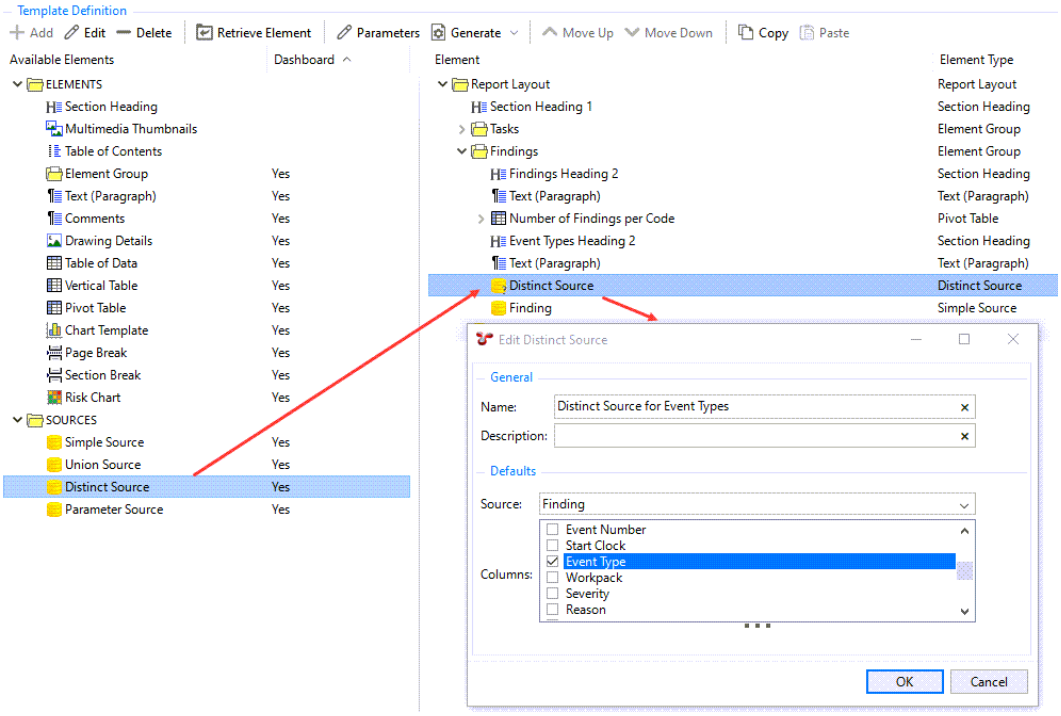
8.2.6.3.4.110 3. Insert a Distinct Source for the Table of Data.

The Distinct Source will use data from the **Finding** Simple Source, restricting it to the **Event Type** field.

1. Add a **Distinct Source** element to the **Report Layout** structure so that it is included within the **Findings** element group. The **Distinct Source** element is located under the **SOURCES** node within the **Template Definition** section of the dialog.

> **Note**
>
> You must insert the distinct source within the element group, else, you cannot refer to it from the other elements of the element group.

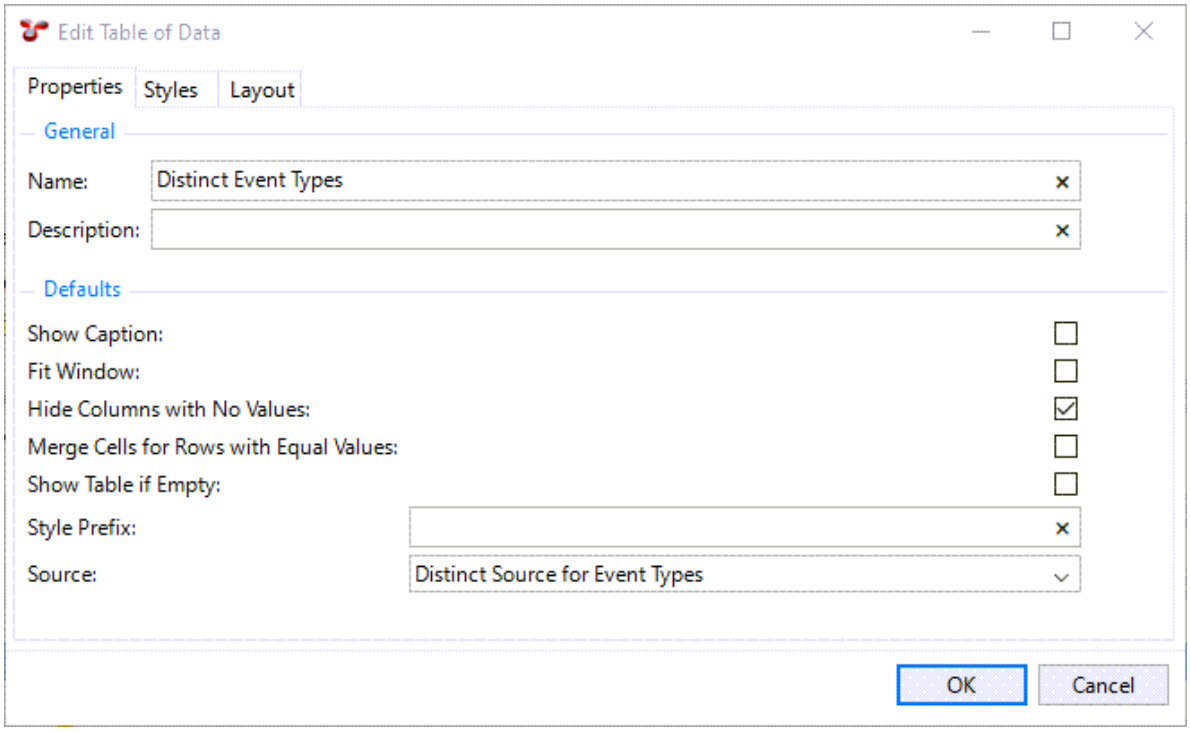
2. Double-click the Distinct Source element in the structure to edit it.
3. Specify the name *Distinct Source for Event Types**.
4. In the **Source** field, select the **Finding** Simple Source. The available values in this drop-down list are the Simple Sources that are within the same Element Group.
5. In the **Columns** field, select **Event Type** from the fields within the **Finding** source.
6. Click **OK**.



8.2.6.3.4.111 4. Insert a Table of Data for Event Types.

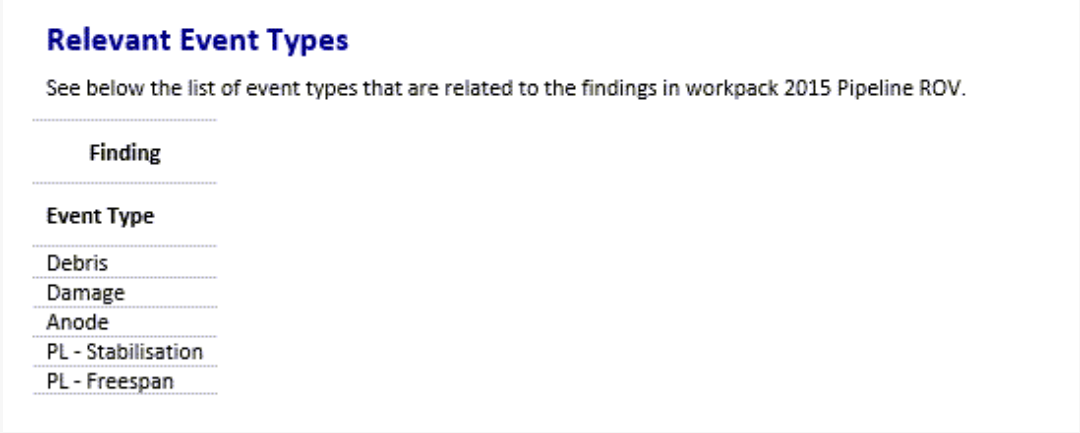
We want the Table of Data to show the list of event types associated with the findings in the selected workpack.

1. Add a **Table of Data** element to the **Report Layout** structure so that it is included within the **Findings** element group after the relevant **Text (Paragraph)** element.
2. Double-click the element in the structure to edit it.
3. On the **Properties** tab, make settings as follows
   - **Name**: Enter *Distinct Event Types* or any name that identifies the element in the structure.
   - Select the **Hide Columns with No Values** checkbox, leave the other checkboxes deselected.
   - **Source**: Select *Distinct Event Types*.
4. On the **Layout** tab, change the value of **Alignment** to *Left*.
5. Click **OK**.



Result

When you generate the output, you can see that a table has been added that shows the event types associated with the findings in the selected workpack. The text above the table shows the workpack ID that you selected when generating the report.



Proceed to Next Step

8.2.6.3.4.112 Add Drawing Details and Extended Simple Source with Filters

We want to insert drawings associated with assets that the user can select upon report generation. We also want to include layers on the drawings and a heading before the drawings. To do that, we create the following elements:

- An Element Group for Drawings to include the Drawing Details element with a parameter that allows excluding this part of the report during report generation
- A level-2 Section Heading
- A Simple Source for the **Drawing** system table, from which the Drawing Details element can retrieve data. We extend the source with a field for *Drawing Name* so that it can be used for the caption. We also add a filter for VN_ID (Asset Location) as a user parameter so that the user can select the required asset tree branch when generating the report.
- A Simple Source for the **Asset** system table, which will be used to retrieve data for the layers of the drawings. We extend this table with a few fields required for the layers and also add a filter for VN_ID (Asset Location) as a user parameter.
- The actual Drawing Details element.

See the detailed steps below:

1. *Insert an Element Group.*
2. *Insert a level-2 Section Heading for the drawings.*
3. *Insert a Simple Source for the Drawings.*
4. *Insert a Simple Source for Asset.*
5. *Insert a Text (Paragraph) element for introduction.*
6. *Insert the Drawing Details element.*

8.2.6.3.4.113 Prerequisites

You have completed the following steps:

- *Create Template, Set Layout, Add Title and Change Heading Style*

8.2.6.3.4.114 Process

8.2.6.3.4.115 1. Insert an Element Group.

This element will contain the heading, drawing details and simple sources that we are going to create for this section of the report.

1. Add an **Element Group** element to the **Report Layout** structure. It should be on the same level as the element groups that you created earlier.

   > **Tip**
   >
   > If the element is not inserted to the right location in the element structure, use the **Move Up** or **Move Down** buttons in the toolbar to move them to the correct place.

2. Double-click the element in the structure to edit it.
3. Enter the name *Drawings*, which will identify the element in the structure.
4. Select the **Allow Excluding Group from Export** checkbox to enable a selection parameter during report generation. This allows users to exclude this element group from the report output when they start generating the

report. This feature is particularly useful when you have numerous drawings that take a long time to generate, and you want to quickly review other parts of the report.

5. Click **OK**.

8.2.6.3.4.116 2. Insert a level-2 Section Heading for the drawings.

1. Add a **Section Heading** element to the **Report Layout** structure so that it is included within the **Drawings** element group.
2. Double-click the element in the structure to edit it.
3. Enter a name that identifies the element in the structure, for example, *Drawings Heading 2*. This text does not appear in the actual report output.
4. Enter the text of the heading that you want to see in the output in the **Content** field, for example, *Drawings*.
5. Select the **Include in Table of Contents** checkbox to have this section heading appear in the Table of Contents.
6. In the **Default Style** field, select **Heading 2**, which is a preconfigured style that can be applied for level-2 section headings. If required, you can set up your own style and apply that instead (see *Styles*).
7. Click **OK**.

8.2.6.3.4.117 3. Insert a Simple Source for the Drawings.

This simple source will be used as the data source for the Drawing Details element and will refer to the **Drawing** system table. Since we want to use the name of the drawing as the caption, we add the extra field *Name* from the *Library* system table. We also set up an asset tree filter with a user parameter for VN_ID to allow the user to filter based on a specific branch of the asset tree. When generating the report, the user will see a selection dialog where they can select the required asset tree branch.

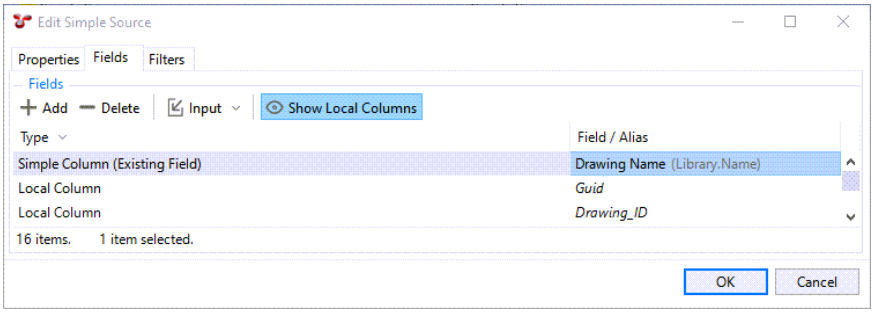
1. Add a **Simple Source** element to the **Report Layout** structure so that it is included within the **Drawings** element group. The **Simple Source** element is located under the **SOURCES** node within the **Template Definition** section of the dialog.

> **Note**
>
> You must insert the simple source within the element group, else, you cannot refer to it from the other elements of the element group.

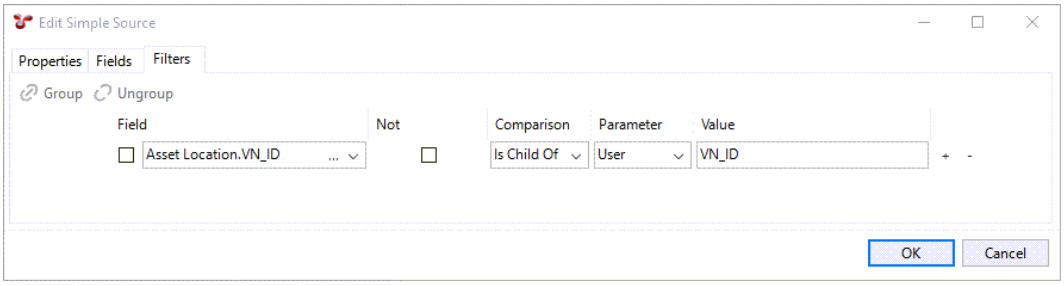
2. Double-click the Simple Source element in the structure to edit it.
3. Specify the name *Drawing** for the simple source.
4. In the **Table** field, click the ellipsis ... to select the System Table **Drawing**.
5. On the **Fields** tab, add an extra field as follows:
    a. Click **Add** to add an extra field to the Simple Source.

        You can see that a Simple Column entry has been added but with no field selected.

    b. Right-click the row, or choose **Input** from the toolbar and choose **Field...**, which brings up a new dialog.
    c. Select the **Name** field under the *Library** system table.
    d. Since the name appears as *Library*, double-click in the *Field / Alias* field for the new row and overwrite the name to *Drawing Name*.



6. On the **Filters** tab, create a new filter with the following data:
   - **Field**: Click the ellipsis and select the **VN_ID** field from under the **Asset Location** system table.
   - **Comparison**: *Is Child Of**
   - **Parameter**: *User*
   - **Value**: *VN_ID*
7. Click **OK**.



8.2.6.3.4.118 4. Insert a Simple Source for Asset.

We want to display layers on the drawings, which will require some asset data, thus, we need to insert a simple source that links to the **Asset Location** system table. We also need to extend the simple source with additional fields for Asset Name, Asset Component ID and Traffic Light colour. Similarly to the step above, we also set up an asset tree filter with a user parameter for VN_ID to allow the user to filter based on a specific branch of the asset tree.

1. Add a **Simple Source** element to the **Report Layout** structure so that it is included within the **Drawings** element group.

> **Note**
>
> You must insert the simple source within the element group, else, you cannot refer to it from the other elements of the element group.

2. Double-click the Simple Source element in the structure to edit it.
3. Specify the name *Asset** for the simple source.
4. In the **Table** field, click the ellipsis to select the System Table **Asset Location**.
5. On the **Fields** tab, add extra fields as follows:
   a. Click **Add** to add an extra field to the Simple Source.

      You can see that a Simple Column entry has been added but with no field selected.

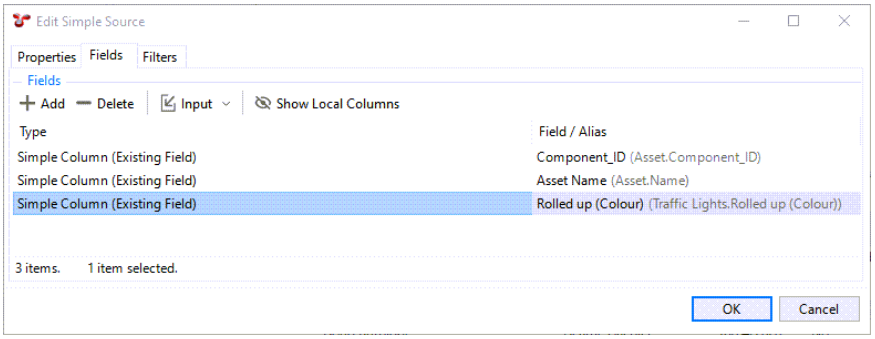
b. Right-click the row, or choose **Input** from the toolbar and choose **Field...**, which brings up a new dialog.

c. Select the **Component_ID** field under the **Asset** system table.

d. Double-click in the *Field / Alias* field for the new row and overwrite the name to *Component ID*.

e. Add two other fields in the same way:

- A row for the **Name** field under the **Asset** system table, overwrite name to *Asset Name*.
- A row for the **Rolled Up (Colour)** field from the **Traffic Lights** system table.



6. On the **Filters** tab, create a new filter with the following data:

- **Field**: Click the ... ellipsis and select the **VN_ID** field from under the **Asset Location** system table.
- **Comparison**: *Is Child Of**
- **Parameter**: *User*
- **Value**: *VN_ID*

7. Click **OK**.

8.2.6.3.4.119 5. Insert a Text (Paragraph) element for introduction.

You want to insert an introductory text to the report before the drawings. You want this text to include the Asset Location ID (VN_ID) that the user selects when generating the report, thus, it has to be a variable. To do that, you add a **Text (Paragraph)** element as shown below:

1. Add a **Text (Paragraph)** element to the **Report Layout** structure so that it is included within the **Drawings** element group and it comes after the Section Heading element.
2. Double-click the new element in the structure to edit it.
3. In the **Content** field, enter text as follows:

   a. Enter *See below the drawings associated with Asset "*.

   b. Right-click and choose *Parameters* → *VN_ID* to select the user parameter that you have added to the Simple Sources earlier.

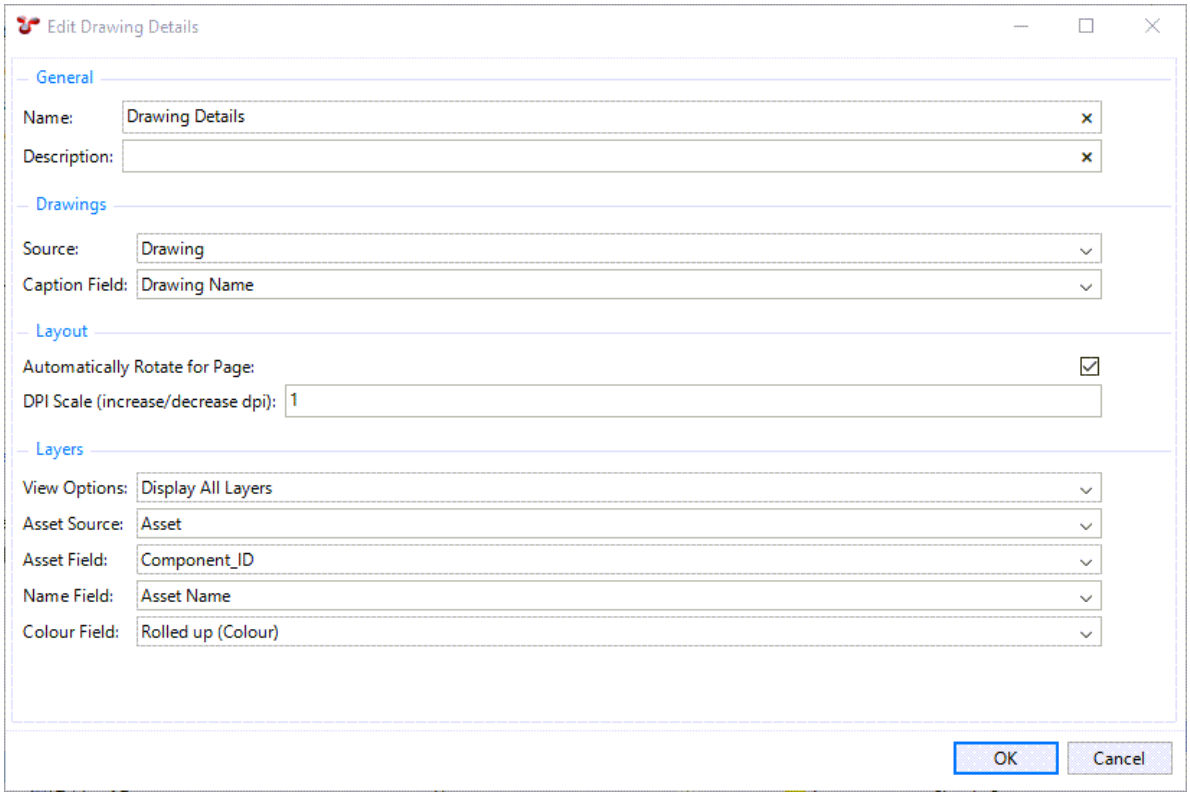
   c. Continue entering the text: "" and its children:"

   That is, the text that you have added looks like this: "See below the drawings associated with Asset "[PARAM VN_ID]" and its children:"

4. Click **OK**.

8.2.6.3.4.120 6. Insert the Drawing Details element.

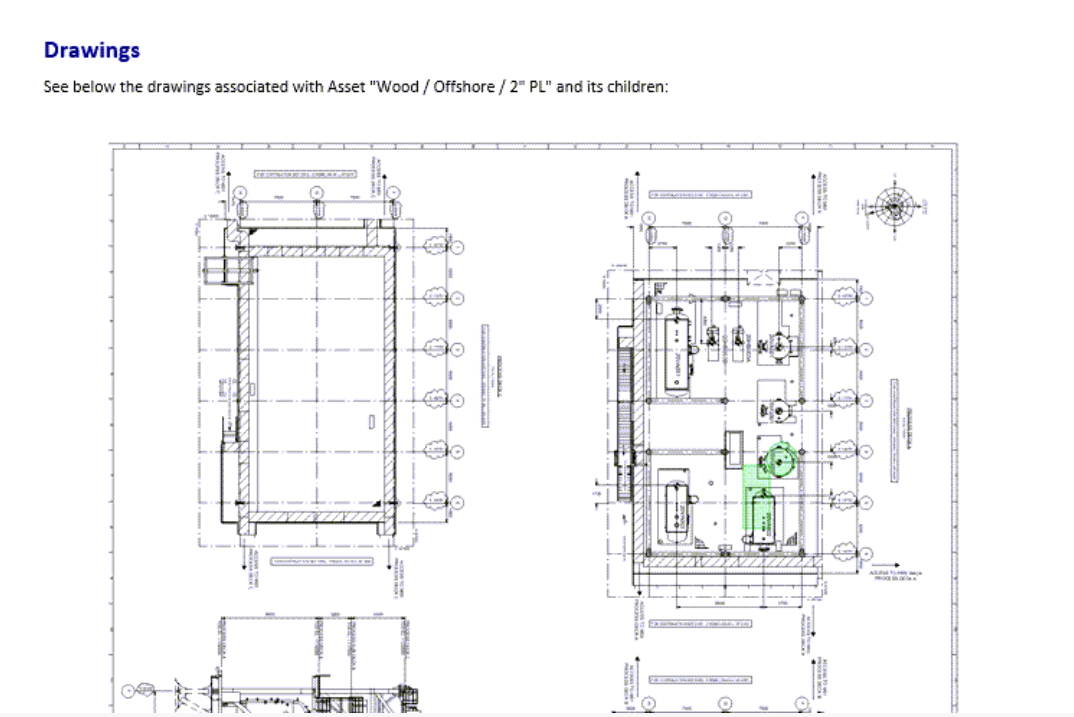
1. Add a **Drawing Details** element to the **Report Layout** structure so that it is included within the **Drawings** element group and it is under the Text (Paragraph) element.
2. Double-click the element in the structure to edit it.
3. In the **Edit Drawing Details** dialog, enter data as follows:
   - **Name**: Enter *Drawing Details* or any name that identifies the element in the structure.
   - **Source**: Select the *Drawing* source, which you have created earlier.
   - **Caption Field**: Select the field *Drawing Name*, which you have added to the simple source earlier.
   - **Automatically Rotate for Page**: Leave it selected.
   - **DPI Scale**: Leave the value *1*.
   - **View Options**: Select *Display All Layers*. Additional fields become available for selection.
   - **Asset Source**: Select the *Asset* source, which you have created earlier. This will be used to retrieve information for the layers.
   - **Asset Field**: Select the field *Component_ID*, which you have added to the simple source earlier.
   - **Name Field**: Select the field *Asset Name*, which you have added to the simple source earlier.
   - **Colour Field**: Select the field *Rolled up (Colour)*, which you have added to the simple source earlier.
4. Click **OK**.



report.template.workpack.drawing_details |

Result

When you generate the output, you can see that the drawings have been inserted including the layers The text above the drawings shows the VN_ID that you selected when generating the report.



Proceed to Next Step

8.2.6.3.4.121 Insert Table of Contents, Verify Output

In this step, you insert a Table of Contents element and check if the output complies with your requirements.

See the detailed steps below:

1. *Insert a Table of Contents element.*
2. *Generate an output to check the final output of the report.*

8.2.6.3.4.122 Prerequisites

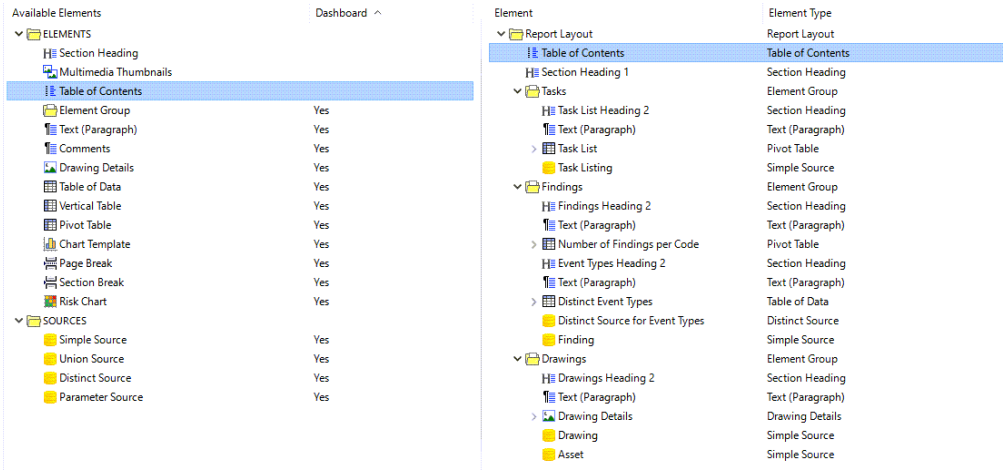
You have completed the following steps:

- *Create Template, Set Layout, Add Title and Change Heading Style*
- *Add Pivot Table for Tasks with Text, Extended Simple Source with Filter*
- *Add Pivot Table for Findings with Text, Simple Source with Filter*
- *Add Table of Data for Event Types with Distinct Source*
- *Add Drawing Details and Extended Simple Source with Filters*

8.2.6.3.4.123 Process

8.2.6.3.4.124 1. Insert a Table of Contents element.

Drag the Table of Contents element or select it and choose **Add** to insert it in the **Report Layout** structure. Ensure that it is the first node within the structure:



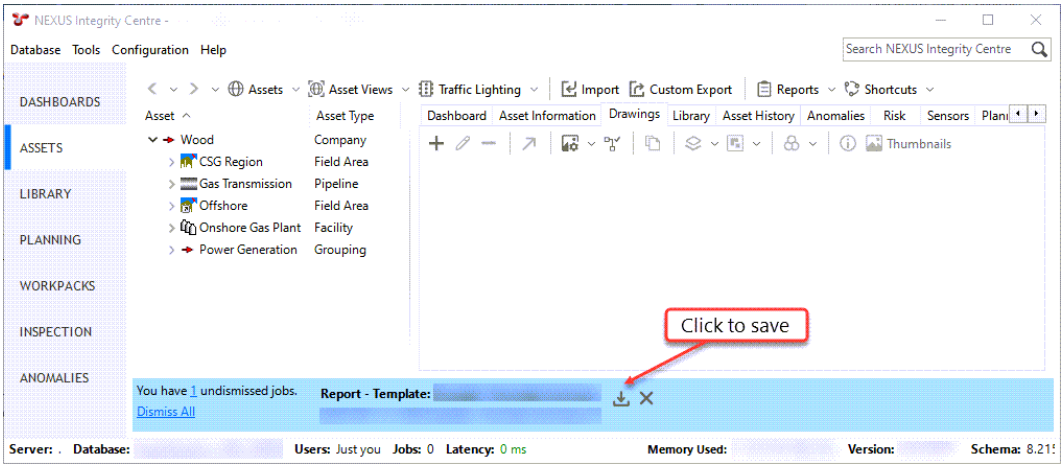
> **Note**
>
> - The Table of Contents element is applicable only to RTF and HTML outputs.
> - The formatting of the Table of Contents element depends on your settings for the elements starting with *TOC* in your generic report style configurations (see *Styles*). You can adjust the look of each heading level as required. For example, for Heading 2 in the TOC, you edit the style TOC Heading 2 and add a left padding value “30”.
> - In the RTF output, you must right-click and update the table of contents to ensure that page numbers appear correctly.

8.2.6.3.4.125 2. Generate an output to check the final output of the report.

To generate the output, proceed as follows:

1. In the **Edit Report Template** dialog, choose **OK** to close the dialog and save your changes.
2. Back in the **Configuration - Templates** dialog, select the report template and choose the **Generate** toolbar button.
3. Select the required output format from the drop-down, which can be either RTF, HTML, Microsoft Excel or PDF.
4. Select a report destination, which, in this case, will be **File**.
5. Choose **Commit**.
6. Close the **Configuration - Templates** dialog.
7. Wait until the report output is generated. The progress is indicated at the bottom of the main **NEXUS IC** screen.

8. Once the generation is complete, click the *Save* icon to download and save the report.



9. Select the destination and open the file.
10. If you generated an RTF output, right-click the Table of Contents and choose **Update Field** to ensure that page numbers appear correctly.
11. Review the report to verify it meets your expectations.

You can make configurations for NEXUS from the **Configuration** menu of NEXUS IC.

When you select **Configuration** from the main menu, you can make settings for the following:

- *General Configuration*
- *Configure Assets*
- *Configure Planning Data*
- *Configure Events*
- *Configure Anomalies*
- *Configure Reports and Dashboards*

Caution

We advise that you take caution when making changes in your configurations, especially for *Configure Chart Templates*, *Configure Functions*, *Configure Connections*, *Configure Shortcuts*, *Configure Asset Information Groups*, *Configure Sensors*, *Configure Risk Charts*, *Configure Risk Models*, and *Configure Event Types*. Before making changes in these areas, we suggest that you take a database backup. Also, before deleting anything, we recommend that you check *Connections*.

8.3 Tools

8.3.1 Options

Under *Tools* → *Options*, you can make some generic settings related to the applications.

All options and settings in this dialog are currently user-specific. The options and settings are stored in the windows folder: `C:\Users\[USER_NAME]\AppData\Roaming\NEXUS`

Under **Options**, you can make settings as follows:

Tab	Settings
General	You can make configurations for database backup, specify the cache and export folders. For information about setting up the network path for backup and restore, see *Setting Up Network Path for Backup/Restore*.
Spell Checking	You can enable spell checking and specify the relevant dictionary to be used as well as any custom words that you want to add to the dictionary. These words are then ignored during spell checking.
Inspection	You can make settings for capturing videos during inspections (for example, specifying the image format, image capture naming or JPEG quality, as well as enabling automatically switching to video time and sync KP) and assign keybindings to actions to be used on the **Inspections Review** screen. For more information, see *Setting Up Keybindings*.

8.3.1.1 Setting Up Network Path for Backup/Restore

You specify the network path for backing up or restoring data in the Network path for backup/restore field under *Tools → Options → General*.

This path must be accessible to both the database server and to NEXUS IC. This may be a UNC path (like '\\MyServer\MyShare') or if the database server and NEXUS IC are running on the same machine, it may be a Windows path (like 'C:\Database Backups').

When the path is valid (that is, it is visible to both Integrity Centre and the database server) it will have no border. If the path is invalid, a yellow border will be shown around the field.

Example valid path:

Example invalid path:

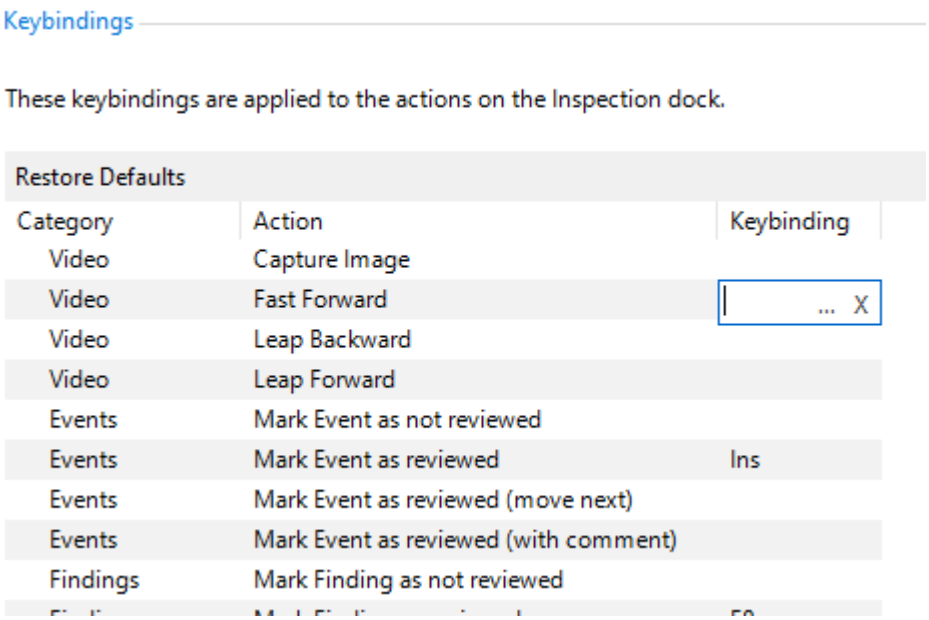
Tip

The database server process must have permission to read and write to the folder. If the path is shown as invalid, check the permissions of the user account that the database server service is running under.

8.3.1.2 Setting Up Keybindings

Inspection keybindings allow the user to assign function keys and numeric keypad keys as shortcuts to common review actions within the **INSPECTION** screen.

You can define keybindings under *Tools → Options → Inspection*.



Click on the **Restore Defaults** button to pre-populate common keybindings.

To assign a keybinding to an action, proceed as follows:

1. Select the Action.
2. Double-click in the **Keybinding** column and click on the ⋯ *Ellipsis* button.
3. Press the key (or key combination) that you want to assign to the currently selected action. The keybinding will then be displayed in the grid.

8.3.2 Video...

The **Configuration - Video** dialog lists all parsed video files that exist in the folders defined in the *Database → Properties → Global Video Path* field and the *Database → Properties → Temporary Inspection Video Path* folders.

From this dialog, you can:

- Add, edit, or delete video files

  If there are videos listed that no longer exist (for example because you have used Windows Explorer to move or delete them), you should remove them from this list too, using the **Delete** button. You can use multi-select for deleting several files at once.

- Export video files to HTML, RTF or Text and save or send them via e-mail (see *Export*)
- Customise the layout of the grid (see *Customise*)
- Play a selected video file
- Open the folder location of the selected video file in Windows Explorer.

  Note that the **Open Location** button is only enabled for non-cloud based storage locations.

- Upload video files, which copies video files from the **Temporary Inspection Video Path** to the **Global Video Path**.

  This is typically used to copy inspection video returned from an inspection campaign to the master video storage location. The **Upload** process gives you the option to delete, rename, or retain the local video files (this could be on a USB HDD) after the **Upload** has finished. Additionally, you can elect to encode the video files to the native streamable H.264 file format during the copy process. To successfully upload, video file names must reflect one

of the accepted *filename formats*. If NEXUS IC cannot parse the start time of the video from the file name, then the video will not upload.

See also

Managing Videos

8.3.3 Parse Video

Clicking on an item in the **Parse Video** drop-down menu causes NEXUS IC to read video and image files and store their properties (such as start time and duration) in the database. The datetime properties of the video and image files are the links to the events in the *Inspection* screen.

- Choosing **Global Video** parses all video and image files in the Global Video Path. (Typically you would use this option onshore.)
- Choosing **Temporary Video** parses all files in the Temporary Inspection Video Path. Files ending in '.uploaded' will be ignored. (Typically you would use this option offshore.)
- Choosing **All Video** parses all files in both those locations.

The parsed videos and images will appear in the *Tools* → *Video...* dialog (see above).

As files are parsed, start time data will be read from the filename. After the parse completes, any files whose start time could not be read will be shown in a list. These files will be present in the **Configuration - Video** dialog but cannot be uploaded until their names are edited to match one of the accepted *filename formats*.

See also

Managing Videos

Under the **Tools** menu, you can access some tools and options for influencing or checking the generic behaviour of the application.

The **Tools** menu is available for NEXUS IC and IC-Inspection, however, in IC-Inspection, not all options are available.

Under **Tools**, you can access the following:

- Options (see *Options*)
- Video.. (see *Video...*)
- Parse Video (see *Parse Video*)

Before you start using NEXUS IC, you must set it up as described in *Deployment*.

From the main menu of NEXUS IC, you can make settings for, adjust, or check the way NEXUS IC works, including:

- Performing tasks related to the database (see *Database*)
- Configuring the NEXUS IC database (see *Configuration*)
- Using the *Tools* menu for influencing or checking the generic behaviour of the application (see *Tools*)

CHAPTER

NINE

GENERAL FEATURES

The topics below describe features that are relevant for NEXUS IC in general.

- *Searching*
- *Checking History*
- *Using the Grid*
- *Using the Status Bar*
- *Validating Data*
- *Unhandled Exceptions*

Some features are also relevant for IC-Inspection, see *General Features in IC-Inspection* for information about the differences.

9.1 Searching

NEXUS IC provides two ways to search information in the database:

- A **database-wide search**, which searches across all records in the database (see *Database-Wide Search*)
- An **asset-specific search**, which searches within the asset tree (see *Asset Search*)

All search types in NEXUS IC run in the background, allowing you to continue working in the application while a search is in progress.

The following sections describe additional search features and options:

- Multi-keyword search logic, describing how multiple terms can be used together (see *Multi-Keyword Search Logic*)
- Search filters, which restrict searches to specific tables (see *Use Search Filters*)
- Searching for specific event records (see *Search Event Records*)
- Reviewing search results in the **Search Results** pane, showing how results are grouped and how to navigate to and edit search result items (see *View Search Results*)
- Differences in search behaviour across NEXUS solutions (see *Searching in Different Solutions*)
- Autocomplete (see *Autocomplete*) and Find As You Type (see *Find As You Type*) features for fast in-grid searching

9.1.1 Database-Wide Search

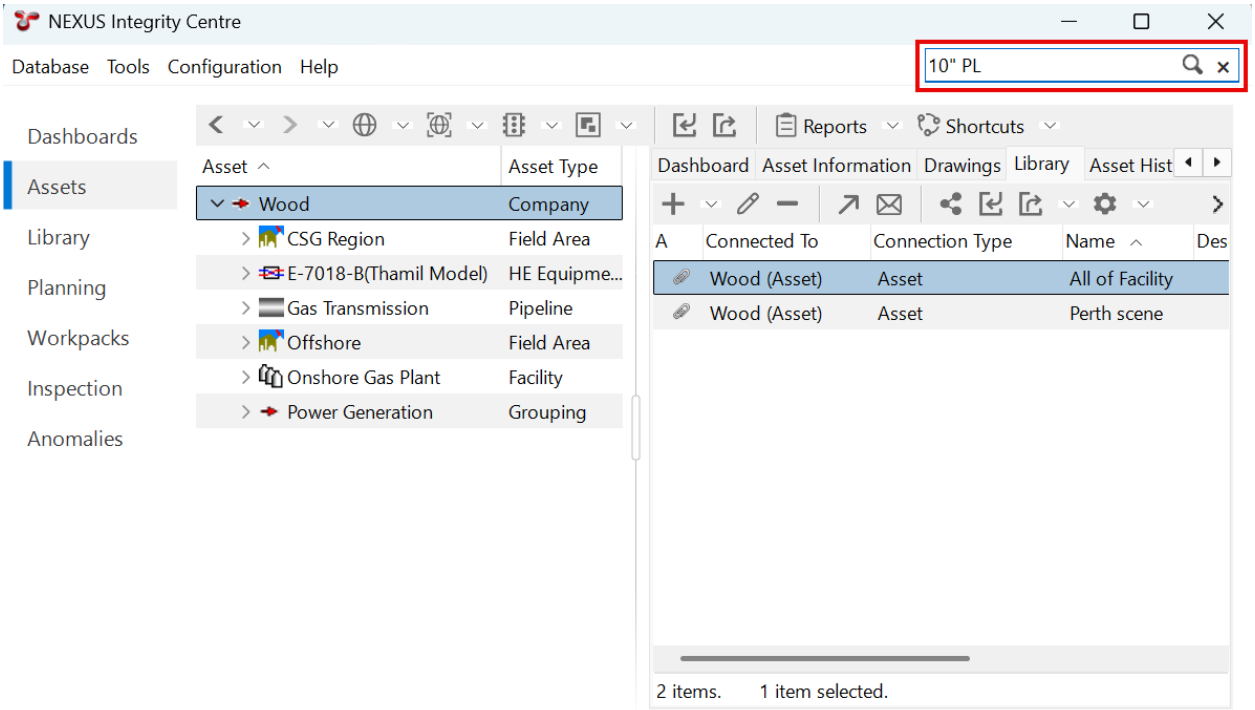
Use a database-wide search to locate items anywhere in the NEXUS IC database.

To perform a database-wide search:

1. In the top-right corner of the main screen, type your search text in the search box.
2. Press **ENTER** or click the icon.
3. Review the results in the **Search Results** pane.

Note

- Anomaly codes and numbers are searchable. For example, an anomaly with code **AN** and number **1** can be found by searching for `AN-1`.
- You can cancel an active search at any time by selecting .



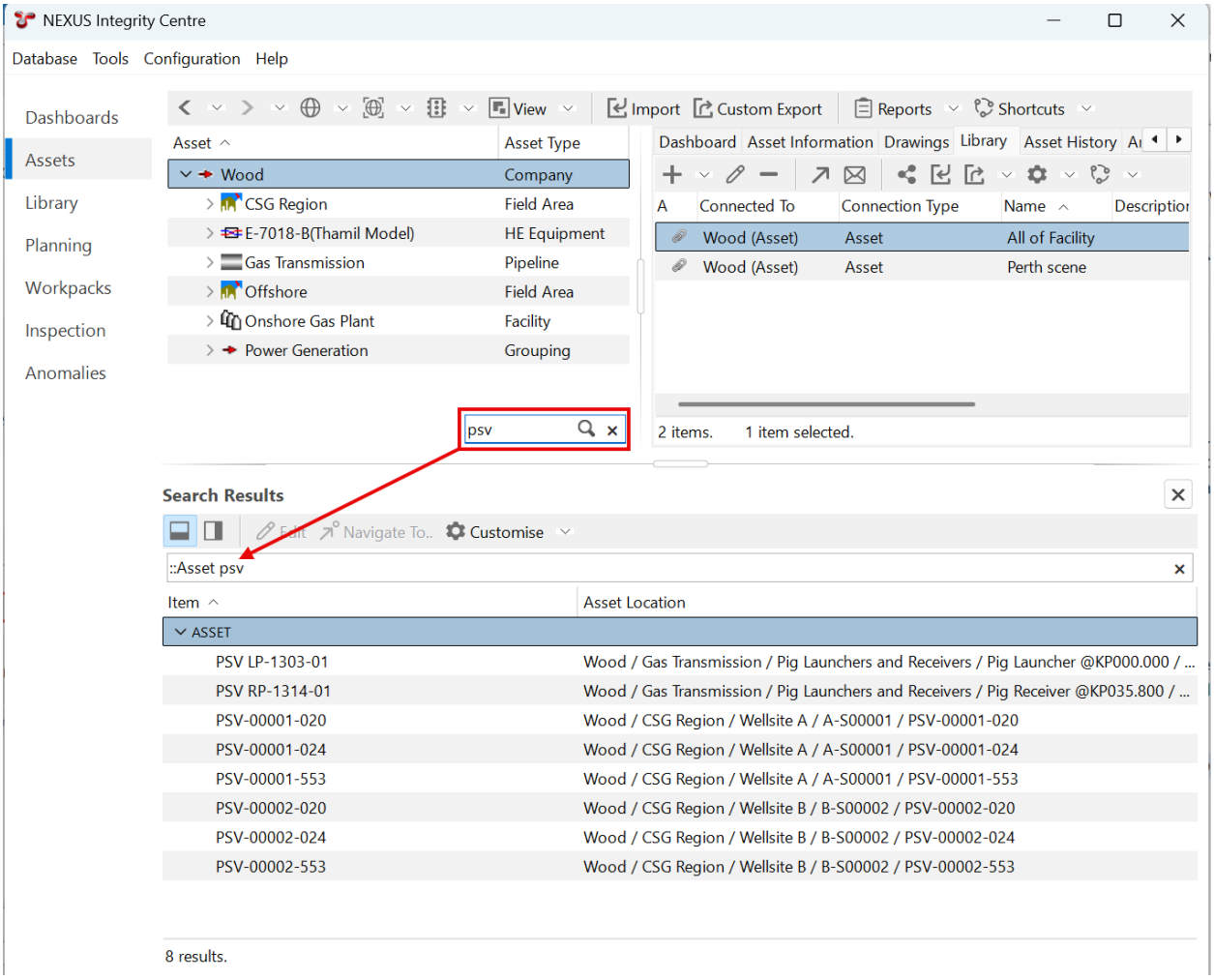
9.1.2 Asset Search

On the **ASSETS**, **PLANNING**, or **INSPECTION** screens, you can search for assets directly from the asset tree.

To perform an asset search:

1. Ensure the asset tree has focus, then start typing on the keyboard. A search box appears at the bottom of the asset tree. Alternatively, press **Ctrl+F** to display the search box.
2. Press **ENTER** or click the icon.
3. Review the results in the **Search Results** pane.

> **Note**
>
> - You can cancel the search at any time by selecting or pressing **ESC**.
> - Pressing **ESC** closes the asset tree search box.



9.1.3 Multi-Keyword Search Logic

NEXUS IC supports multiple search terms in a single query.

- Unquoted keywords use **OR logic**. For example, `abc def` matches items containing **either** `abc` **or** `def`.
- Quoted phrases use **AND logic**. For example, `"def ghi"` matches items containing **both** `def` and `ghi`.

You may combine both forms. For example, `abc "def ghi"` matches items containing `abc` or items containing `def` and `ghi`.

This behaviour applies to all search types, including database-wide, asset, and filtered searches.

> **Tip**
>
> Use the underscore character (_) as a wildcard to represent a single character.

9.1.4 Use Search Filters

You can restrict searches to specific tables to improve performance and reduce irrelevant results. To apply a search filter, prefix your search term with `::`, followed by the table name:

```
::[Table Name] [Search term]
```

If the table name contains spaces, enclose it in quotation marks.

Examples

- Search *only* assets for the string `PSV-1005`:

  ```
  ::Asset PSV-1005
  ```

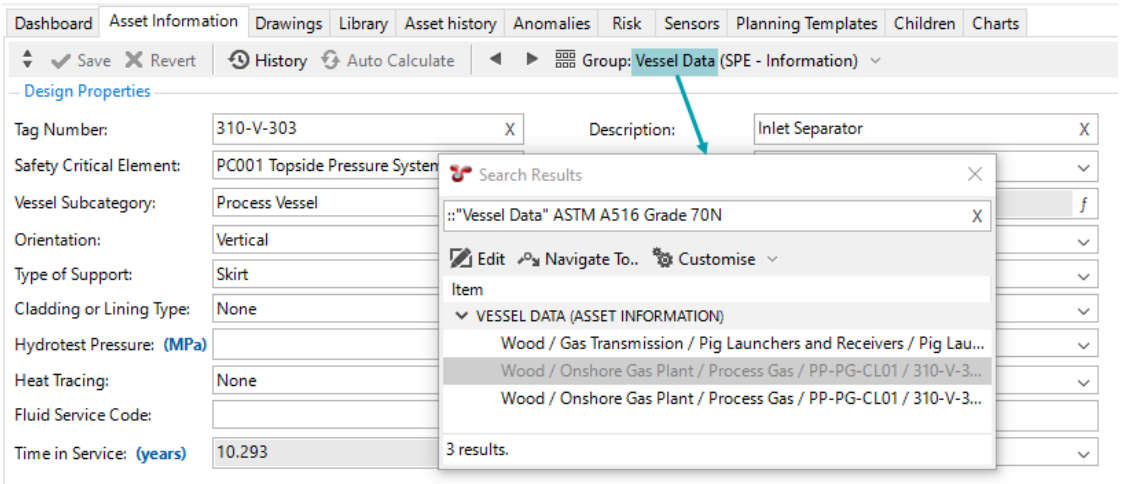
- Search *only* anomalies for the string `AW @ 10" PL`:

  ```
  ::Anomaly AW @ 10" PL
  ```

You can also limit searches to a specific **Asset Information Group (AIG)** or **event** by using the same syntax. Precede the search term with `::`, followed by the name of the AIG or event. If the AIG or event name has spaces in it, enclose it in quotations.

For example, to search for the material type *ASTM A516 Grade 70N* within the *Vessel Data* AIG:

```
::"Vessel Data" ASTM A516 Grade 70N
```



9.1.4.1 Common Search Parameters

You can use the following common search parameters to search data within specific tables:

Category	Search Parameters
Inspections	`::[Event Name]`, `::Finding`, `::Commentary`, `::Multimedia`
Assets	`::Asset`, `::[AIG Name]`, `::"Asset History"`
Anomalies	`::Anomaly`, `::"Anomaly Action"`, `::Finding`
Library	`::Library`
Planning	`::Workpack`, `::Task`, `::"Planning Template"`, `::Shutdown`
Miscellaneous	`::"Report Template"`, `::"Table Definition"`, `::"Field Definition"`, `::"Function Definition"`

Filtering your search results is especially useful in large databases where global searching takes a long time.

9.1.4.2 Refine Searches by Column

You can further refine a filtered search to target a specific column within a table. To search within a specific column, use the following syntax:

`::[Table Name].[Column Name] [Search term]`

Example

To search explicitly for the value `2553` within the `component_ID` column of the **Asset** table:

`::Asset.component_ID 2553`

By default, NEXUS IC does **not** search unique identifiers (IDs). Column-level searches allow you to explicitly include unique IDs in your search.

> **Note**
>
> If the column name contains spaces, enclose it in double quotation marks. For example:
>
> `::Anomaly."Reference Number" 10022014_269`

9.1.5 Search Event Records

You can locate specific events by combining the event type with its event number using the format:

`"EventType #EventNumber"`

Examples:

- `"GVI #7"` returns the GVI event with Event Number 7.
- `"Monitoring #3"` returns the Monitoring event with Event Number 3.

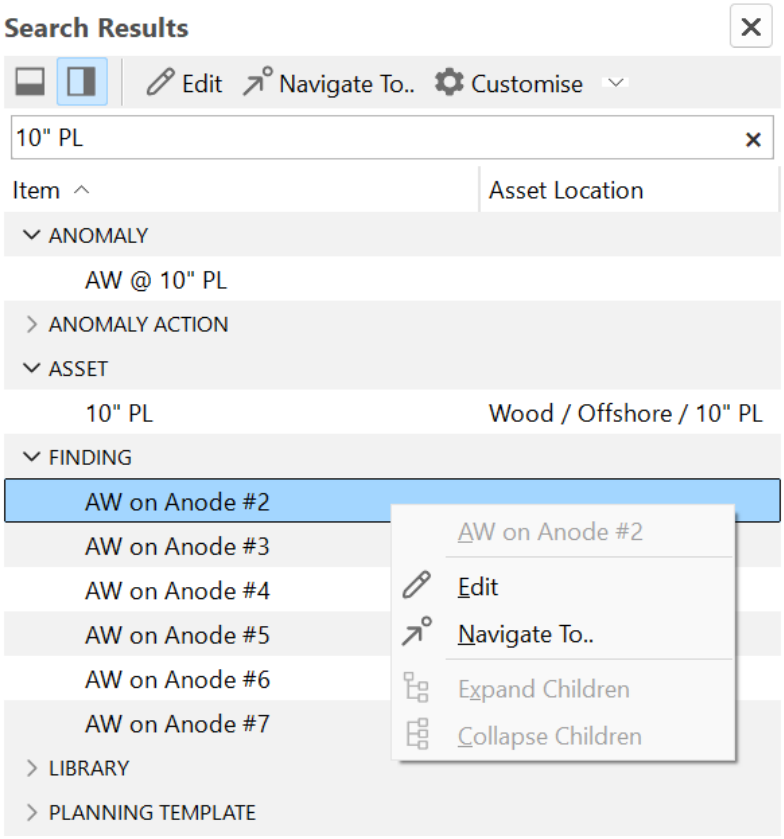
Quotation marks and the # symbol restrict the search to the specified event type and number. If quotation marks or # are omitted (for example, `GVI #7` or `"GVI 7"`), the search may return broader results matching either the event type or the number.

9.1.6 View Search Results

The **Search Results** pane displays all items returned by your search. It is docked either to the right or the bottom of the application window. You can change its docking position using the **Align Bottom** or **Align Right** icons in the pane toolbar.

The pane supports basic view adjustments, such as showing or hiding the **Asset Location** column or applying best-fit sizing. These options are available through the **Customise** toolbar option.

Results are grouped into categories (see *Result Categories*). You can also navigate to search result items (see *Navigate to Search Result Items*) or edit them directly (see *Edit Items from Search Results*).



Tip

- You can also initiate additional searches directly from the **Search Results** pane by entering new text and pressing **ENTER**.
- You can keep the **Search Results** pane open while working in NEXUS IC and close it when no longer needed.

9.1.6.1 Result Categories

In the **Search Results** pane, results are grouped into categories (for example, *ANOMALY*, *ASSET*, *FINDING*).

- Category names are displayed in capital letters.
- Categories with many results are initially collapsed.
- Categories with fewer results are automatically expanded.

9.1.6.2 Navigate to Search Result Items

From the **Search Results** pane, you can navigate to a result item in any of the following ways:

- Double-click a result item (not a category).
- Select an item and click **Navigate To** in the toolbar.
- Right-click an item and select **Navigate To** from the context menu.

When navigating to an item, NEXUS IC opens the relevant screen and focuses on the selected item. For example:

- If you navigate to a specific asset, NEXUS IC switches to the **ASSETS** screen and focuses the asset in question.
- If the item is managed through a configuration screen (see *Configuration*), screen, NEXUS IC opens that screen docked within the main application window and displays the item.

9.1.6.3 Edit Items from Search Results

You can edit items directly from the **Search Results** pane:

- Select an item and click **Edit** in the toolbar.
- Right-click an item and select **Edit** from the context menu.

9.1.7 Searching in Different Solutions

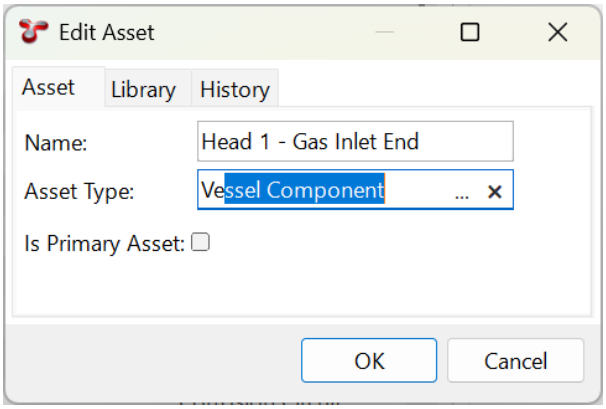
NEXUS IC performs a full database-wide search. Other NEXUS solutions behave differently:

- **IC-Inspection** searches only a subset of the database.
- **IC-Web** provides a search box above the asset tree, which searches asset names only.

For information about searching in **IC-Inspection**, see *General Features in IC-Inspection*.

9.1.8 Autocomplete

In case you see a record lookup editor (a text box with a ellipsis button and clear button at the right), you can begin typing the desired value. NEXUS IC automatically completes the entry where possible, without opening the picker dialog.



Autocomplete works best when the desired value is unique or clearly identifiable by its first few characters. If multiple entries share similar names (for example, *Anode 001*, *Anode 002*), **Find As You Type** may be more suitable.

9.1.9 Find As You Type

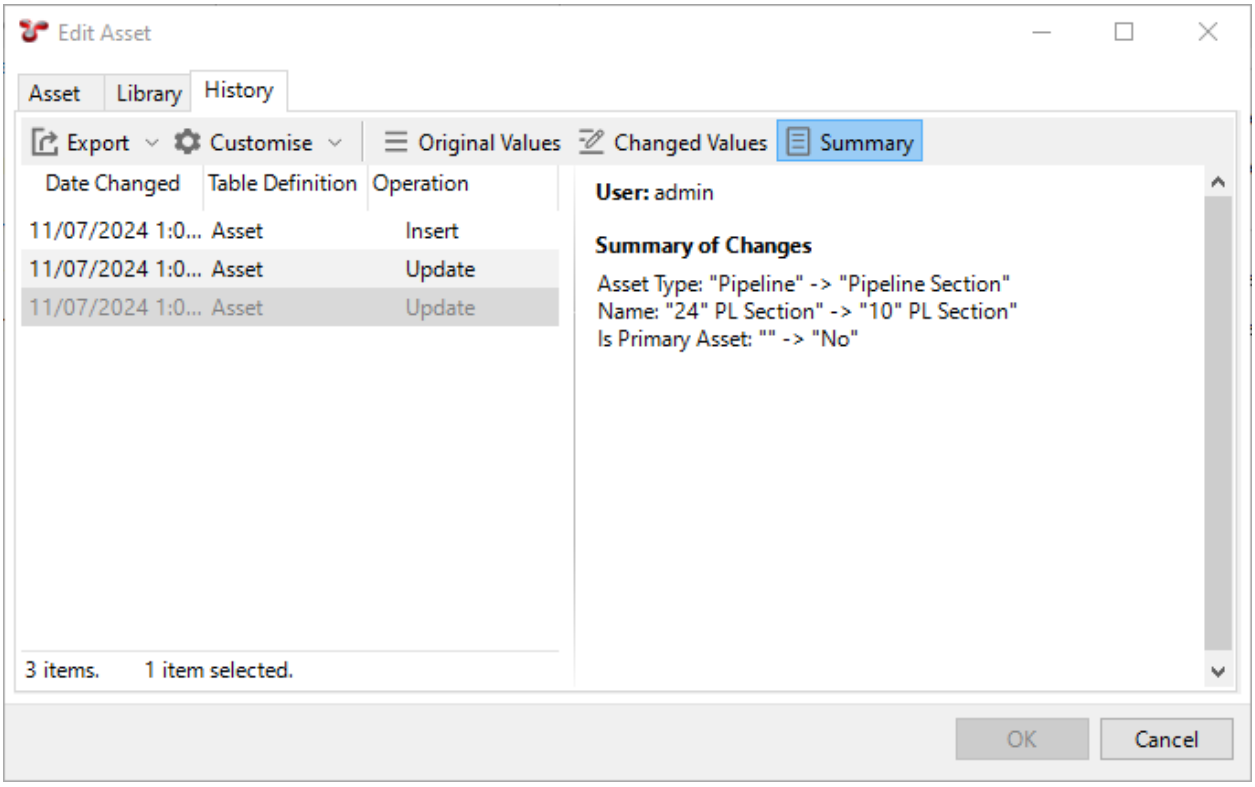
In most grids, you can filter visible rows by typing directly while the grid has focus. This activates the **Find As You Type** feature.

For more information, see *Find As You Type*.

> **See also**
>
> *Filtering*

9.2 Checking History

With each editable dialog, there is a tabbed page titled **History**, which shows all changes made to the record. The **History** tab is similar to the *Changes* section of the *Audit Log*.



The left side of this area contains three columns. Their visibility can be toggled from the **Customise** toolbar option:

Column	Description
Table Definition	Indicates the table in which the change occurred. This may be: • *System* tables. For example, moving an asset creates a record under *Asset Location*. • *User* tables, where the name reflects your Asset Information Group, Event or other user-defined structure.
Operation	Shows the type of change: • **Insert**: A new record was added. • **Update**: An existing value was changed. • **Delete**: A record was removed.
Date Changed	Shows the date and time when the operation took place in the database. The list is ordered chronologically by default.

The operation type determines which toolbar options are available and what information appears on the right side of the screen area:

- **Insert** and **Delete**

  The **Form** toolbar button is available. It allows you to see the name of the user and the values of the inserted or deleted items on the right-side of the screen.

- **Update** operation type:

  The following toolbar buttons are available:

  – **Original Values** - Shows values *before* the change. A icon appears next to changed fields; hovering

over the icon shows details about the change.

  - **Changed Values** - Shows values *after* the change, again with the icon indicating modified fields.

For all operation types, you can use the **Summary** toolbar button to display a concise written summary of all changes within the selected record.

9.3 Using the Grid

Grids are a core component of many screens in both **NEXUS IC** and **IC-Inspection**. The topics below describe common functionality available across grids, helping you interact with and manage data.

- **Add, Edit, Delete** (see *Add/Edit/Delete*)

  Create new records, modify existing entries, or remove items directly within the grid.

- **Connections** (see *Connections*)

  View items that are linked to the active record and manage them through editing, copying, or revealing unlinked items.

- **Import** (see *Import*)

  Bring external data into the grid and bulk update data stored in the database.

- **Export** (see *Export*)

  Extract grid data for use outside the application.

- **Reports** (see *Reports*)

  Generate reports based on preconfigured report templates.

- **Customise** (see *Customise*)

  Adjust grid layout and column visibility.

- **Multi-Edit** (see *Multi-Edit*)

  Apply changes to multiple selected records simultaneously, saving time and reducing manual effort.

- **Sorting** (see *Sorting*)

  Sort grid data by one or more columns to organise information.

- **Find As You Type** (see *Find As You Type*)

  Quickly locate records within the grid by typing directly into the active grid.

- **Filtering** (see *Filtering*)

  Narrow down visible records using filters based on column values or conditions.

- **Grouping** (see *Grouping*)

  Organise records into collapsible groups based on shared attributes.

- **Right-Clicking** (see *Right-Clicking*)

  Access context-specific actions and shortcuts by right-clicking on grid rows.

- **Unit Conversion** (see *Unit Conversion*)

  View and convert measurement units directly within the grid.

9.3.1 Add/Edit/Delete

Most grids in NEXUS IC have toolbar buttons for adding (+), editing (✎) and deleting (−) items.

If there is insufficient space for some or all of the captions, you will see buttons without captions. If you have read-only permissions on a specific item, you will see a **View** button instead of an **Edit** button.

- + *Add* Adds a new item.
- ✎ ***Edit***
  Edits the selected items in the grid.
- − ***Delete***
  Deletes the selected items in the grid.

Tip

- You can use keyboard shortcuts to perform an Add, Edit or Delete action:
  - Add - `Insert` key
  - Edit - `Enter` key
  - Delete - `Delete` key

  To use the shortcut keys, ensure that the grid you want to edit has focus. To set focus to a grid, click on a row or empty area inside the grid.
- Most grids support multi-edit, which can be used to bulk edit/delete items (see *Multi-Edit* for more information).

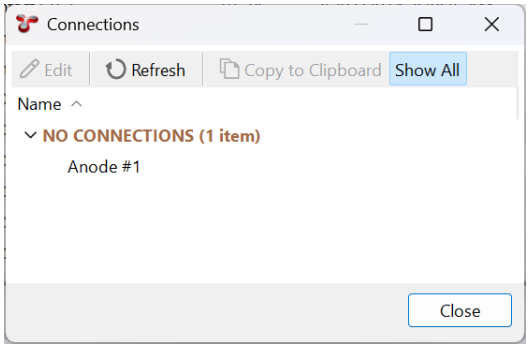
9.3.2 Connections

The **Connections** toolbar button allows you to view items that are linked to the active record. It displays elements that have a reference or connection to the selected record.

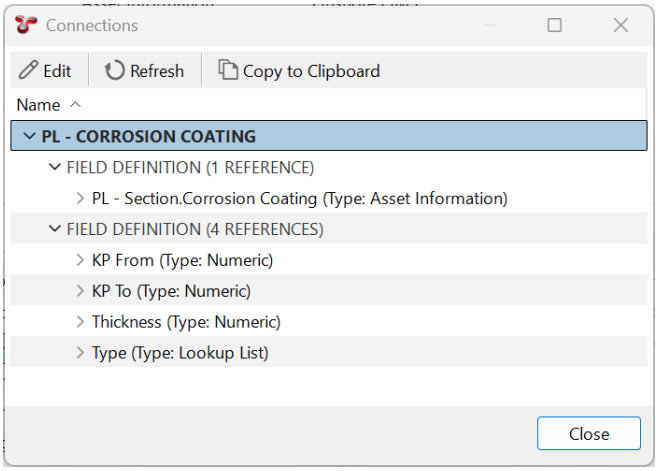
This feature follows a one-way relationship: it shows items that depend on the active record, not the reverse. For example, when viewing connections for an event, it will show related items such as multimedia and findings. It will not show the asset that the event sits on because the event is connected to the asset, not the asset to the event.

In the **Connections** dialog, you can perform the following actions:

- Edit the selected connection using the **Edit** button. This opens the appropriate edit dialog for the selected record type. For example, selecting an anomaly opens the **Edit Anomaly** dialog and selecting a task opens the **Edit Task** dialog.
- Copy the text of the selected connection to the clipboard.
- If any selected items have no connections, a **Show All** button appears in the toolbar. Selecting this reveals a root node called **NO CONNECTIONS**, which contains all source items without connections. Clearing the button hides these items from the list.



When checking connections for Sub Asset Information records, the dialog displays all field definition nodes in the format `[Table Name].[Field Name]`. The exception is when the direct parent is the Field Definition Table, in which case only `[Field Name]` is shown:



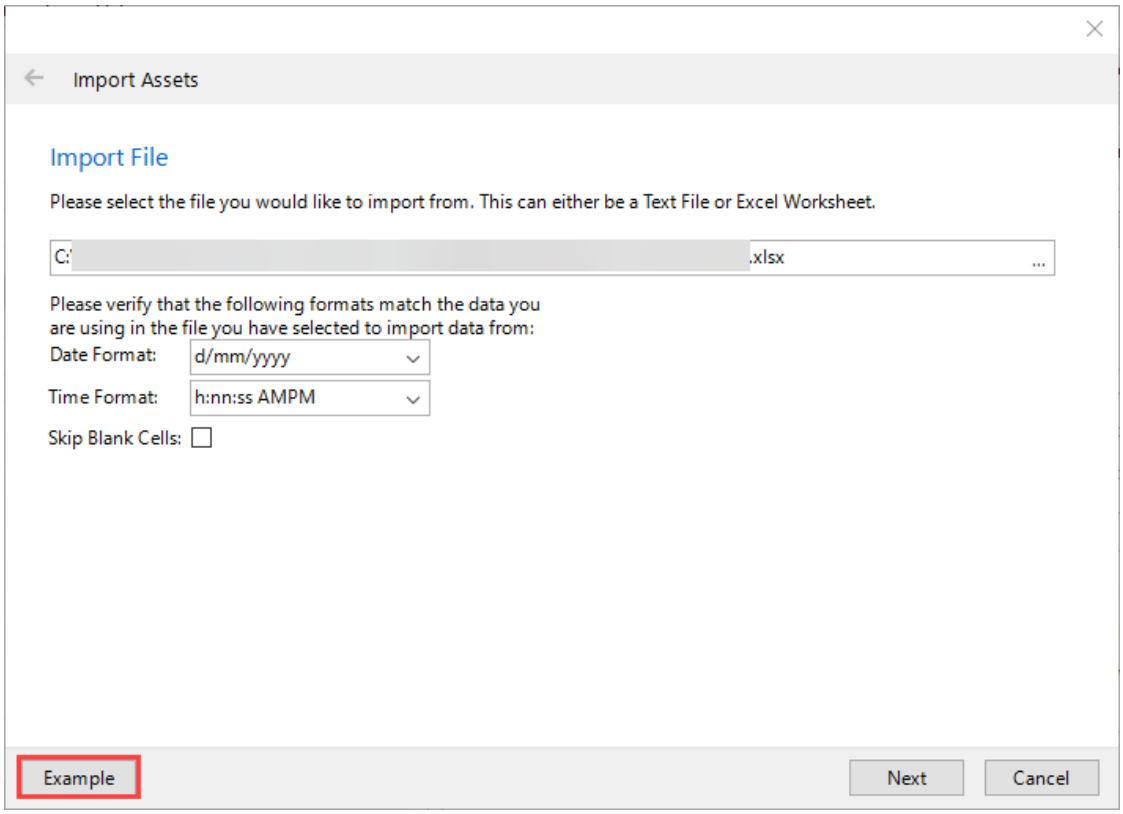
Hint

If you are considering deleting an asset or multiple assets from the asset tree, we recommend checking what data may be linked to that asset first. To do this, open the **ASSETS** screen, right click any asset in the tree and select **Connections** from the context menu. The **Connections** dialog will open, categorising and listing all data elements that reference or connect to the selected asset.

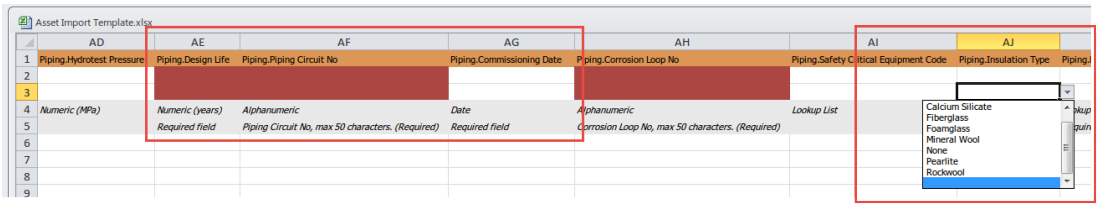
9.3.3 Import

The **Import** functionality enables you to bulk update data stored in the database. There are numerous **Import** buttons throughout NEXUS IC — the Import button on the *ASSETS* screen allows you to import assets and asset information (see *Import Assets*), the **Import** button on the *LIBRARY* screen allows you to import library types, the **Import** button on the **Library** tab within the **LIBRARY** screen allows you to import library items, and so on.

The format of the Excel workbook needs to be specific. We recommend that you use the **Example** button (shown below) to generate an Excel template in a format suitable for importing data.



The Import Template generated using the **Example** button will highlight fields that have been flagged as *Required* fields, set up lookup lists and provide information on the format and field type in the grey rows as shown here:



Caution

It's essential to understand that during the import process, the SQL server generates Row and Table Locks. As a result, other users accessing NEXUS IC might perceive the application as unresponsive. However, once the import completes and the data is committed, these locks are released. Subsequently, other users can resume using NEXUS IC without any issues.

9.3.3.1 Import Files

Prepare Data for Import

Before you start the import, you must prepare the files in the required format. Compatible file types include .zip, .xlsx (Excel), .csv, and .txt. Zip files can contain the xlsx/csv/txt file plus any additional files, for example, multimedia images or electronic documents for importing into the library.

Tip

- For very large imports, saving your Excel file as a .csv and then importing from the .csv may be faster.
- The `Asset Location.Full Location` data can be defined in one of the following ways (you can use only one option, not both):
  - As a single column, where each level of the asset location is separated by the string " / ", for example, 'My Field / My Platform / My Member'
  - As multiple columns, where each level of the asset location is stored in a separate sequential column, that is, for each node in the hierarchy, you create a separate column with the name `Asset Location.Full Location` and with one asset hierarchy level in each.

Note

Importing directly from .xlsx files is not supported for SaaS customers using the new virtualisation technology (see *Software as a Service (SaaS)*). We recommend using .csv files instead.

Sub-Rows in Import Sheet

Sometimes a single row may have several sub-rows. For example, an AIG row might have several sub-AIG rows; or an event might have several findings or several multimedia images or both. When this occurs, you must create separate rows in the import sheet for each sub-item, with different "detail" values in each.

For example, if you have several multimedia images to import against a single event, your Excel sheet should have several rows that are identical except for the Multimedia.Name and Multimedia.Image columns. If you have specified an event number, and you use the same event number on each row, NEXUS will only create the event once, but will create several multimedia items. If you do not specify an event number, NEXUS will instead create several different events with one multimedia item each.

You can also leave event fields blank for all except the last row. Under the hood, NEXUS is importing each Excel row into the event, and only the last Excel row imported will "stick". Note that if your event has a finding, you should *not* repeat the finding data on each event row; if you do, NEXUS will create one finding for each Excel row that has finding data filled in.

In some cases, you *do* want multiple findings on one event, and in that case you must fill in several rows as appropriate. Similarly for sub-event data or sub-AIG data: if you want several different sub-events or sub-AIG rows imported, you should repeat the event row or AIG row with different sub-event or sub-AIG data in each case. If you are repeating an Excel row for another reason and you do *not* want several sub-event or sub-AIG rows imported, you should fill in sub-event or sub-AIG data in only one of the Excel rows.

Tip

You can find the next available event number for a given event type by creating an event of that type using *Add Event*, noting the event number, then deleting that event. If you want the next available event numbers for several event types, create a report template with a Simple Source on table Event and a Pivot Table with a pivot row on Event Type and a value field on Event Number with aggregate Max, then add 1.

Perform Data Import

1. Choose **Import** from the toolbar.
2. In the **Import File** dialog, choose ... to navigate to the file that you want to import and select it.

   Note

   By default, the dialog shows only CSV files.

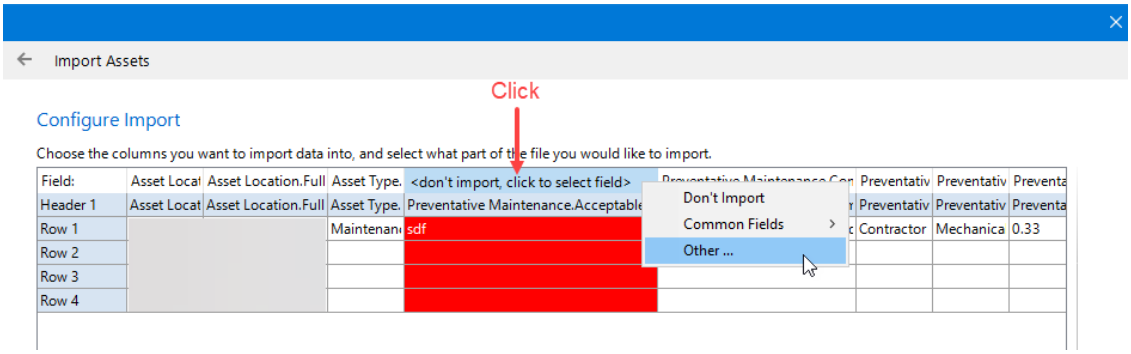
3. If required, you can also verify the date and time format in this dialog and you can choose whether you want to skip blank cells:
   - If you select skipping blank cells, then any cells that are blank will be ignored during the import.
   - If you do not select skipping blank cells, then blank cells will update any existing data and make it blank.
4. Click **Next**.

   Result

   The system reads the import file and uses the `<table name>.<field name>` naming convention to map the headers in the import file to database fields in the NEXUS system.

5. In the **Configure Import** dialog, you can review the mapping proposed by the system and make changes, if required:
   - In the top **Field** row, you can see the fields to which the system proposes to map the column headers from the import file. You can manually change the default mapping option for each column by clicking on the title of the column in the top **Field** row and selecting one of the following options:
     - *Don't Import* - Does not import the selected column to the database.
     - *Common Fields* - Allows you to select common fields in the database to which you want to map the selected column instead of the database field proposed by the system.
     - *Other ...* - Allows you to search and select a field from a list of your field definitions as required.

     Note that if the system couldn't match a column to a database field for some reason, the column is displayed in red colour. By default, the system does not map these columns, you can manually map them if required.



- In case there are required fields in the database for which the system couldn't find any values in your import sheet, the system prompts you to set these values in this dialog. In this case, the relevant fields will be displayed on the right-hand side of the dialog under **Required Fields**, where you have the option to set the value globally for this import as required.
- Under **Settings**, you can specify how many header rows your import sheet contains. For example, you may have the table name as the first header row and the field name in the second header row, in which case, instead of having a column title like `Asset Location.Asset View`, you'd have a header row for Asset Location and second header row for Asset View.
- If your import file contains multiple worksheets, ensure that you select the correct worksheet in the **Worksheet** field.

Note that if the field type is set to change for an existing field, the import will abort as data loss may occur.

6. Click **Next**.

Result

The system tests every single row in the import file and shows if there are any issues with importing. You can abort the test import at any time by clicking **Skip**.

7. Once the import test is finished, you can see a log that shows any errors or warnings that the system may have found during test import. In case of errors, you cannot proceed with the import and the **Import** button will be inactive. In this case, you must rectify the errors in the import file and start the import process again.

Tip

You can copy and select import results from the dialog for review. For instance, it can be helpful to paste all errors into a spreadsheet to make it simpler to methodically update them.

8. If the import test is finished without errors, you can click **Import** to complete the process.

Result

Depending on your client, the following happens:

- If using a SaaS client, the import job is offloaded to the SaaS server and is started remotely. It is then possible to close the current NEXUS IC session while the active import job continues.
- If using a non-SaaS client, the import job is executed in the current NEXUS IC session and you may continue using NEXUS IC. Closing the current NEXUS IC session will cancel the active import job.

In both cases, the UI will refresh intermittently throughout the import, and there will be delays between the import finishing and final refresh as NEXUS IC does not directly monitor changes.

Note

When importing inspection event data, anomaly triggers are checked during the import and findings created automatically from data which falls outside the data bounds.

9. Check the status and result of the import in the *Job Management Console*, which records the status and history of all import jobs.

   The import job banner at the bottom of the window shows the status of the import job and provides the option to dismiss the job or check the details. You can double-click the job, which triggers a dialog that summarises the import. From this dialog, you can click **Details** to show how many rows have been added to various forms or tables. If you have multiple rows in your import sheet that update the same row, these rows will be counted by the test import individually, whereas the final import statistics will only show 1 updated row.

   You can also save the summary to file.

Tip

- We highly recommend that you scrutinise the summary to ensure that the import has performed the actions that you expected. Take note of the total rows for a specific item, that is, add together the number added and updated and make sure that is equal to the number you expect.
- If the importer encounters a completely blank row in an Excel file, it will stop importing at that point, even if there are non-blank rows further down. This can provide an easy way to test an import sheet: set it up, and then after just one or two rows of data, insert a blank. Run the import to see if it's doing what you expect, and if so, delete the blank and run again. Similarly, if the importer encounters a blank column in an Excel file, columns to the right of this will not be imported.

Note

During an import, NEXUS communicates with Excel in the background. NEXUS commands Excel to open the file you want to import, and asks Excel what's in each cell. If you use Excel to modify the file while we're importing it, even if you don't hit *Save*, you may confuse the import process. The same happens if you take a variety of other actions, such as *Save As*, closing the Excel, and so on. If you see the error text "Call was rejected by callee", it means that Excel has stopped answering calls from NEXUS.

9.3.4 Export

The **Export** toolbar option is available on many screens throughout **NEXUS IC**. It allows you to export the contents of the active grid into several file formats, including **HTML**, **RTF** and **Text (CSV)**.

Note

- The **Export** button on grids is different from the custom export functionality available for assets (see *Custom Export Assets*) and events (see *Custom Export Events*). Custom exports launch the Export wizard, which allows you to select a specific subset of asset or event data.
- To export data as formatted reports (HTML, RTF, Excel or PDF), use the report generation functionality. For more information, see *Reports*.

9.3.4.1 Export Grid Data

To export the contents of a grid:

1. Click the **Export** toolbar button.
2. Select the required export format:
   - *Export* → *HTML* – Exports the grid data as an HTML file.
   - *Export* → *RTF* – Exports the grid data as a Rich Text Format file.
   - *Export* → *Text* – Exports the grid data as a CSV (comma-separated values) file.
3. Choose how to deliver the exported data:
   - **File** – Saves the exported file to your computer. Use the **Save As** dialog to select a location and filename, then click **Save**.
   - **Email** – Sends the exported file by email to the address associated with your current NEXUS IC login.

9.3.5 Reports

The **Reports** toolbar button enables you to generate a report based on a report template that has been configured in the NEXUS IC database. The drop-down menu on the **Reports** toolbar button displays each of the report categories, and a submenu listing each of the report templates assigned to that category. For information on configuring report templates, see *Configure Report Templates*.

For detailed information about the report functionality, see *Reports*.

9.3.6 Customise

The **Customise** toolbar button enables you to control which columns appear in the active grid and how rows are displayed.

These settings are saved for each user and will be remembered next time the user logs into NEXUS IC.

Note

The settings are saved to a file called `Integrity Centre.Settings` in `C:\Users\[USER_NAME]\AppData\Roaming\NEXUS`.

Under the **Customise** toolbar button, you have the following options:

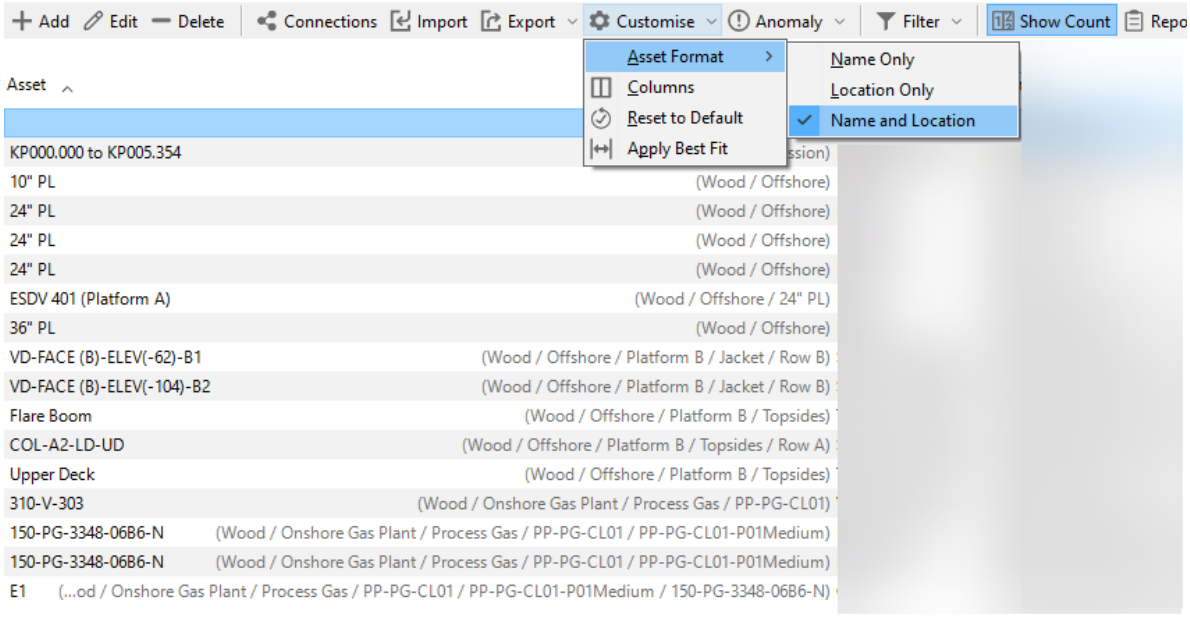
- **Asset Format**

  Choose what appears in the **Asset** column:

  - **Name Only**: Displays only the asset name.
  - **Location Only**: Displays the full location of the asset.

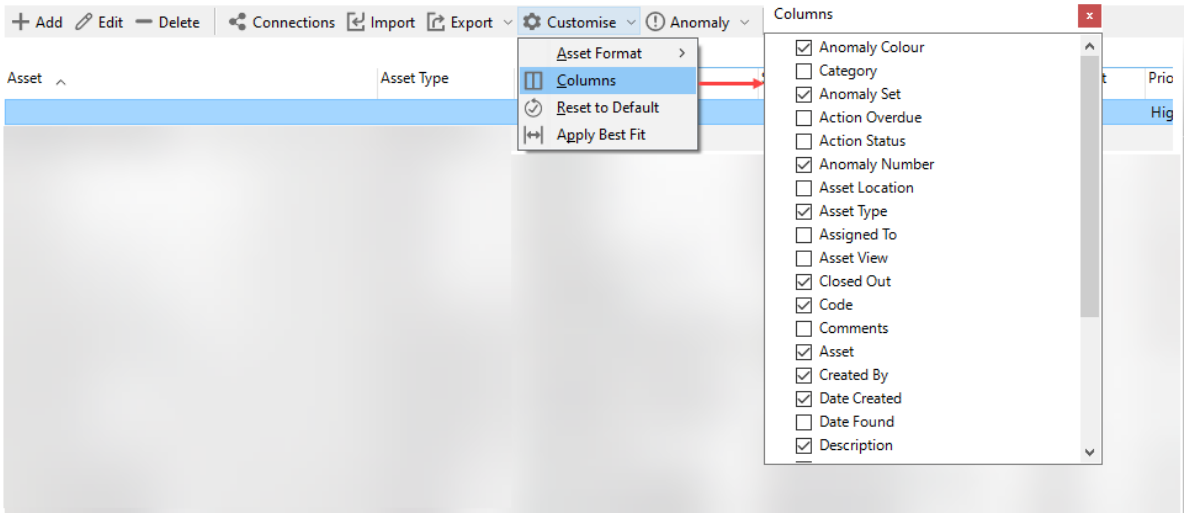
– **Name and Location**: Displays both name and full location.

> **Note**
>
> This option is available only if the **Asset** column is present. Sorting in this column is always based on the Full Location, even if only the name is shown.



- **Columns**

  Select columns that you want to be displayed or deselect columns that you want to hide from the grid. You can also hide columns by right-clicking the column header and choosing **Hide** from the context menu.



- **Reset to Default**

  Restores the original column layout and sizes.

- **Apply Best Fit**

  Automatically resizes visible columns for optimal display.

9.3.7 Multi-Edit

Most grids in NEXUS IC enables you to edit and delete multiple rows in a single action.

9.3.7.1 Select Multiple Rows

You can select several rows at once in the following ways:

- To select a consecutive group of rows, click the first item, press and hold down the **Shift** key, and then click the last item.
- To select non-consecutive rows, press and hold down the **Ctrl** key, and then click each item that you want to select.

9.3.7.2 Edit Multiple Rows

To edit several rows at once, proceed as follows:

1. Select the rows that you want to edit (see above).
2. Click the **Edit** toolbar button.
3. In the edit dialog that appears, update any values as required.

   Note the following:

   - Fields that are unedited will retain their original values for all selected rows (even when the data differs from row to row).
   - If you edit a field value in this dialog, an (Undo) icon appears directly to the right-hand side of the edited field. If you click this icon, the field value will be reverted back to its original value.
4. Click **OK** to apply all changes to the edited fields for all selected rows.

9.3.7.3 Delete Multiple Rows

To delete several rows at once, proceed as follows:

1. Select the rows that you want to delete (see above).
2. Click the **Delete** toolbar button.
3. In the confirmation dialog that appears, you can check any connections that the items under deletion have.
4. Click **Delete** to confirm deletion or **Cancel** to abort it.

See also

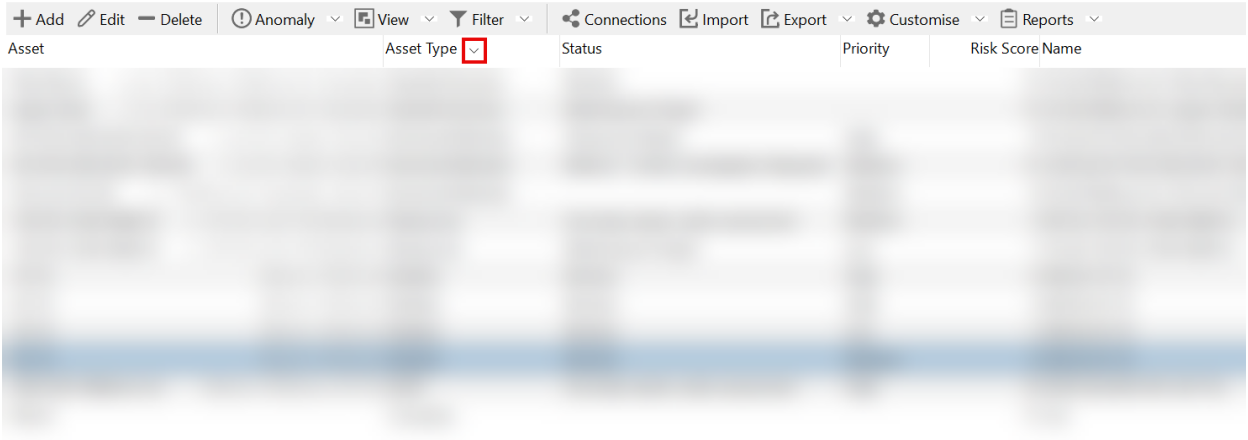
- *Sorting*
- *Filtering*
- *Grouping*

9.3.8 Sorting

All grids in NEXUS IC provide the user the ability to sort by one or more columns.

9.3.8.1 Sorting by a single column

Click anywhere in the column heading to sort by that column. Down arrow indicates descending order, Up arrow indicates ascending order.



9.3.8.2 Sorting by one or more columns

Shift + Click in any column heading to sort by that column. Down arrow indicates descending order, Up arrow indicates ascending order. Shift + Click in another column to apply a second sort.

9.3.9 Find As You Type

In most grids in NEXUS IC, if the grid has focus and you type on the keyboard, the grid will filter for the text you have typed. For example, if you are active on a grid screen and you type "Pipe" (without the quote marks), all rows in that grid that contain "Pipe" will be shown, and other rows will be temporarily hidden.

Find As You Type searches all text fields, which includes the *Name* column and any other text fields in the grid. It does *not* include any fields of type *Lookup List*. A blue arrow in their column header indicates which fields are included in the search.

You can dismiss the Find As You Type search box by clicking ✖ at the right side of the find box. You can also dismiss it by pressing the *Escape* key. Note though that if the Find As You Type box doesn't have focus, and you're in a dialog, pressing *Escape* cancels the whole dialog. You can manually bring up the Find As You Type box by pressing Ctrl-F.

9.3.9.1 Find As You Type in Asset Trees

If you want to use Find As You Type on assets, you can do that from the following places:

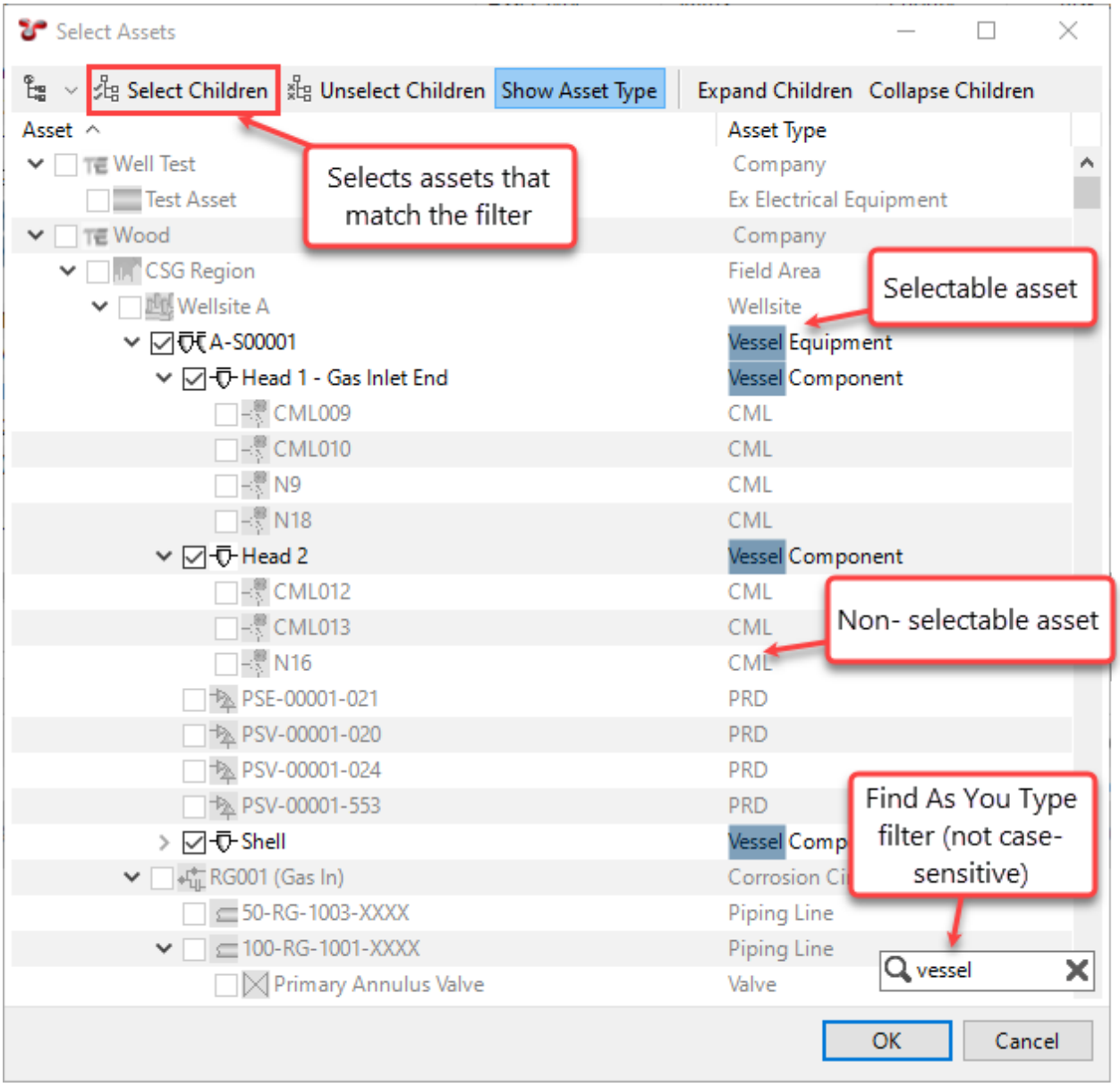
- On the *ASSETS* → *Children* tab.
- In dialogs where the asset tree appears and you can select assets from the hierarchy.

When filtering a tree, unmatched rows will not disappear, instead, they will be greyed out. This ensures that you can still expand nodes to reach child nodes that may be included in your filter.

If you are in a dialog that allows you to select *multiple* assets (for example, Copy Assessment feature on the *Risk* tab, *Filter* → *Asset* on the *ANOMALIES Screen*, etc.), then any assets that are not matched in your filter will be unselected. In this case, you can use **Select Children** as follows:

1. Select your root asset.
2. Type the text that you want to filter for, for example, the asset type.
3. Click **Select Children**.

4. See that all the assets that match your filter are selected.



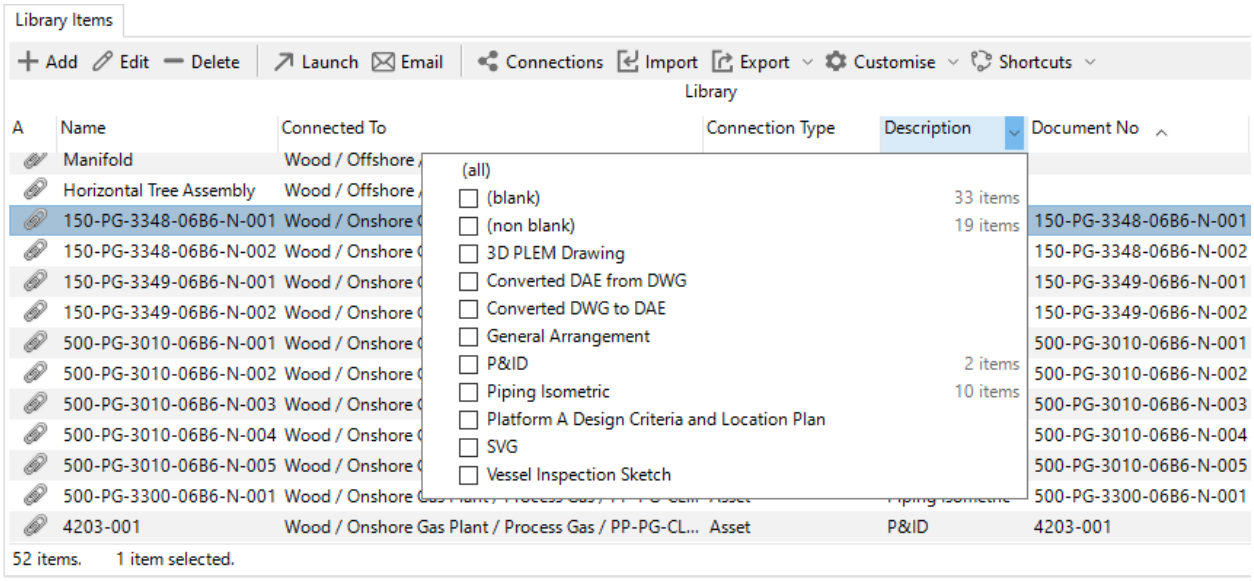
> **Note**
>
> When you're using Find As You Type in an asset tree on the **ASSETS**, **PLANNING** or **INSPECTION** screens, instead of filtering, you can perform an actual search for the assets. For more information, see *Searching*.

9.3.10 Filtering

All grids in NEXUS IC allow users to apply one or more filters to individual columns, helping to narrow down the displayed data.

9.3.10.1 Applying a column filter

1. Hover over a column header. The header will be highlighted in blue, and a filter dropdown icon will appear (as shown below).
2. Click the dropdown icon to display a list of unique values for that column.
3. Select one or more checkboxes to filter the column based on the selected values.



> **Note**
>
> Filters are not saved between sessions. When you close and reopen NEXUS IC, all filters will be cleared.

See also: *Find As You Type*.

9.3.11 Grouping

You can organise rows in the grid by grouping them based on the values of one or more columns. This helps create a structured, hierarchical view that makes data analysis easier.

9.3.11.1 Grouping by a Column

To group rows by a specific column:

1. **Right-click** the column header you wish to group by.
2. Select **Group** from the context menu.

Once a column is selected for grouping, a grouping panel appears at the top of the grid. This panel displays the active groupings and allows you to manage them.

9.3.11.2 Managing Groupings

From the grouping panel, you can:

- **Add additional grouping levels** by clicking the **plus [+]** icon and selecting more columns.
- **Remove a grouping** by clicking the **close [×]** icon next to the column name.

9.3.11.3 Example: Grouping Anomaly Records

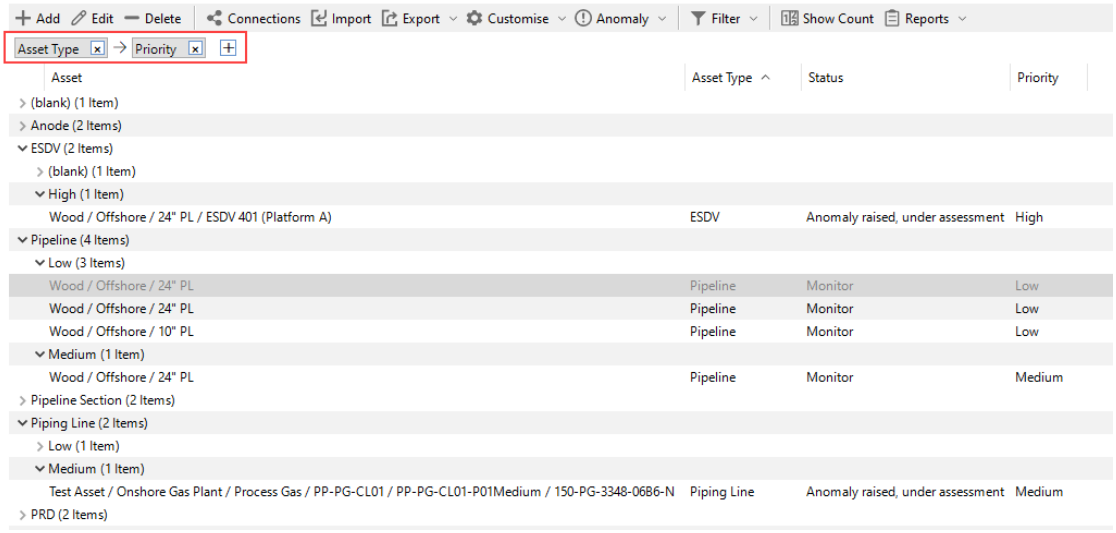
Suppose you have a grid displaying anomaly records. To better analyse the data, you want to apply two levels of grouping:

1. **First level**: Group by **Asset Type**.
2. **Second level**: Within each asset type, group by **Priority**.

The resulting grid will display a hierarchical structure:

- Top-level groups are based on **Asset Type**.
- Within each asset type, records are further grouped by **Priority**.

The grouping panel at the top reflects this structure, showing both levels of grouping in order.



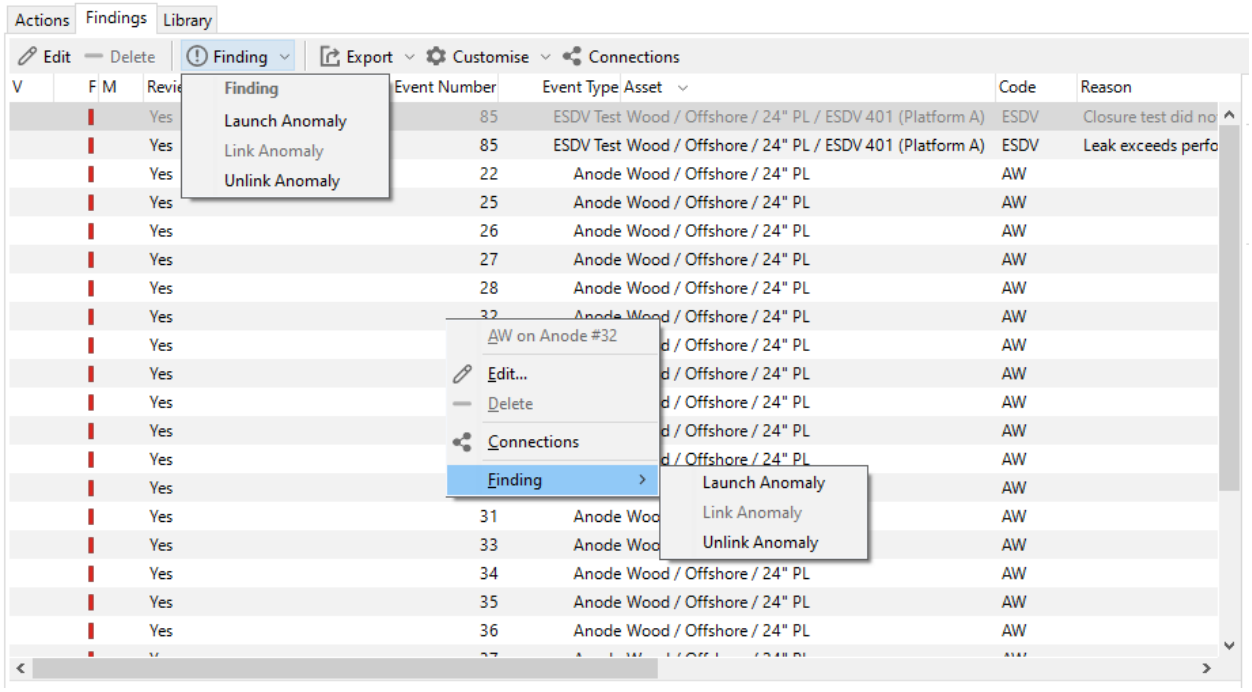
See also

- *Customise*
- *Sorting*
- *Filtering*
- *Find As You Type*

9.3.12 Right-Clicking

Most grids in NEXUS IC support the right-click functionality.

Right-clicking an item within the grid opens a context menu, typically containing some or all toolbar menu options. The action you select from this context menu will apply only to the item you right-clicked.



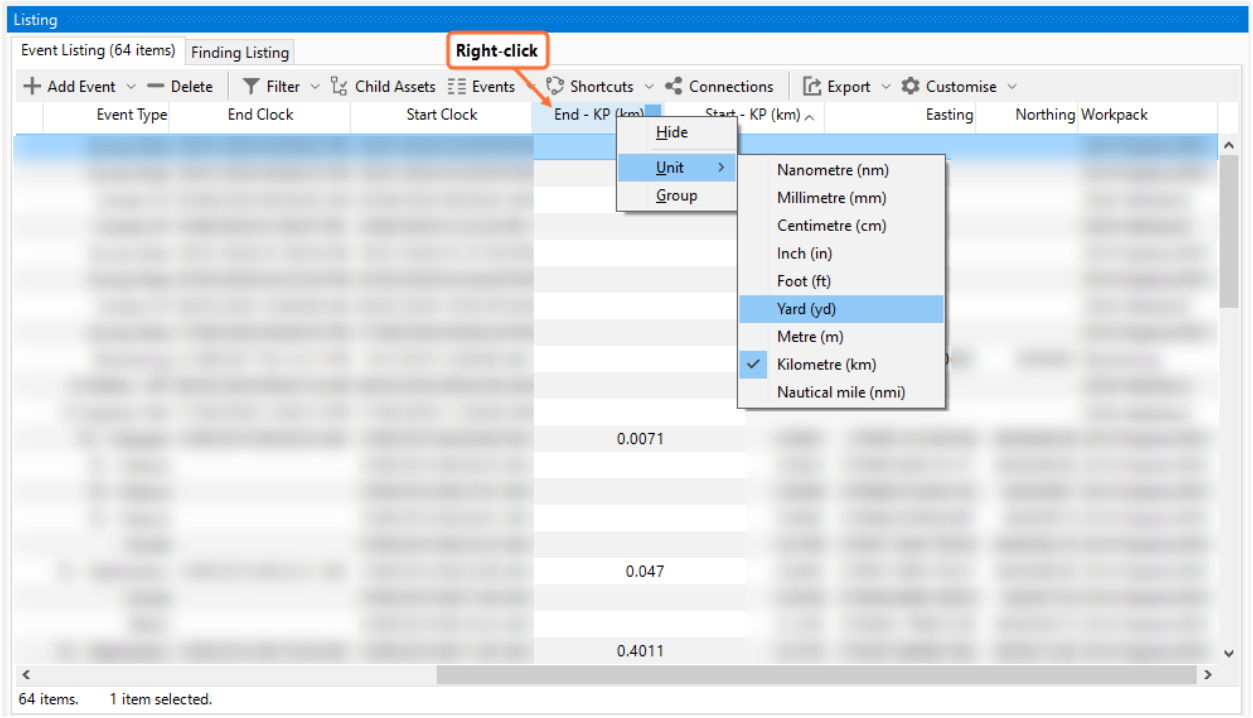
9.3.13 Unit Conversion

When a column in the grid contains values expressed in a specific unit, you can convert those values to a different unit directly within the interface.

To convert units:

1. **Right-click** the column header.
2. Hover over the **Unit** option in the context menu.
3. Select the desired unit from the list.

The values in the column will be automatically converted to the selected unit.

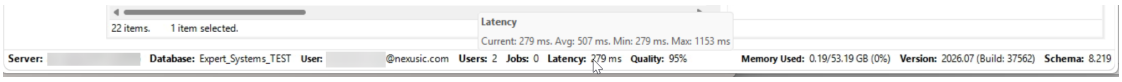


9.4 Using the Status Bar

The **Status Bar** at the bottom of the main NEXUS IC window provides real-time system and session information. It includes:

- The database server you are connected to
- The name of the database you are connected to
- The number of currently connected users
- The number of active jobs. This refers to the number of background jobs currently running (e.g., imports, reports). For more information, see *Job Management Console*.
- An estimate of how fast the connection to this database server is (latency)
- Quality (hosted environment only) - shows the percentage quality of the streamed images sent from the application server
- The memory used/available. When memory available is small compared to memory used, you are running low. In this circumstance, NEXUS IC may start clearing parts of its cache in order to avoid running out of memory. You can force a complete emptying of cache by closing the application and restarting.
- Software version displayed as YEAR.MM (Build xxxx)
- Database schema number

You can hover the mouse over several items in the status bar to reveal additional information through tooltips:



Tip

- You can right-click on the data shown in the status bar and click **Copy to Clipboard** to copy the tooltip content.
- You can toggle the status bar on/off using the *Database → Show/Hide Status Bar* menu option.

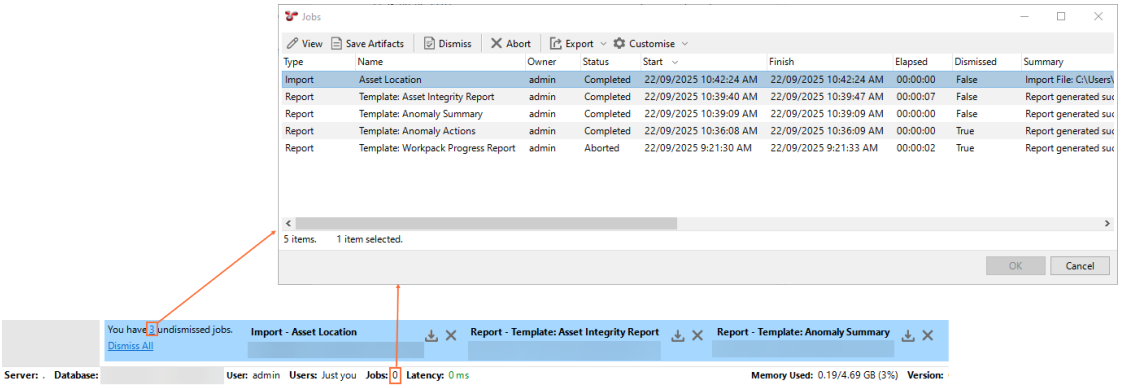
9.4.1 Job Management Console

When a job is initiated - such as an import, report generation, or video parsing - a blue ribbon appears above the Status Bar. This ribbon provides:

- Live job progress
- Options to dismiss the job
- Access to download artifacts (if available)

You can open the **Job Management Console** in two ways:

- Click the number of active jobs in the Status Bar.
- Click the number of undismissed jobs in the blue ribbon above the Status Bar.



In this dialog, you can view more detailed information on each job's progress, including jobs that are currently running or have been dismissed. These jobs may include imports, reports or video parsing tasks.

The Console includes a toolbar that allows you to interact with jobs. The functionality of each button varies depending on the job type. The table below outlines the behaviour of each toolbar button across different job types:

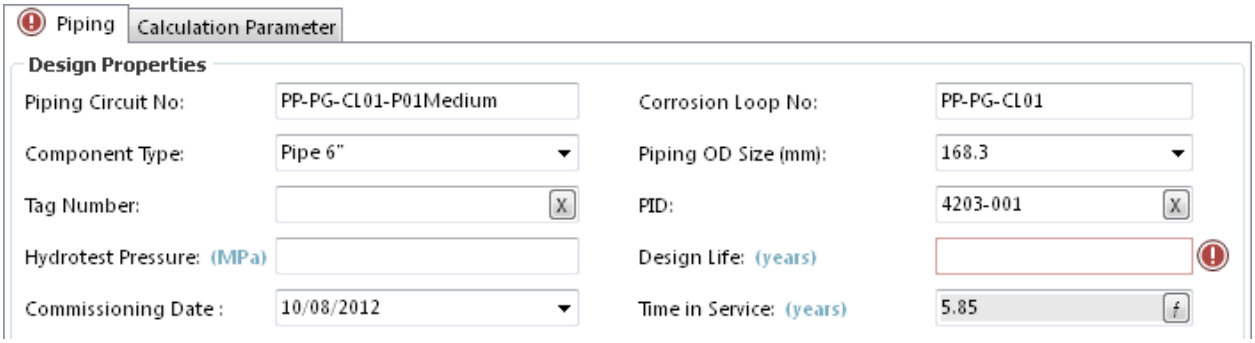
Toolbar Button	Report Jobs	Import Jobs	Video Parsing Jobs
View	Allows you to download the generated report.	Shows the import summary, errors, and/or warnings.	Shows the completion time and any information, warning, or error messages.
Save Artifacts	Does not have any artifacts.	Allows you to save the source import files (csv or xlsx)	Does not have any artifacts.
Dismiss	Hides the blue ribbon notification above the Status Bar.	Hides the blue ribbon notification above the Status Bar.	Hides the blue ribbon notification above the Status Bar.
Abort	Aborts the report job if possible.	Aborts the import job. The import job saves data incrementally, so aborting will only stop further data from being imported into the database.	Aborts the video parsing job if possible.

9.5 Validating Data

A number of data validation rules can be defined to ensure data quality within the NEXUS database. These are applied on the individual data fields contained within "Asset Information" or "Event" forms.

9.5.1 Required

Any data field of any field type can be set to be "Required". This means that, when adding a new record, this field must be filled before the record can be saved. Typically fields should be set to "Required" when they provide essential information or are used as an input to critical calculations. Required fields are clearly identified on the form.



Hovering your mouse over the provides the hint: "Design Life is a required field and must have a value specified"

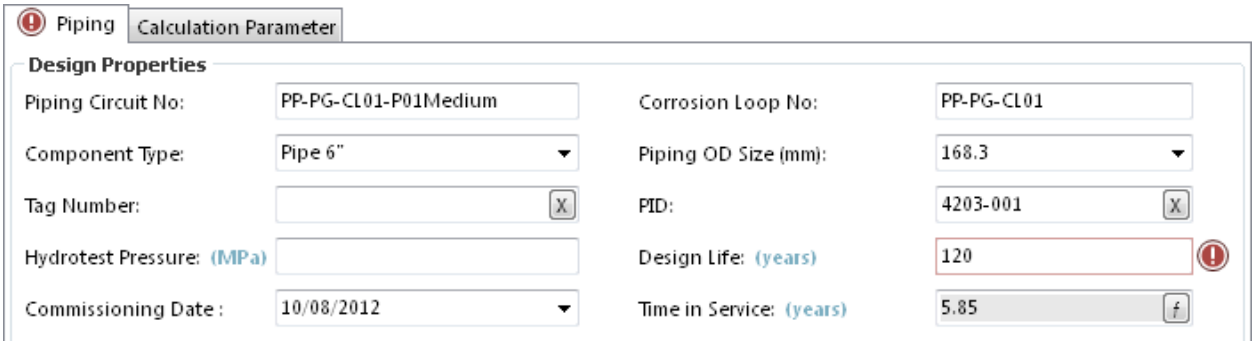
This requirement is also enforced during any data import. The user is unable to proceed with the import until the column with the 'required' field is present in the import sheet. Import sheets created by NEXUS identify required fields with a red column in MSExcel.

9.5.2 Maximum & Minimum

Numeric and Whole Number data fields can have Maximum and Minimum values set. This means that, when adding a new record, values in this field must be within range before the record can be saved.

Typically maximum and minimum values should be set to ensure data quality for fields where ranges are consistent for all assets. For example; a percentage field must be between 0 and 100.

Fields with out of range data are clearly identified on the form.



Hovering your mouse over the provides the hint: "Design Life must be less than or equal to 90" or "Design Life must be greater than or equal to 0"

9.5.3 Lookup Lists

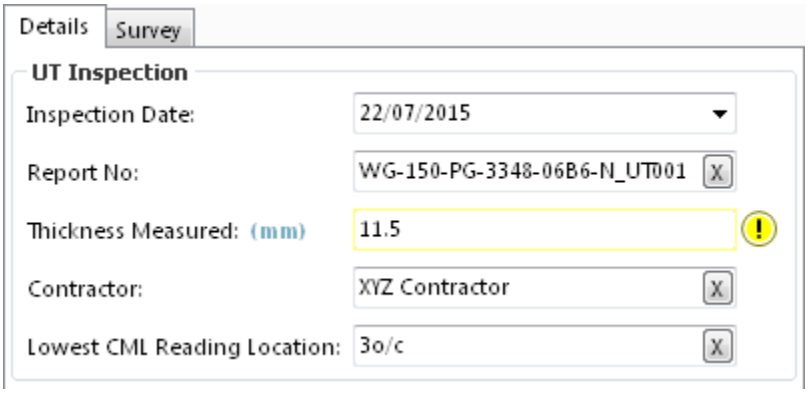
Look List fields by their very nature enforce selection of valid data and provide consistency.

9.5.4 Anomaly Triggers

Data input onto Event forms are additionally subject to Anomaly Triggers. These are validation checks that define anomalous readings and are used to trigger the automatic creation of Findings of a given type and severity.

For more information, see *Set Up Anomaly Triggers*.

Fields with out-of-range data are clearly identified on the form.



9.5.5 Data quality alerts

Even with the most rigorous of data validation regimes it is sometimes possible for inaccurate data to be entered. Data quality checks can additionally be established for calculation results by means of Traffic Lights and Reports. For example, a "Remaining Life" traffic light could be configured to shown any negative values as red. Simply turning on the traffic light enables you to spot and investigate any potential data issues.

9.6 Unhandled Exceptions

NEXUS IC handles most issues within the application and provides clear messages that describe the problem and how to proceed. In some cases, however, an unexpected error may occur that the system cannot manage. When this happens, NEXUS displays an **Unhandled Exception** dialog and automatically attempts to send a crash log to our bug tracking server.

When the **Unhandled Exception** dialog appears, you will be asked to **enter a brief description** of the actions you took immediately before the error occurred. This information is important and assists our development team in diagnosing and resolving the issue.

The crash report does not contain any personally identifying information and cannot be linked to individual users.

> **Note**
>
> After an unhandled exception, restart your NEXUS instance as soon as possible. Continuing to work in the same session may result in additional errors that are not related to the original issue.

CHAPTER

TEN

DASHBOARDS AND REPORTS

NEXUS provides dashboards and reports to help you view, analyse and export your data:

- **Dashboards**

  Dashboards are interactive views based on reports. They allow you to display report output directly on the **DASHBOARDS** screen or on the **Dashboard** tab of the **ASSETS** screen, making key information easily accessible at a glance. For more information, see *Dashboards*.

- **Reports**

  Reports allow you to extract and export data from NEXUS for offline analysis or sharing. Report outputs can be exported in RTF, HTML, Microsoft Excel or PDF format. For more information, see *Reports*.

See also

- *Configure Report Templates*
- *Dashboards*
- *Reports*

10.1 Dashboards

Dashboards display the output from any report template that has been configured in the report template library and marked as a Dashboard. For example, you can choose report templates that summarise data in the database, or that show statistics on anomalies or risk.

You can view dashboards on the **DASHBOARDS** screen or on the **Dashboards** tab on the **ASSETS** screen (see *Asset Dashboards*).

When you log in NEXUS IC for the first time, you will be presented with the **DASHBOARDS** screen. On subsequent logins, NEXUS IC will open to the screen that was active when you logged out.

Note

If you make changes to data, the dashboard will not be refreshed to show those changes automatically. You'll need to click the **Refresh** button.

10.1.1 Prerequisites

To make report templates available as dashboards, the following configurations must have been done:

- A report template must exist under *Configuration → Reports and Dashboards → Templates*. For more information, see *Configure Report Templates*.
- The report template must have been set as a dashboard in your configuration settings under *Configuration → Reports and Dashboards → Templates*. For more information, see *Set a Report Template as a Dashboard*.

10.1.2 Using the Dashboard

To select a dashboard template:

1. Click the **Dashboard** toolbar button on the **DASHBOARDS** screen.
2. From the drop-down list, choose the required template.

Templates are grouped by the report categories as per your configuration settings (*Configure Reports and Dashboards*).

> **Note**
>
> If the report template linked to the dashboard includes user-configurable parameters, the **Parameters** toolbar button will be active. You can click this button to adjust the selection parameters as needed. The selected values are automatically saved in your user profile settings under the **Report** category (see *Your Profile*).

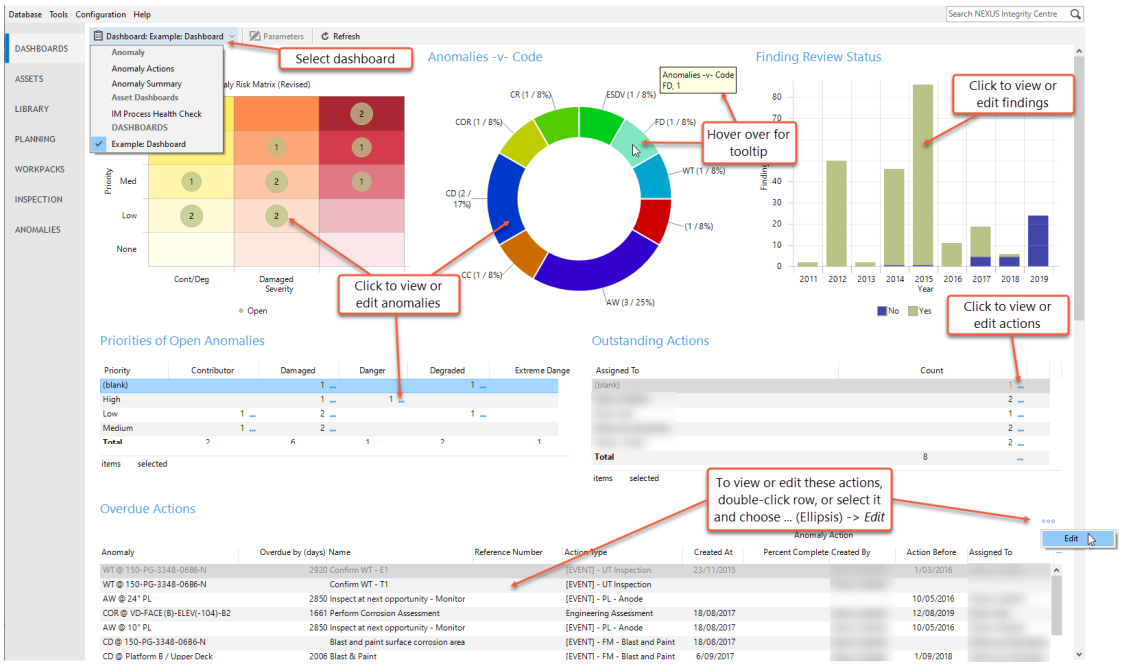
Dashboard Actions

On the dashboard, you can perform various actions depending on the specific report element:

Charts	For charts (including risk charts), you can click on a data point to get a list of rows that make up that point, or a form showing the single row represented by that cell. You can click a legend item to show or hide data related to that legend item in the chart. If you hover over a legend item, the chart shows only the related data. Hovering over a chart element will show a tooltip with relevant information. This functionality is similar to that of charts on the **Charts** tab. Note that hover tooltips are not visible on the Risk Matrix or Tables report elements.
Tables	Tables have a blue ellipsis at the top right. You can view or edit the contents of a table row by double-clicking the row or selecting the row, clicking the blue ellipsis, and choosing **Edit**.
Pivot Tables	Pivot tables have a little blue ellipsis on each cell that contains a number. Clicking that ellipsis will show either a grid with a list of all the rows that make up the number in that cell, or a form showing the single row represented by that cell. If you have edit permission on the relevant table, you can make changes here and click **OK** to save them.

Example Dashboard

The image below shows an example dashboard and highlights the actions available for this specific template:



See also

- *Set a Report Template as a Dashboard*
- *Configure Report Templates*
- *Asset Dashboards*

10.2 Reports

The **Reports** functionality allows you to export data from NEXUS IC into **RTF, HTML, Excel or PDF** files.

You can generate reports using the **Report** toolbar button, which is available on multiple screens throughout NEXUS IC. The report generation workflow is consistent across all screens.

Note

Selecting large datasets may increase report generation time. If performance is an issue, consider running the report over a smaller dataset.

Each report template is assigned to a **report category**. Although additional categories can be configured (see *Configure Report Categories*), a standard NEXUS IC database includes the following default categories:

- Anomaly
- Archived
- Asset

- Miscellaneous
- Risk
- Schedule
- Workpack

Two additional special categories are available:

- **No Category** – Displays report templates that are not assigned to any category.
- **Favourites** – Displays report templates you have marked as favourites.

You can configure which templates appear in **Favourites** under *Database → Your Profile*.

10.2.1 Prerequisites

Before generating reports, ensure that the following prerequisites are met:

- Report templates have been configured (see *Configure Reports and Dashboards* and *Configure Report Templates*).
- If you intend to send reports by email, email account properties have been configured (see *Set Up Email*).

For Software as a Service (SaaS) customers, these settings are preconfigured as part of the service.

10.2.2 Generate Reports

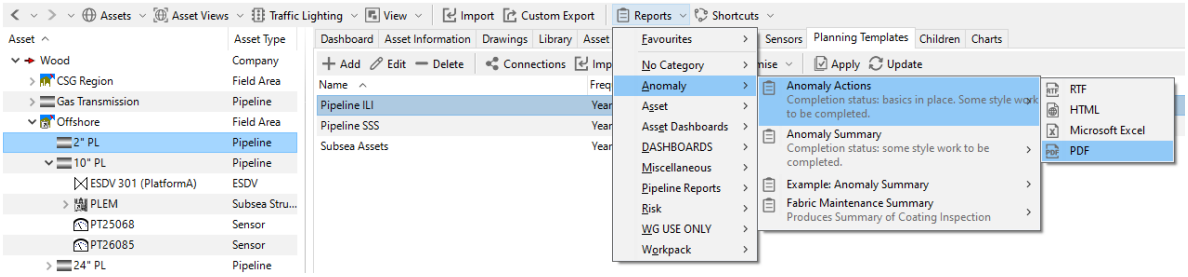
To generate a report, follow these steps:

1. On the relevant screen, select:

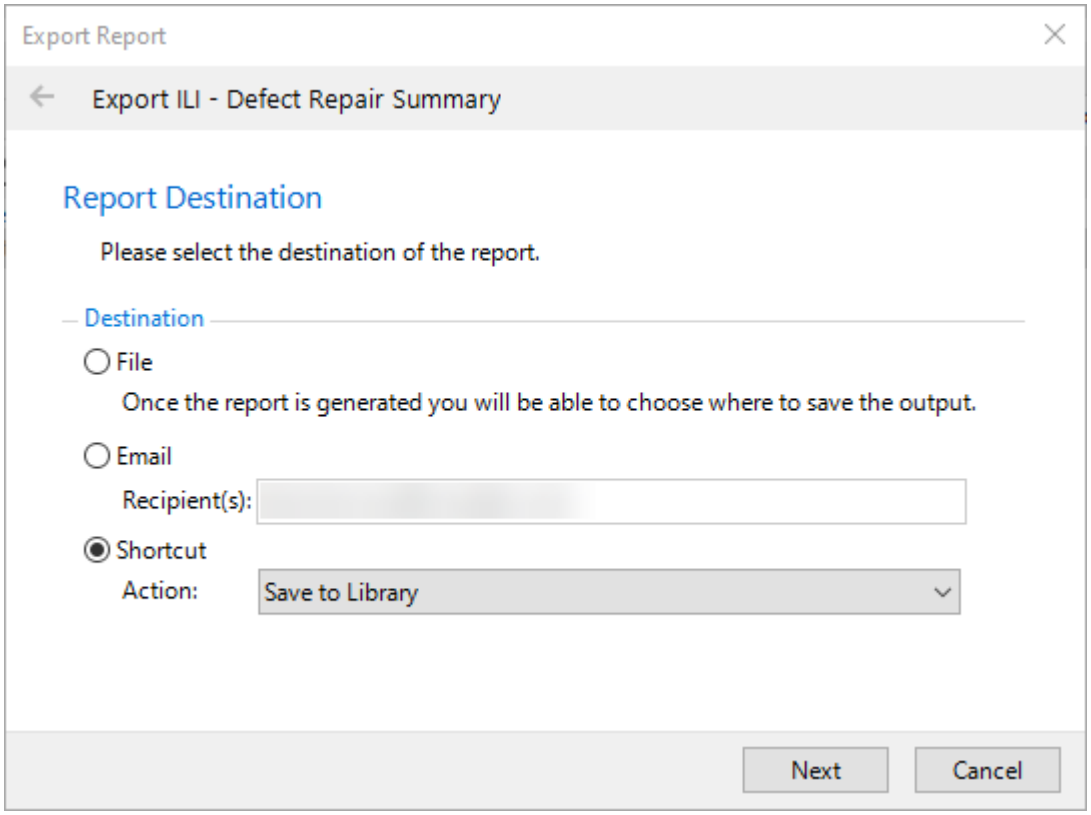
   Reports → <Report Template Category> → <Report Template> → <Format>

   where:

   - *Report Template Category* and *Report Template* are defined in your configuration (see *Prerequisites*)
   - *Format* is one of **RTF**, **HTML**, **Excel** or **PDF**



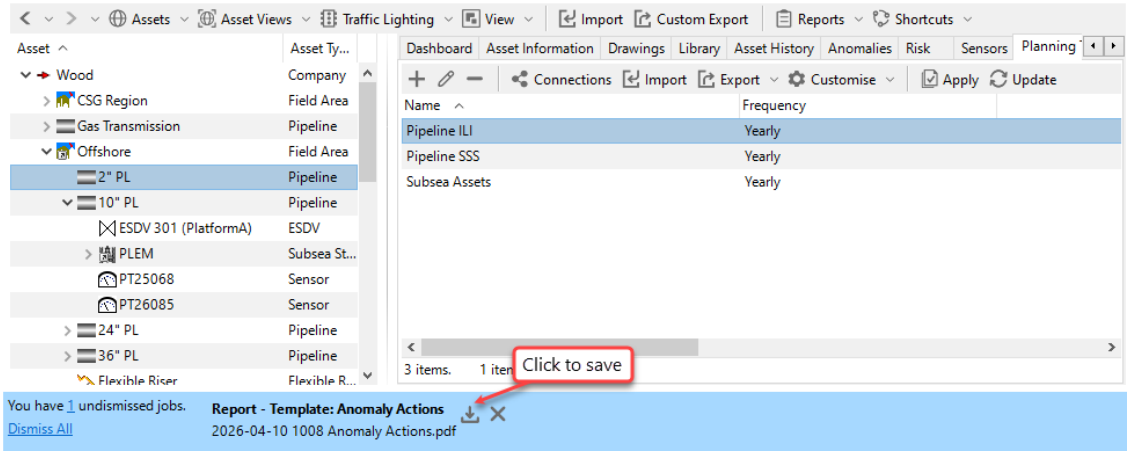
2. In the dialog that opens, select where you want to export the report.



You can choose one of the following options:

- **Save to local drive**

  Save the report to your local drive. Once generated, the report is available for download from the bottom of the screen.



- **Send by email**

  Send the report to one or more email addresses. By default, the system proposes the email address associated with your user account, which you can modify if required. To change the email address linked to your account, see *Set Up Email*.

  > **Note**
  >
  > If you do not receive the report by email, check that the job has completed in the job banner and review your junk email folder. Delivery may also fail if the report exceeds your organisation's email attachment size limit.

- **Use a configured shortcut**

  If additional shortcuts are configured (see *Configure Shortcuts*), you may be able to perform actions such as **Save to Library**. When saving a report to the library, you must specify:

  – The library type

  – The NEXUS element to which the report will be linked

  Reports saved this way are available from the **LIBRARY** screen in NEXUS IC.

> **Note**
>
> If your report template includes additional selection parameters, you may be prompted to provide further details before generation. These parameters default to the values selected the last time you ran the report and are stored in your user profile under **Report** category (see *Your Profile*).

3. Select **Generate**.

> **Result**
>
> The report is generated and delivered to the selected destination.
>
> All report jobs are listed in the *Job Management Console*, where you can monitor progress, review job history and download previously generated reports.

10.2.3 Worksheet Naming

When exporting reports to **Excel**:

- The first worksheet name is derived from the report template name and is truncated to **31 characters**.
- If the report template contains a **Page Break** element, each page break creates a new worksheet.
- The name of each new worksheet corresponds to the name of the associated Page Break element.

CHAPTER

ELEVEN

ASSET DATA MANAGEMENT

In NEXUS IC, you can store and manage all information related to your assets. To do that, you set up a hierarchical view of your assets, called *asset tree* and you link all required data to specific assets in the asset tree. You can view and manage all your asset data on the **ASSETS** screen of NEXUS IC (see *ASSETS Screen*).

11.1 Managing Asset Data

In NEXUS IC, you can manage your asset data as follows:

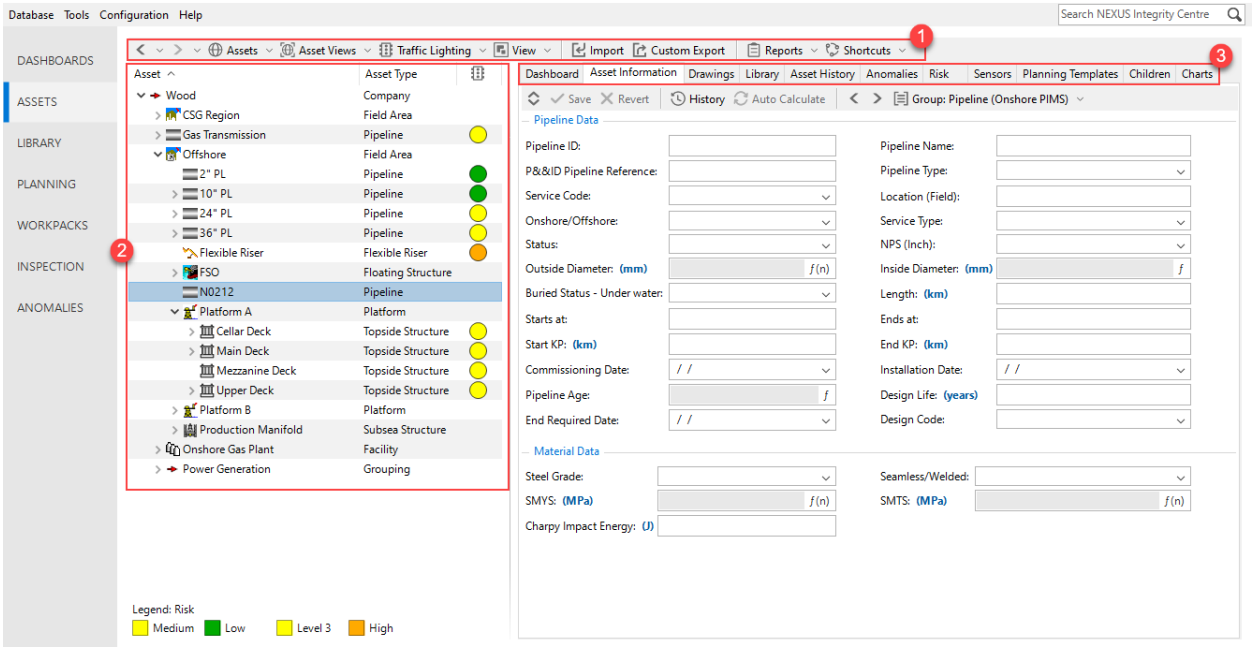
- You set up your *asset tree* where each node represents a specific asset in a hierarchical view. From the asset tree, you can also set up asset-specific anomaly triggers and display traffic lights for the assets in the tree as required. For more information, see *Asset Tree*.
- You define asset-specific data on the **Asset Information** tab, where information is grouped into *Asset Information Groups (AIGs)*. AIGs are preconfigured groups of asset information fields and are accessible on the **Asset Information** tab if the AIG has been assigned to the asset type of the selected asset. For more information, see *Asset Information Groups (AIGs)*.
- You can link 2D or 3D drawings to your assets and add or edit layers to them. For more information, see *Drawings*.
- You can attach *library items* to your assets. For more information, see *Library*.
- You can record key historical events against an asset. For more information, see *Asset History*.
- You can manage anomaly records specific to the selected asset (and optionally, its children). For more information, see *Anomalies*.
- You can review risk assessment results for the selected asset and its children in preconfigured risk matrixes and assign risk models or scenarios to assets as required. For more information, see *Risk*.
- You can review sensor data logged for the selected asset and its children. For more information, see *Sensors*.
- You can maintain planning templates specific to the selected asset. For more information, see *Planning Templates*.
- You can display or maintain asset information data for multiple assets under the same parent node. For more information, see *Children*.
- You can review charts that are associated with the selected asset's asset type. For more information, see *Charts*.

11.2 Searching Assets

On the **ASSETS**, **PLANNING** or **INSPECTION** screens, you can search for an asset in the database directly from the asset tree. For more information, see *Searching*.

11.2.1 ASSETS Screen

The **ASSETS** screen is divided into three main areas:



Screen Area	Description
1 **Toolbar**	See *Assets Toolbar*.
2 **Asset tree**	Displayes a hierarchical view of all your assets (see *Asset Tree*).
3 **Tabs**	Tabs show different types of information related to the asset selected in the asset tree. You can toggle the visibility of most tabs using the **View** option on the toolbar. The **Asset Information** tab is always visible and can be docked to the bottom of the screen. The following tabs are available: • Dashboard (see *Asset Dashboards*) • Asset Information (see *Asset Information Groups (AIGs)*) • Drawings (see *Drawings*) • Library (see *Library*) • Asset History (see *Asset History*) • Anomalies (see *Anomalies*) • Risk (see *Risk*) • Sensors (see *Sensors*) • Planning Templates (see *Planning Templates*) • Children (see *Children*) • Charts (see *Charts*)

Note

- The asset selection is persistent between the **ASSETS** and **INSPECTION** screens, that is, if you choose an asset on the **ASSETS** screen and change the screen to **INSPECTION**, the same asset will be selected and vice versa.
- If you exit out of NEXUS and open the application, it will reopen the application on the same location that you exited last time.

11.2.1.1 Assets Toolbar

Elements of the **Assets** toolbar are available from multiple screens and dialogs in NEXUS IC.

The **Assets** toolbar provides options to add, edit, delete, move and manage assets in the hierarchy, as well as navigation and filtering functions.

Toolbar Option	Description
Back	Returns to assets previously selected in the asset tree.
Forward	Returns to assets selected before using the **Back** option.
Assets → Add → Asset	Adds a new child asset to the asset currently selected in the hierarchy.
Assets → Add → Root Asset	Adds a new root level asset into the active Asset View. A root level asset is an asset that does not have a parent asset.
Assets → Add → Linked Asset (With Children)	Adds a link to an existing asset including all its children. An asset tree will be displayed to allow selection of the asset to link as a child to the currently selected asset.
Assets → Add → Linked Asset (Without Children)	Adds a link to an existing asset, without any of its children. An asset tree will be displayed to allow selection of the asset to link as a child to the currently selected asset.
Assets → Edit → Asset Properties	Changes the name or asset type of the currently selected asset or adds/removes the Primary Asset flag.
Assets → Edit → Asset Type Properties	Allows you to edit the *asset type* of the currently selected asset, for example, change its name or change what AIGs, event types and survey types it is associated with.
Assets → Delete	Deletes or unlinks the selected asset. If the asset exists in multiple places, it removes only the asset at the current location, it doesn't delete all locations where the asset exists. Click on the **Connections** button to view dependant records of the current asset.
Assets → Show Asset Type	Toggles the display of the asset type in the hierarchy.
Assets → Expand Children	Expands all subnodes (children, grandchildren) of the selected asset. You can also press the * key on the numeric keypad.
Assets → Collapse Children	Collapses all subnodes (children, grandchildren) of the selected asset.
Assets → Copy to Clipboard	Copies either the asset name or full hierarchy location of the selected asset to the clipboard.
Assets → Move → To...	Moves the selected asset and inserts it as a child under the node that you select in the asset hierarchy.
Assets → Move → To Root	Repositions the selected asset in the asset tree so that it becomes a root asset.
Assets → Show on Drawing	Shows a list of drawings that have this asset as a layer. Click on a menu item to go to that drawing. If the drawing name has "(Different Asset)" after it, the drawing you will be taken to is not available on the current asset; thus, when you select the menu option, you will not only be taken to that layer on that drawing, you will also be navigated to the new asset. You can get back by using the **Back** toolbar button.
Assets → Other Locations	Lists other locations in the hierarchy where the asset appears (including other Asset Views). Click on a menu item to navigate there. If this asset does not appear in any other locations, you will not see any items in this list.
Assets → Connections	See *Connections* for information about the Connections function.
Assets → Anomaly Triggers	See *Set Up Anomaly Triggers for Assets* for information about the Anomaly Triggers function.
Assets → Coordinates	Allows you to define the baseline coordinates for survey points relevant for the asset. You can define coordinates for several survey points. In this case, on the **INSPECTION** screen, on the **Map** tab, a line is displayed, which connects the survey points defined.
Assets → Retire Equipment	See *Retire Equipment* for detailed information on this function.
Assets → Rotate Equipment	See *Rotate Equipment* for detailed information on this function.
Asset Views	See *Asset Views* for detailed information on the Asset Views toolbar option.
Traffic Lighting	See *Traffic Lighting* for detailed description of the Traffic Lighting toolbar option.
View	Toggles visibility of tabs on the screen. All tabs can be shown or hidden except **Asset Information**, which is always available and can be docked to the bottom of the screen.
Import	See *Import Assets* for detailed information about the import function. The MS Excel Import Template details the required format for importing library items.
Custom Export	See *Custom Export Assets* for information about exporting assets and asset information data.
Reports	See *Reports* for information about the Reports toolbar option.

11.2.2 Asset Tree

The *asset tree* is a central part of the NEXUS IC application. Most data stored in NEXUS IC is linked back to an asset in the asset hierarchy, including (but not limited to) risk assessments, anomalies, drawings, library items, inspection data and inspection schedules.

Assets are presented to the end-user in a hierarchical tree view, where each asset may have a single parent, and multiple children or siblings. Each asset is also assigned an *asset type*. There is no limit to the number of levels that can be configured in the asset hierarchy, however, from a usability perspective, Wood recommends keeping the hierarchy levels to less than 10 (this is for guidance purposes only).

The asset tree appears on several screens and dialogs within NEXUS IC (for example, *ASSETS Screen*, *Planning and Workpacks*, *Inspection*). If you click on an asset to select it in one of those screens, it will be selected in all of those screens. The selected asset and its view are also remembered between sessions, that is, when you next open NEXUS IC, it will automatically return to the same asset and asset view that were open in your last session.

Tip

- Ctrl+C copies the name of the currently selected asset to the clipboard.
- Ctrl+Shift+C copies the full asset path of the currently selected asset to the clipboard.
- You can directly search for an asset in the asset tree by simply typing the search term when the asset tree is active or by pressing Ctrl+F. For more information about searching, see *Searching*.

11.2.2.1 Asset Views

You can set up several different asset trees for your assets depending on your requirements using asset views and you can switch between these asset tree views by selecting the required view from the **Asset Views** menu in the toolbar. For more information, see *Asset Views*.

11.2.2.2 Maintain Asset Trees and Asset Nodes

You can access asset-tree-related functions on the **ASSETS** screen through the **Assets** toolbar menu or by **right-clicking** on the selected asset node. See below for more information about these functions:

- *Create Assets*
- *Edit Assets and Asset Types*
- *Move Assets*
- *Retire Equipment*
- *Rotate Equipment*
- *Set Up Anomaly Triggers for Assets*

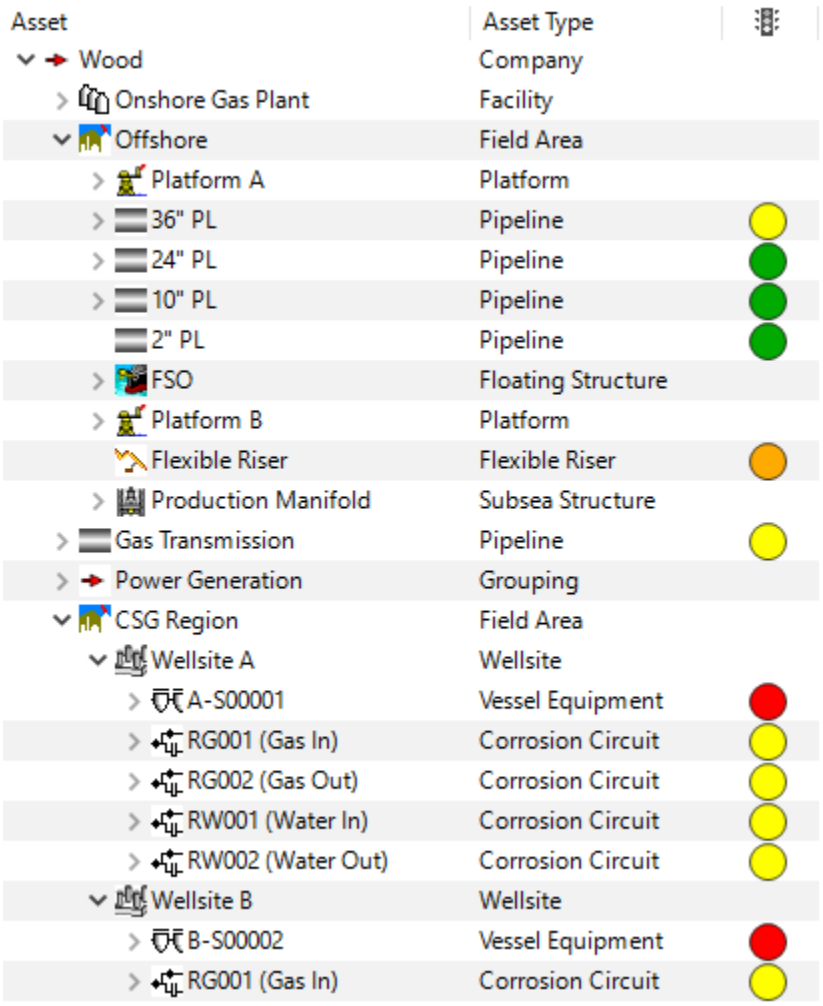
11.2.2.3 Import and Export Asset Trees

You can import and export your asset trees, nodes within the asset trees and the related asset information data using the standard import and export functionality. For more information, see *Import Assets* and *Custom Export Assets*.

11.2.2.4 Traffic Lighting

You can display preconfigured traffic lighting values for the asset nodes in your asset tree. For more information, see *Traffic Lighting*.

See an example asset tree below with traffic lighting enabled:



11.2.2.4.1 Asset Views

Asset views allow you to organise and present assets in different ways. You can isolate asset trees from one another, display only a filtered list of assets or arrange assets to suit a particular purpose. When multiple asset views exist, you can switch between them using the **Asset Views** toolbar menu wherever the asset tree appears.

You can maintain asset views on the **ASSETS** screen of NEXUS IC using the **Asset Views** toolbar menu.

11.2.2.4.1.1 Creating an Asset View

Choose *Asset Views* → *Add* to create a new asset view. Enter a name and a descriptive comment for informational and reporting purposes. After creating the view, you can build its asset tree using the standard asset tree maintenance steps (see *Maintain Asset Trees and Asset Nodes*).

11.2.2.4.1.2 Editing an Asset View

Choose *Asset Views* → *Edit* to update the properties of the currently selected asset view.

The **Edit Asset Views** dialog also includes a **Permissions** tab where you can manage access to the asset view:

- Add a user or user group to grant permission.
- Delete users or user groups if you need to remove their access.

11.2.2.4.1.3 Deleting an Asset View

Choose *Asset Views* → *Delete* to remove the currently selected asset view.

> **Note**
>
> Deleting an asset view will delete all assets contained within that view, regardless of whether those assets exist in other asset views.

11.2.2.4.1.4 Examples

The following examples show typical ways asset views can be used to organise assets.

- Create an asset view titled "Subsea" which contains all subsea assets. Create a second asset view titled "SPE" which contains all topside Static Pressure Equipment assets. Using separate views makes it easier to work with subsea and topside equipment independently.
- Create an asset view titled "Pressure Relief Devices" which contains only the PRD assets that already exist in the "SPE" view. In this example, the PRDs are *Linked* from the SPE asset view rather than duplicated. This provides a focused view of PRDs while keeping their original position in the SPE asset tree.
- If required, you can create additional asset views that contain selected assets from existing views. For example, you may create a temporary view for a specific review or reporting activity by linking only the assets relevant to that task. Linked assets remain part of their original asset views.

11.2.2.4.2 Create Assets

To store your assets' data in NEXUS, you set up an asset tree by creating a hierarchy of asset nodes on the **ASSETS** screen.

You can manually create nodes in the asset tree in one of the following ways:

11.2.2.4.2.1 Create a Root Asset

When you create a root asset, the asset is created at the top level of the hierarchy without a parent node. To create an asset at root level, proceed as follows:

1. Choose *Assets* → *Add* → *Root Asset* from the toolbar on the **ASSETS** screen.
2. In the **Add Asset** dialog, specify the name of the asset (mandatory) and assign an asset type as required.

   You can also indicate if this is a primary asset. This attribute can then be used for grouping your assets or in reporting.

   > **Note**
   >
   > Asset names must not contain a forward slash surrounded by spaces (" / ").

3. Click **OK**.

11.2.2.4.2.2 Create an Asset Under a Parent Node

When you create an asset under another parent asset, the new node is created as the last node under the selected asset. Proceed as follows:

1. Select the asset under which you want to insert the new asset.

2. Access the **Add Asset** dialog in either of the following ways:
   - Choose *Assets* → *Add* → *Root Asset* from the toolbar on the **ASSETS** screen.
   - Right-click the asset and select **Add** from the context menu.
3. In the **Add Asset** dialog, specify the name of the asset (mandatory) and assign an asset type as required.

   You can also indicate if this is a primary asset. This attribute can then be used for grouping your assets or in reporting.

   > **Note**
   >
   > Asset names must not contain a forward slash surrounded by spaces (" / ").

4. Click **OK**.

11.2.2.4.2.3 Insert Linked Asset With Children

When you insert a linked asset under a parent asset with its children, you select an existing asset, which is then inserted as a child under the selected asset, including all its children. Proceed as follows:

1. Select the asset under which you want to insert the new asset.
2. Choose *Assets* → *Add* → *Linked Asset (With Children)* from the toolbar on the **ASSETS** screen.
3. In the dialog that appears, select the asset that you want to include from the asset tree. If required, you can switch the asset view using the **Asset Views** toolbar button.
4. Click **OK**.

11.2.2.4.2.4 Insert Linked Asset Without Children

When you insert a linked asset under a parent asset without its children, you select an existing asset, which is then inserted as a child under the selected asset, without its children. Proceed as follows:

1. Select the asset under which you want to insert the new asset.
2. Choose *Assets* → *Add* → *Linked Asset (Without Children)* from the toolbar on the **ASSETS** screen.
3. In the dialog that appears, select the asset that you want to include from the asset tree. If required, you can switch the asset view using the **Asset Views** toolbar button.
4. Click **OK**.

11.2.2.4.3 Edit Assets and Asset Types

You can edit the properties of existing assets and asset types, or change their assignments any time after they have been created.

11.2.2.4.3.1 Edit Assets

You can change an existing asset's name, assign new asset types to it, or modify the *Primary Asset* indicator settings.

You can edit these properties in one of the following ways:

- Choose *Assets* → *Edit* → *Asset Properties* . . . from the toolbar on the **ASSETS** screen.
- Right-click the asset and select **Edit** from the context menu.

11.2.2.4.3.2 Edit Asset Types

You can change an existing asset type's properties or assign AIGs, event definitions, survey data groups, risk models or library items to it. To do that, you make changes in the **Edit Asset Type** dialog as described in *Configure Asset Types*.

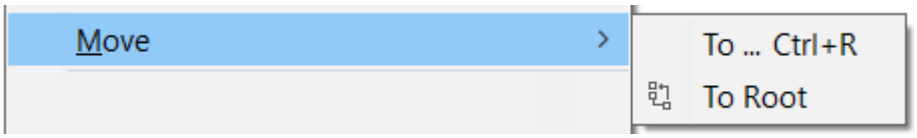
You can access this dialog in one of the following ways:

- Navigate to *Configuration* → *Assets* → *Types* from the main menu.
- Choose *Assets* → *Edit* → *Asset Type Properties* from the toolbar on the **ASSETS** screen.

11.2.2.4.4 Move Assets

You can move an asset within the asset tree as follows:

- Move it under another parent within the asset tree. In this case, proceed as follows:
  1. Select the asset that you want to move.
  2. Choose *Move* → *To…* either from the drop-down menu of the **Assets** toolbar button or from the context menu of the asset (available by right-clicking the asset).
  3. In the dialog that appears, select the asset under which you want to insert the asset node. If required, you can switch the asset view using the **Asset Views** toolbar button.
  4. Click **OK**.
- Make the asset a new root-level asset within the asset tree. In this case, proceed as follows:
  1. Select the asset that you want to move.
  2. Choose *Move* → *To Root* either from the drop-down menu of the **Assets** toolbar button or from the context menu of the asset (available by right-clicking the asset).
  3. In the confirmation dialog, click **Reparent**.



If the asset that you have chosen to move has children, then the child assets will be moved along with the selected asset.

Tip

- **Ctrl-R** is available as a shortcut key to initiate the move.
- Cursor up and down move between assets in the picker dialog. Cursor left and right close and open sub-trees.
- Press **Enter** to complete or **Escape** to cancel the dialog.

11.2.2.4.5 Retire Equipment

When you retire an equipment, you change the location of the selected asset in the asset tree. Changing the asset location in the asset tree creates records on the **Asset History** tab for the asset itself as well as the source parent, to record details of the relocation.

To retire an equipment, proceed as follows:

1. Select the relevant asset node in the asset tree.

2. Choose the **Retire Equipment** menu option either from the **Assets** toolbar menu or from the right-click context menu of the node.
3. In the dialog that is displayed, select the destination parent asset from the asset tree.
4. Click **OK**.

> **Result**
>
> The asset tree is refreshed and the asset will be selected in the tree under the new location.

> **Note**
>
> The **Retire Equipment** menu item is a Shortcut. As such, if necessary, it can be debugged using the Shortcut debugger. When you select the menu item, hold down the Control key on the keyboard. The **Select Asset** dialog will be displayed, but will be followed by the **Debug Shortcut** dialog. You can step through shortcut items one at a time, which may help to narrow down any problems.

11.2.2.4.6 Rotate Equipment

When you rotate an equipment, you swap the location of the selected asset with another asset of the same type. Swapping assets will exchange their location in the asset tree and create records on the **Asset History** tab for both assets, to record details of the exchange.

To retire an equipment, proceed as follows:

1. Select the relevant asset node in the asset tree.
2. Choose the **Rotate Equipment** menu option either from the **Assets** toolbar menu or from the right-click context menu of the node.
3. In the dialog that is displayed, select another asset of the same type from the asset tree. Assets that are not of the same type will be greyed out in the tree.
4. Click **OK**.

> **Result**
>
> The asset tree is refreshed and the swapped asset will be selected in the tree.

> **Note**
>
> - The **Rotate Equipment** menu item will only be enabled if the selected asset has an asset type.
> - You cannot rotate an asset with one of its children.
> - The **Rotate Equipment** menu item is a Shortcut. As such, if necessary, it can be debugged using the Shortcut debugger. When you select the menu item, hold down the Control key on the keyboard. The **Select Asset** dialog will be displayed, but will be followed by the **Debug Shortcut** dialog. You can step through shortcut items one at a time, which may help to narrow down any problems.

This functionality is most commonly used for PRDs where they are “rotated” out for valves that have been tested and prepared for service.

11.2.2.4.7 Set Up Anomaly Triggers for Assets

You can set up asset-specific anomaly triggers for fields directly from the asset tree. In case you create an asset-specific anomaly trigger, it will be relevant for the selected asset only.

Generic anomaly triggers (independent of assets) are set up in *Configure Asset Information Groups* and *Configure Event Types*. If you have both an asset-specific and a generic anomaly trigger on the same field, for assets with the asset-specific trigger, only the asset-specific trigger will apply. For assets with only a generic trigger, only the generic trigger will apply.

> **Note**
>
> Asset-specific anomaly triggers are specific to their asset and they do not automatically apply to an asset's children.

To set up an anomaly trigger for an asset field from the asset tree, proceed as follows:

1. Select the relevant asset node from the asset tree.
2. Choose the **Anomaly Triggers ...** menu option either from the **Assets** toolbar menu or from the right-click context menu of the node.
3. In the dialog that is displayed, choose **Add**.
4. In the **Add Anomaly Triggers** dialog, select the field for which you want to apply the anomaly trigger and specify the anomaly trigger parameters as required. These parameters are the same as the ones that you define when you set up the generic anomaly triggers on the **Anomaly Triggers** tab of the **Add/Edit Field Definition** dialog. For more information, see *Set Up Anomaly Triggers*.
5. Click **OK** to apply your changes.

11.2.2.4.8 Import Assets

You can import or bulk update data stored in the Asset Information Groups (AIGs) by choosing **Import** from the toolbar on the **ASSETS** screen.

The format of the Excel workbook needs to be specific. We recommend that you generate an Excel export using the *Custom Export Assets* functionality, to generate the workbook in the correct format for importing data.

It is possible to create new asset hierarchies by importing assets with hierarchy structures that don't already exist. In doing so, new parent assets will be created. In case this is not the desired result, the **Test Import** will throw a warning.

> **Caution**
>
> While imports are being carried out, transactions are now committed every 50 rows from the source import sheet, so table locking will be heavily reduced from v6.7 onwards. However, this higher frequency of transaction commits may cause other users' NEXUS sessions to "refresh" the imported data, depending on the type of data other users have in their cache and the type of data being imported.

11.2.2.4.8.1 Import Files

Prepare Data for Import

Before you start the import, you must prepare the files in the required format. Compatible file types include .zip, .xlsx (Excel), .csv, and .txt. Zip files can contain the xlsx/csv/txt file plus any additional files, for example, multimedia images or electronic documents for importing into the library.

Tip

- For very large imports, saving your Excel file as a .csv and then importing from the .csv may be faster.
- The `Asset Location.Full Location` data can be defined in one of the following ways (you can use only one option, not both):
  - As a single column, where each level of the asset location is separated by the string " / ", for example, 'My Field / My Platform / My Member'
  - As multiple columns, where each level of the asset location is stored in a separate sequential column, that is, for each node in the hierarchy, you create a separate column with the name `Asset Location.Full Location` and with one asset hierarchy level in each.

Note

Importing directly from .xlsx files is not supported for SaaS customers using the new virtualisation technology (see *Software as a Service (SaaS)*). We recommend using .csv files instead.

Sub-Rows in Import Sheet

Sometimes a single row may have several sub-rows. For example, an AIG row might have several sub-AIG rows; or an event might have several findings or several multimedia images or both. When this occurs, you must create separate rows in the import sheet for each sub-item, with different "detail" values in each.

For example, if you have several multimedia images to import against a single event, your Excel sheet should have several rows that are identical except for the Multimedia.Name and Multimedia.Image columns. If you have specified an event number, and you use the same event number on each row, NEXUS will only create the event once, but will create several multimedia items. If you do not specify an event number, NEXUS will instead create several different events with one multimedia item each.

You can also leave event fields blank for all except the last row. Under the hood, NEXUS is importing each Excel row into the event, and only the last Excel row imported will "stick". Note that if your event has a finding, you should *not* repeat the finding data on each event row; if you do, NEXUS will create one finding for each Excel row that has finding data filled in.

In some cases, you *do* want multiple findings on one event, and in that case you must fill in several rows as appropriate. Similarly for sub-event data or sub-AIG data: if you want several different sub-events or sub-AIG rows imported, you should repeat the event row or AIG row with different sub-event or sub-AIG data in each case. If you are repeating an Excel row for another reason and you do *not* want several sub-event or sub-AIG rows imported, you should fill in sub-event or sub-AIG data in only one of the Excel rows.

Tip

You can find the next available event number for a given event type by creating an event of that type using *Add Event*, noting the event number, then deleting that event. If you want the next available event numbers for several

event types, create a report template with a Simple Source on table Event and a Pivot Table with a pivot row on Event Type and a value field on Event Number with aggregate Max, then add 1.

Perform Data Import

1. Choose **Import** from the toolbar.
2. In the **Import File** dialog, choose ... to navigate to the file that you want to import and select it.

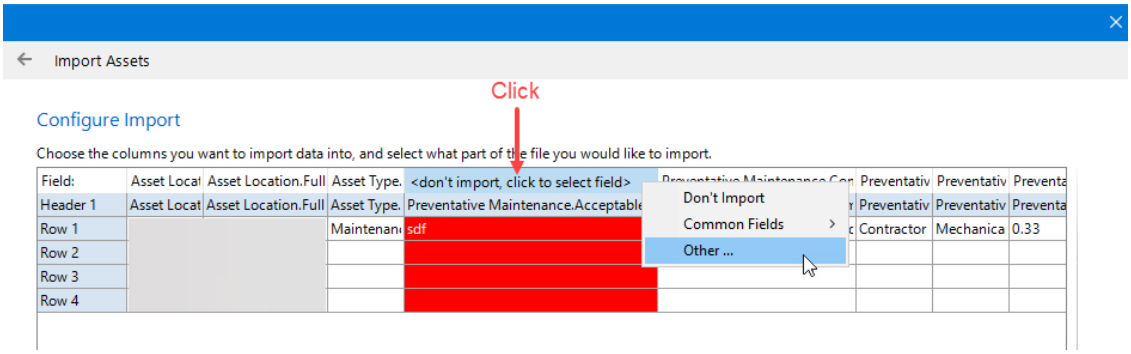
> **Note**
>
> By default, the dialog shows only CSV files.

3. If required, you can also verify the date and time format in this dialog and you can choose whether you want to skip blank cells:
   - If you select skipping blank cells, then any cells that are blank will be ignored during the import.
   - If you do not select skipping blank cells, then blank cells will update any existing data and make it blank.
4. Click **Next**.

> **Result**
>
> The system reads the import file and uses the `<table name>.<field name>` naming convention to map the headers in the import file to database fields in the NEXUS system.

5. In the **Configure Import** dialog, you can review the mapping proposed by the system and make changes, if required:
   - In the top **Field** row, you can see the fields to which the system proposes to map the column headers from the import file. You can manually change the default mapping option for each column by clicking on the title of the column in the top **Field** row and selecting one of the following options:
     - *Don't Import* - Does not import the selected column to the database.
     - *Common Fields* - Allows you to select common fields in the database to which you want to map the selected column instead of the database field proposed by the system.
     - *Other . . .* - Allows you to search and select a field from a list of your field definitions as required.

   Note that if the system couldn't match a column to a database field for some reason, the column is displayed in red colour. By default, the system does not map these columns, you can manually map them if required.



- In case there are required fields in the database for which the system couldn't find any values in your import sheet, the system prompts you to set these values in this dialog. In this case, the relevant fields will be displayed on the right-hand side of the dialog under **Required Fields**, where you have the option to set the value globally for this import as required.
- Under **Settings**, you can specify how many header rows your import sheet contains. For example, you may have the table name as the first header row and the field name in the second header row, in which case, instead of having a column title like `Asset Location.Asset View`, you'd have a header row for Asset Location and second header row for Asset View.
- If your import file contains multiple worksheets, ensure that you select the correct worksheet in the **Worksheet** field.

Note that if the field type is set to change for an existing field, the import will abort as data loss may occur.

6. Click **Next**.

> **Result**
>
> The system tests every single row in the import file and shows if there are any issues with importing. You can abort the test import at any time by clicking **Skip**.

7. Once the import test is finished, you can see a log that shows any errors or warnings that the system may have found during test import. In case of errors, you cannot proceed with the import and the **Import** button will be inactive. In this case, you must rectify the errors in the import file and start the import process again.

> **Tip**
>
> You can copy and select import results from the dialog for review. For instance, it can be helpful to paste all errors into a spreadsheet to make it simpler to methodically update them.

8. If the import test is finished without errors, you can click **Import** to complete the process.

> **Result**
>
> Depending on your client, the following happens:
>
> - If using a SaaS client, the import job is offloaded to the SaaS server and is started remotely. It is then possible to close the current NEXUS IC session while the active import job continues.
> - If using a non-SaaS client, the import job is executed in the current NEXUS IC session and you may continue using NEXUS IC. Closing the current NEXUS IC session will cancel the active import job.
>
> In both cases, the UI will refresh intermittently throughout the import, and there will be delays between the import finishing and final refresh as NEXUS IC does not directly monitor changes.

> **Note**
>
> When importing inspection event data, anomaly triggers are checked during the import and findings created automatically from data which falls outside the data bounds.

9. Check the status and result of the import in the *Job Management Console*, which records the status and history of all import jobs.

The import job banner at the bottom of the window shows the status of the import job and provides the option to dismiss the job or check the details. You can double-click the job, which triggers a dialog that summarises the import. From this dialog, you can click **Details** to show how many rows have been added to various forms or tables. If you have multiple rows in your import sheet that update the same row, these rows will be counted by the test import individually, whereas the final import statistics will only show 1 updated row.

You can also save the summary to file.

Tip

- We highly recommend that you scrutinise the summary to ensure that the import has performed the actions that you expected. Take note of the total rows for a specific item, that is, add together the number added and updated and make sure that is equal to the number you expect.
- If the importer encounters a completely blank row in an Excel file, it will stop importing at that point, even if there are non-blank rows further down. This can provide an easy way to test an import sheet: set it up, and then after just one or two rows of data, insert a blank. Run the import to see if it's doing what you expect, and if so, delete the blank and run again. Similarly, if the importer encounters a blank column in an Excel file, columns to the right of this will not be imported.

Note

During an import, NEXUS communicates with Excel in the background. NEXUS commands Excel to open the file you want to import, and asks Excel what's in each cell. If you use Excel to modify the file while we're importing it, even if you don't hit *Save*, you may confuse the import process. The same happens if you take a variety of other actions, such as *Save As*, closing the Excel, and so on. If you see the error text "Call was rejected by callee", it means that Excel has stopped answering calls from NEXUS.

11.2.2.4.9 Custom Export Assets

The Custom Export functionality allows you to choose a subset of assets and associated Asset Information Groups (AIGs) and export their data to an Excel file.

You can perform custom export by choosing **Custom Export** from the toolbar on the **ASSETS** screen.

The format in which the data is exported to Excel is the same format in which the data can be reimported (see *Import Assets* for more information on importing data from Excel).

Hint

The format in which data is exported is the same format in which the data can be reimported. Thus, it's recommended that you create your import files based on the format produced by a custom export. For example, you can use the "Custom Export" wizard to export the operating properties of a Process Stream. Update the operating temperature and pressure in the Excel sheet, then reimport the data.

11.2.2.4.9.1 Perform Custom Export

1. On the **ASSETS** screen, choose **Custom Export** from the toolbar.

> **Result**
>
> The **Asset Export Wizard** opens.

2. Specify the name of the file and the location where you want it to be saved to. NEXUS proposes a default path and name, which you can overwrite as required.
3. Click **Next**.
4. In the next dialog, specify the export options:

Field	Description
Columns	Select one of the following options: • *All columns* - includes all the relevant columns in the exported file. • *All visible columns* - columns that have the Visible Grid or Visible Form options ticked will be exported. Workflow rules affecting field visibility will not be run. • *User selected* - you can select which columns to include in the export. A subsequent dialog will be shown later select those columns.
Asset Location	Select one of the following options: • *Single column* - the location of the assets will be included in a single column, each node separated by " / " (note the space), for example, "Field / Asset / Elevation / Member / Anode" • *Multiple columns* - each node in the asset location hierarchy will have its own column in the exported file.
Calculated fields	Indicate whether you want to include calculated fields in the export.
Sub Asset Information	Indicate whether you want to include Sub-AIG data in the export.
Hide Lookup Lists	Extra worksheets are created for each Lookup List used in the forms. You can choose to hide these worksheets.
Date	Specify the formatting of dates in the exported file.
Time	Specify the formatting of times in the exported file.
Cell formatting	If you select this option, some cell formatting options will be applied, for example, cells with invalid values will be shown in red, cells not relevant to this AIG or event form will be greyed out, and so on.

5. Click **Next**.
6. In the next dialog, choose the Asset View and select which subset of assets you want to include in the export.

> **Note**
>
> Use the **Select Children** and **Unselect Children** toolbar buttons to include and exclude the visible and non-visible child assets. Simply selecting an asset at the top level will not automatically select all the child assets beneath it.

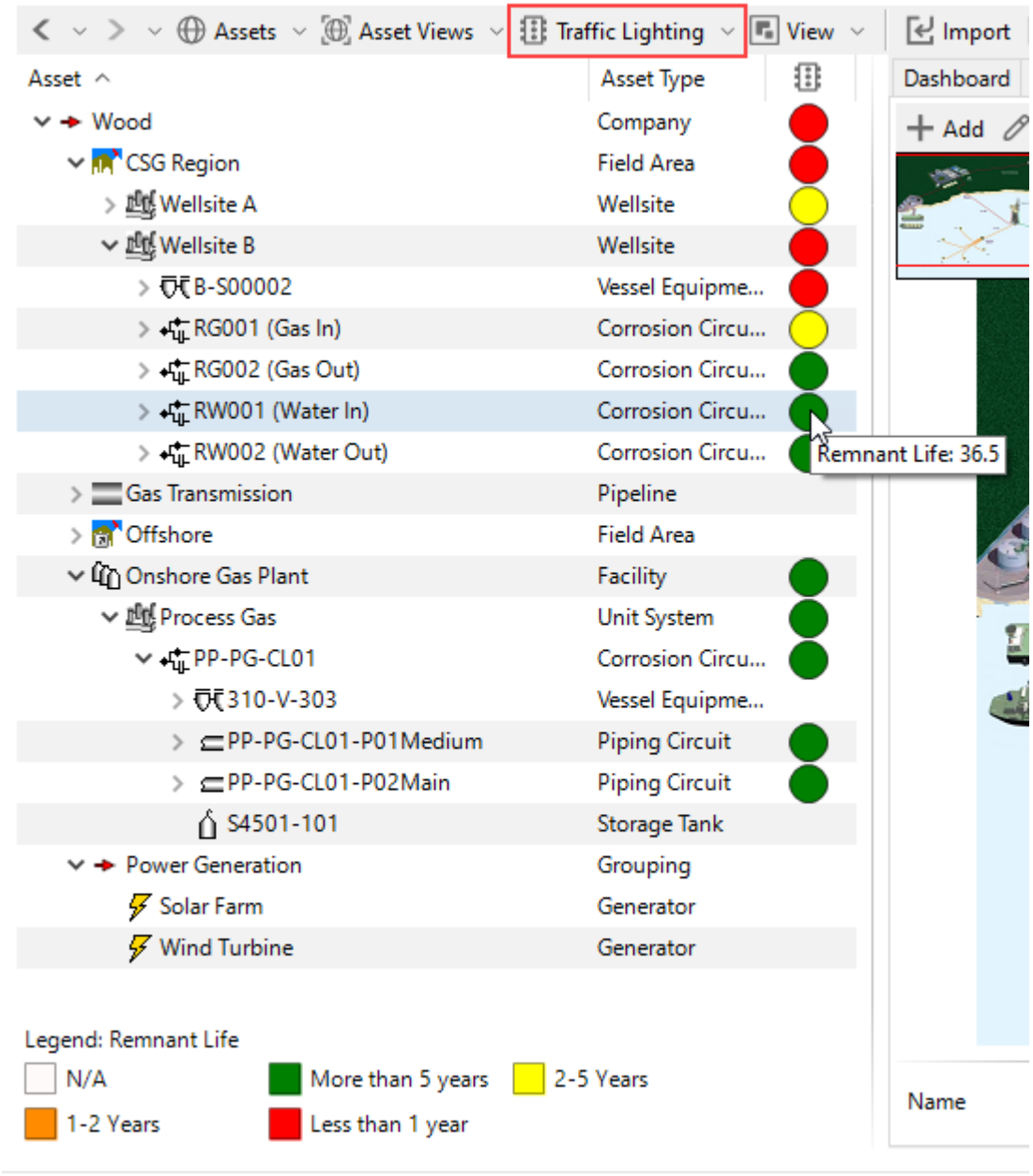
7. Click **Next**.
8. In the next dialog, select which AIGs you want to include in the exported file.
9. Click **Export**.

> **Result**
>
> The system generates the Excel file to the location that you specified. If required, you can choose to open the document immediately.

> **Hint**
>
> - The column order within the exported sheet is determined by the grid column order set within each form under *Configuration* → *Assets* → *Information* (see *Configure Asset Information Groups*).
> - The exported Excel sheet contains a **Legend** tab, which shows the meaning of various cell and row colours.

11.2.2.4.10 Traffic Lighting

Traffic lighting shows pre-defined coloured dots next to each asset in the asset tree when a traffic lighting option is selected. To enable traffic lighting, you choose an option from the **Traffic Lighting** toolbar button. A legend appears at the bottom of the asset tree, showing the name of the selected traffic lighting rule and the meaning of each colour. Hovering the mouse over a traffic light displays a hint showing its value. For example:



Note

Traffic lighting requires the **Traffic Light** field to be calculated for every asset. As a result, NEXUS IC may respond more slowly when a traffic lighting rule is enabled. This typically occurs only the first time a group of assets is viewed, as NEXUS IC caches the results.

11.2.2.4.10.1 Traffic Lighting Toolbar Options

The **Traffic Lighting** toolbar button is available on screens that display the asset tree, such as **ASSETS** and **INSPECTION**.

The options under the toolbar button include all configured traffic lighting rules (see *Configure Traffic Lights*). If a rule has been assigned to a category, it appears under that category in the menu. Rules that have no category assigned appear under the **No Category** option, except for **None** and **Active Workpack...**, which always appear at the top level.

By default, the following options are provided:

- *Traffic Lighting → None*

  Removes all traffic lights from the asset tree.

- *Traffic Lighting → No Category → Anomalies*

  Indicates the number of anomalies for each asset, based on the *Anomalies* traffic lighting rules.

- *Traffic Lighting → No Category → Incomplete Tasks*

  Highlights where incomplete tasks exist for the currently selected workpack. This option depends on the active workpack chosen under *Traffic Lighting → Active Workpack*.

- *Traffic Lighting → No Category → Risk*

  Shows the risk value for each asset, based on the *Risk* traffic lighting rules.

- *Traffic Lighting → No Category → Rolled up Risk*

  Shows the rolled-up (maximum) risk of each asset and all its children, based on the *Rolled Up Risk* traffic lighting rules.

- *Traffic Lighting → Active Workpack*

  Opens the **Select Workpack** dialog, allowing you to choose a workpack. This selection is used by the *Incomplete Tasks* traffic lighting rule.

11.2.2.4.10.2 Traffic Lighting on Drawings

Traffic lighting can also be shown on drawings. If an asset has a defined region on a drawing and a traffic light colour is assigned to that asset, the region is displayed in that colour. You can toggle the display on drawings from the **Layer Colour** toolbar option on the **Drawings** tab.

See also

- *Configure Traffic Lights*
- *Configure Traffic Light Categories*

11.2.3 Asset Dashboards

The **Dashboards** tab on the **ASSETS** screen shows you the output of any of the pre-configured report templates in the database that has been marked as an asset dashboard. The visibility of this tab can be toggled on or off under the **View** toolbar option.

11.2.3.1 Prerequisites

To make report templates available as asset dashboards, the following configurations must have been done:

- A report template must exist under *Configuration → Reports and Dashboards → Templates*. For more information, see *Configure Report Templates*.
- The report template must have been set as an asset dashboard in your configuration settings under *Configuration → Reports and Dashboards → Templates*. For more information, see *Set a Report Template as a Dashboard*.

> **Note**
>
> For the asset dashboard report, choose a report template that requires an asset as a report parameter.

11.2.3.2 Using the Dashboard

To choose which dashboard template is shown, click the **Dashboard** toolbar button, and select the required template from the drop-down list. Templates are grouped by the report categories as per your configuration settings (*Configure Reports and Dashboards*).

As compared to the **DASHBOARDS** screen, on the **Dashboard** tab of the **ASSETS** screen, the dashboard report recognises what asset is currently selected in the asset tree and updates the contents of the dashboard report based on the selected asset.

Asset dashboards work in the same way as the generic dashboard on the **DASHBOARDS** screen. For more information about the dashboard functionality, see *Dashboards*.

> **See also**
>
> - *Set a Report Template as a Dashboard*
> - *Configure Report Templates*
> - *Dashboards*

11.2.4 Asset Information Groups (AIGs)

Asset Information Groups (AIGs) are preconfigured sets of fields used to record asset-specific data. You can access and manage AIGs on the **Asset Information** tab, which is available on both the *ASSETS* and *INSPECTION* screens. The functionality is identical in both locations.

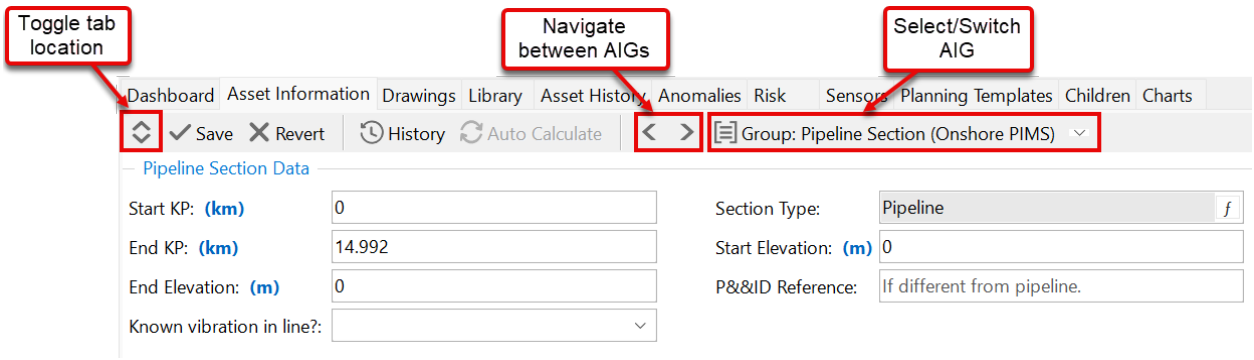
Before entering data, ensure that:

- The AIG has been set up (see *Configure Asset Information Groups*)
- The AIG has been assigned to the asset type of the selected asset (see *Assign AIGs to an Asset Type*)

11.2.4.1 Using the Asset Information Tab

To learn about the different field types available on this tab, see *Field Types*.

You can interact with the **Asset Information** tab using the tab's toolbar options:



- **Select or switch AIGs**: Click the **Group** toolbar button and select the required AIG.
- **Navigate between AIGs**: Use the arrow buttons next to the **Group** button. Navigation follows the order defined in the asset type configuration (see *Ordering groups*).
- **Toggle tab location**: Click the ⇕ button to move the tab:
  - Among other asset tabs (for example, **Dashboard**, **Drawings**)
  - To the bottom of the window, below the other tabs.

  This allows you to view asset information alongside other data or maximise the window space for the data you're interested in.
- **Save or discard changes**: After making changes, the ✓ **Save** and ✗ **Revert** buttons become active, which you can use to save or discard your changes. If you switch assets without saving or reverting, your changes will be saved automatically.
- **View history**: Click the 🕘 *History* button to open the **History** dialog for the current AIG on the selected asset. (see *Checking History*).

For detailed information about editing AIGs, see *Edit AIGs (Individually/in Bulk)*.

> **Tip**
>
> If you are navigating through the asset tree and the *Asset Information* tab is not important, you can select a different tab, such as **Library**. This prevents asset information from being loaded, which can be useful if the asset information involves extensive calculations.

11.2.4.2 Ordering groups

The order of asset information groups determines which group is shown by default. When switching to a new asset on the **ASSET** screen, the previously active group will remain active if it also belongs to the new asset. If the previous group is no longer applicable, the default AIG (ordered highest on the list) will be shown.

To reorder AIGs:

1. Go to *Configuration* → *Assets* → *Configure Asset Types*
2. Edit the relevant asset type.
3. Go to the **Asset Information Groups** tab.

4. Adjust the order using the up/down buttons.

11.2.4.3 Field Types

For information about the various field types available in an AIG form, see *Field Types*.

11.2.4.4 Sub-Asset Information Groups

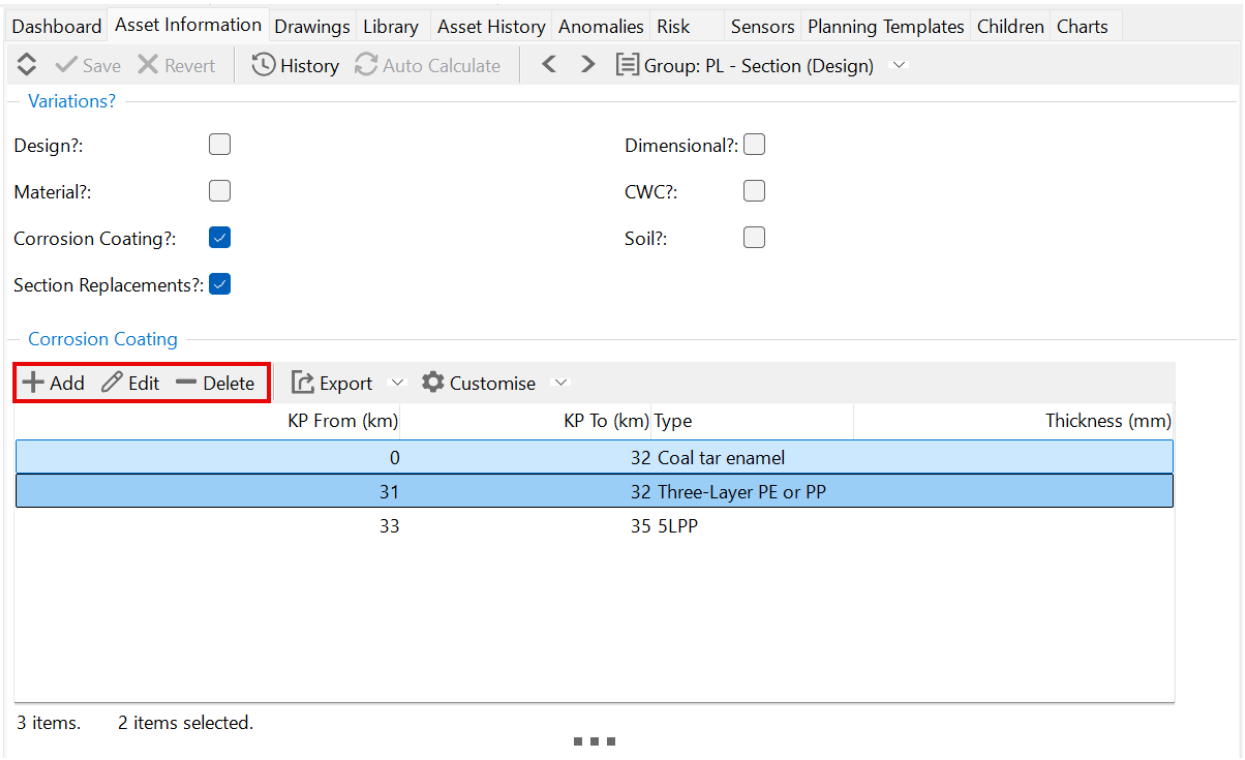
Often, you will need to record a list or table of information for a single asset. For example, you might have a list of various threats that apply to this asset, along with their severity levels.

To represent this, we use a sub-form within the form.

> **Note**
>
> To view sub-asset groups for multiple assets, use the *Children* tab to select multiple sub-asset information groups. This provides the ability to bulk update sub-asset information across multiple assets simultaneously.

You can use **Add**, **Edit**, and **Delete** to add, edit or remove rows.

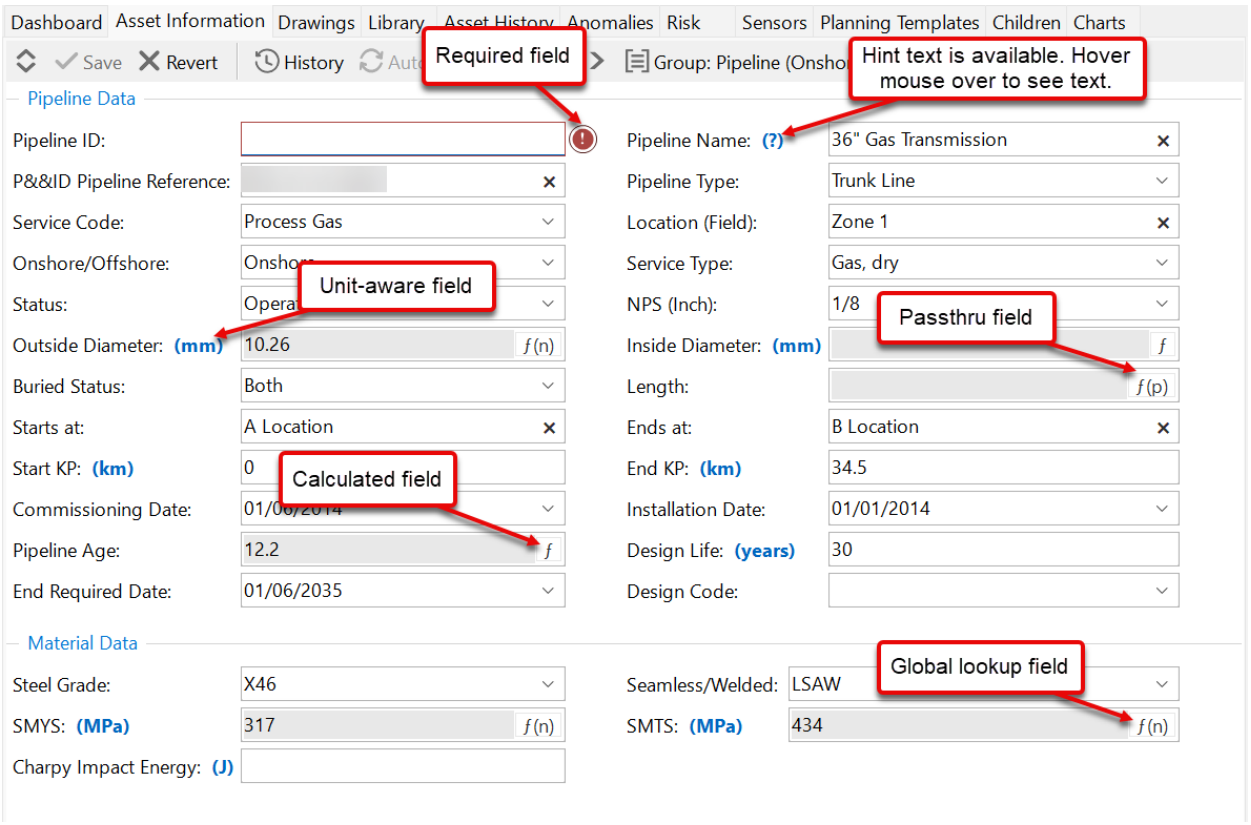
By ctrl-clicking sub-asset information rows, you can edit or remove multiple rows at once. See the screenshot below for an example:



> **See also**
>
> - *Edit AIGs (Individually/in Bulk)*
> - *Field Types*

11.2.4.4.1 Field Types

You can find various field types in an Asset Information Group (AIG). See below for a description of each.

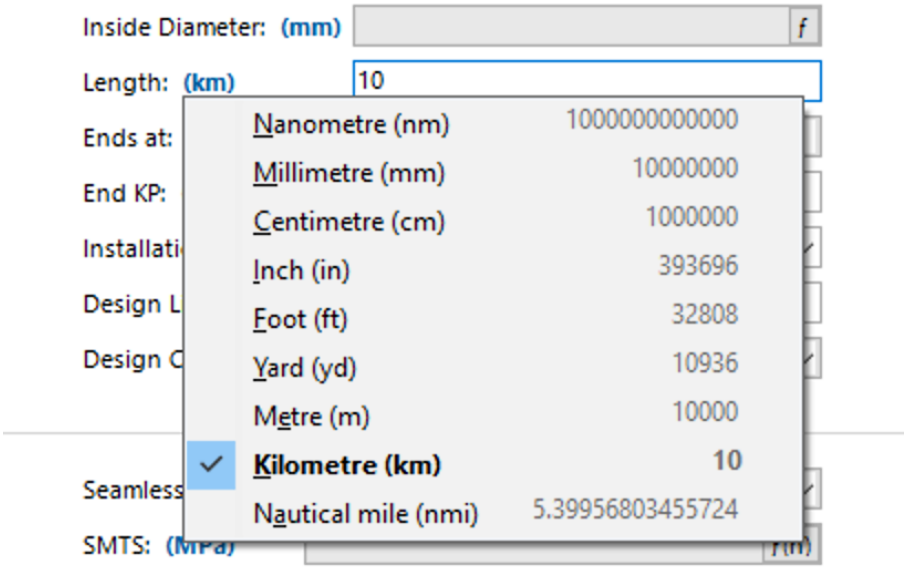


11.2.4.4.1.1 Unit-Aware Numeric Field

When numeric fields are configured in an AIG, you have an option to define a base unit type for that field. By default, the base unit type is displayed to all users, however, each user has the option to view the numerical value in that field in a different unit type. The menu item in bold indicates the default unit.

Unit-aware numerical fields are identified by the label after the field name that states the unit type in blue text.

To view a different unit type in the asset information group, click on the unit label and choose an alternate unit type from the popup menu. Note that NEXUS IC will "remember" your preferred unit type and display that next time you login to NEXUS IC.

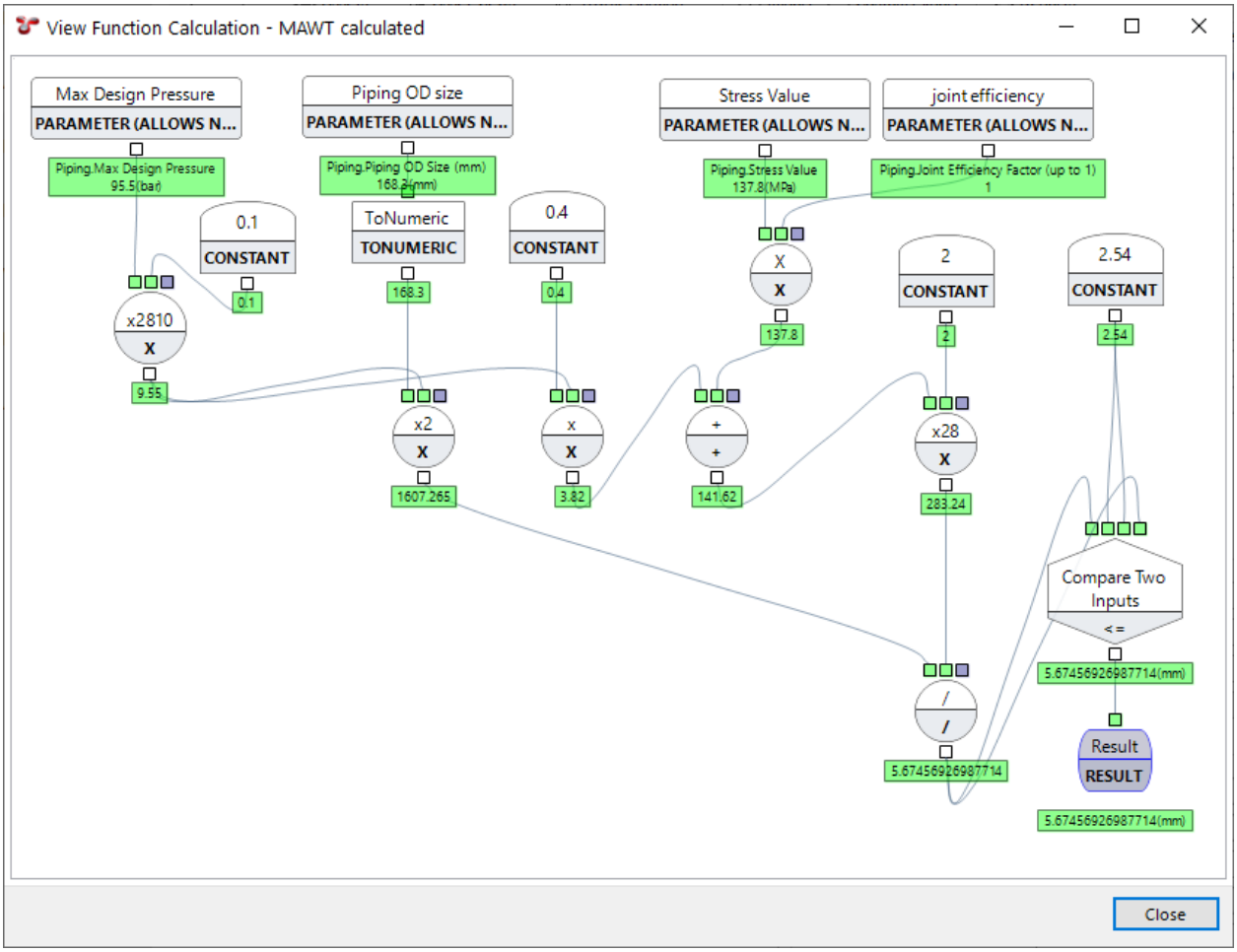


11.2.4.4.1.2 Calculated Field

Calculated fields are those where the value displayed is derived by a function that has been configured in the database (see *Configure Functions*).

Calculated fields are identified by the f icon.

To view the function for the calculated field, click on the f icon to launch the **View Function Calculation** dialog.

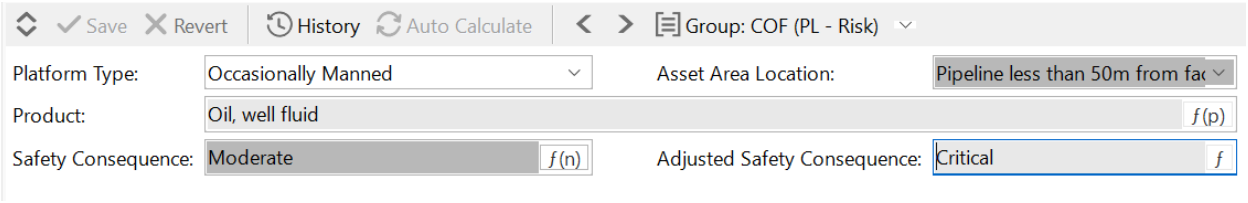


Note that you cannot edit the function from this dialog. You can, however, right-click on any element and select **View** to view its internal details.

Hint

When focus is on a calculated field (by clicking in it with the mouse or tabbing into it), any other fields on the same form which are inputs into the function, are highlighted a darker grey colour. You can also see a function's inputs by clicking on the *f* icon. An input parameter will be labelled "Source - Constant" if it is being given a constant value rather than a value from a field; or "Source - Field" followed by the table name and the field name.

In the example shown below, the 'Adjusted Safety Consequence' calculated field has inputs from 'Asset Area Location' and 'Safety Consequence'.



11.2.4.4.1.3 Passthru Field

Passthru fields show data from another field on the same asset. A passthru field has a f(p) icon at its right-hand side. Clicking this button shows a dialog telling you what form and field the passthru is pulling information from.

11.2.4.4.1.4 Global Table Link Field

A Global Table Link field enables linking of a global table to an AIG. NEXUS-IC applies filters progressively (guided by the user) until the desired table row is linked to the AIG. All values for the selected global table field are displayed in a drop-down list, where the user can select the required value, similar to a lookup list.

For information about configuring global tables, see *Configure Global Tables*.

When adding or editing a Global Table Link, it will be displayed as a pseudo form. This is built based on:

- The fields that are visible in the Global Table form
- The order of fields visible in the Global Table form

For each field, NEXUS IC displays a drop-down list with the distinct set of values for that field. The first drop-down list allows you to choose from all values available to that field. Once this is entered, the second field will include all distinct values from rows where the first field value matches what the user has chosen, and so on. If a field list only contains one value, it will be preselected automatically. This process continues until the user has chosen a value for each drop-down list, and thus filtered the global table row that will ultimately have its value persisted.

When importing or exporting a Global Table Link, the fields will be represented in the document as data separated by '/' characters. For example:

Asset Location.Full Location	Asset Type.Name	Component Damage Global Table Link.Component Damage
Wood	Company	Material / Insulation Failure / Degraded

Note that if a field called 'Name' is present in the global table, the values in that column will be used in place of the automated value for importing, reporting and displaying in the grid. If a 'Name' column is configured, it should be made invisible on the form via the Field Layout options.

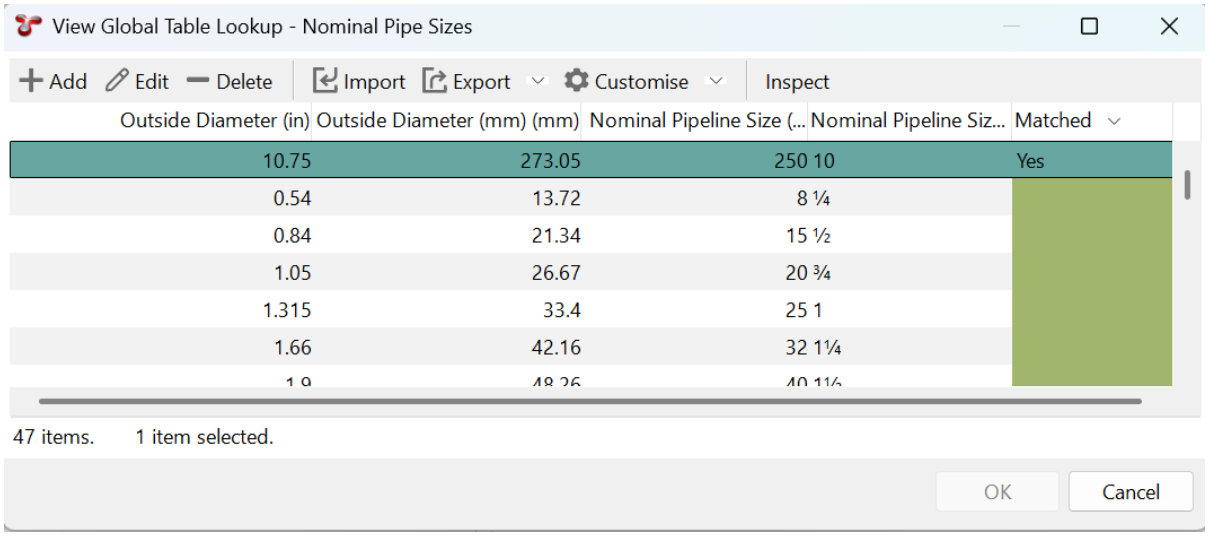
See *Example: Assign Global Table Link to AIG* for more information.

11.2.4.4.1.5 Global Lookup Field

Global Lookup fields are fields whose value is returned from a global table matrix table. Lookup values are passed into the comparison function and the first value which meets the specified criteria is returned as the value for that field. For information about configuring global tables, see *Configure Global Tables*.

Global Lookup fields are identified by the f(n) icon.

Click on the f(n) icon to launch the **View Global Table Lookup** dialog. This dialog highlights which row matched the Global lookup criteria and is being displayed in the field. Click the **Inspect** button to see the Compare function evaluation for the focused row.



11.2.4.4.2 Edit AIGs (Individually/in Bulk)

You can specify and store all asset-specific data in *Asset Information Groups (AIGs)*. You edit AIGs on the **Asset Information** tab of the **ASSETS** screen. For more details about the tab, see *Asset Information Groups (AIGs)*.

11.2.4.4.2.1 Prerequisites

- You have configured AIGs (see *Configure Asset Information Groups*).
- You have defined asset types and assigned AIGs to them (see *Assign AIGs to an Asset Type*).
- You have assigned the relevant asset type to the asset (see *Edit Assets and Asset Types*).

11.2.4.4.2.2 Processes

Edit AIG for Individual Asset Node

You can edit the AIG of individual asset nodes as follows:

1. On the **ASSETS** screen, select the asset in the asset tree.
2. Go to the **Asset Information** tab.
3. Select the required AIG from under the **Group:** toolbar button.
4. Edit the fields on the AIG form as required. For more information about this tab, see *Asset Information Groups (AIGs)*.
5. Save your entries.

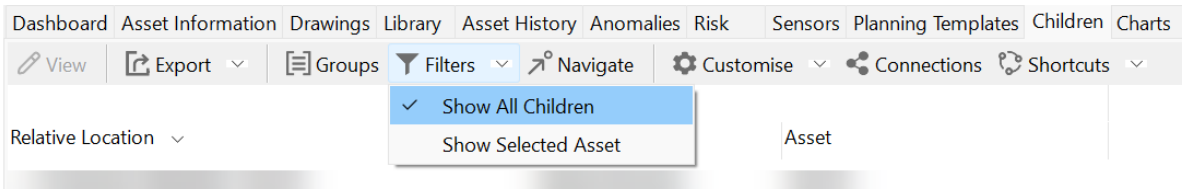
> **Note**
>
> - If you navigate away from the screen without saving your entries, your changes will be automatically saved.
> - If you do not want to save the changes you made, choose the **Revert** toolbar button.

Edit AIGs for Assets in Bulk

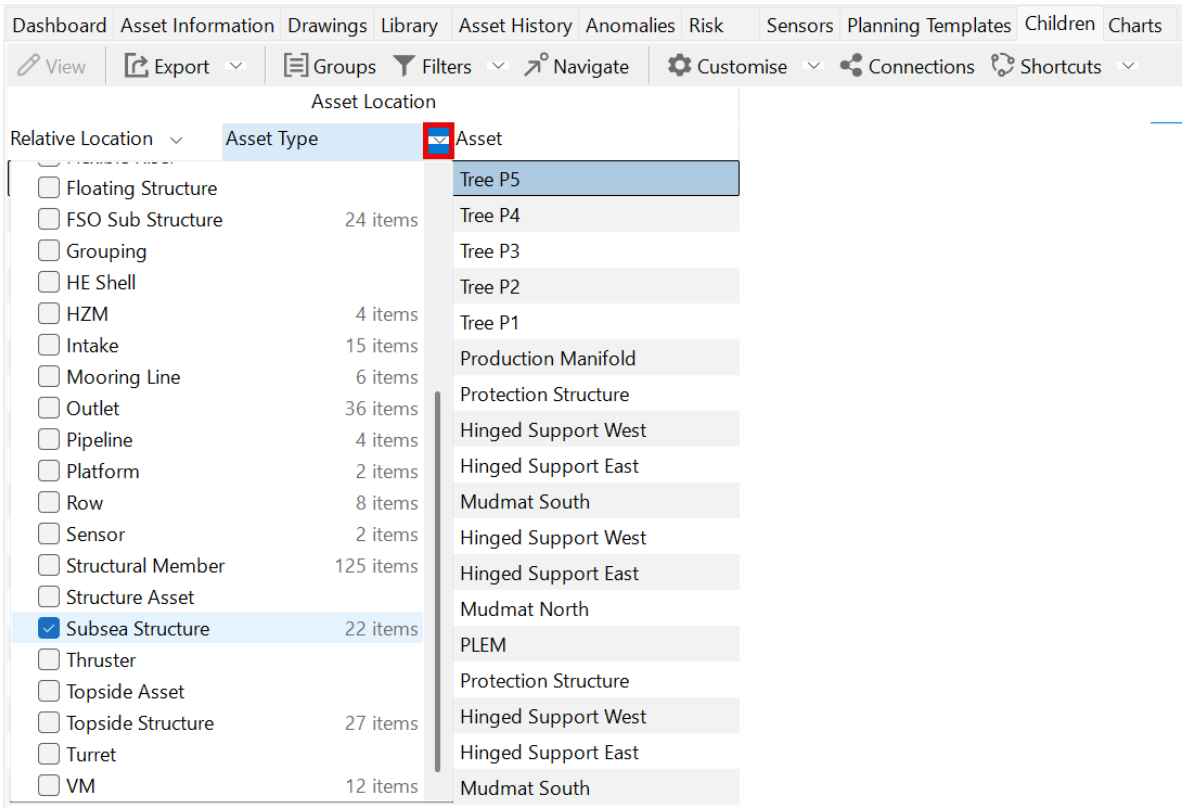
You can edit AIG data for several assets simultaneously using the **Children** tab.

To edit AIGs in bulk:

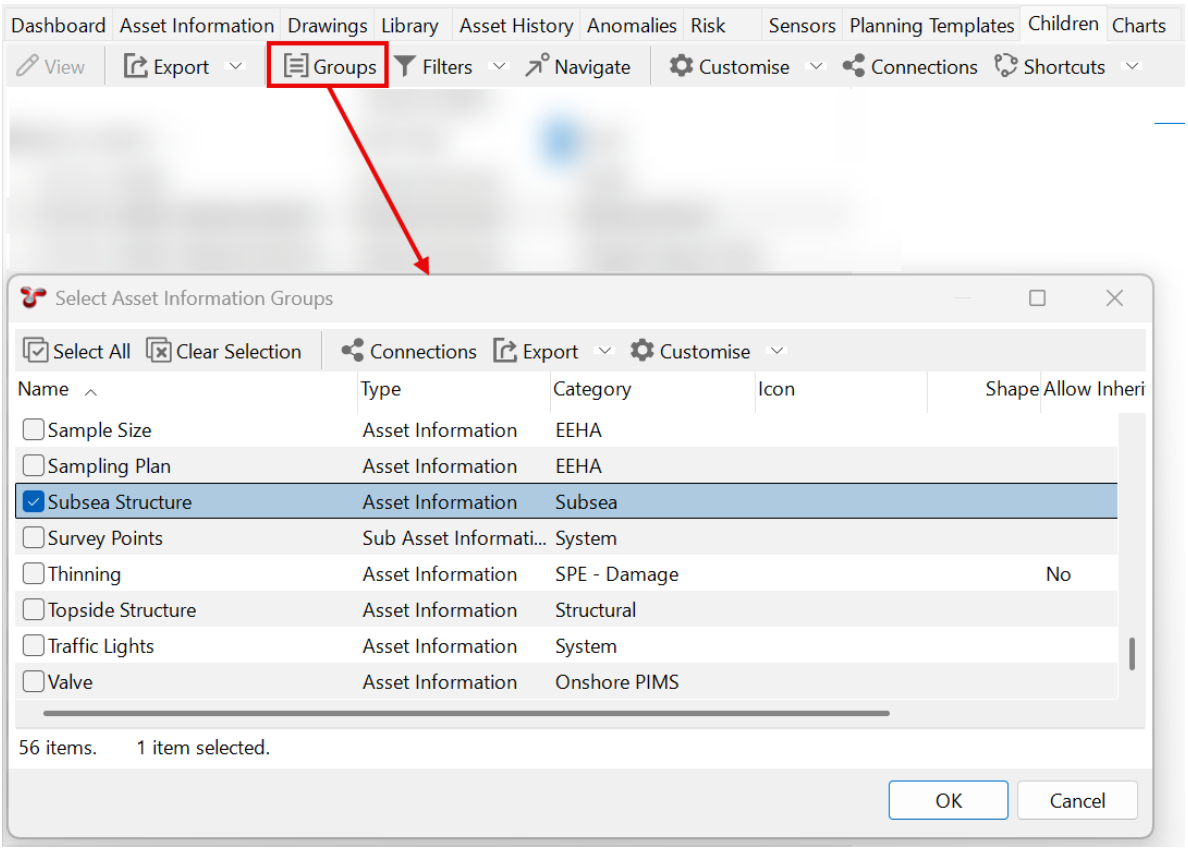
1. On the **ASSETS** screen, navigate to the high-level asset node that contains all the assets for which you want to update the AIG data.
2. Go to the **Children** tab.
3. Under **Filters**, choose *Show All Children*.



4. If required, you can filter your assets. For example, you can filter your assets based on the asset type in the **Asset Type** column:



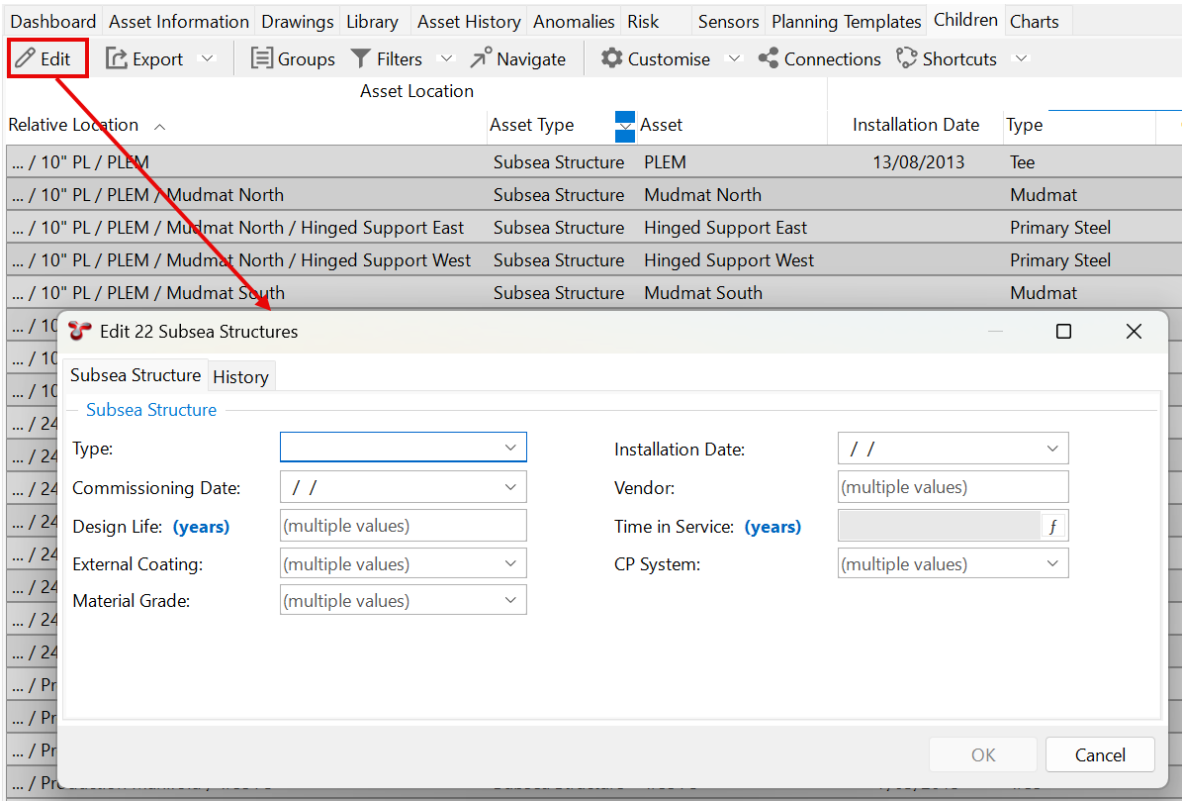
5. Choose **Groups** from the toolbar and select the AIG that you want to edit. You can select only one AIG at a time.



Result

The fields of the selected AIG appear as columns in the grid. If required, you can further filter, group or sort your assets based on the AIG field values.

6. Select all the items that you want to update from the displayed assets (for example, you can use CTRL+A to select all items), and click **Edit**.



Result

A dialog appears that contains all the fields of the selected AIG. In case the assets have different values for a given field, the value appears as *(multiple values)*.

7. Edit the field values in the AIG as required. For more information about this tab, see *Asset Information Groups (AIGs)*.
8. Click **OK** to apply the changes.

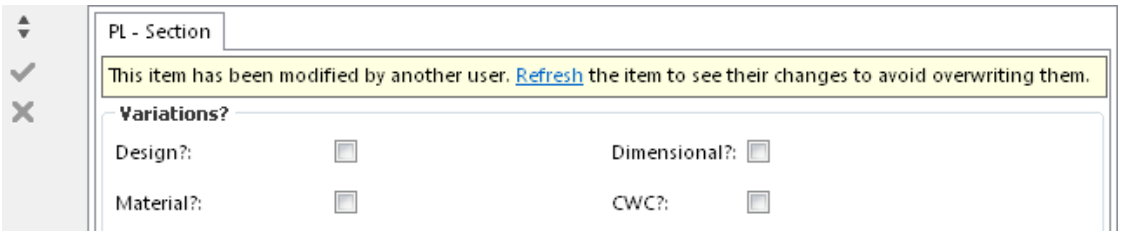
Note

Bulk editing is only available when:

- Exactly one AIG is selected under **Groups**, and
- All selected assets are of types that have that AIG assigned.

Changes by Other Users

If a change is made in another copy of NEXUS IC or IC-Inspection to data on a form you are viewing, you will see a message saying that this item has been modified by another user.



You can do the following:

- Click **Refresh** to load their changes into your copy of the application. This will discard any changes you have made.
- Click the ✓ Save button to save your changes. This will overwrite the changes the other user has made, meaning that they in turn will see this message, and have the opportunity to refresh or save.

This feature applies generally throughout NEXUS IC and IC-Inspection, but asset information is perhaps the most common place to see it.

11.2.5 Drawings

In NEXUS, library items with a library item type of either `Drawings` or `Photographs and Negatives` are treated as drawings and can be viewed and managed from the **Drawings** tab on the **ASSETS** screen. The visibility of this tab can be toggled on or off under the **View** toolbar option.

For description about all the toolbar options, see *Drawings Toolbar*.

For information about how to use this tab and the different actions you can perform with the drawing functionality, see *Manage Drawings*.

11.2.5.1 Drawings Toolbar

11.2.5.1.1 2D Drawings Toolbar

Toolbar Option	Description
Add	Allows you to add a new drawing. For more information, see *Add Drawings*. When you add a new drawing, the **Add/Edit Library** dialog opens, where you can define its properties. For more information, see *Add/Edit Library Dialog*.
Edit	Allows you to edit the properties of the current drawing. From this dialog you can also **Add** and **Edit** connections to the drawing. When you edit a drawing, the **Add/Edit Library** dialog opens, where you can view or define its properties. For more information, see *Add/Edit Library Dialog*.
Delete	Deletes or unlinks the drawing from the asset. **Delete** deletes the library item from NEXUS. **Unlink** removes the link to the asset, but keeps the library item.
Launch	Opens the drawing on the local machine using the default viewer.
Drawing Type	You can select which library types appear here. To control what appears on this list, go to *Library*, edit the library types in question, and tick or untick **Show As Drawings**.
Include Parents	If you tick *Include Parents*, drawings on this asset's parents will be shown in the thumbnail list for you to select.
Copy to Clipboard	Copies the drawing to your clipboard at the current scale and offset shown. The drawing thumbnail and layers will also be included.
Information	Toggles a panel at the bottom of the **Drawings** tab showing EXIF data for the drawing. Information is shown only for drawings with EXIF data.
Thumbnails	Toggles a panel at the right side of the **Drawings** tab showing thumbnails for all the images associated with the selected asset. You can customise the layout of this panel using the **Customise** button in its toolbar.

11.2.5.1.1.1 Layers Menu

Toolbar Option	Description
Layers → Extract Layers	On a PDF drawing with comments/annotations, the Extract Layers tool will be enabled. Click this to extract and create layers for each annotation on the drawing. If the annotation matches an existing asset name in the asset hierarchy, the layers will be automatically linked to their corresponding assets.
Layers → Edit Layers	Click this to add, edit or delete layers on drawings. A 'layer' is a region, or a button, or a caption, drawn on the drawing. When you click this menu option, the **Add/Edit Layer** dialog opens, where you can maintain its properties. For more information, see *Add/Edit Layer Dialog*. For information about creating and editing layers, see *Create Layers* and *Edit Layers*.
Layers → Save	Saves the changes (add/edit/deletions) that you've done to layers on this drawing and exits Edit Layers mode. This option is only available if you've made changes.
Layers → Cancel	Cancels the changes (add/edit/deletions) that you've done to layers on this drawing.
Layers → Layer properties	Shows the properties of the currently selected layers. Different types of layer have different properties. Pick a different item from the **Layer Type** drop-down to change this layer to another type. You can set a **Colour**, which will be shown in the shape's border, and shown translucent in the shape's area. **Opacity** sets how translucent — 0 is completely transparent; 100 is completely opaque.
Layers → Delete Layer	Deletes the layer off the drawing.
Layers → Create Layer	If you're partway through creating, for example, a Polygon layer (see below), you can right-click and choose **Create Layer** (or press Enter) to complete the shape. This will take you to the **Layer Properties** dialog for your new layer.
Layers → Cancel Point	If you don't like the point you've just left-clicked to create, you can right-click it and choose **Cancel Point** (or press Shift-Ctrl-P).
Layers → Cancel Layer	If you don't like the layer you're partway through creating, you can right-click it and choose **Cancel Layer** (or press Escape).
Layers → Copy	Select a layer using the **Selection Tool** (see below), then right-click and choose *Copy* (or press Ctrl-C). This will copy the region to NEXUS IC's internal clipboard.
Layers → Paste	Paste the layer you copied above by right-clicking and choosing *Paste* (or Ctrl-V). NEXUS will paste the layer in, offset a little from the original. Then click inside the layer with the left mouse button and drag the layer to its desired location.
Layers → Select All	Selects all the layers on the drawing. **Tip** Using 'Select All' is useful way to reposition or delete multiple layers. You can also select multiple layers by holding down the Ctrl key and clicking each layer.
Layers → Clear Selection	Unselects all the layers. This is useful, for example, if you want to unselect the selected layer so you can see the colours of all layers at once. (The selected layer is shown in pale blue; Clear Selection means no layer is so shown.)

11.2.5.1.1.2 Layer Tools

Toolbar Option	Description
Selection Tool	Click this, and when you click on a layer in the drawing, you'll be selecting it. Ctrl-click to select additional layers. You can click inside a layer and drag to move layers. Click-dragging a point will move just that point.
Rectangle	Click this, then click-drag to create a rectangular region on the drawing. Once complete, you can drag the four corners of the rectangle separately so that it's not a rectangle anymore.
Polygon	Click this to start drawing a polygon region. Each click in the drawing will add a point to your polygon. Press Enter or right-click and choose **Create Layer** to complete the polygon.
Ellipse	Click this, then click-drag to create an ellipse region on the drawing. Once complete, this is turned into a 50-sided polygon.
Line Region	This tool is useful for putting regions on P&IDs etc., where you have a thin, possibly branching line and you want to put a narrow region over it. Click the **Line Region** button, then left-click on an end of the line you want to trace, left-click at the next point that it turns a corner, etc. As with **Rectangle**, when you complete (by pressing Enter or right-clicking and choosing **Complete Layer**), the layer is a region and you can adjust all its corners independently.
Caption	Click this, then click in the drawing at the top left of where you would like your caption to appear. In the **Layer Properties** dialog, type some **Caption** text. Optionally choose a **Caption Colour** and a **Caption Angle**. Blank or 0 gives ordinary horizontal text.
Button	Click this, then click in the drawing at the top left of where you would like your caption to appear. In the **Layer Properties** dialog, type some **Caption** text. If you type no text, you will get a very small button, because the button sizes to fit the text.

11.2.5.1.1.3 View Menu

Toolbar Option	Description
View → Fit Width	Changes the pan and zoom on the drawing so that it fits within the width available on the *Drawings* tab.
View → Fit Height	Changes the pan and zoom on the drawing so that it fits within the height available in the *Drawings* tab.
View → Default Size	Sets zoom to 100%. This may or may not fit in your *Drawings* tab, depending on how big the drawing is.
View → Zoom In	Zoom In.
View → Zoom Out	Zoom Out.
View → Zoom Selection	Click this, then in the drawing click and drag a rectangle. NEXUS IC will then zoom to the area you've selected.
View → Increase Caption Size	Increases the size of *all* captions on the drawing: on captions, buttons, and regions.
View → Decrease Caption Size	Decreases similarly.
View → Caption → ...	If you select **Default**, captions will display the text you have set in **Layer Properties**. If you select **Asset Information** or **Event**, NEXUS IC will display a picker. You pick a field, and NEXUS IC will use values from that field to fill captions. This only works for layers that have an asset set in **Layer Properties**.

11.2.5.1.1.4 Layer Colour Menu

Toolbar Option	Description
Layer Colour → Default	Shows layers on drawings in the colours that you have selected in the Properties of each layer.
Layer Colour → Traffic Lighting	Shows layers on drawings in the colours specified by the currently selected Traffic Light.
Layer Colour → Transparent	Shows layers on drawings as just an outline, in the colours that you have selected in the Properties of each layer.
Layer Colour → Unknown Asset	Shows layers that have an asset in the **Known Asset Colour**, and layers that don't have an asset assigned in the **Missing Asset Colour**. You can configure these in *Database → Properties*.

11.2.5.1.2 3D Drawings Toolbar

3D drawings get different items on their toolbar. **Add**, **Edit**, **Delete** and **Colour** are as described above.

Toolbar Option	Description
Rotate	When selected, dragging on the 3D drawing will change the "camera" angle. When unselected, dragging on the drawing will pan.
Wireframe / Hidden Lines / Smooth Shading / Flat Shading	Select between the options to control rendering of the drawing. Some options prioritize speed, while others focus on aesthetics. For some drawings, Wireframe may not show anything.
Information	Toggles a panel at the bottom of the *Drawings* tab showing information for the selected region of the drawing.
Coordinates	Toggles the display of coordinates at the bottom right of the drawing, showing the mouse location.

11.2.5.1.2.1 View Menu

For 3D drawings, the **View** menu option contains extra items:

Toolbar Option	Description
View → Rotate	Same as the Rotate button.
View → View Direction	Select one of 10 viewing directions. You can get to any of these viewing directions via the Rotate button, but this is faster.
View → Viewports	For a 3D drawing, available viewports will be displayed on this menu.
View → 3D Styles	Same as the Wireframe / Hidden Lines / Smooth Shading / Flat Shading buttons.
View → Hint → ...	Similar to *View → Caption → ...*, but information will be displayed as a mouse-over hint on the region you're currently on, rather than as captions.
View → Show → ...	• **Information** and **Coordinates** are the same as their respective buttons. • **Grid** may or may not show a grid, depending on the drawing. • **Axis** will show/hide the axis orientation arrows at the bottom left of the *Drawings* tab. • **North Arrow** may or may not show an arrow illustrating the North direction, depending on the drawing.

See also

- *Manage Drawings*
- *Add/Edit Library Dialog*
- *Add/Edit Layer Dialog*

11.2.5.2 Manage Drawings

NEXUS IC allows you to upload and edit drawings for each asset and add layers to these drawings as required.

Note

NEXUS IC supports the following image formats: GIF, JPG, JPEG, JFIF, TIF, BMP, PNG, PDF, DWG, CGM, DXF, SVG, WMF and EMF.

You manage drawings on the **Drawings** tab of the **ASSETS** screen. For detailed information about this screen, see *Drawings*.

For detailed information about the functionality and the actions you can perform, see the following sections:

- *Add Drawings*
- *Manage Layers in Drawings*
- *3D Drawings*

11.2.5.2.1 Add Drawings

You can add a new drawing to an asset in one of the following ways:

- You can drag image files from your file explorer onto the **Drawings** tab of the **ASSETS** screen. If you drag and drop a single file, the **Add Library** dialog appears, where you can enter data as required. If you drag and drop multiple files, they will simply be added.

  > **Note**
  >
  > The drag and drop functionality is not supported in remote environments (for example, Remote Desktop).

- You can add drawings from the **Drawings** tab of the **ASSETS** screen as follows:

  1. Choose **Add** from the toolbar.

     Since drawings are essentially *Library* records in NEXUS, the **Add Library** dialog appears.

  2. In the **Add Library** dialog, select the library type and enter the name of the drawing.

     > **Note**
     >
     > To ensure that the drawing (library item) appears on the **Drawings** tab, you must select a library type for which you have selected the **Show as Drawings** checkbox when you have set up the library type (see *Add Library Types*).

  3. Enter other parameters as required (see *Add/Edit Library Dialog* for more information), and click the **Attachment** button to select the image file that you want to upload.

     In most cases, you use the **Import** option for adding the attachments. The **Link** option works only in on-premise environment and only items on network drives can be linked.

  4. Click **OK**.

> **See also**
>
> - *Manage Drawings*
> - *Manage Layers in Drawings*
> - *3D Drawings*

11.2.5.2.2 Manage Layers in Drawings

Layers are marked-up regions on a drawing that can show specific information or contain links to other data. The layers functionality allows you to:

- Add links from parts of a drawing to assets in the asset hierarchy
- Add links from parts of a drawing to other drawings
- Display captions with specific text on a drawing
- Highlight parts of drawings with colours or add traffic light colours to them
- Display Asset Information Group (AIG) field values for specific parts of the drawing

11.2.5.2.2.1 Create Layers

You can add a new layer to a drawing using one of the following methods:

11.2.5.2.2.2 Create Layers from the Toolbar

1. On the **ASSETS** screen, select the asset in the asset tree that contains the drawing to which you want to add layers.
2. Go to the **Drawings** tab and select the required drawing.
3. From the toolbar of the **Drawings** tab, choose *Layers* → *Edit Layers* or right-click the drawing and choose **Edit Layers** from the context menu. This step opens the layer editing mode with additional toolbar options. These new options are also available from the context menu when right-clicking the drawing.
4. Select the required tool from the new options and draw the layer to the drawing as required. For information about the available tools, see *Layer Tools*.
5. If you're creating a polygon or line region, once you have added all the points of the region, press **Enter** or right-click and choose **Create Layer** from the context menu. This step is not required for the other layer types.
6. In the **Add Layer** dialog that appears, specify the parameters of the new layer. You can define the type, colour, and opacity of the layer, add a caption to it and add links to assets, relative assets or other drawings as required. For more information, see *Add/Edit Layer Dialog*.
7. Click **OK**.
8. Once you have created all the layers for the drawing, choose *Layers* → *Save* from the toolbar of the **Drawings** tab.

11.2.5.2.2.3 Create Layers Using Drag & Drop

1. On the **ASSETS** screen, select the asset in the asset tree that contains the drawing you want to modify.
2. Go to the **Drawings** tab and select the required drawing.
3. In the asset tree, locate the asset for which you want to create a layer. Drag and drop it onto the drawing canvas at the desired location.
4. In the **Add Layer** dialog that appears, specify the parameters of the new layer (see *Add/Edit Layer Dialog*). The selected asset is automatically populated in the **Asset** and **Caption** fields.

5. Click **OK**.

   A new layer is added to the drawing with a rectangular region.

> **Tip**
>
> To create a layer with a different shape, first create the layer using the toolbar method described in *Create Layers from the Toolbar*. Then, add the direct asset reference via drag and drop (see *Add Asset Reference Using Drag & Drop*).

6. Adjust the position and shape of the layer as needed.
7. Choose *Layers* → *Save* from the toolbar to save your changes.

11.2.5.2.2.4 Create Layers by Extracting from PDF

If a PDF drawing contains comments or annotations, you can have NEXUS automatically create layers for them using the *Extract Layers* function. To do that, follow the steps below:

1. Select the PDF drawing on the **Drawings** tab of the **ASSETS** screen.
2. From the toolbar of the **Drawings** tab, choose *Layers* → *Extract Layers*.
3. In the dialog that appears, select one of the following options:
   - Choose **All Layers** if you want to create layers for all the texts that NEXUS finds in the PDF drawings.
   - Choose **Asset Exists** if you want to create layers only for those texts that exactly match the name of an existing asset in the asset tree.

> **Result**
>
> The layers are automatically created for the annotations of the drawing. If the system could find an asset with the same name as the annotation text, it automatically adds a link to the asset as a **Relative Asset** (see *Relative Asset Reference*). If you selected **All Layers** and the system couldn't find an asset with the same name, the layer will be created without links to any assets.

4. If required, you can edit the properties of the layers (see *Edit Layers*).
5. Choose *Layers* → *Save* from the toolbar of the **Drawings** tab to save your changes.

11.2.5.2.2.5 Edit Layers

11.2.5.2.2.6 Edit Layer Properties

You can edit an existing layer on a drawing as follows:

1. On the **Drawings** tab, select the required drawing.
2. Hover over the drawing layer that you want to change.
3. From the toolbar of the **Drawings** tab, choose *Layers* → *Edit Layers* or right-click the layer and choose **Edit Layers** from the context menu. This step opens the layer editing mode.

4. Select the layer and from the toolbar of the **Drawings** tab, choose *Layers* → *Layer Properties* or right-click the layer and choose **Layer Properties** from the context menu.
5. In the **Edit Layer** dialog that appears, update the parameters of the layer as required. For more information, see *Add/Edit Layer Dialog*.
6. Click **OK**.
7. Once you have finalised your changes, choose *Layers* → *Save* from the toolbar of the **Drawings** tab.

11.2.5.2.2.7 Add Asset Reference Using Drag & Drop

You can add a direct asset reference (see *Direct Asset Reference*) to an existing layer by dragging and dropping an asset from the asset tree onto the layer:

1. On the **Drawings** tab, select the drawing that contains the target layer.
2. In the asset tree, locate the asset you want to reference and drag it onto the layer.
3. In the **Edit Layer** dialog that appears, update the parameters of the layer as required (see *Add/Edit Layer Dialog*). The selected asset is automatically populated in the **Asset** and **Caption** fields.
4. Click **OK**.
5. To finalise your changes, choose *Layers* → *Save* from the toolbar.

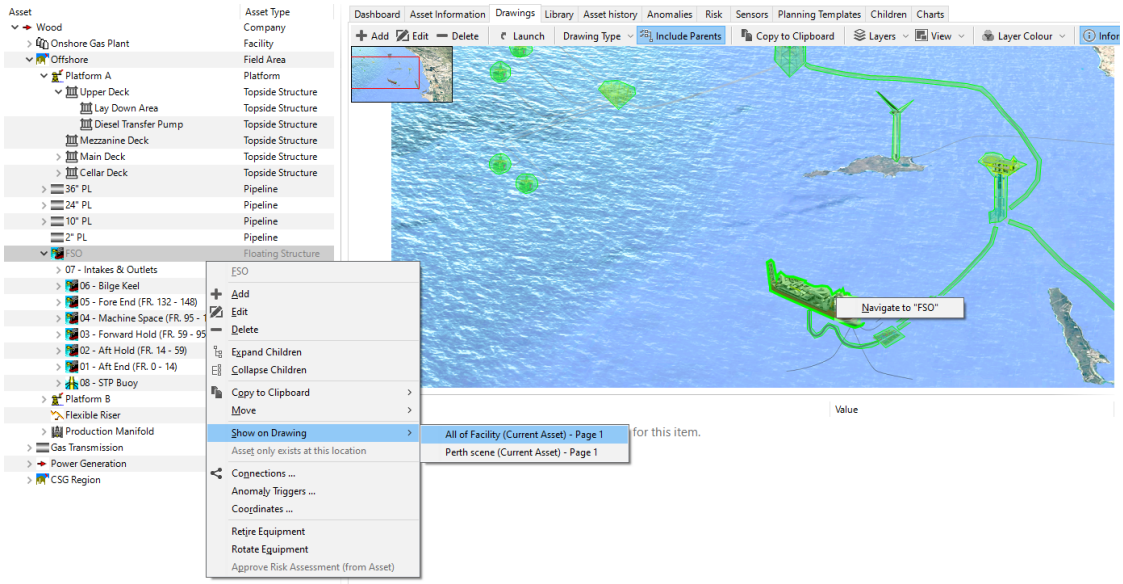
11.2.5.2.2.8 Link from Layers to Assets

You can link to assets from a layer when you create or edit layers (see *Create Layers* or *Edit Layers*).

You can create asset references in two ways:

11.2.5.2.2.9 Direct Asset Reference

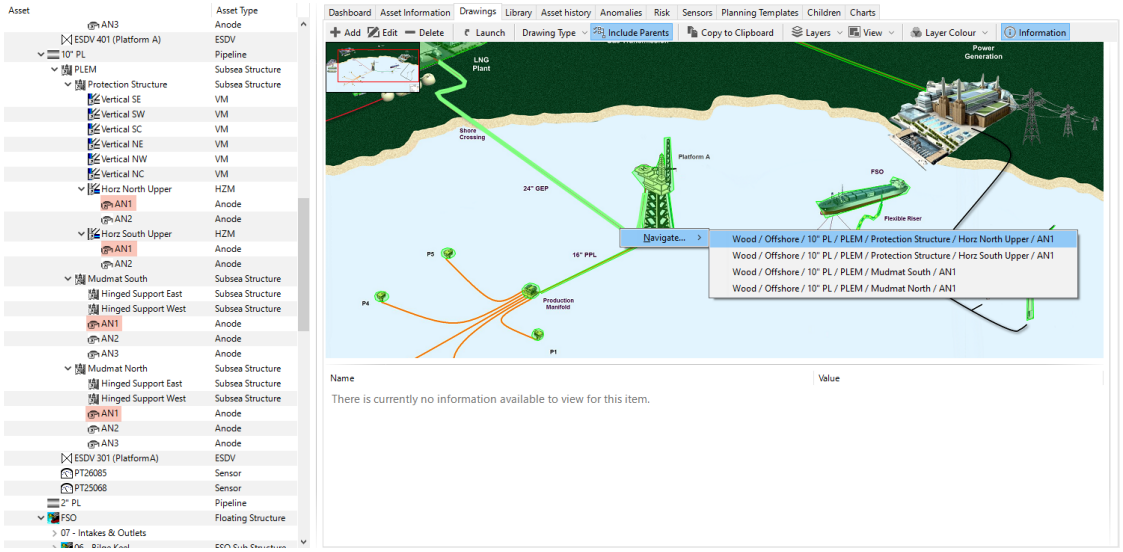
In this case, the asset is specified in the **Asset** field of the **Add/Edit Layer** dialog (see *Add/Edit Layer Dialog*). When you use direct asset reference, you can directly navigate to an asset in the asset hierarchy from the layer of the drawing and vice versa, you can navigate from the asset in the asset tree to the actual layer of the drawing from the context menu (right-click) of the asset:



11.2.5.2.2.10 Relative Asset Reference

In this case, instead of specifying a particular asset, a text is defined in the **Relative Asset** field of the **Add/Edit Layer** dialog (see *Add/Edit Layer Dialog*). NEXUS searches for child assets that match that name under the asset for which the drawing is displayed for. In case multiple assets are found, the user can navigate from the layer of the drawing by selecting the relevant asset from the context menu (right-click) of the asset. However, in case of relative asset references, you're not able to navigate from the asset in the asset tree to the drawing layer. Also, you cannot display AIG field values on drawing layers if the layer has only a relative asset reference.

For example, if you specify *AN1* in the **Relative Asset** field, and you have several child assets with the name *AN1* under the relevant asset, you'll have the following navigation options when clicking the layer on the drawing:

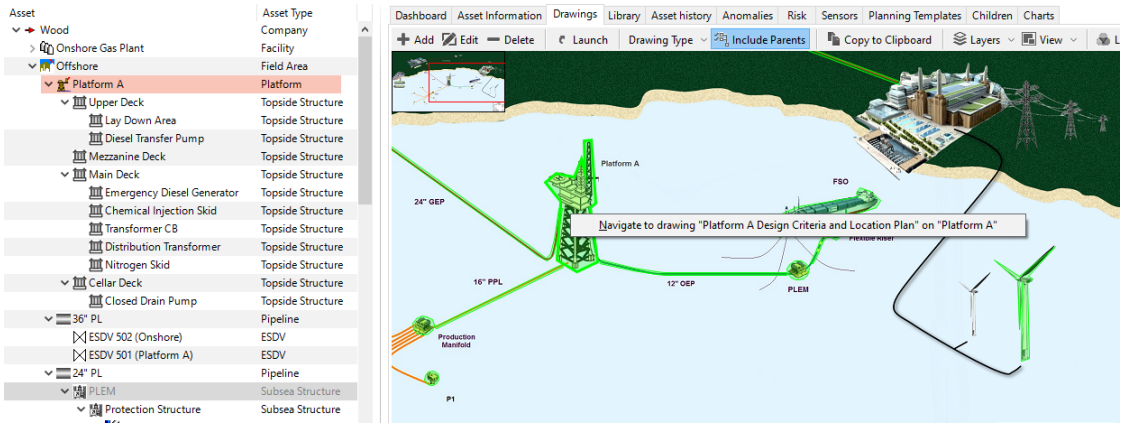


> **Note**
>
> In case you extract layers from a PDF drawing, the layers are assigned relative asset references and not direct ones.

11.2.5.2.2.11 Link from Layers to Drawings

You can link to other drawings from a layer when you create or edit layers (see *Create Layers* or *Edit Layers*). This option is available if you have also set up a direct asset reference (see *Direct Asset Reference*) and you have specified the asset that has the drawing you want to link to. In this case, the **Associated Drawing** field becomes available in the **Add/Edit Layer** dialog (see *Add/Edit Layer Dialog*) where you can select the required drawing.

When navigating to the other drawing, you're also directed to the relevant asset in the asset tree.

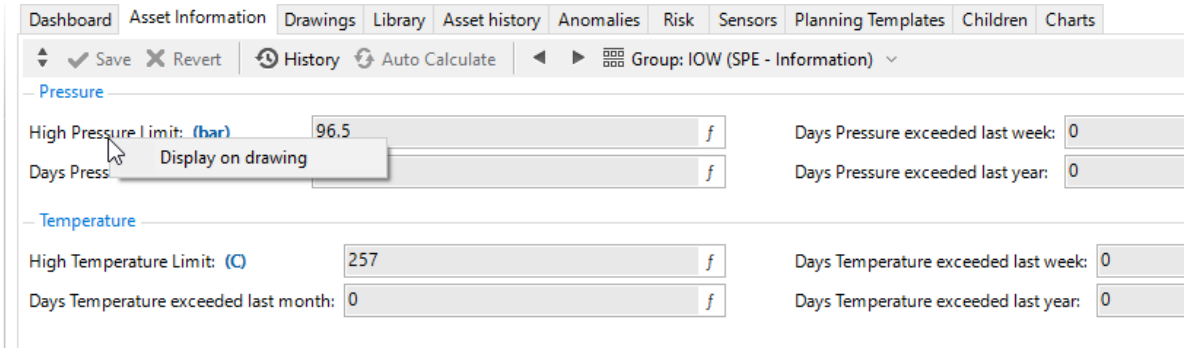


11.2.5.2.2.12 Display AIG Field Values on Drawings

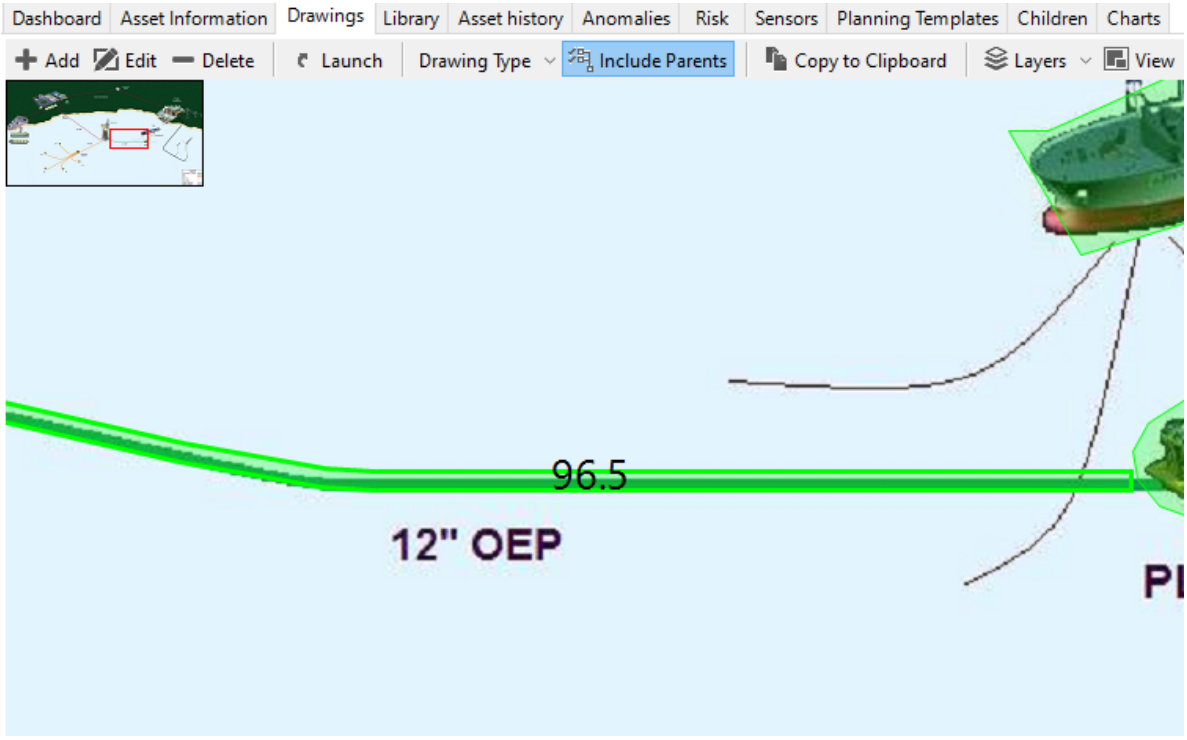
You can display actual values of specific AIG fields as a caption of drawing layers. This option is available if you have set up a direct asset reference (see *Direct Asset Reference*) and you have specified the asset that has the AIG field whose value you want to get displayed.

You can display AIG field values on drawings in one of the following ways:

- You can select the AIG field in the **Associated Field** field of the **Add/Edit Layer** dialog when you create or edit layers (see *Create Layers* or *Edit Layers*). In this case, the **Asset** field must contain the asset that has the AIG with the associated field.
- If you have specified a direct asset reference to a layer, you can display the value of any of its AIG fields by right-clicking the relevant field label on the **Asset Information** pane, and selecting **Display on drawing**:



The value of the AIG field is now indicated on the drawing:



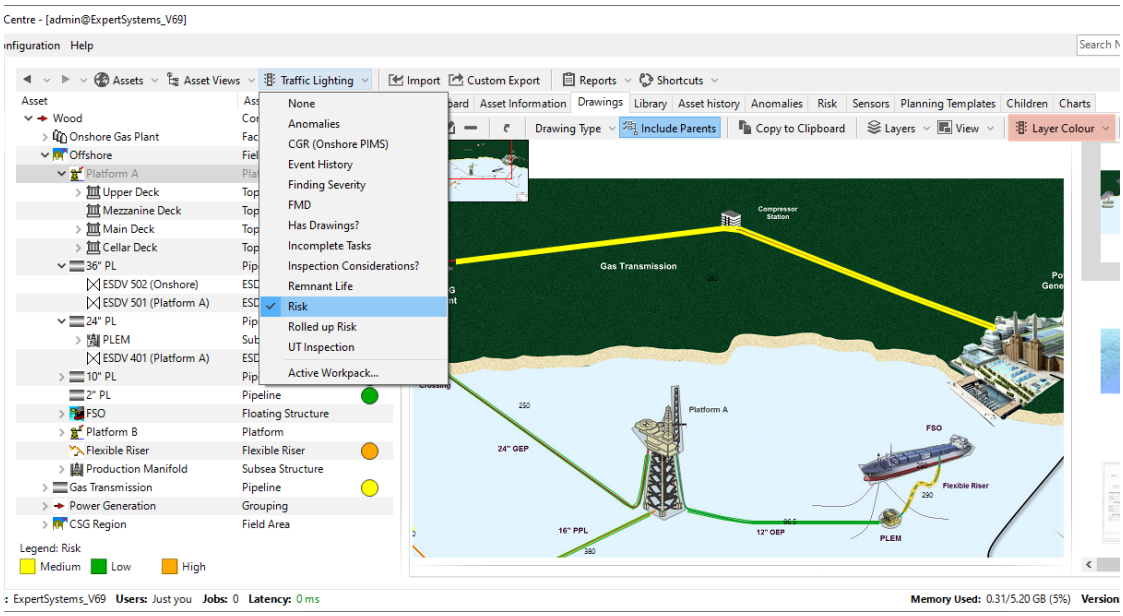
11.2.5.2.2.13 Change Layer Colours on Drawings

By default, the system displays the colour that you have set up for the layer when creating or editing the layer (see *Create Layers* or *Edit Layers*). You can change the default layer colours by selecting the required option from the **Layer Colour** toolbar menu. You have the following options:

- Display the currently selected traffic light colours on drawing layers
- Display the layer colour only in the outline of the layer, instead of filling it with colour (transparent layer)

- Display unknown assets, in which case, layers that have an asset are shown in the **Known Asset Colour**, and layers that don't have an asset assigned are displayed in the **Missing Asset Colour**. You can configure these under *Database* → *Properties*.

For example, if you want to have traffic light colours displayed on the layers of the drawing, select the relevant traffic light from above the asset tree on the left and choose *Layer Colour* → *Traffic Light* from the toolbar of the **Drawings** tab. The layers of the drawing get the colour of the selected traffic light:



See also

- *Manage Drawings*
- *Add/Edit Layer Dialog*

11.2.5.2.3 3D Drawings

Three-dimensional drawings are different from standard drawings and there are additional editing and viewing options available when you have a 3D drawing (see *3D Drawings Toolbar*).

For information about configuring 3D drawing objects to link to assets in the asset hierarchy, see the sections below:

- *3D Drawing Setup Example*
- *3D Drawing Preparation in Autocad*

11.2.5.2.3.1 3D Drawing Setup Example

There is some configuration required to be able to link assets in the NEXUS IC hierarchy to objects in a 3D drawing. Once configured successfully, you will be able to:

1. Hover over the object in the 3D Drawing to view the NEXUS IC asset name.

2. Click on an object in the 3D drawing to auto navigate to that asset in the NEXUS IC asset hierarchy.
3. Display traffic lighting on the 3D drawing objects.

Caution

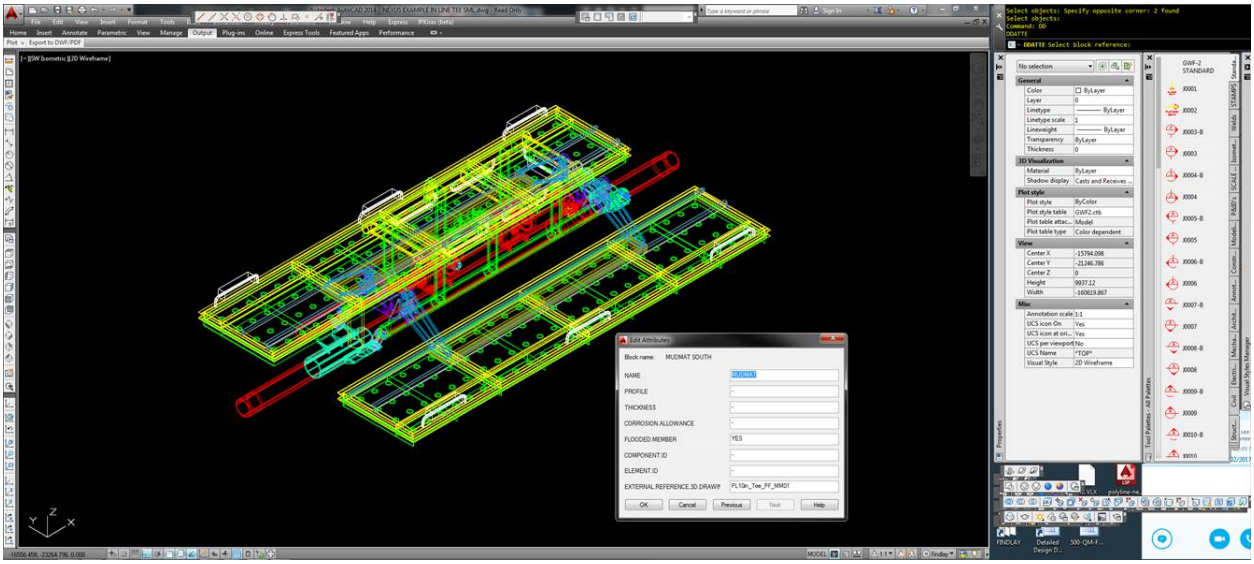
For optimal performance, an OpenGL graphics card is required on the client machine for this functionality. 3D drawings can take a considerable time to load. We recommend that 3D drawings are simplified as much as possible to reduce file size and load times.

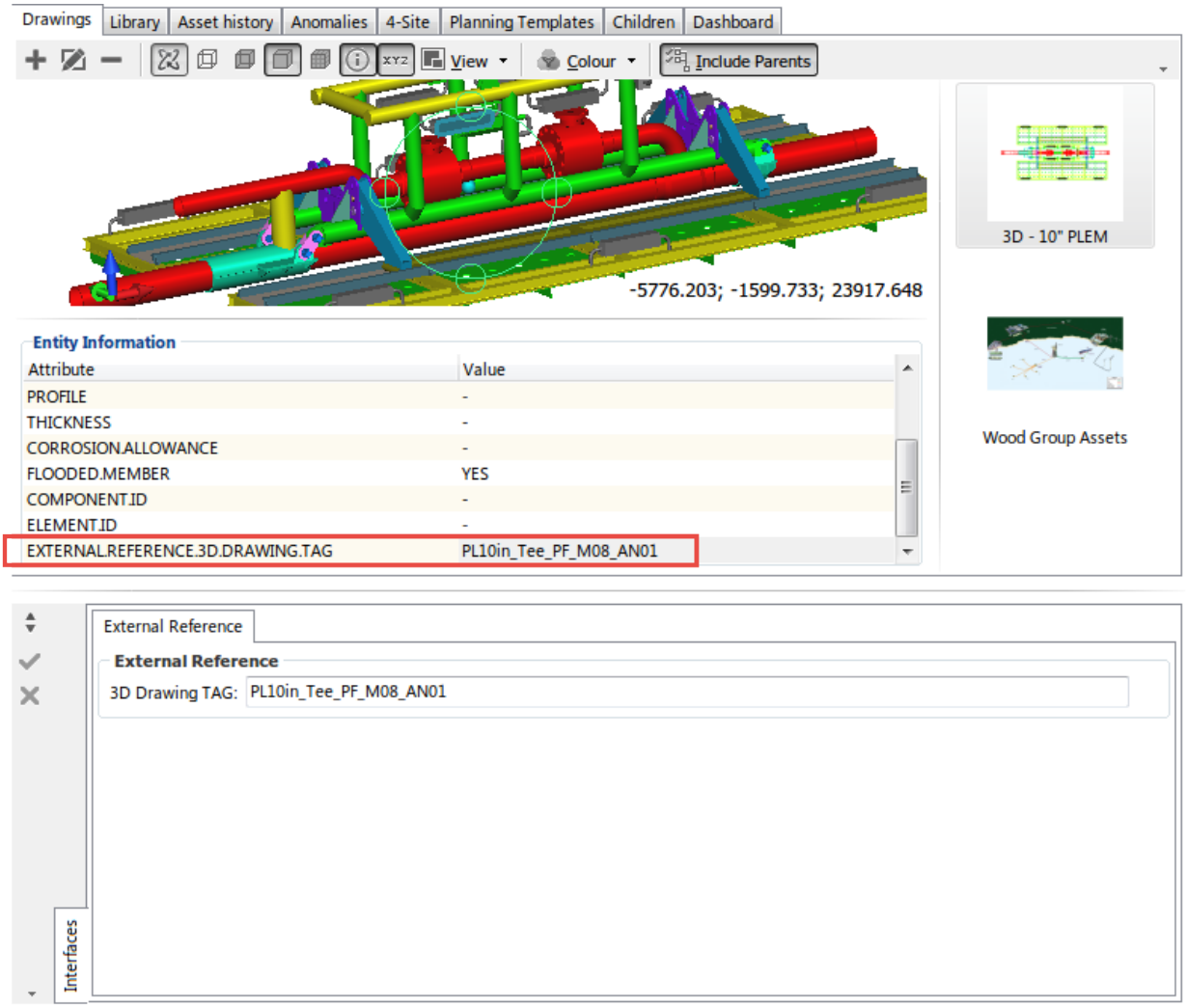
11.2.5.2.3.2 Step 1

The first step is to ensure that the 3D Drawing is configured with an Asset Serial Number attribute.

Using Autocad, create a block which represents a single asset in the NEXUS IC asset hierarchy. For each block, define an attribute (using the ATTDEF command) and populate the attribute with the "Asset Serial Number".

In this example, the attribute in the 3D drawing is titled EXTERNAL.REFERENCE.3D.DRAWING.TAG. The following images illustrate the attributes in Autocad and in NEXUS IC.

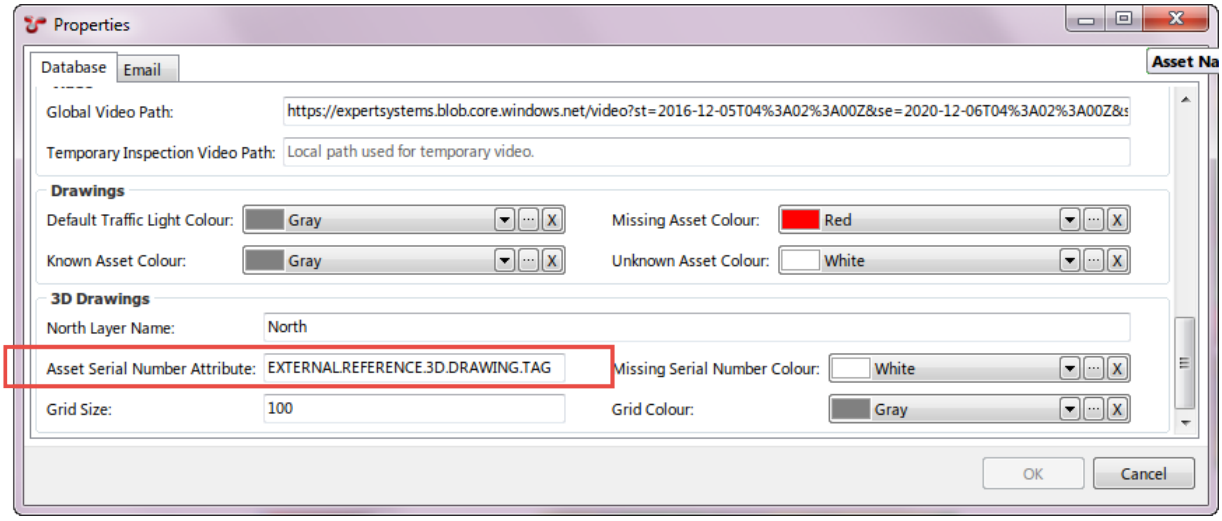




For detailed instructions on how to prepare an Autocad drawing, refer to *3D Drawing Preparation in Autocad*.

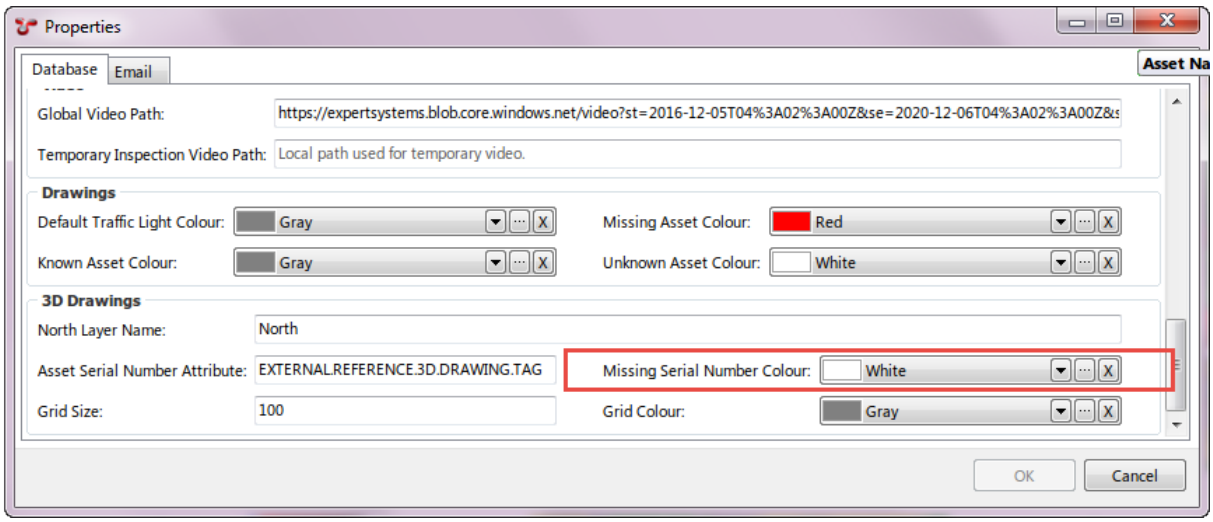
11.2.5.2.3.3 Step 2

Go to *Database* → *Properties* → *3D Drawings*. Type in the 3D Drawing Attribute name which contains the **Asset Serial Number** information. In this example, the attribute in the 3D drawing is titled EXTERNAL.REFERENCE.3D.DRAWING.TAG.



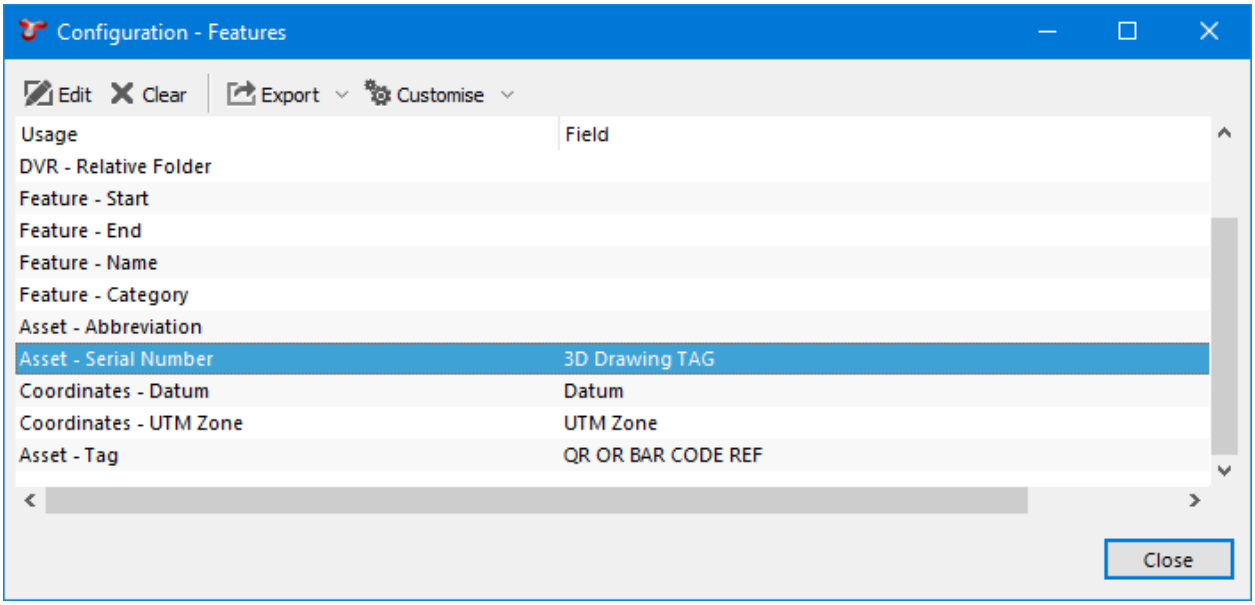
11.2.5.2.3.4 Step 3

Go to *Database* → *Properties* → *3D Drawings*. Select a colour to be displayed for any block where the attribute is defined, but there is no corresponding match in the asset hierarchy in NEXUS.



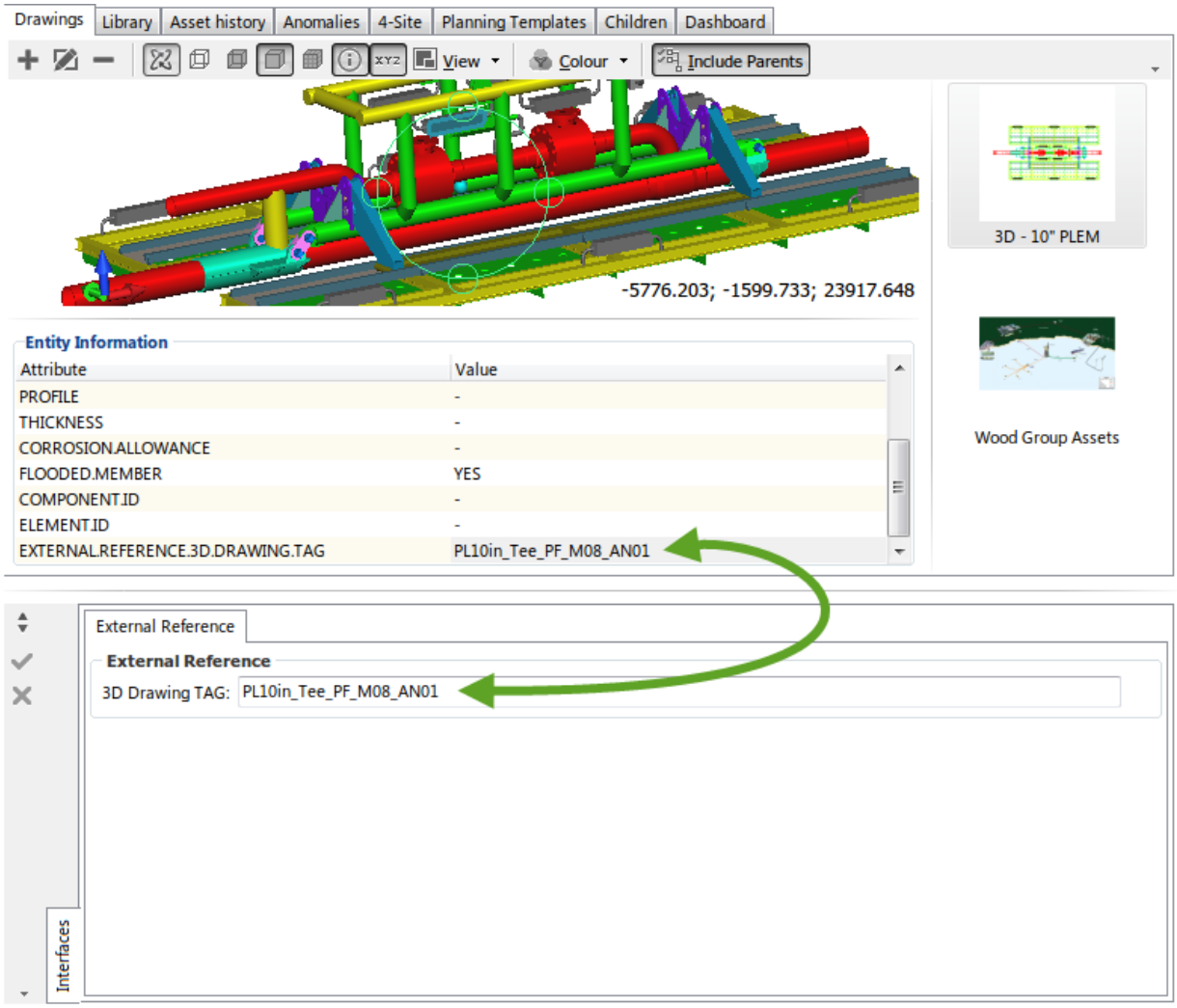
11.2.5.2.3.5 Step 4

Go to *Configuration* → *Assets* → *Features* to edit the field. In this example, the AIG field **Asset - Serial Number** has the **3D Drawing TAG** field set, located in the AIG titled **External Reference**.



11.2.5.2.3.6 Step 5

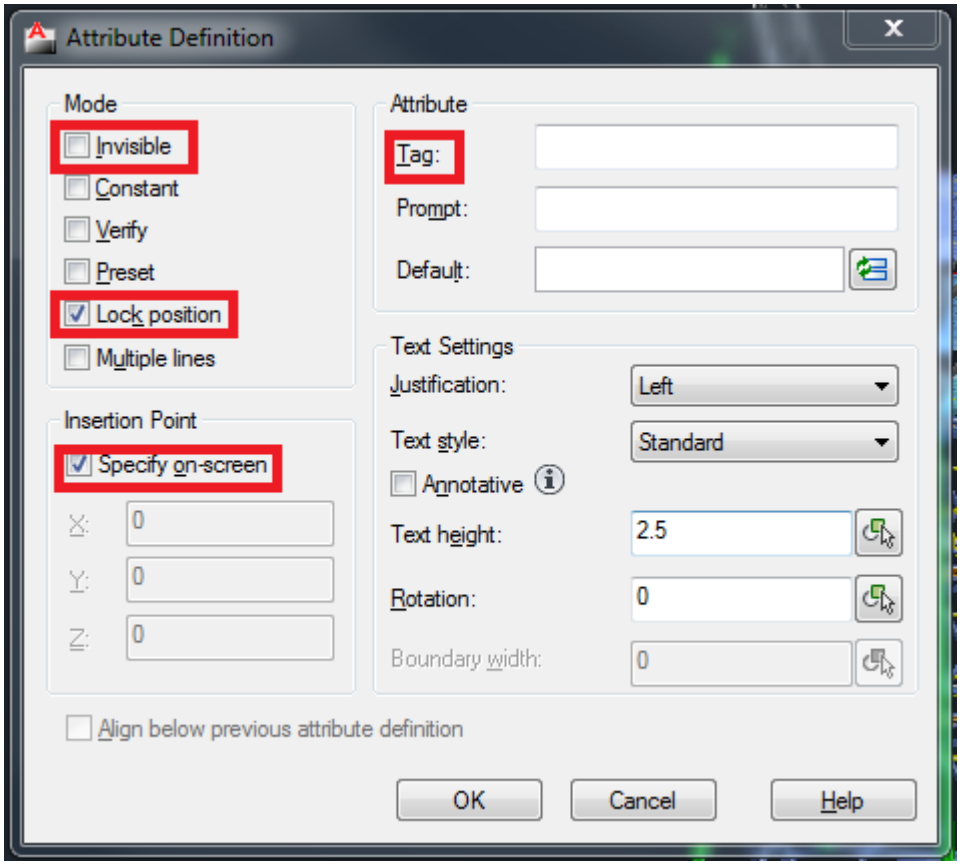
Ensure that the Asset Serial Number data is populated in the specified AIG field and that the data matches that in the Asset Serial Attribute in the 3D drawing.



11.2.5.2.3.7 3D Drawing Preparation in Autocad

In order to prepare a 3D drawing follow the steps below:

1. Create the required attributes in Autocad
    a) In Autocad type ATTDEF, the following form will open



b) Check the **Invisible** mode and uncheck the **Lock position** mode

c) Uncheck the **Specify on-screen** and leave the coordinates X:0, Y:0, Z:0

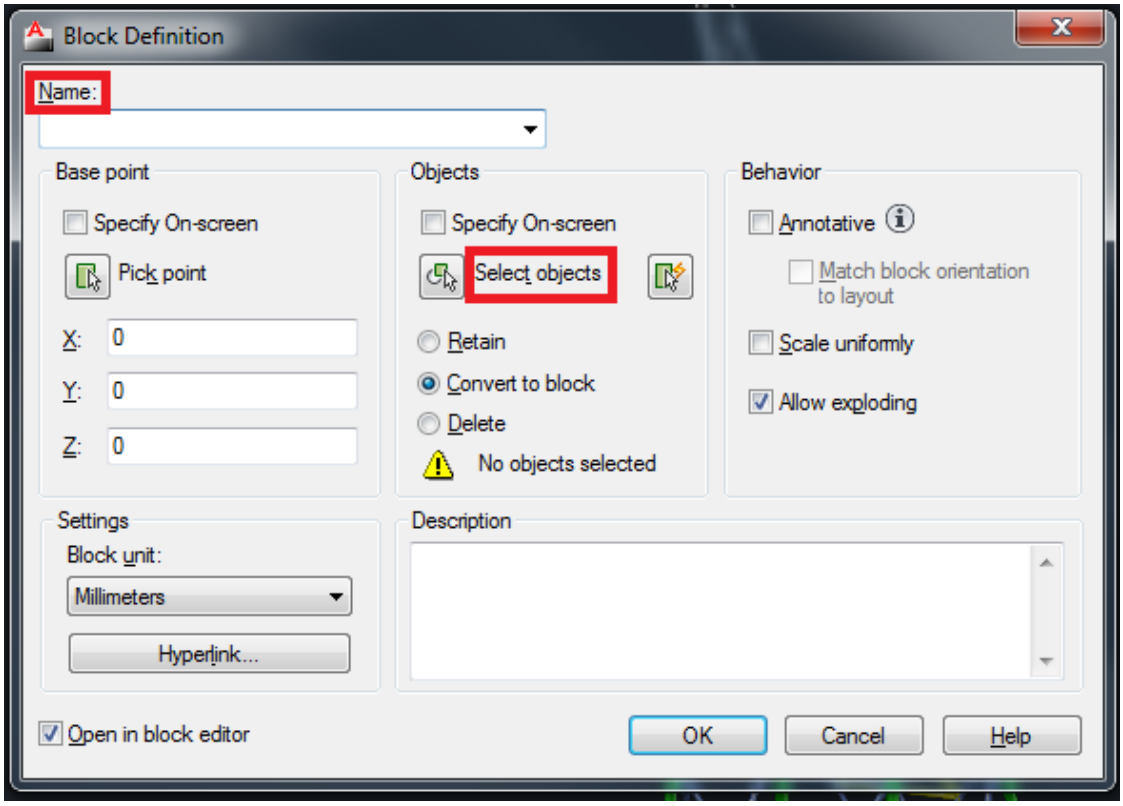
d) In the **Tag** textbox, type the name of the attribute (e.g. EXTERNAL.REFERENCE.3D.DRAWING.TAG)

e) Press **OK** button

f) Repeat steps a – e for each attribute to be created

2. Create blocks with attributes

a) In Autocad type BLOCK, the following form will open



b) Type the block name (preferred to be the object component unique ID)

c) Click on **Select objects**

d) Select the attributes created in step 1

e) Select the object required

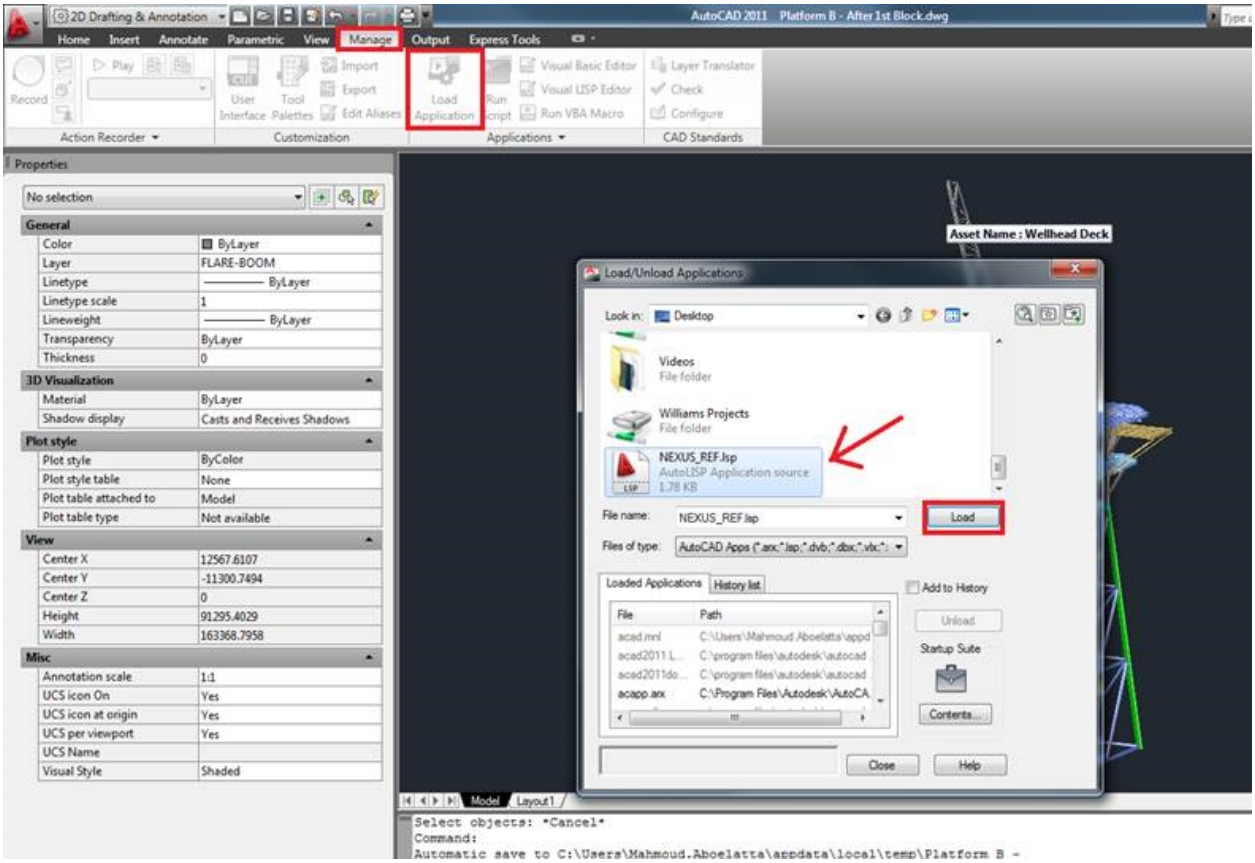
f) Press **OK** button

3. Fill out the attributes values. The value will be filled with the unique identifier that will be used by NEXUS IC
4. Repeat steps 1 – 3 for each object in the Autocad drawing

The above steps could be time consuming, therefore an AUTOLISP (one of the Autocad scripting languages) has been developed to automate the attribute and block creation as well as the attributes value population. You will need to download the AUTOLISP file `NEXUS_REF.lsp`.

This file can be used to automatically do the steps for creating a 3D drawing using Autocad. The steps to use the AUTOLISP are as follow:

1. Open the drawing in Autocad
2. Go to the **Manage** tab and click on **Load Application**
3. Select the "NEXUS_REF.lsp" file
4. Press the **Load** button
5. Press the **Close** button



6. In the command line type the following command: (NEXUS_REF)

In order to use this AUTOLISP, it is required that each object in the drawing to be on a separate layer. These layers should be named as the external reference name (e.g. Leg_B1). The script will do the following:

1. Create attribute with the name "EXTERNAL.REFERENCE.3D.DRAWING.TAG"
2. Create a block for one object, setting the block name to be the same as the object's layer name
3. Populate the attribute value with the object's layer name
4. Loop on all the objects and repeat steps 1 - 3

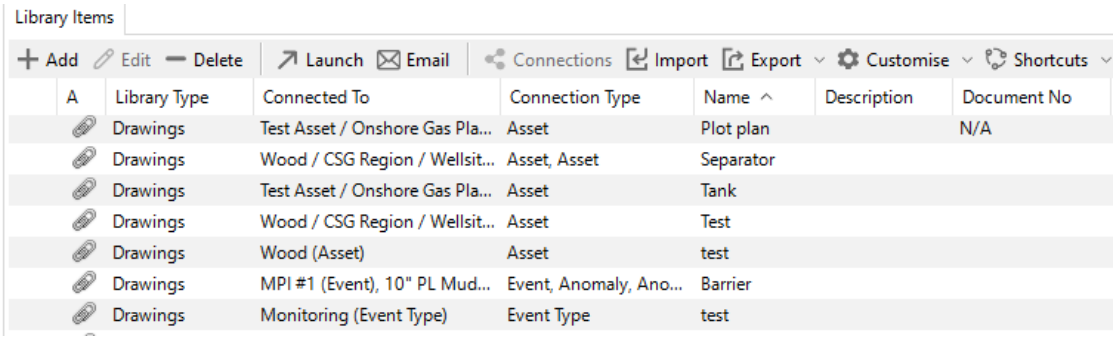
You can download a sample 3D drawing from `here`.

This sample Autocad drawing can be used in conjunction with the Autoslip file for further clarification.

11.2.6 Library

This functionality is also available on the *LIBRARY* screen. On the **ASSETS** screen, you can view all the library items for a particular asset on the **Library** tab. The visibility of this tab can be toggled on or off under the **View** toolbar option.

Library items are electronic documents that can be linked to data and data types in NEXUS IC using connections (see *Library Connections*).



The electronic documents can be uploaded directly into the NEXUS IC database, or can be referenced using URL or UNC paths.

11.2.6.1 Manage Library Items

You can manage library items from several screens within NEXUS IC, including:

- **Library Items** tab on the **LIBRARY** screen (see *Library*)
- **Library** tab on the **ASSETS** screen (see *Library*)
- **Library** tab on the **INSPECTION** screen (see *INSPECTION*)
- **Library** tab on the **ANOMALIES** screen (see *ANOMALIES*)
- **Library** tab under *Configuration* → *General* → *Functions* → *Edit Function Definition*
- **Library** tab on the **Edit Asset Type** dialog under *Configuration* → *Assets* → *Types*
- **Library** tab in various dialogs where library items can be managed for the relevant record, including the *Edit Anomaly*, *Edit Table Definition*, *Edit Task* and *Edit Workpack* dialogs

> **Example**
>
> If you upload company piping specifications to the NEXUS IC Library and assign it to the asset type "Pipework", the piping specifications will be available from the **Library** tab of the **ASSETS** screen whenever the active asset is of type "Pipework".

You can also manage library items on the **Library** pane of IC-Inspection.

You use the standard toolbar functions on the **Library/Library Items** tab to add, edit, delete, import, export library items or customise the grid layout. For more information about these functions, see *Using the Grid*.

> **Note**
>
> - You can edit the properties of the selected library item from the toolbar, but not the document itself.
> - Deleting a library item will also delete all its associated connections.
> - The **Export** option only exports the grid contents, not the actual library documents.

See below for more information about some actions you can perform on library items:

Add Library Items

To create a new library item, proceed as follows:

1. Start adding a new library item in one of the following ways:
   - On the *Library/Library Items* tab, choose **Add** from the toolbar.
   - Drag files from your file explorer onto the *Library/Library Items* tab.

> **Note**
>
> Drag-and-drop is not supported in remote environments (e.g., Remote Desktop).

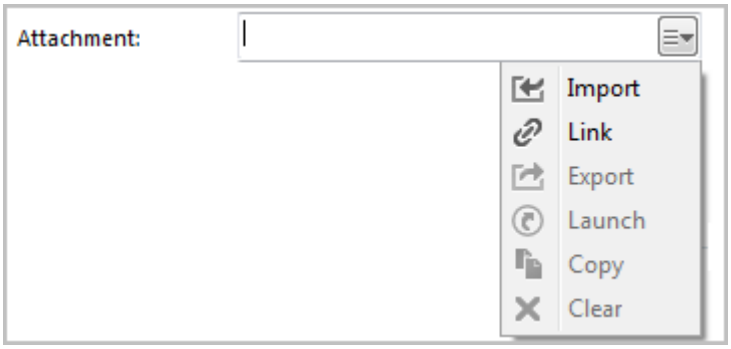
2. Depending on the screen from which you accessed the **Library** tab, you may be prompted to select a connection type. You can connect a library item to different types of data records:

Screen	Connection Type
ASSETS	• Asset • Asset Type
INSPECTION	• Asset • Asset Type • Event • Event Type • Workpack
ANOMALIES	• Anomaly • Asset

> **Note**
>
> If you're adding a library item from the **LIBRARY** screen, you add the connection to a data record from the **Connections** tab after you have created the library item. For more information, see *Add Library Connections*.

3. In the **Add/Edit Library** dialog, select the library type, enter a name for the library item (mandatory) and enter other parameters as required. For information about filling in all the parameters, see *Add/Edit Library Dialog*.
   - If the document is to be uploaded into NEXUS IC, then click on the **Attachment** button, else enter a **Hyperlink** location.
   - When adding an attachment, you can either **Import** or **Link** it:
     - If you *import*, the item will be saved to the database. If you subsequently change the original on disk, the item in the database will not change to match.

– If you *link* the item, then when you change the original on your disk, the next time you view the item within NEXUS IC, you'll see the updated item.



Note

- NEXUS IC still loads a copy of a linked item into the NEXUS database. This ensures that if the original is unavailable (for example, because you are away from your network), NEXUS IC can display the cached copy.

  When you view the item, if the original has been updated, the database cached copy is updated too. You can't link items that are on your local hard disk, only items on network drives can be linked. The Link feature is designed to keep you up-to-date with items that may have been changed by others, and that is not possible on your local drive.

- If you drag and drop multiple files, they will be added, and then multi-selected in the grid. You can then click **Edit** to multi-edit them (see *Multi-Edit*). Drag and drop will *import* items, not *link* them.

4. Click **OK**.

   On the **LIBRARY** screen, you can view the details of the library item by selecting it and checking the *Details* tab under the *Library Items* tab.

Edit Library Items

To edit an existing library item, proceed as follows:

1. On the *Library*/*Library Items* tab, select the library item.
2. Choose **Edit** from the toolbar.
3. In the **Edit Library** dialog, update data as required. For more information, see *Add/Edit Library Dialog*.
4. Click **OK** to save your changes.

Delete Library Items

To delete an existing library item, proceed as follows:

1. On the *Library*/*Library Items* tab, select the library item.
2. Choose **Delete** from the toolbar.
3. In the confirmation dialog, click **Check Connections** if you want to review any connections to this library item before deletion.

4. If you want to proceed deleting the library item, click **Delete**, else, choose **Cancel**.

Launch Library Items

Use the **Launch** toolbar button to launch library items on the local machine. By default, NEXUS only launches files with the following extensions: doc, docx, xls, xlsx, jpg, png, jpeg, jfif, bmp, tiff, gif, mpg, mp3, wav, ppt, pptx, txt, pdf, emf, zip, dwg, avi, rtf, mp4, csv.

> **Hint**
>
> Use the Space Bar on your keyboard to launch the currently selected library item.

Note that if the local machine does not have an associated viewer for the document type (for example, AutoCad viewer for DWG type), then the document can not be launched.

Email Library Items

Use the **Email** toolbar button to send an email message with the selected library items attached to it. You can select multiple library items to be sent in the same email message. Note that you must have properly configured your email settings (see *Set Up Email*) for this option to function.

> **Warning**
>
> If the size of the attachment exceeds your organization's attachment size limit, you may get an "Out of memory" error message.

Import Library Items

You can import library items using the standard **Import** toolbar option (see *Import*). You can download the MS Excel Import Template, which shows the required format for importing library items.

You can also import the *Connections* in the same import as the library items, so in addition to the Library Import columns, you can additionally define the Connection information using the following column headings:

- *Library Connection.Connect To*
- *Library Connection.Workpack*
- *Library Connection.Asset Type*
- *Library Connection.Asset*
- *Library Connection.Event Type*
- *Library Connection.Event*
- *Library Connection.Anomaly*
- *Library Connection.Risk Model*
- `Library Connection.Function

Note that the *Connect To* column should only contain one of the following text items:

- Anomaly
- Asset
- Asset Type

- Event
- Event Type
- Function
- Risk Model
- Workpack

11.2.6.1.1 Double-click

The first time you double-click on a library item, NEXUS asks you whether you want to launch the library item in an external editor, or edit the library item. If you want your choice to become permanent, tick the **Always do this** checkbox. Note that if you hold down the **Alt** key while double-clicking, you will be asked again.

11.2.7 Asset History

The **Asset History** functionality allows you to record key events related to an asset or group of assets throughout their lifecycle. These records capture important information for posterity and can be retrieved in report templates or accessed via the user interface.

You can manage asset history records on the **Asset History** tab of the **ASSETS** screen. The visibility of this tab can be toggled on or off under the **View** toolbar option.

For details on customising the tab layout, see *Customise*.

11.2.7.1 Add Asset History Record

1. On the **ASSETS** screen, select the relevant asset in the asset tree and open the **Asset History** tab.
2. Click **Add** in the toolbar.
3. In the **Add Asset History** dialog, enter data as required. For field descriptions, see *Add/Edit Asset History Dialog*.
4. Save your entries.

11.2.7.2 Edit Asset History Record

1. On the **ASSETS** screen, select the relevant asset in the asset tree and open the **Asset History** tab.
2. Select the asset history record that you want to update.
3. Click **Edit** in the toolbar.
4. In the **Edit Asset History** dialog, update data as required. For field descriptions, see *Add/Edit Asset History Dialog*.
5. Save your entries.

11.2.7.3 Delete Asset History Record

1. On the **ASSETS** screen, select the relevant asset in the asset tree and open the **Asset History** tab.
2. Select the asset history record that you want to delete.
3. Click **Delete** in the toolbar.

4. In the confirmation dialog: - Click **Check Connections** to review any linked records. - Click **Delete** to confirm deletion, or **Cancel** to abort.

> **Hint**
>
> To bulk update or delete asset history items, use the *Multi-Edit* functionality.

11.2.7.4 Import Asset History Record

You can import asset history records using the standard import functionality available via the **Import** toolbar button. The MS Excel Import Template details the required format for importing asset history records. For more information, see *Import*.

11.2.7.5 Export Asset History Record

You can export asset history records using the standard export functionality. For more information, see *Export*.

11.2.7.6 Reporting on Asset History

To retrieve Asset History data in a report template, use the System Table titled **Asset History**.

11.2.8 Anomalies

The **Anomalies** tab on the **ASSETS** screen allows you to review and manage anomaly records that are associated with the currently selected asset in the asset tree.

By default, the tab shows anomalies that belong directly to the selected asset. If the *Filter → Child Assets* toolbar option is enabled, anomalies linked to the selected asset *and its child assets* are also included.

The visibility of the **Anomalies** tab itself can be toggled on or off under the **View** option in the main toolbar of the **ASSETS** screen.

The functionality available on the **Anomalies** tab is largely the same as on the **ANOMALIES** screen (see *ANOMALIES Screen*). However, some toolbar options differ slightly. For details, see *Anomalies Toolbar*.

> **Note**
>
> On the **Anomalies** tab, only the anomaly grid is displayed. The **Actions**, **Findings** and **Library** tabs that appear at the bottom of the **ANOMALIES** screen are not available here.
>
> However, when you create or edit an anomaly from the **Anomalies** tab, these related records are available within the **Add/Edit Anomaly** dialog, allowing you to manage associated actions, findings and library items as required.

For detailed information about the anomalies functionality, see *Anomaly Management*.

11.2.8.1 Anomalies Toolbar

Toolbar Option	Description
Add	Creates a new anomaly. See *Create Anomalies* and *Add/Edit Anomaly Dialog*.
Edit	Updates the selected anomaly record. See *Add/Edit Anomaly Dialog*. You can also bulk update anomalies using the standard grid functions (see *Multi-Edit*).
Delete	Deletes the selected anomaly records from the database. You can also bulk delete records using the standard grid functions (see *Multi-Edit*).
Filter → Child Assets	Toggles the inclusion of anomalies associated with child assets of the selected asset.
Filter → Show Closed	Toggles the visibility of closed anomalies in the grid. By default, closed anomalies are hidden.
View → Risk Chart	Toggles the visibility of the **Risk Chart** pane on the right-hand side of the tab. The pane shows the Anomalies Risk Matrix (see *Risk Chart*).
View → Show Count	If the **Risk Chart** pane is visible, it toggles the visibility of the anomaly count values shown on the Anomalies Risk Matrix.
View → Multimedia	Toggles the visibility of the **Multimedia** pane on the right-hand side of the tab.
Connections	Displays items that are linked to the selected anomaly. See *Connections*.
Import	Imports anomaly data into the database. See *Import*.
Export	Exports anomaly data from the active grid. See *Export*.
Customise	Customises the grid layout and columns. See *Customise*.
Shortcuts → Close Anomaly	Closes the selected anomaly. See *Close Anomalies*.

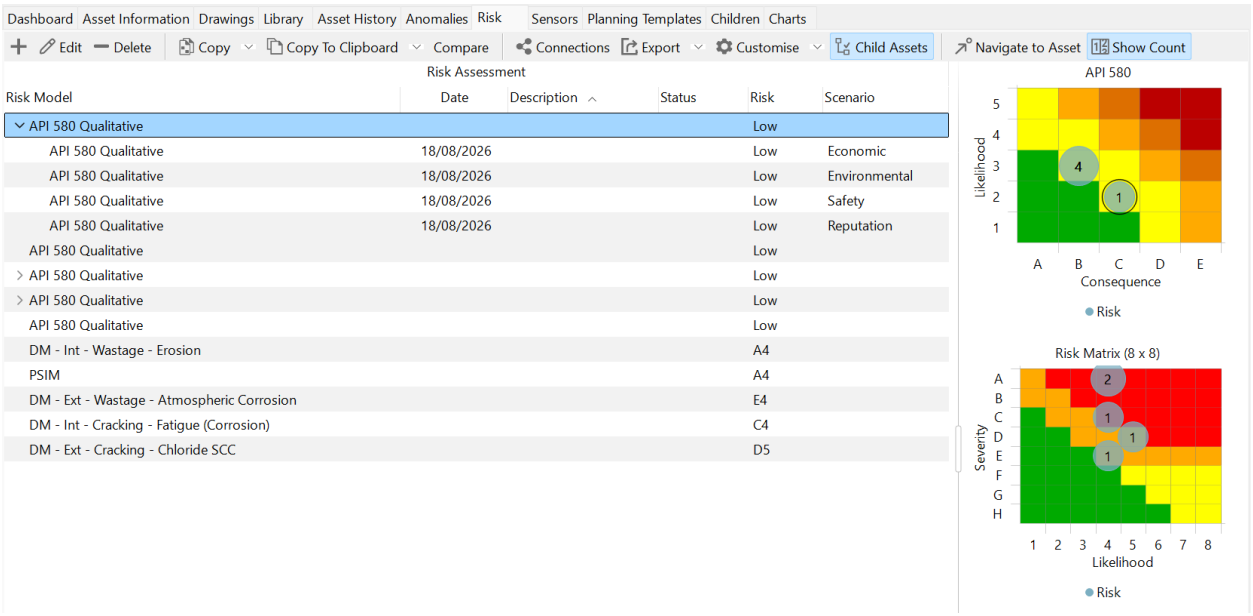
See also

- *Anomaly Management*

11.2.9 Risk

You can display risk assessment results for the currently selected asset and all its children on the **Risk** tab of the **ASSETS** screen. The visibility of this tab can be toggled on or off under the **View** toolbar option.

Risk assessment results for the currently selected asset and, optionally, its child assets are displayed in preconfigured risk matrices and in a data grid, as shown below:



11.2.9.1 Prerequisites

To enable displaying risk models for assets, you must ensure the following:

- Risk charts and risk models have been configured (see *Configure Risk Charts* and *Configure Risk Models*).
- The relevant risk models have been assigned to the asset type of the asset (see *Assign Risk Models to Asset Type*).
- Risk models have been assigned to the asset (see *Assign Risk Models*).

11.2.9.2 Display Options

When viewing risk assessment results, note the following:

- Where multiple risk assessments occupy the same position in the matrix, the corresponding indicator is displayed larger.
- Selecting a row in the grid highlights the corresponding indicator in the matrix.
- Selecting an indicator in the matrix highlights the corresponding row or rows in the grid.
- If you are using scenarios, each scenario is displayed in its own colour.
- Scenario indicators may be offset slightly within the same matrix square. This is for readability only and does not indicate a difference in risk.
- Selecting a scenario indicator highlights the corresponding scenario in the grid and also highlights the same asset's other scenarios in the matrix.
- Select **Show Count** to display the number of risk assessments at each matrix location.

11.2.9.3 Managing Risk Assessments and Scenarios

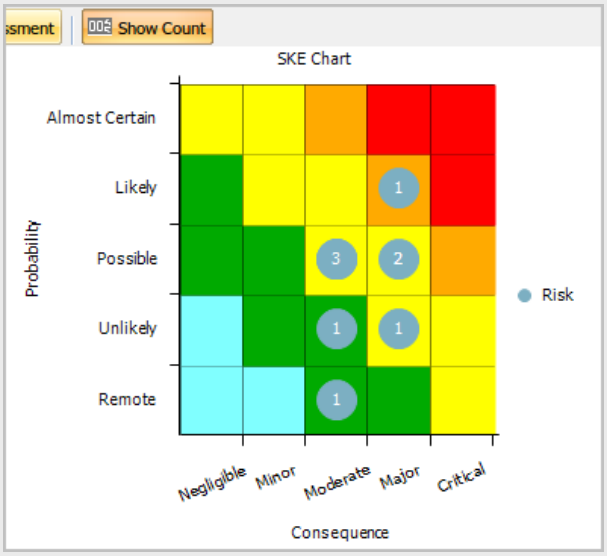
The **Risk** tab supports the following activities:

- Assigning risk models to assets. For more information, see *Assign Risk Models*.
- Reviewing and updating risk assessments. For more information, see *Edit Risk Assessments*.
- Creating and managing scenarios for risk assessments. For more information, see *Manage Risk Assessment Scenarios*.

Risk assessments are created when a risk model is assigned to an asset. You can then update assessment values, compare the results of different scenarios and analyse the resulting risk positions in the risk matrix.

11.2.9.4 Risk Toolbar

Toolbar Option	Description
Assign to <name of asset>	Choose from the list of pre-configured risk models in the drop-down menu to assign a risk model to the currently selected asset. For more information, see *Assign Risk Models*.
Edit	Opens the risk assessment editor (**Edit Risk Assessment** dialog), where you can review and update risk assessment values and manage scenarios. For more information, see *Manage Risk Assessments and Scenarios*.
Delete	Removes the selected risk assessment or scenario from the asset. The asset itself and any associated asset information remain unchanged.
Copy → Risk Assessment Only	Copies the selected risk assessment to one or more assets without any associated scenarios. For more information, see *Assign Risk Models*.
Copy → Risk Assessment and Scenarios	Copies the selected risk assessment together with all associated scenarios to one or more assets. For more information, see *Assign Risk Models*.
Copy → To Scenario	Creates a scenario from the selected risk assessment. For more information, see *Manage Risk Assessment Scenarios*.
Copy To Clipboard	Copies the displayed risk matrix to the clipboard as an image.
Connections	See *Connections*.
Export	See *Export*.
Customise	See *Customise*.
Child Assets	Includes risk assessments for child assets of the currently selected asset.
Navigate to Asset	Changes the active asset in the hierarchy to the asset associated with the selected risk assessment. The Risk grid is then filtered to display only assessments for the selected asset.
Show Count	Displays the total number of risk assessments at each position in the matrix, as shown below:



11.2.9.4.1 Assign Risk Models

You can assign risk models to individual assets from the **ASSETS**, **PLANNING** or **WORKPACKS** screen as described below.

> **Note**
>
> The same risk model can be assigned to an asset multiple times. Each assignment creates a separate risk assessment that can be managed independently.

11.2.9.4.1.1 Prerequisites

Before assigning a risk model, ensure that:

- Risk charts and risk models have been configured (see *Configure Risk Charts* and *Configure Risk Models*).
- The risk model has been assigned to the asset type of the asset (see *Assign Risk Models to Asset Type*).

11.2.9.4.1.2 Assign a Risk Model to an Asset

1. Select the asset in the asset tree and open the **Risk** tab.
2. Click ➕ **Assign to <name of asset>** in the toolbar.
3. Select the required risk model.

   > **Note**
   >
   > Only risk models that have been assigned to the asset's type are available for selection.

4. Click **OK**.

11.2.9.4.1.3 Copy Risk Models to Multiple Assets

You can assign risk models to multiple assets at a time by copying existing risk assessments from an asset.

1. Select the asset whose risk assessment you want to copy and open the **Risk** tab.
2. Select the required risk assessment and choose one of the following options from the toolbar:
   - *Copy → Risk Assessment Only* to copy the risk assessment without its scenarios
   - *Copy → Risk Assessment and Scenarios* to copy the risk assessment together with the scenarios beneath it.

   > **Note**
   >
   > You can select only a single risk assessment at a time.

3. In the dialog that opens, select the target assets. If required, you can switch to a different asset view.
4. Click **OK**.

Result

The selected risk assessments are copied to the target assets together with the values assigned to factors and categories in the risk model. If you selected **Risk Assessment and Scenarios**, the associated scenarios are copied as well.

See also

- *Risk*
- *Configure Risk Models*
- *Assign Risk Models to Asset Type*

11.2.9.4.2 Manage Risk Assessments and Scenarios

You can review and edit risk assessments and assign scenarios on the **Risk** tab of the **ASSETS**, **PLANNING** or **WORKPACKS** screen.

11.2.9.4.2.1 Prerequisites

You have assigned a risk model to the asset as described in *Assign Risk Models*.

11.2.9.4.2.2 Edit Risk Assessments

You can update the values of editable fields within a risk model. You cannot edit Pass Thru and Calculation values.

1. On the **Risk** tab, select the required risk assessment or scenario and click **Edit** from the toolbar.

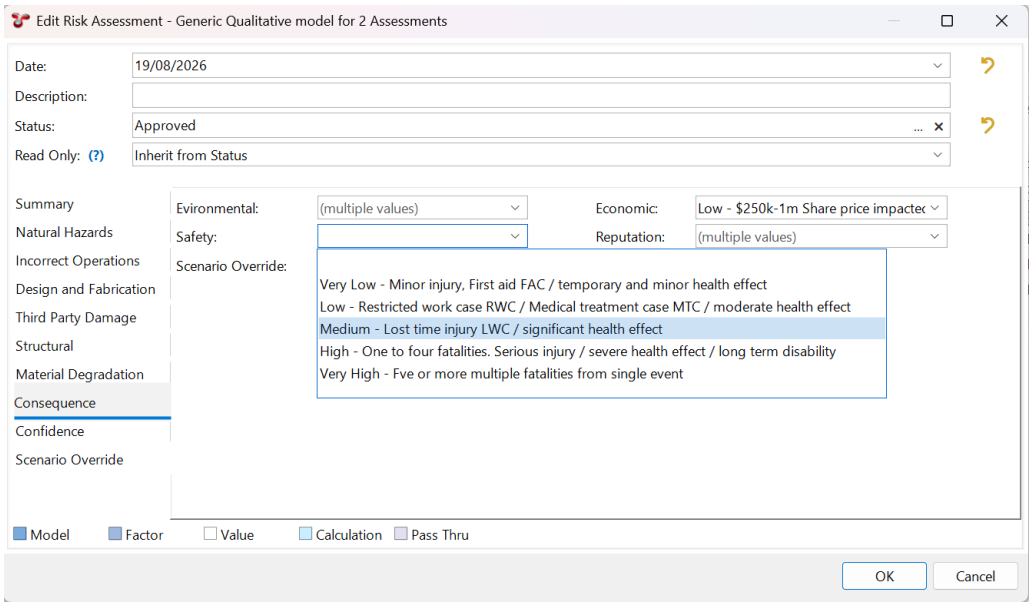
Tip

You can select multiple scenarios and edit their values in bulk.

2. In the **Edit Risk Assessment** dialog (risk assessment editor), review or update the general properties of the assessment in the upper section of the dialog.

Field Name	Description
Date	Specifies the date of the risk assessment. It is automatically populated when the risk model is assigned to the asset, or copied from an existing risk assessment.
Description	Optional text that provides additional information about the risk assessment. You can enter up to 100 characters.
Status	Allows you to manage workflows for risk assessments. For example, statuses can be used to indicate that an assessment is Prepared, Approved, Complete or Archived. Click ... at the end of the row to add or edit a status. When creating or editing a status, you can select **Read Only** to prevent further changes to assessments using that status.
Read Only	This functionality is currently under construction.

3. In the lower section of the dialog, you can review or update the risk assessment using the tabs in the left sidebar:
   - **Summary**: Displays the risk model hierarchy and calculated results.
   - Factors that contain editable fields are displayed as individual tabs. Selecting a factor tab displays the child elements of that factor as editable fields in a form. Update the field values as required.



> **Note**
>
> In case you're editing more than one risk assessment at once and they have different values for a given field, the value appears as *(multiple values)*.

4. Click **OK** to save your changes.

11.2.9.4.2.3 Manage Risk Assessment Scenarios

A scenario represents a particular set of conditions or assumptions under which an asset's risk is assessed.

Scenarios allow you to compare the results of the same risk model under different circumstances. The meaning of a scenario depends on how the risk model has been configured. For example, a risk model might use scenarios to compare different consequence types, such as Economic, Safety or Environmental consequences, or different operating conditions.

Each scenario maintains its own assessment values and produces its own risk result.

> **Note**
>
> If multiple scenarios are used for an asset, any information that varies between scenarios must be stored as **values** within the risk model.

11.2.9.4.2.4 Create a Scenario

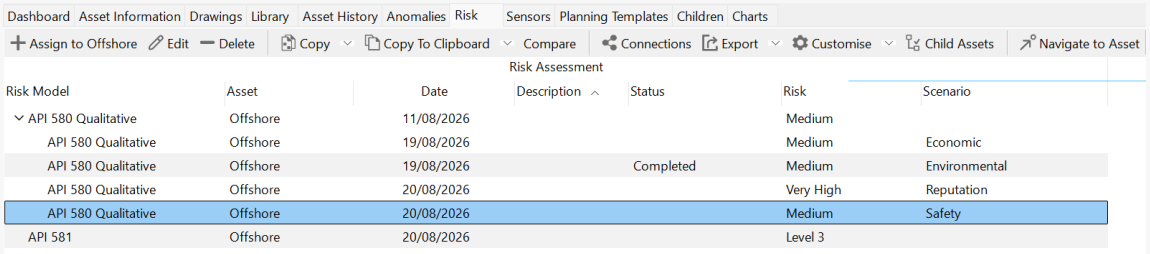
You can create a scenario by copying an existing risk assessment.

1. On the **Risk** tab, select the risk assessment that you want to use as the basis for the scenario.
2. Choose *Copy* → *To Scenario* from the toolbar.
3. In the dialog that opens, either:
   - Select an existing scenario.
   - Click **Add** to create a new scenario.
4. Click **OK**.

Result

A new scenario is created beneath the selected risk assessment. The scenario inherits the values and settings of the source assessment, allowing you to modify only the values that differ from the original assessment.

The scenario name is displayed in the **Scenario** column.



11.2.9.4.2.5 Edit a Scenario

To modify a scenario, edit it in the same way as a risk assessment. Changes made to a scenario affect only that scenario and do not modify the original risk assessment or other scenarios.

For more information, see *Edit Risk Assessments*.

11.2.10 Sensors

Sensor data is periodically logged data (for example, once per hour) recorded against assets.

NEXUS IC allows you to store, view and aggregate sensor data for your assets. On the **Sensors** tab of the **ASSETS** screen, you can import sensor data, display and export them as required. The visibility of this tab can be toggled on or off under the **View** toolbar option.

Note

The Sensors feature is separately licensed. Contact support@nexusic.com for details.

11.2.10.1 Prerequisites

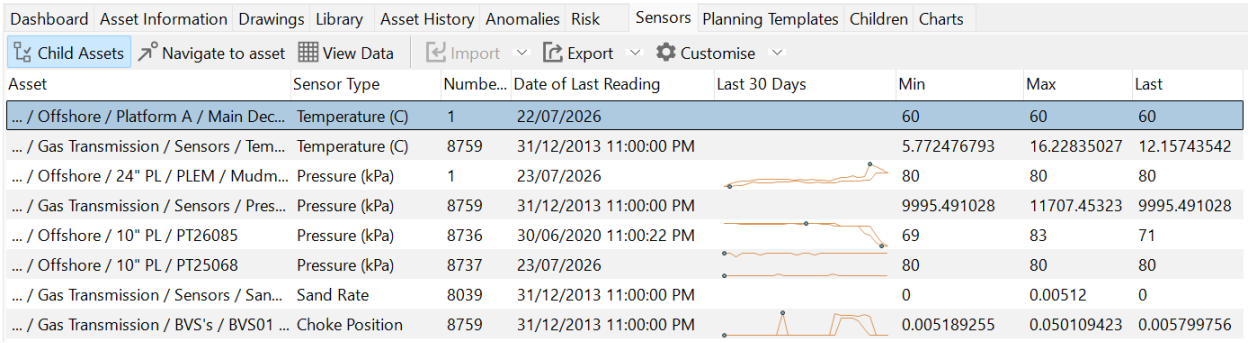
To enable displaying and importing sensor data for assets, you must have created a sensor data form and must have assigned the form to the asset type of the relevant asset. For more information, see *Configure Sensors*.

11.2.10.2 Import Sensor Data

You can import sensor data by selecting the relevant asset in the asset tree and using the standard import functionality (see *Import*). You can only import one sensor data type at a time and it will be enabled only if the sensor data form has been assigned to the asset type of the selected asset.

11.2.10.3 Display Sensor Data

Once you have imported sensor data against an asset, you can display it on the **Sensors** tab on the **ASSETS** screen.



Asset	Sensor Type	Numbe...	Date of Last Reading	Last 30 Days	Min	Max	Last
... / Offshore / Platform A / Main Dec...	Temperature (C)	1	22/07/2026		60	60	60
... / Gas Transmission / Sensors / Tem...	Temperature (C)	8759	31/12/2013 11:00:00 PM		5.772476793	16.22835027	12.15743542
... / Offshore / 24" PL / PLEM / Mudm...	Pressure (kPa)	1	23/07/2026		80	80	80
... / Gas Transmission / Sensors / Pres...	Pressure (kPa)	8759	31/12/2013 11:00:00 PM		9995.491028	11707.45323	9995.491028
... / Offshore / 10" PL / PT26085	Pressure (kPa)	8736	30/06/2020 11:00:22 PM		69	83	71
... / Offshore / 10" PL / PT25068	Pressure (kPa)	8737	23/07/2026		80	80	80
... / Gas Transmission / Sensors / San...	Sand Rate	8039	31/12/2013 11:00:00 PM		0	0.00512	0
... / Gas Transmission / BVS's / BVS01 ...	Choke Position	8759	31/12/2013 11:00:00 PM		0.005189255	0.050109423	0.005799756

Here you can see a summary of sensor data, including a "sparkline" chart showing the last 30 days of data. The dots on each chart show the minimum and maximum (within the 30-day range). The two lines show the minimum and maximum values for that particular range. If the chart is 90 pixels wide, each pixel represents a third of a day, so a considerable range of values may occur within a single horizontal pixel.

Typically, a sensor will only have a single numeric field configured. However, if your sensor data type has more than one field, then the Sparkline chart shown on the Sensors grid will display the data from the field that is ordered first. See *Configure Sensors* for more information on Form Order.

To see row-by-row data for a sensor, select it in the grid and click **View Data**.

11.2.10.4 Sensors Toolbar

Toolbar Option	Description
Child Assets	Displays all children of the currently selected asset (multiple levels of the hierarchy) if it is selected. Note that if the selected asset has many children that are sensors with large quantities of data, this may be slow.
Navigate to asset	Changes the active asset in the asset tree to the currently selected asset in the data grid. By navigating to a different asset in the hierarchy, this will also update the contents of data grid.
View Data	Displays the **View Sensor Data** dialog showing you the row-by-row data for this sensor. Note that this dialog has a Shortcuts button which shows any Sensor-specific On Focussed Item shortcuts.
Import	This is shared functionality. Refer to *Import* for a full feature description.
Export	This is shared functionality. Refer to *Export* for a full feature description.
Customise	See *Toolbar* → *Customise* for information about the Customise toolbar option.

11.2.11 Planning Templates

The planning template functionality on the **ASSETS** screen is the same as the planning template functionality on the **PLANNING** screen. On the **ASSETS** screen, you can manage planning templates on the **Planning Templates** tab and the tab shows planning templates associated with the asset selected in the asset tree. The visibility of this tab can be toggled on or off under the **View** toolbar option.

For more information about this functionality, see *Planning Templates*.

11.2.12 Children

The **Children** functionality in NEXUS IC allows you to view asset information and perform actions on multiple assets simultaneously.

On the **Children** tab of the **ASSETS** screen, you can:

- View asset information for multiple assets in a single tabular view (see *View AIG Data for Multiple Assets*).
- Edit Asset Information Group (AIG) fields for multiple assets at once (see *Edit AIGs for Assets in Bulk*).
- Perform any action available from the **Shortcuts** toolbar menu on multiple assets.
- Export all grid data to Excel, text, or CSV formats (see *Export*).

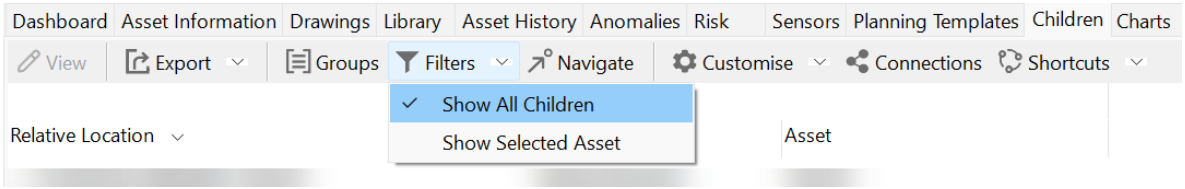
The visibility of the **Children** tab can be toggled on or off from the **View** toolbar menu.

11.2.12.1 View AIG Data for Multiple Assets

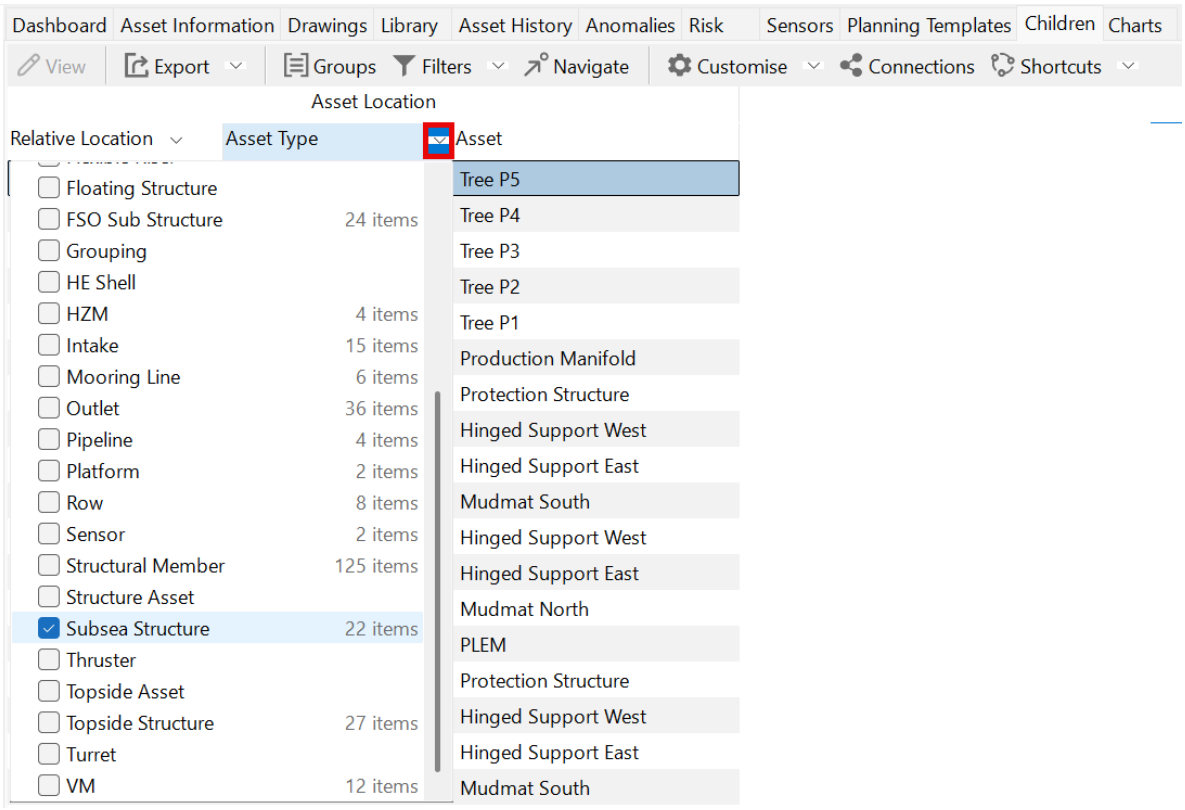
You can display AIG fields for more than one asset at a time using the **Children** tab.

To view AIG data for multiple assets:

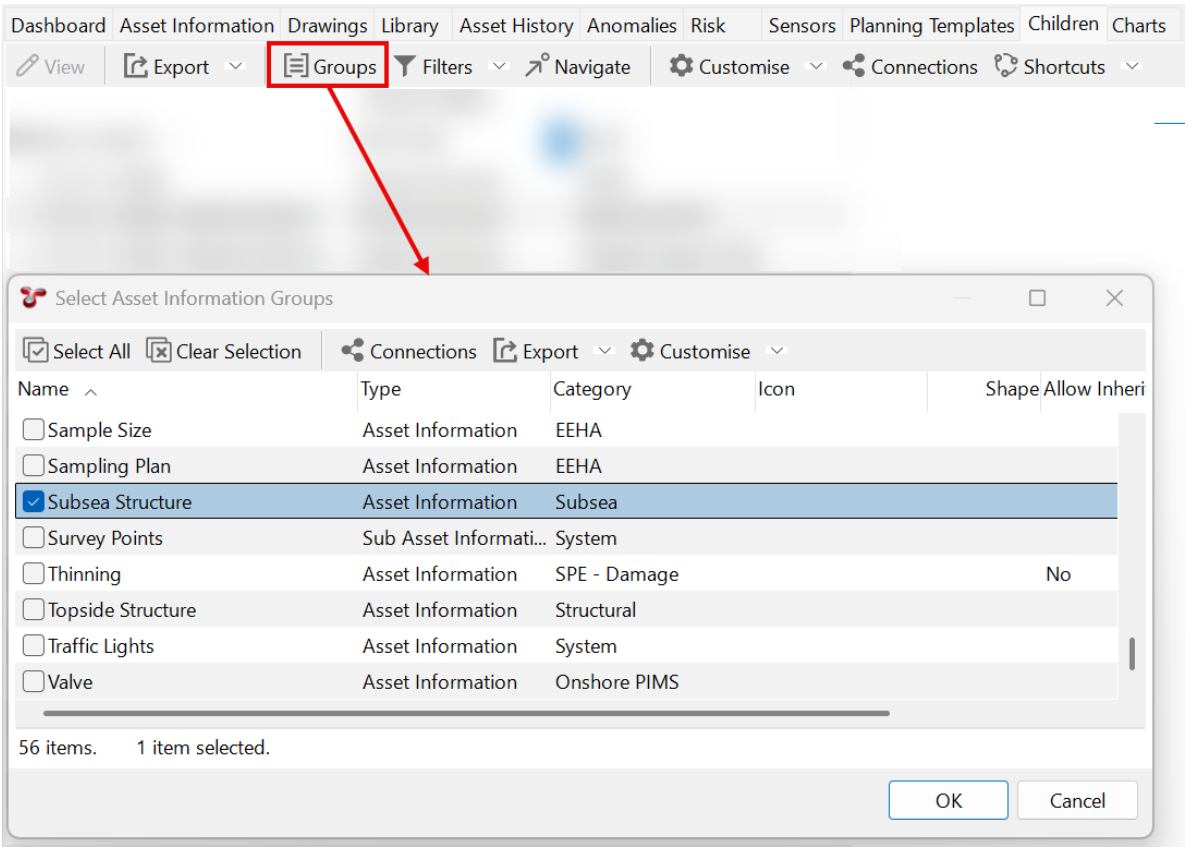
1. In the asset tree, select the high-level asset node that contains all the assets for which you want to view the asset information data.
2. Go to the **Children** tab.
3. Under **Filters**, choose one of the following options:
   - **Show All Children** — displays all descendants of the selected asset.
   - **Show Selected Asset** — displays only the selected asset and its direct children.



4. If required, you can filter your assets. For example, you can filter your assets based on the asset type in the **Asset Type** column:



5. From the toolbar, select **Groups**, then choose the AIG whose fields you want to display.
    - You can select multiple AIGs.
    - You can select only one Sub AIG.
    - You cannot select both an AIG and a Sub AIG at the same time.



Result

The selected AIG fields are added as columns in the grid. You can further filter, group, or sort assets based on the AIG field values.

Caution

Viewing complex AIG forms with calculations or references may significantly increase load times. Performance depends on both AIG complexity and the number of displayed assets.

Note

In some databases (particularly those upgraded from version 5), assets may contain AIG records that are not currently assigned to the asset type.

This can occur because AIG records are not deleted when an AIG is unassociated from an asset type.

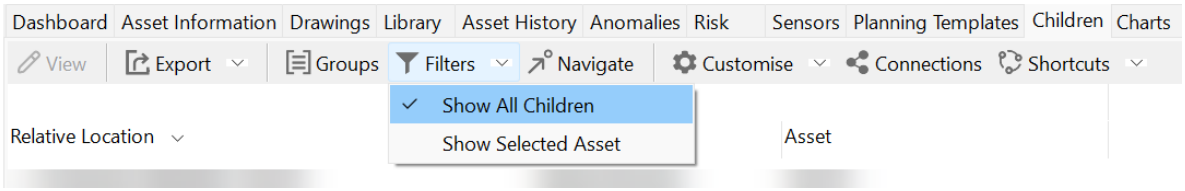
These records are shown with a **purple border** in the **Children** tab to indicate that they will not appear as an AIG form when navigating directly to the asset.

11.2.12.2 Edit AIGs for Assets in Bulk

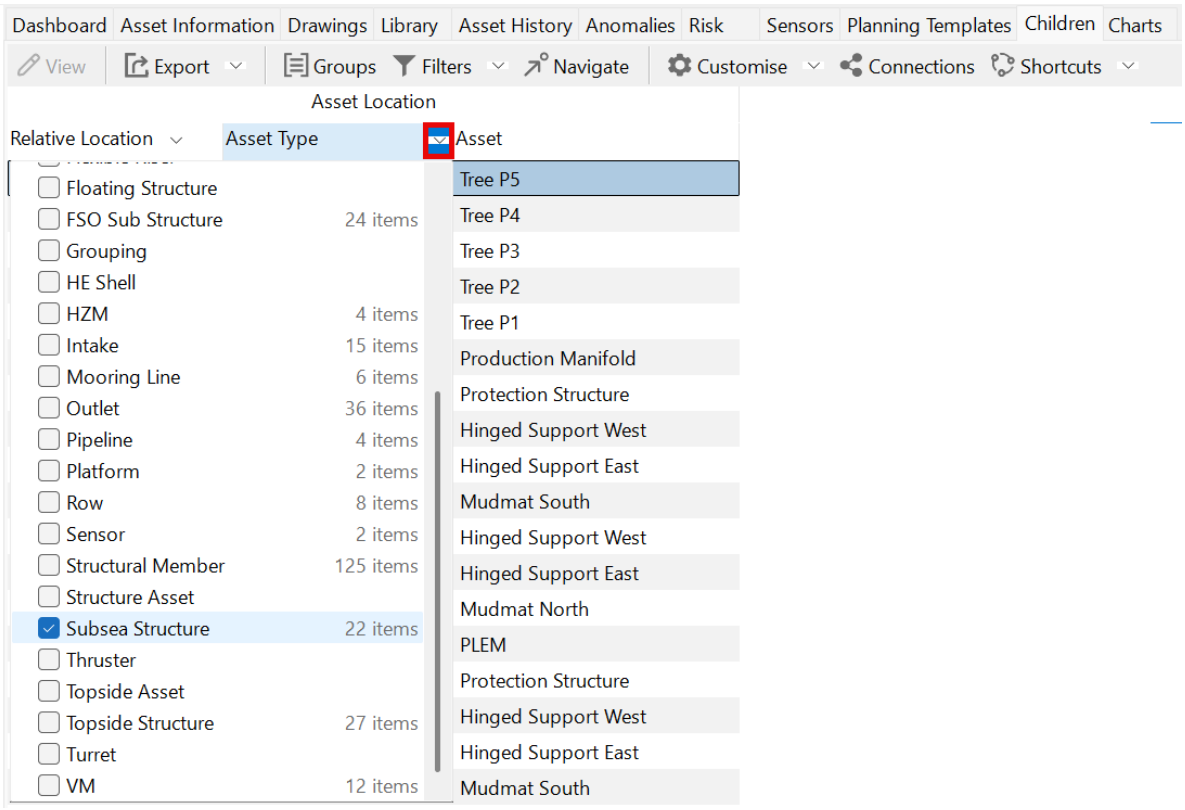
You can edit AIG data for several assets simultaneously using the **Children** tab.

To edit AIGs in bulk:

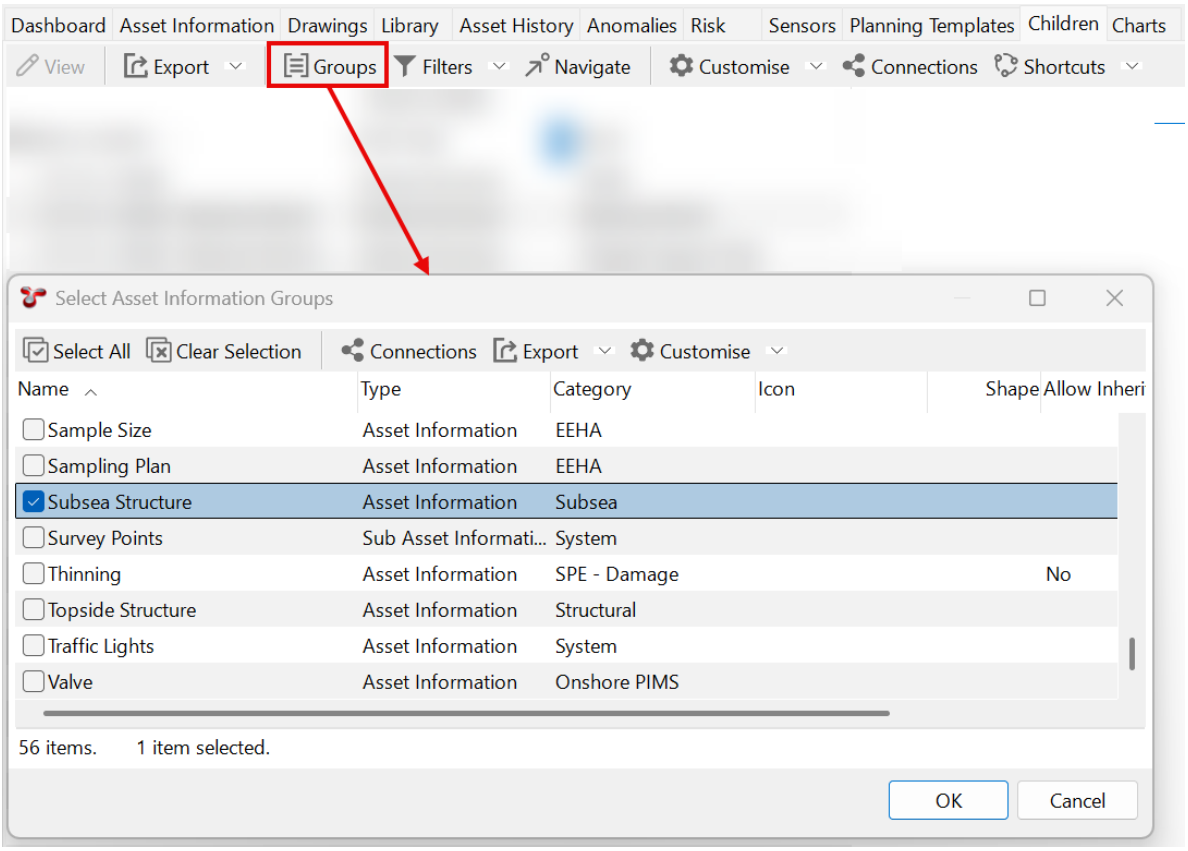
1. On the **ASSETS** screen, navigate to the high-level asset node that contains all the assets for which you want to update the AIG data.
2. Go to the **Children** tab.
3. Under **Filters**, choose *Show All Children*.



4. If required, you can filter your assets. For example, you can filter your assets based on the asset type in the **Asset Type** column:



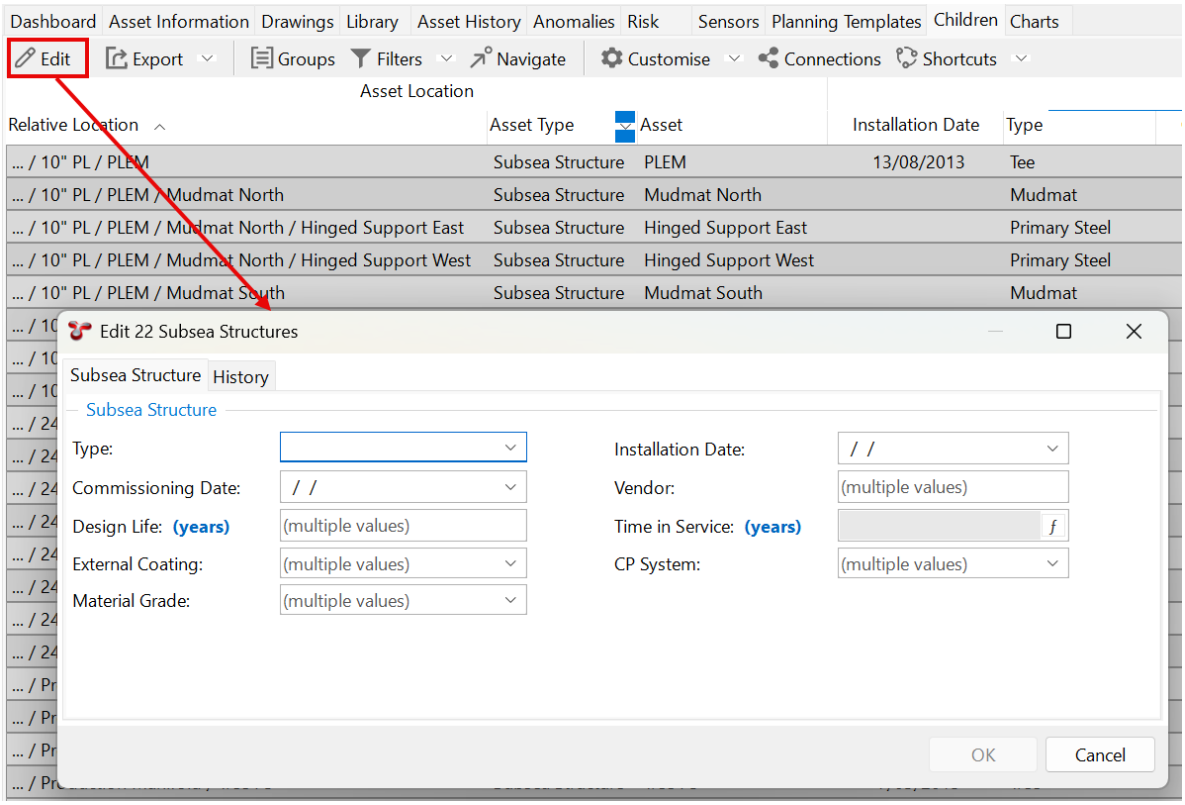
5. Choose **Groups** from the toolbar and select the AIG that you want to edit. You can select only one AIG at a time.



Result

The fields of the selected AIG appear as columns in the grid. If required, you can further filter, group or sort your assets based on the AIG field values.

6. Select all the items that you want to update from the displayed assets (for example, you can use CTRL+A to select all items), and click **Edit**.



Result

A dialog appears that contains all the fields of the selected AIG. In case the assets have different values for a given field, the value appears as *(multiple values)*.

7. Edit the field values in the AIG as required. For more information about this tab, see *Asset Information Groups (AIGs)*.
8. Click **OK** to apply the changes.

Note

Bulk editing is only available when:

- Exactly one AIG is selected under **Groups**, and
- All selected assets are of types that have that AIG assigned.

11.2.12.3 Children Toolbar

The **Children** toolbar provides commands for editing, navigating, and managing the assets displayed in the Children grid.

Toolbar Option	Description
Children → Edit	Used to edit asset information for multiple assets at once. This option is enabled only when: • Exactly one AIG is selected under **Groups**, and • One or more selected assets have that AIG assigned to them. When multiple assets are selected, editing follows the standard rules described in *Multi-Edit*. For more information, see *Edit AIGs (Individually/in Bulk)*.
Children → Export	Exports the data currently displayed in the grid. This functionality is shared across the application. For details, see *Export*.
Children → Groups	Displays all AIGs that are assigned to the asset types of the assets currently visible in the grid. Use this option to select or deselect which AIG or Sub AIG fields are shown.
Children → Filters → Show All Children	When enabled, displays all children of the currently selected asset across multiple levels of the asset hierarchy. When disabled, only the direct descendants of the selected asset are shown.
Children → Filters → Show Selected Asset	When enabled, displays the selected asset together with its direct descendants. When disabled, only the direct descendants of the selected asset are shown.
Children → Navigate	Changes the active asset in the asset tree to the asset currently selected in the data grid. Navigating to a different asset in the hierarchy also updates the contents of the data grid.
Children → Customise	See *Customise*.
Children → Connections	See *Connections*.
Children → Shortcuts	Displays any configured shortcuts in the database. If shortcuts are enabled in the database (which is the default), they appear both here and in the main **ASSETS** screen toolbar. For more information, see *Configure Shortcuts*.

11.2.13 Charts

You can view charts that are relevant for the selected asset's type on the **Charts** tab of the **ASSETS** screen. The visibility of this tab can be toggled on or off under the **View** toolbar option.

11.2.13.1 Prerequisites

Charts are generated from preconfigured chart templates. To enable displaying charts for an asset, the relevant chart templates must have been configured as described in *Configure Chart Templates*.

11.2.13.2 Display Charts

To expand/collapse each chart, click the button at the top left of that chart, or click the chart's grey header row.

> **Tip**
>
> Click on the chart area and then, with the mouse cursor still inside the chart area, use your mouse wheel to increase/decrease the chart scale.

Note the following:

- Available charts are listed alphabetically. The first chart will be automatically expanded.
- Events with findings are shown on the chart in red.
- For some chart templates, at the right or the bottom of the chart is the chart legend. If you hover the mouse over an item on the legend, other series on the chart will fade out temporarily. If you click an item on the legend, that series will be toggled on/off. If you export the chart, only series currently visible will be exported.

11.2.13.3 Chart Width

When the **Charts** tab is 1000 pixels wide or less, all charts are shown at the full width of the tab. When the **Charts** tab is over 1000 pixels wide, some charts are shown full width, and some are shown half width, in order to fit more charts side-by-side onto your screen.

Charts that have an X axis of type string, date, or date/time, or whose X axis includes 'KP' are always shown full width. You can adjust the width of all charts by adjusting the width of the whole application window, adjusting other elements such as the asset tree wider/narrower, and so on.

11.2.13.4 Zooming

At the bottom of most chart templates, below the horizontal scrollbar (if visible) is the Zoom Bar. You can hover the mouse over the left or right end of the selected part of the Zoom Bar and drag to change the selection. Initially the entire Zoom Bar will be selected, so hover the mouse over the left or right end of the bar and drag. Once a subset of the chart is selected, you can use the scroll bar or the Zoom Bar to drag the whole selection area without zooming.

You can also zoom in or out by clicking in the chart area and (with the mouse cursor still inside the chart area) spinning the mouse wheel. For charts with a lot of data (thousands of events) this can be slow, so the Zoom Bar may be faster. You can zoom on a single axis by putting the mouse pointer over that axis and spinning the mouse wheel. Not all charts support zooming in both axes.

You can also control zoom with toolbar buttons Zoom In, Zoom Out, and Reset Zoom.

11.2.13.5 Charts Toolbar

There is no toolbar for the whole **Charts** tab. Instead, each chart has its own toolbar.

Button	Description
	Zooms the image in.
	Zooms the image out.
	Resets to default zoom level.
	Opens the **Export** dialog, from which you can generate images from the chart. Ensure the range you want is set correctly using the Zoom Bar. Ensure the series you want to export are visible. If you want to export the chart as a series of images, each covering a smaller horizontal range, enter the range you would like each chart to cover in the **Range of X Axis per image** field. For example, if you have a 300 km pipeline and you enter "10" as the range per image, it will be broken into 30 images, each covering 10 km.
	Copies the chart, as you see it displayed, without the "zoom" section at the bottom, to the clipboard.
	Expands/collapses the display of this chart.

11.2.13.6 Report Table Sources

To extract chart template data into a report template, use a Chart Template element in the report, and use the appropriate Event table as a source. For more information see *Configure Report Templates*.

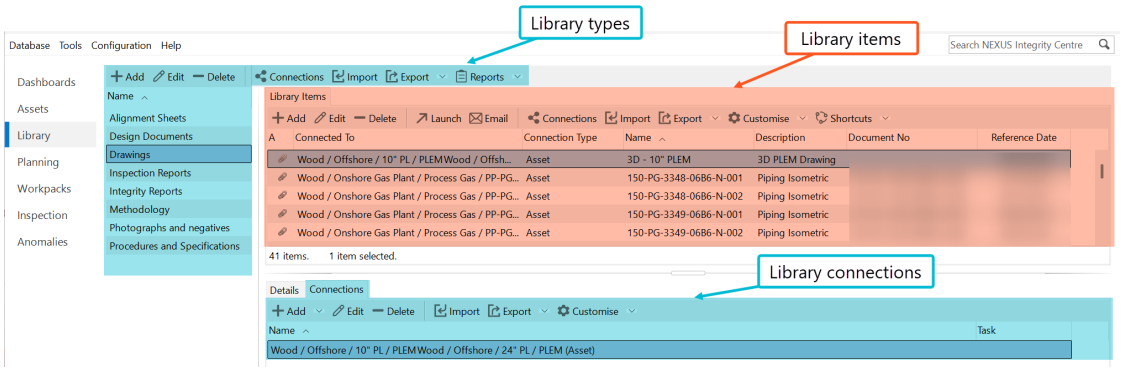
CHAPTER

TWELVE

LIBRARY

The **Library** functionality allows you to link electronic documents (library items) to data and data types in NEXUS IC.

The main functionality is available from the **LIBRARY** screen of NEXUS IC:



On this screen, you can maintain the following three types of data:

- **Library types**, which allow you to group several library items into categories (see *Library Types*)
- **Library items**, which are the actual electronic documents that you can assign to data records in NEXUS IC (see *Library Items*)
- **Library connections**, which are the actual links between a library item and a record (see *Library Connections*)

See also

- *Library Types*
- *Library Items*
- *Library Connections*

12.1 Library Types

Library types are categories that are assigned to library items (see *Library Items*).

You can group several library items under a library type. Once you have created a library type, you can add library items to it as required.

You use the standard toolbar functions on the top of the **LIBRARY** screen to add, edit, delete, import, export library types, customise the grid layout or generate reports. For more information about these functions, see *Using the Grid*.

Note

- From this toolbar, you can edit the properties of the selected library type, not the library item properties or the document itself.
- If there are library items that have been assigned to the library type that you are attempting to delete, you will be unable to delete the library type until all library items have been reassigned.

12.1.1 Add Library Types

To create a new library type, proceed as follows:

1. On the **LIBRARY** screen, choose **Add** from the top toolbar.
2. Enter a name for the library type (mandatory) and select whether you want the library items under the library type to be displayed on the **Drawings** tab of the **ASSETS** screen (see *Drawings*).
3. Click **OK**.
4. Add library items to the library type on the **Library Items** tab (see *Library Items*).

12.1.2 Assign Library Items to Library Types

You can assign library items to library types in the following ways:

- On the **LIBRARY** screen, select the library type and on the *Library Items* tab, add a library item to it as required (see *Library Items*). The selected library type is automatically filled in the **Add Library** dialog.
- You can assign/reassign a library type to a library item whenever you add or edit a library item from any screens.

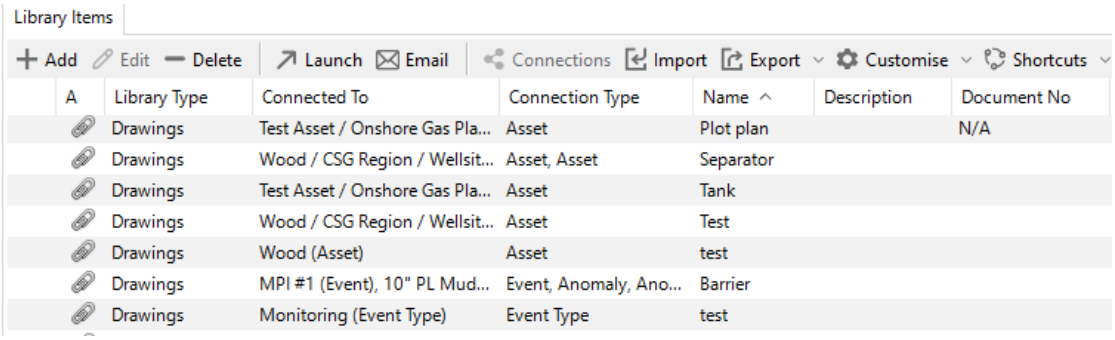
See also

- *Library*
- *Library Items*
- *Library Connections*

12.2 Library Items

On the **LIBRARY** screen, library items are displayed on the **Library Items** tab and are filtered by the currently selected library type. You can view the properties of a selected library item on the **Details** tab at the bottom of the screen.

Library items are electronic documents that can be linked to data and data types in NEXUS IC using connections (see *Library Connections*).



The electronic documents can be uploaded directly into the NEXUS IC database, or can be referenced using URL or UNC paths.

12.2.1 Manage Library Items

You can manage library items from several screens within NEXUS IC, including:

- **Library Items** tab on the **LIBRARY** screen (see *Library*)
- **Library** tab on the **ASSETS** screen (see *Library*)
- **Library** tab on the **INSPECTION** screen (see *INSPECTION*)
- **Library** tab on the **ANOMALIES** screen (see *ANOMALIES*)
- **Library** tab under *Configuration* → *General* → *Functions* → *Edit Function Definition*
- **Library** tab on the **Edit Asset Type** dialog under *Configuration* → *Assets* → *Types*
- **Library** tab in various dialogs where library items can be managed for the relevant record, including the *Edit Anomaly*, *Edit Table Definition*, *Edit Task* and *Edit Workpack* dialogs

> **Example**
>
> If you upload company piping specifications to the NEXUS IC Library and assign it to the asset type "Pipework", the piping specifications will be available from the **Library** tab of the **ASSETS** screen whenever the active asset is of type "Pipework".

You can also manage library items on the **Library** pane of IC-Inspection.

You use the standard toolbar functions on the **Library/Library Items** tab to add, edit, delete, import, export library items or customise the grid layout. For more information about these functions, see *Using the Grid*.

> **Note**
>
> - You can edit the properties of the selected library item from the toolbar, but not the document itself.
> - Deleting a library item will also delete all its associated connections.
> - The **Export** option only exports the grid contents, not the actual library documents.

See below for more information about some actions you can perform on library items:

Add Library Items

To create a new library item, proceed as follows:

1. Start adding a new library item in one of the following ways:
   - On the *Library/Library Items* tab, choose **Add** from the toolbar.
   - Drag files from your file explorer onto the *Library/Library Items* tab.

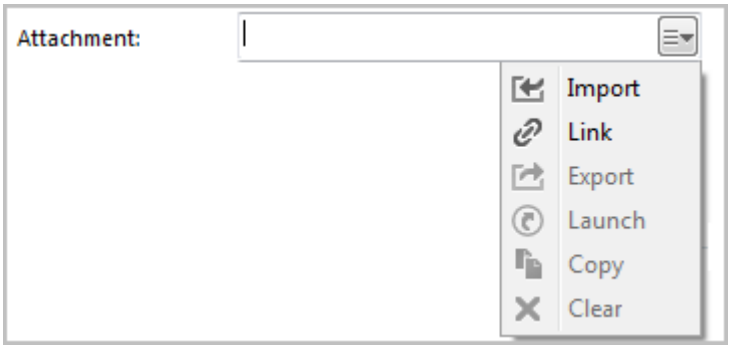
> **Note**
>
> Drag-and-drop is not supported in remote environments (e.g., Remote Desktop).

2. Depending on the screen from which you accessed the **Library** tab, you may be prompted to select a connection type. You can connect a library item to different types of data records:

Screen	Connection Type
ASSETS	• Asset • Asset Type
INSPECTION	• Asset • Asset Type • Event • Event Type • Workpack
ANOMALIES	• Anomaly • Asset

> **Note**
>
> If you're adding a library item from the **LIBRARY** screen, you add the connection to a data record from the **Connections** tab after you have created the library item. For more information, see *Add Library Connections*.

3. In the **Add/Edit Library** dialog, select the library type, enter a name for the library item (mandatory) and enter other parameters as required. For information about filling in all the parameters, see *Add/Edit Library Dialog*.
   - If the document is to be uploaded into NEXUS IC, then click on the **Attachment** button, else enter a **Hyperlink** location.
   - When adding an attachment, you can either **Import** or **Link** it:
     - If you *import*, the item will be saved to the database. If you subsequently change the original on disk, the item in the database will not change to match.
     - If you *link* the item, then when you change the original on your disk, the next time you view the item within NEXUS IC, you'll see the updated item.



> **Note**
>
> - NEXUS IC still loads a copy of a linked item into the NEXUS database. This ensures that if the original is unavailable (for example, because you are away from your network), NEXUS IC can display the cached copy.
>
> When you view the item, if the original has been updated, the database cached copy is updated too. You can't link items that are on your local hard disk, only items on network drives can be linked. The Link feature is designed to keep you up-to-date with items that may have been changed by others, and that is not possible on your local drive.
>
> - If you drag and drop multiple files, they will be added, and then multi-selected in the grid. You can then click **Edit** to multi-edit them (see *Multi-Edit*). Drag and drop will *import* items, not *link* them.

4. Click **OK**.

   On the **LIBRARY** screen, you can view the details of the library item by selecting it and checking the *Details* tab under the *Library Items* tab.

Edit Library Items

To edit an existing library item, proceed as follows:

1. On the *Library/Library Items* tab, select the library item.
2. Choose **Edit** from the toolbar.
3. In the **Edit Library** dialog, update data as required. For more information, see *Add/Edit Library Dialog*.
4. Click **OK** to save your changes.

Delete Library Items

To delete an existing library item, proceed as follows:

1. On the *Library/Library Items* tab, select the library item.
2. Choose **Delete** from the toolbar.
3. In the confirmation dialog, click **Check Connections** if you want to review any connections to this library item before deletion.
4. If you want to proceed deleting the library item, click **Delete**, else, choose **Cancel**.

Launch Library Items

Use the **Launch** toolbar button to launch library items on the local machine. By default, NEXUS only launches files with the following extensions: doc, docx, xls, xlsx, jpg, png, jpeg, jfif, bmp, tiff, gif, mpg, mp3, wav, ppt, pptx, txt, pdf, emf, zip, dwg, avi, rtf, mp4, csv.

> **Hint**
>
> Use the Space Bar on your keyboard to launch the currently selected library item.

Note that if the local machine does not have an associated viewer for the document type (for example, AutoCad viewer for DWG type), then the document can not be launched.

Email Library Items

Use the **Email** toolbar button to send an email message with the selected library items attached to it. You can select multiple library items to be sent in the same email message. Note that you must have properly configured your email settings (see *Set Up Email*) for this option to function.

> **Warning**
>
> If the size of the attachment exceeds your organization's attachment size limit, you may get an "Out of memory" error message.

Import Library Items

You can import library items using the standard **Import** toolbar option (see *Import*). You can download the MS Excel Import Template, which shows the required format for importing library items.

You can also import the *Connections* in the same import as the library items, so in addition to the Library Import columns, you can additionally define the Connection information using the following column headings:

- *Library Connection.Connect To*
- *Library Connection.Workpack*
- *Library Connection.Asset Type*
- *Library Connection.Asset*
- *Library Connection.Event Type*
- *Library Connection.Event*
- *Library Connection.Anomaly*
- *Library Connection.Risk Model*
- `Library Connection.Function

Note that the *Connect To* column should only contain one of the following text items:

- Anomaly
- Asset
- Asset Type
- Event
- Event Type
- Function
- Risk Model
- Workpack

12.2.1.1 Double-click

The first time you double-click on a library item, NEXUS asks you whether you want to launch the library item in an external editor, or edit the library item. If you want your choice to become permanent, tick the **Always do this** checkbox. Note that if you hold down the **Alt** key while double-clicking, you will be asked again.

See also

- *Library*
- *Library Types*
- *Library Connections*

12.3 Library Connections

A *library connection* is a link between a library item and a data record. Each library item can have one or more associated connections.

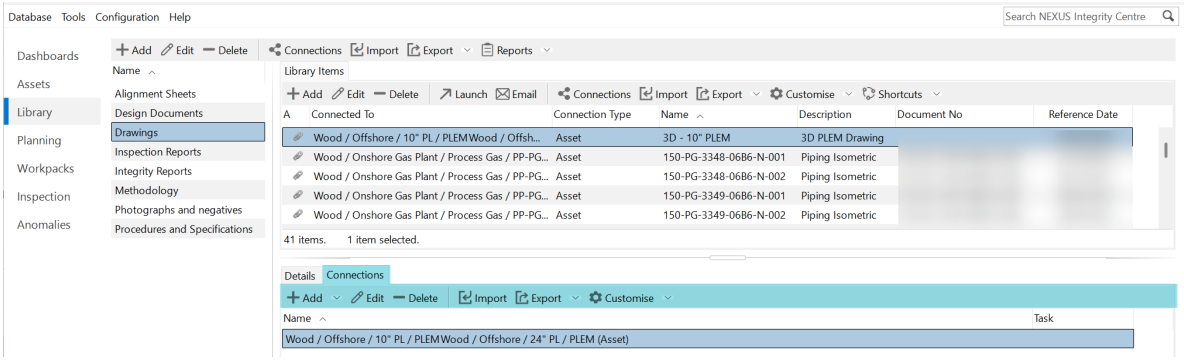
You can create the following types of connections:

- **Anomaly**: Links a library item to an anomaly.
- **Asset**: Links a library item to one or more specific assets.
- **Asset Type**: Links a library item to an asset type.
- **Event**: Links a library item to a discrete event.
- **Event Type**: Links a library item to an event definition.
- **Function**: Links a library item to a function.
- **Risk Model**: Links a library item to a risk model.
- **Task**: Links a library item to a task in a workpack.
- **Workpack**: Links a library item to one or more specific workpacks.

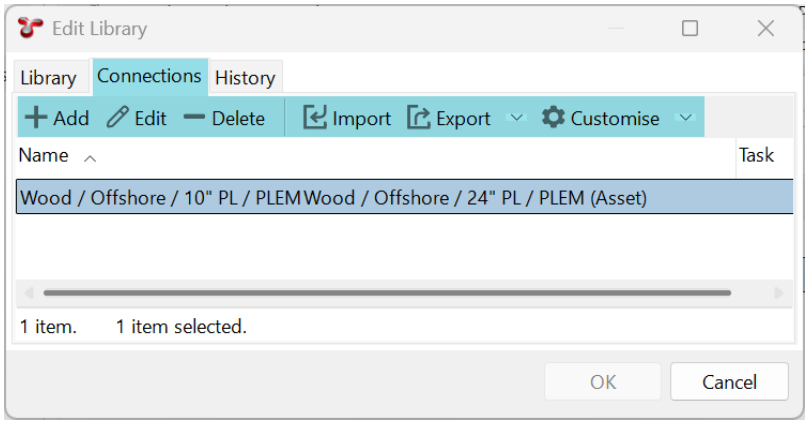
12.3.1 Manage Library Connections

You can manage library connections for a library item in one of the following ways:

- On the **Connections** tab of the **LIBRARY** screen, use the toolbar to add, edit, delete, import, or export connections for the selected library item. You can also customise the grid layout. For more information, see *Using the Grid*.



- Edit the library item (see *Library Items*) and configure its connections on the **Connections** tab of the **Edit Library Item** dialog (see *Add/Edit Library Dialog*).



Note

- From the toolbar, you can edit the properties of the selected library connection, not the library item properties or the document itself.
- Deleting a library connection only removes the selected connection. The library item itself remains unaffected.

12.3.1.1 Add Library Connections

To create a new library connection, proceed as follows:

1. On the **Library Items** tab of the **LIBRARY** screen, select the library item to which you want to add a connection.
2. Go to the **Connections** tab at the bottom of the screen and click **Add** in the toolbar.
3. From the drop-down list, choose the type of connection to create.
4. Select the required records in the selection dialog.
5. Click **OK**.

You can also add a connection while editing the library item (see *Library Items*). On the **Connections** tab of the **Edit Library Item** dialog, click **Add** and define the parameters in the **Add Library Connection** dialog (see *Add/Edit Library Connection Dialog*).

12.3.1.2 Edit Library Connections

When editing an existing connection, you can update:

- the library item assignment
- the connection type and the record to which the library item is linked

- the workpack task associated with the connection

To edit a library connection:

1. On the **Library Items** tab of the **LIBRARY** screen, select the library item whose connection you want to update.
2. Go to the **Connections** tab at the bottom of the screen and click **Edit** in the toolbar.
3. In the **Edit Library Connection** dialog, modify the connection as required. For more information, see *Add/Edit Library Connection Dialog*.
4. Click **OK**.

You can also edit a connection while editing the library item (see *Library Items*). On the **Connections** tab of the **Edit Library Item** dialog, click **Edit** and update the parameters in the **Edit Library Connection** dialog (see *Add/Edit Library Connection Dialog*).

See also

- *Library*
- *Library Types*
- *Library Items*

CHAPTER

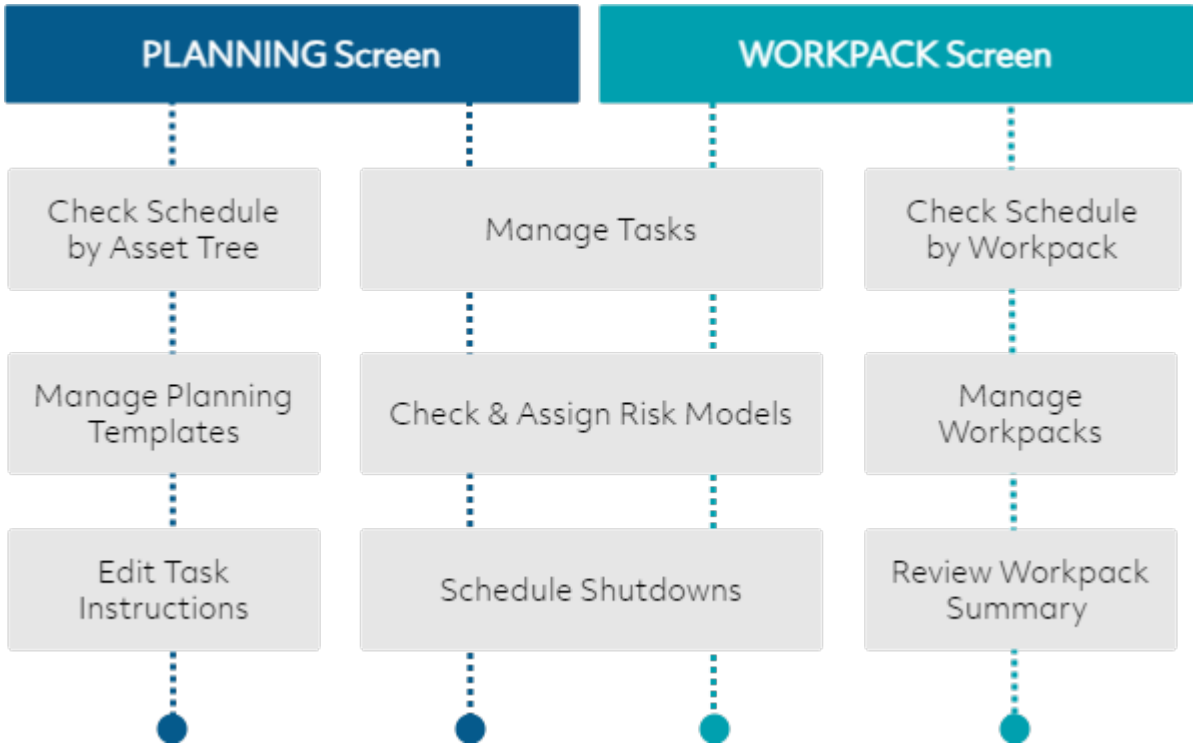
THIRTEEN

PLANNING AND WORKPACKS

During the planning phase, you set up the actual tasks to be carried out during inspections. Each task must be assigned to a workpack, which is a collection of tasks and events and is a central part of planning. Optionally, you can set up planning templates, which allow you to automatically set up future workpacks through the use of planning tasks that repeat on either a fixed or dynamic (calculated) frequency.

For more information about how the planning phase is integrated into the whole workflow, see *NEXUS Workflow*.

You check and maintain all planning-related activities on the **PLANNING** and **WORKPACKS** screens as follows:



See also

- *Configure Planning Data*

- *PLANNING Screen*
- *WORKPACKS Screen*
- *Tasks*
- *Workpacks*

13.1 PLANNING Screen

On the **PLANNING** screen, you can perform the following actions:

- Review the task schedule by asset tree (see *Check Schedule by Asset Tree*)
- Manage tasks (see *Tasks*)
- Manage planning templates and planning tasks (see *Planning Templates*)
- Assign and review risk models (see *Risk*)
- Schedule shutdowns (see *Shutdowns*)
- Edit task instructions (see *Task Instructions*)

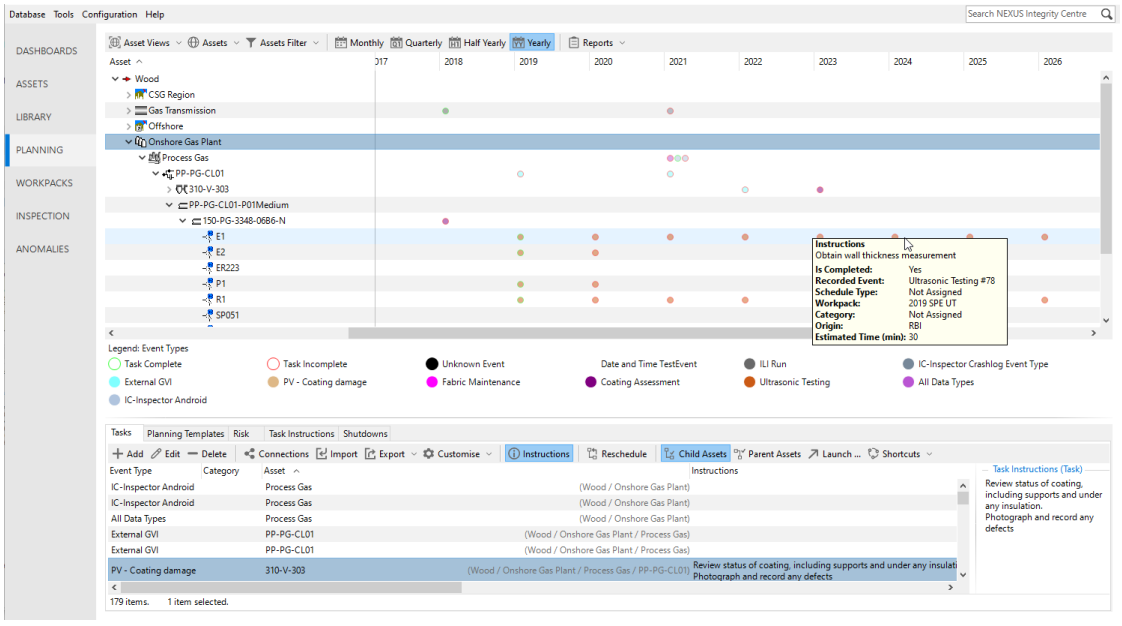
13.1.1 Check Schedule by Asset Tree

The upper section of the PLANNING screen displays tasks in a calendar view, organised by asset. Each task appears as a dot with two colours:

- **Outer ring**: Indicates task completion (green = complete, red = incomplete)
- **Inner dot**: Represents the event type (colour is configurable, see *Configure Event Types*).

The date shown for each task in the calendar corresponds to the **actual start date** of the associated workpack.

Hovering over a task dot reveals a tooltip with details such as the task description, workpack, event type, completion status, and any linked anomaly actions.



On this screen area, you have the following options:

- *Assets Filter → Show Task Completion*: Toggle the outer ring display to show task completion status.
- **Calendar Granularity**: Choose between **Monthly**, **Quarterly**, **Half Yearly**, or **Yearly** views to adjust the calendar granularity. For example, if you select **Monthly**, there will be one column for each calendar month.
- **Asset Views** and **Assets** toolbar options: Use these options as on the **ASSETS** screen, see *Asset Views* and *Assets Toolbar*. Note that on the **PLANNING** screen, not all options may be available.

13.1.2 Planning Toolbar

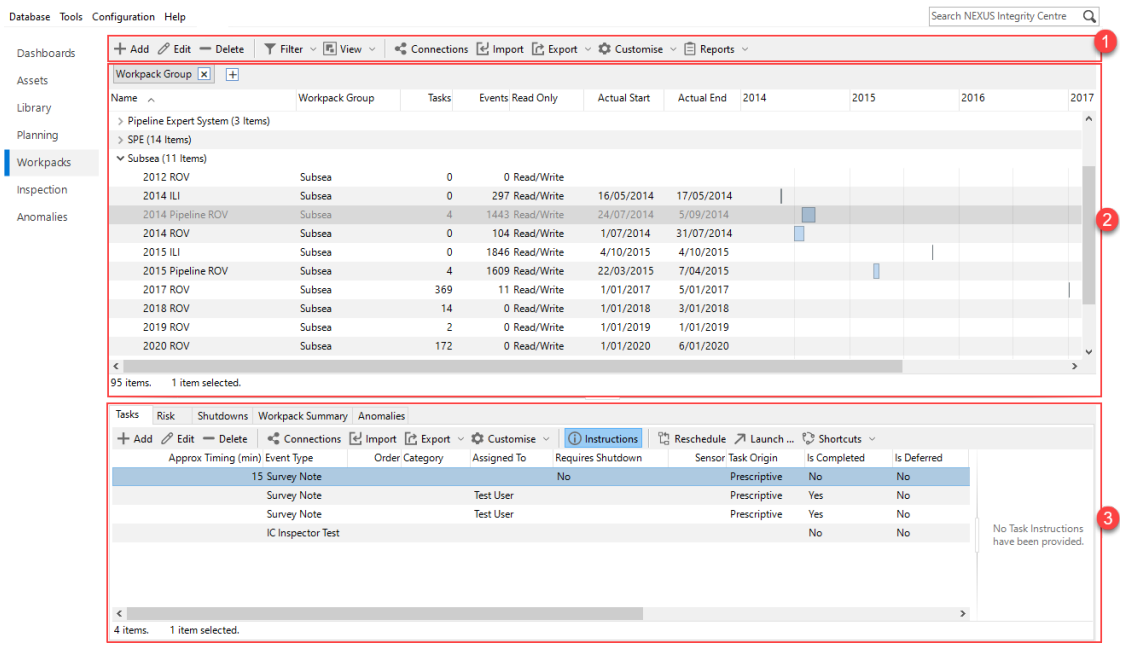
Toolbar Option	Description
Asset Views	See *Asset Views*.
Assets	See *Assets Toolbar*.
Assets Filter → Show Task Completion	Activates or deactivates the display of task completion in the outer ring of the dot. When selected, each task in the calendar will be outlined with a green (complete) or red (incomplete) circle identifying the completion status of that task.
Monthly/Quarterly/Half Yearly/Yearly	Allows you to choose the 'resolution' of the grid. For example, if you select **Monthly**, there will be one column for each calendar month.
Reports	See *Reports*.

See also

- *Planning and Workpacks*
- *Tasks*
- *Planning Templates*
- *Risk*
- *Shutdowns*
- *Task Instructions*

13.2 WORKPACKS Screen

The **WORKPACKS** screen allows you to manage your workpacks (see *Workpacks*) and review the schedule of tasks across workpacks. The screen consists of the following main parts:



Screen Area	Description
1 **Toolbar**	Provides actions for viewing and managing workpack data. See *Workpack Toolbar*.
2 **List of workpack records**	Displays workpacks in a grid with key details and an integrated Gantt chart. The Gantt chart shows the start and end dates for each workpack in a calendar view, allowing you to quickly review the schedule of tasks across workpacks.
3 **Associated records**	Displays records related to the workpack currently selected in the grid. Using the tabs, you can perform the following actions: • Review and manage tasks included in the workpack (see *Tasks*) • Assign and review risk models (see *Risk*) • Schedule shutdowns (see *Shutdowns*) • Export a workpack summary (see *Workpack Summary*) • View and manage anomaly records associated with the asset of the selected workpack (see *Anomalies*)

13.2.1 Filter Workpacks

You can filter workpacks using the **Filter** option in the toolbar. The following options are available:

- **Show Read Only**: When enabled, displays workpacks that are marked as read-only or have a read-only revision. This option is disabled by default.

- **Show Empty**: When enabled, displays workpacks that have no tasks associated with them. This option is enabled by default.

> **Tip**
>
> Use the grid *Grouping* functionality to group and filter workpacks. This provides a quick and effective way to focus on the workpacks you want to review. All columns in the grid can also be filtered and sorted using the standard filtering (see *Filtering*) and sorting (see *Sorting*) functionality.

13.2.2 Workpack Toolbar

Toolbar Option	Description
Add	Creates a new workpack. See *Create Workpacks Manually*.
Edit	Edits the selected workpack. See *Edit Workpacks*.
Delete	Deletes the selected workpack.
Filter	Opens the workpack filter options. See *Filter Workpacks*.
View → *Monthly/Quarterly/Half Yearly/Yearly*	Sets the time resolution of the Gantt chart and adjusts the calendar scale. For example, if you select **Monthly**, there will be one column for each calendar month.
View → *Go to Today*	Scrolls the calendar to the current date. This button is inactive if the calendar does not cover today's date (because all your workpacks are in the past, or all your workpacks are in the future, or no workpacks have start/end dates).
View → *Go to Workpack*	Scrolls the calendar to the start date of the selected workpack. If multiple workpacks are selected, the calendar scrolls to the most recently selected one.
Connections	Displays items that are linked to the selected workpack. See *Connections*.
Import	Imports workpack data into the database. See *Import*.
Export	Exports workpack data from the active grid. See *Export*.
Customise	Customises the grid layout and columns. See *Customise*.
Reports	Generates reports based on workpack data. See *Reports*.

> **See also**
>
> - *Planning and Workpacks*
> - *Workpacks*
> - *Tasks*
> - *Risk*
> - *Shutdowns*
> - *Workpack Summary*

13.3 Tasks

Tasks represent individual units of work to be performed. While tasks are often inspection-related, they are not limited to inspections. Each task is typically associated with an asset and an event type that defines the nature of the work. For example, if a task involves performing a General Visual Inspection on an asset, you would assign the event type *GVI*.

Tasks are organised into workpacks, which group related work for planning, execution and tracking.

13.3.1 Managing Tasks

In NEXUS IC, you can manage tasks on the **Tasks** tab, which is available from several locations, such as the **PLANNING** and **WORKPACK** screens, when editing tasks in supported dashboards or when editing workpacks. This tab provides a toolbar that allows you to perform common task-related actions, as described below.

Action	Description
Add/Edit/Delete tasks	Create, modify or remove tasks. See *Create Tasks*, *Edit Tasks* and *Using the Grid*.
Assign tasks	Assign an inspector to a task by editing the task and entering the inspector's name in the **Edit Task** dialog. See *Assign Tasks*.
Check connections	Check the selected task's connections to related items. See *Connections*.
Import/Export tasks	Import tasks from, or export tasks to, external files. See *Import* and *Export*.
Customise grid layout	Adjust the columns, order and layout of the task grid. See *Customise*.
Show/Hide task instructions	Toggle the **Instructions** toolbar button to show or hide task instructions in a pane on the right. Instructions may be sourced from the task's event type, its planning template, or the task itself. See *Task Instructions*.
Reschedule tasks	Move planning template tasks from one workpack to another. See *Reschedule Tasks*.
Show tasks for child or parent asset (**PLANNING** screen only)	Enable the **Child Assets** or **Parent Assets** toolbar button to display tasks for the currently selected asset as well as its related child or parent assets.
Launch tasks	Launch the event form for the currently selected task, allowing you to enter the related event details. Launching a task also completes the task. See *Launch Tasks*.

13.3.2 Completing Tasks

A task is completed when the associated work has been carried out. To record the completion of a task in NEXUS, you must mark it as completed. For more information, see *Complete Tasks*.

13.3.3 Report Table Sources

To extract task data into a report template, use the System Table titled **Task** as the primary Table Source. For more information see *Configure Report Templates*.

See also

- *Planning and Workpacks*
- *Workpacks*
- *PLANNING Screen*

- *WORKPACKS Screen*

13.3.3.1 Create Tasks

You can create *tasks* in NEXUS IC in several ways, depending on how the work is identified and planned.

Tasks can be created in the following ways:

- Manually, from the **Tasks** tab, which is available on the **PLANNING** or **WORKPACKS** screen, when editing tasks in supported dashboards or when editing workpacks. (see *Create Tasks Manually*).
- By importing, using the **Import** function on the **Tasks** tab of the **PLANNING** or **WORKPACKS** screen (see *Import*).
- Automatically, when a planning template is applied (see *Planning Templates*).
- From an anomaly action, where a task is created to carry out remediation or follow up work.

  For example, a previous inspection may have identified a fault by recording an event and logging a finding, or NEXUS IC may have logged a finding when a data value was outside acceptable limits. An anomaly can then be raised to track the issue, followed by an anomaly action that defines the intended response. A task can be created and linked to that anomaly action so that the remediation work is carried out as part of a specific workpack.
- As a continuation of an existing task, when work cannot be completed in a single session, for example due to time constraints or weather conditions. In this case, a continuation task can be created to capture the remaining work.

13.3.3.1.1 Prerequisites

Before creating a task, ensure that:

- A workpack exists to which the task can be assigned (see *Workpacks*).
- The required event type has been configured (see *Configure Event Types*).

13.3.3.1.2 Create Tasks Manually

1. Open the **Tasks** tab from any supported location such as the **PLANNING** screen, the **WORKPACKS** screen, when editing tasks in supported dashboards or when editing workpacks.
2. Choose **Add** in the toolbar.
3. In the **Add Task** dialog, select the asset to which you want to assign the task and specify other parameters as required. Assigning a workpack and an event type is mandatory. For information about how to fill the fields in the dialog, see *Add/Edit Task Dialog*.
4. Click **OK** to save the task.

Result

The task is created and displayed in the list of tasks on the **Tasks** tab.

13.3.3.1.3 Create Ad Hoc Tasks

You can create *ad hoc tasks* when you create or edit a regular task and select the **Adhoc Task** checkbox in the **Add Task** or **Edit Task** dialog (see *Add/Edit Task Dialog*). When you change a regular task to an ad hoc task, the available fields and screen options change.

In IC-Inspector, when an inspector selects an ad hoc task and fills out the form, the task will not vanish from their list — it will be available for them to complete again and again. You only need to create one ad hoc task of each type, as a single ad hoc task will be available on all assets. You should create that task on the highest-level relevant asset that has that event type available. Ad hoc tasks are suitable for events like "Damage", where you want inspectors to be able to note any damage they see, even if it's not part of the explicitly-tasked scope.

13.3.3.2 Edit Tasks

Once you have created a task, you can update its properties, assign them to inspectors or manage its associated library items as follows:

1. Open the **Tasks** tab from any supported location such as the **PLANNING** screen, the **WORKPACKS** screen, when editing tasks in supported dashboards or when editing workpacks.
2. Select the relevant tasks (you can use multi-select) and choose **Edit** on the toolbar.
3. In the **Edit Task** dialog, you can:
   - Use the **Task** tab to update the task's properties, assign inspectors (see *Assign Tasks*), and review its completion status.
   - Use the **Library** tab to manage library items linked to the task.

   For more information, see *Add/Edit Task Dialog*.
4. Click **OK** to save your changes.

13.3.3.3 Assign Tasks

To ensure that tasks appear on an inspector's task list, you must assign tasks to the inspector. To do that, follow the steps below:

1. Open the **Tasks** tab from any supported location such as the **PLANNING** screen, the **WORKPACKS** screen, when editing tasks in supported dashboards or when editing workpacks.
2. Select the relevant tasks (you can use multi-select) and choose **Edit** in the toolbar.
3. In the **Edit Task** dialog, select the required inspector in the **Assigned To** field. You can click **Add** on the picker to create a new inspector.
4. Click **OK** to save the task.

> **Result**
>
> The next time the inspector clicks **Sync** in IC-Inspector, they will receive their tasks.

> **Note**
>
> In case you do not assign an *ad hoc task* to an inspector, it will still be synchronised to all inspectors that have at least one assigned task in the same workpack.

13.3.3.4 Reschedule Tasks

Reschedule allows for planning template tasks to be moved from one workpack to another.

To reschedule tasks, proceed as follows:

1. Open the **Tasks** tab from any supported location such as the **PLANNING** screen, the **WORKPACKS** screen, when editing tasks in supported dashboards or when editing workpacks.
2. Select the relevant tasks (you can use multi-select) and choose **Reschedule** from the toolbar.
3. In the **Select Workpack** dialog, select the workpack to which you want to reassign the planning template task.
4. Click **OK** to move the task to the selected workpack.
5. On the **PLANNING** screen, go to the **Planning Templates** tab and select the planning template that has been changed due to rescheduling.
6. Choose **Update** in the toolbar to update the planning template.

> **Note**
>
> You can only reschedule tasks that are associated with a planning template. The reschedule option is not available for tasks that have been imported or manually created.

13.3.3.5 Launch Tasks

Launching a task opens the relevant event or sensor form so you can record inspection, maintenance or sensor data for that task. The form that appears depends on the event type assigned to the task.

When you complete and save the event details, an event record is created and linked to the task. If the task uses a sensor event type, a sensor record is created instead. In both cases, the task is marked as complete once the record is saved.

To launch a task:

1. Open the **Tasks** tab from any supported location such as the **PLANNING** screen, the **WORKPACKS** screen, when editing tasks in supported dashboards or when editing workpacks.
2. Select one or more tasks (multi-select is supported) and choose **Launch** from the toolbar.
3. In the dialog that opens, enter the required details in the form.

   > **Note**
   >
   > The **Start Clock** and **End Clock** fields are not populated automatically. You must enter these values manually on the **Survey** tab.

4. Click **OK**.

   > **Result**
   >
   > - If you have selected multiple tasks, the event forms are presented one after another, allowing you to complete each task in turn.
   > - An event record is created and linked to each launched task.
   > - Event numbers are assigned automatically for each event type by incrementing the highest existing number. Once completed, the relevant event type and event number is displayed in the **Event** column for the task in the task grid.

- If a sensor event type is assigned to the task, a sensor record is created, which will be visible on the **Sensor** tab of the **Assets** screen for the relevant asset. Once completed, the sensor name and timestamp appear in the **Sensor** column for the task in the task grid.
- Each task is marked as complete.

Note

Only incomplete tasks can be launched.

13.3.3.6 Complete Tasks

In general, inspectors complete tasks directly in IC-Inspector (see *Complete Tasks - IC-Inspector*) or IC-Inspection (see *Complete Tasks - IC-Inspection*).

Tasks can also be marked as complete in NEXUS IC in the following ways:

- By launching the task from the **Tasks** tab from any supported location (see *Launch Tasks*).
- For **ad hoc tasks**, by editing the task on the **PLANNING** or **WORKPACKS** screen and selecting the **Adhoc Complete** checkbox in the **Edit Task** dialog.
- From the **Incomplete Tasks** pane on the **INSPECTIONS** screen, by performing one of the following actions:
  - Launching the task.
  - Manually linking the task to an existing event.

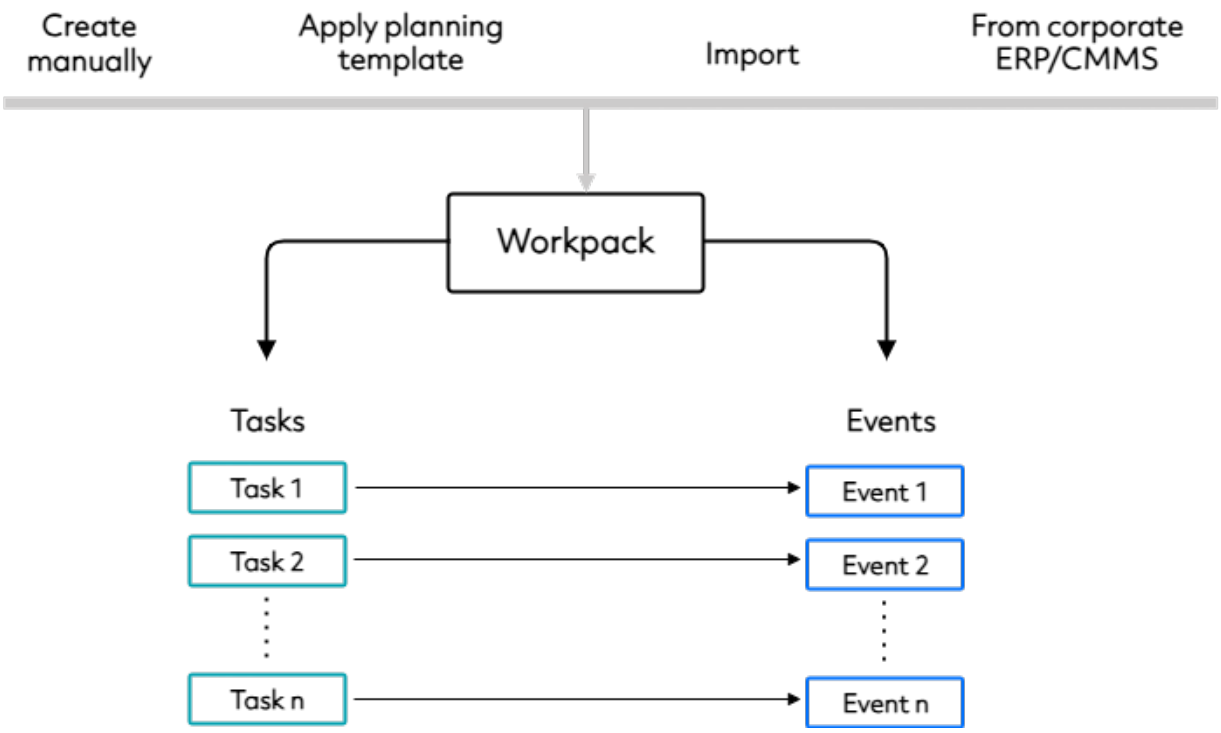
  For more information, see *Incomplete Tasks*.

13.4 Workpacks

A workpack is a collection of tasks and events.

Workpacks can be created in the following ways:

- Automatically by means of *Planning Templates*
- Manually created from the **WORKPACKS** screen or from wherever the **Add Workpack** dialog is triggered
- Bulk imported from MS Excel (see *Import*)
- Automatically via connection with a corporate Enterprise Resource Planning (ERP) / Computerised Maintenance Management System (CMMS) system



You perform workpack-related activities on the **WORKPACK** screen. For more information about navigating on the screen, see *WORKPACKS Screen*.

13.4.1 Configuration

You can set up cost codes, define workpack groups and workpack revisions in your configuration settings. For more information, see *Configure Planning Data*. You can also make these settings when you're editing workpacks.

13.4.2 Manage Workpacks

You can create, edit, delete, import or export workpacks from the main toolbar of the **WORKPACKS** screen. For more information, see the sections below:

- *Create Workpacks Manually*
- *Edit Workpacks*
- *Import*
- *Export*

You can also manage records associated with a selected workpack using the tabs at the bottom of the **WORKPACKS** screen, which allow you to:

- Review and manage tasks included in the workpack (see *Tasks*)
- Assign and review risk models (see *Risk*)
- Schedule shutdowns (see *Shutdowns*)
- Export a workpack summary (see *Workpack Summary*)

- View and manage anomaly records associated with the asset of the selected workpack (see *Anomalies*)

13.4.3 Report Table Sources

To extract workpack data into a report template, use the System Table titled **Workpack** as the primary Table Source. For more information see *Configure Report Templates*.

See also

- *Planning and Workpacks*
- *WORKPACKS Screen*

13.4.3.1 Create Workpacks Manually

To create a new workpack, proceed as follows:

1. On the **WORKPACKS** screen, choose **Add** from the top toolbar. Alternatively, you can start creating a workpack by choosing **Add** whenever you select a workpack from the **Select Workpack** dialog. (For example, this dialog can be triggered when you assign a workpack to a task whenever you create or edit a task.)
2. In the **Add Workpack** dialog, enter a name for the workpack (mandatory) and specify other parameters as required. For more information about specifying the parameters, see *Add/Edit Workpack Dialog*.
3. Click **OK** to save the workpack.

Result

The workpack is created and displayed in the list of workpacks on the **WORKPACKS** screen (see *WORKPACKS Screen*).

See also

- *Workpacks*
- *WORKPACKS Screen*

13.4.3.2 Edit Workpacks

Once you have created a workpack, you can update its properties, assign library items to it or check the planning templates associated with it as follows:

1. On the **WORKPACKS** screen, select the relevant workpack and choose **Edit** from the top toolbar.
2. In the **Edit Workpack** dialog, you can:
   - Update the properties, reassign workpack group, revision or asset on the **Workpack** tab.
   - Review or add associated asset history records linked to the workpack asset on the **Asset History** tab.
   - Manage tasks associated with the workpack on the **Tasks** tab.
   - Add a library item to the workpack on the **Library** tab.
   - Check the associated planning templates on the **Associated Planning Templates** tab.

   For more information, see *Add/Edit Workpack Dialog*.

3. Click **OK** to save the workpack.

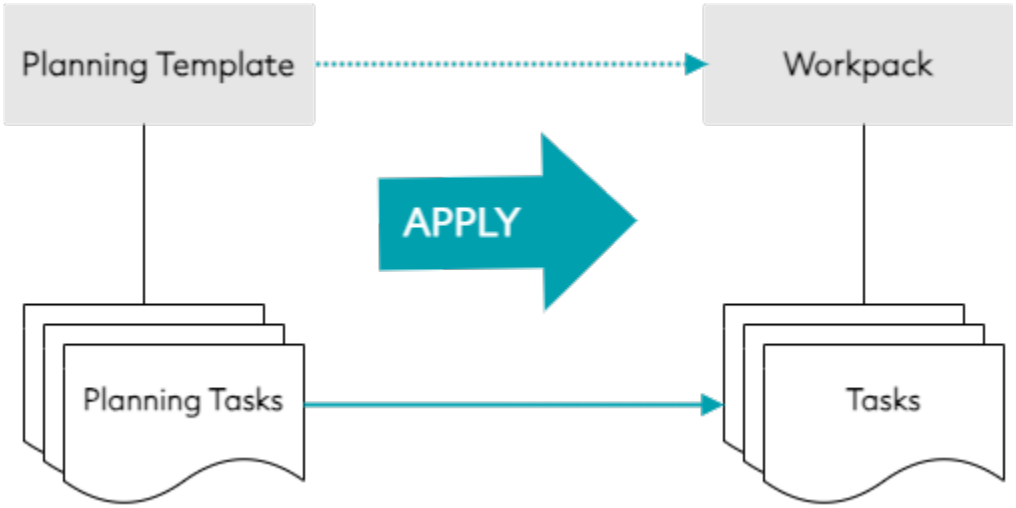
See also

- *Workpacks*
- *WORKPACKS Screen*
- *Add/Edit Workpack Dialog*

13.5 Planning Templates

Planning templates are records on which workpacks and tasks are generated.

Planning templates allow you to automatically set up future workpacks (groups of inspection or testing tasks). A planning template is a group of *planning tasks*. When you apply the planning template, a planning task becomes a task in a workpack.



Note

By default, new workpacks are created when you apply planning templates, however, you can also select existing workpacks to which you want to assign the future tasks.

You can manage planning templates on the **Planning Templates** tab either on the **PLANNING** screen or the **ASSETS** screen. See below for more information:

- *Create Planning Templates*
- *Check Summary*
- *Manage Planning Tasks*

- *Apply Planning Templates*
- *Update Planning Templates*

See *Worked Examples* for step-by-step guide on how to configure and maintain planning templates.

13.5.1 Report Table Sources

To extract Planning Template data into a report template, use the System Table titled **Planning Template** as the primary Table Source. For more information on Report Templates see *Configure Report Templates*.

See also

- *PLANNING Screen*
- *WORKPACKS Screen*
- *Planning and Workpacks*
- *Worked Examples*

13.5.1.1 Create Planning Templates

To create a new planning template in NEXUS IC, follow the steps below:

1. On the **ASSETS** or **PLANNING** screen, go to the **Planning Templates** tab and choose **Add**.
2. In the **Add Planning Template** dialog, enter a name for the planning template (mandatory) and specify other parameters as required. For more information about specifying the parameters, see *Add/Edit Planning Template Dialog*.
3. Click **OK** to save the planning template.

Result

The planning template is created and displayed in the list of planning templates on the **Planning Templates** tab.

See also

- *Example: Create Planning Template and Asset Task with Manual Repeat*
- *Worked Examples*
- *Planning Templates*

13.5.1.2 Check Summary

When editing a planning template, you can review the details of the planning template and its associated planning tasks on the **Summary** tab of the **Edit Planning Template** dialog.

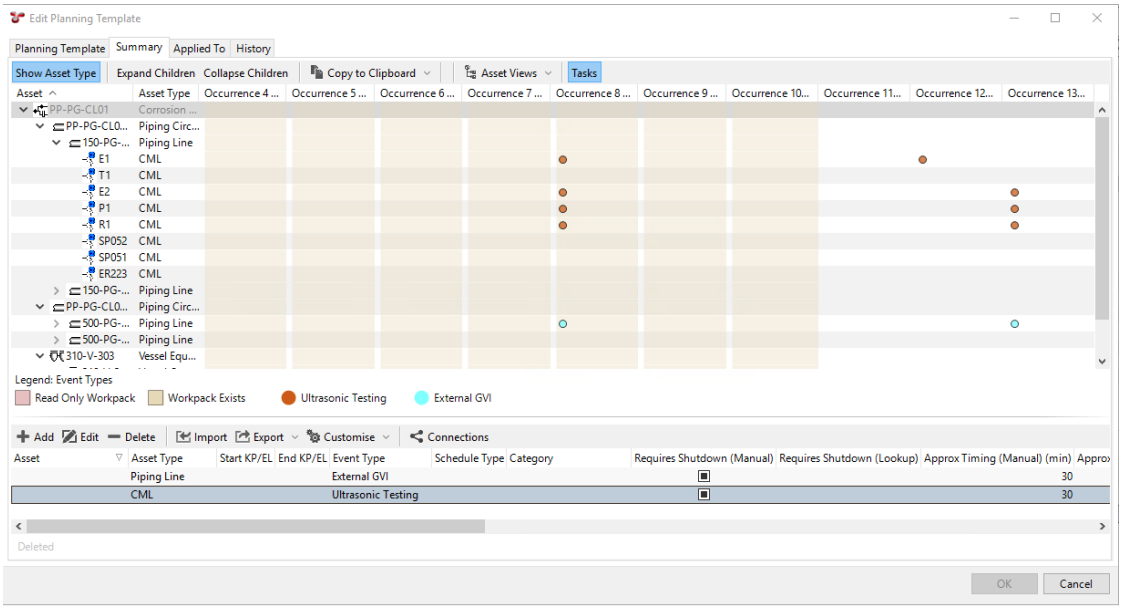
The screen on the **Summary** tab has two main parts:

- The top half of the dialog is a visual summary showing the tasks that will be created once the planning template is applied (see below for more information).
- If you toggle the **Tasks** button in the toolbar on, you can see a list of the planning tasks at the bottom of the dialog. Here you can create and manage planning tasks. For more information, see *Manage Planning Tasks*.

13.5.1.2.1 Visual Summary

In the top half of the dialog, you can see the asset tree, which is filtered from the **Base Asset** that you have set up in the Planning Template properties (see *Add/Edit Planning Template Dialog*). If no Base Asset has been defined, then the entire tree for the default Asset View is displayed.

Each planning task is represented by a coloured circle in the summary against their asset in the asset tree displayed in a calendar form. Here you can see where the tasks will be created once the planning template is applied. The number of **Occurrence** columns displayed on the right of the asset tree is equal to the number of Occurrences defined in the planning template. Each occurrence will be represented by a workpack after the planning template has been applied.



13.5.1.3 Manage Planning Tasks

You can create, update and delete *planning tasks* as described below:

- *Create Planning Tasks from Planning Templates*
- *Create Planning Tasks from Anomaly Actions*
- *Update Planning Tasks*
- *Delete Planning Tasks*
- *Assign Anomaly Action to a Planning Task*

13.5.1.3.1 Create Planning Tasks from Planning Templates

1. On the **ASSETS** or **PLANNING** screen, go to the **Planning Templates** tab.
2. Select the planning template to which you want to assign the planning task and choose **Edit** from the toolbar (1).
3. In the **Edit Planning Template** dialog, go to the **Summary** tab (2) and ensure that **Tasks** in the toolbar is toggled on (3).
4. In the bottom part of the dialog, choose **Add** from the toolbar (4).

5. In the **Add Planning Task** dialog, you must specify the following (mandatory fields): 5

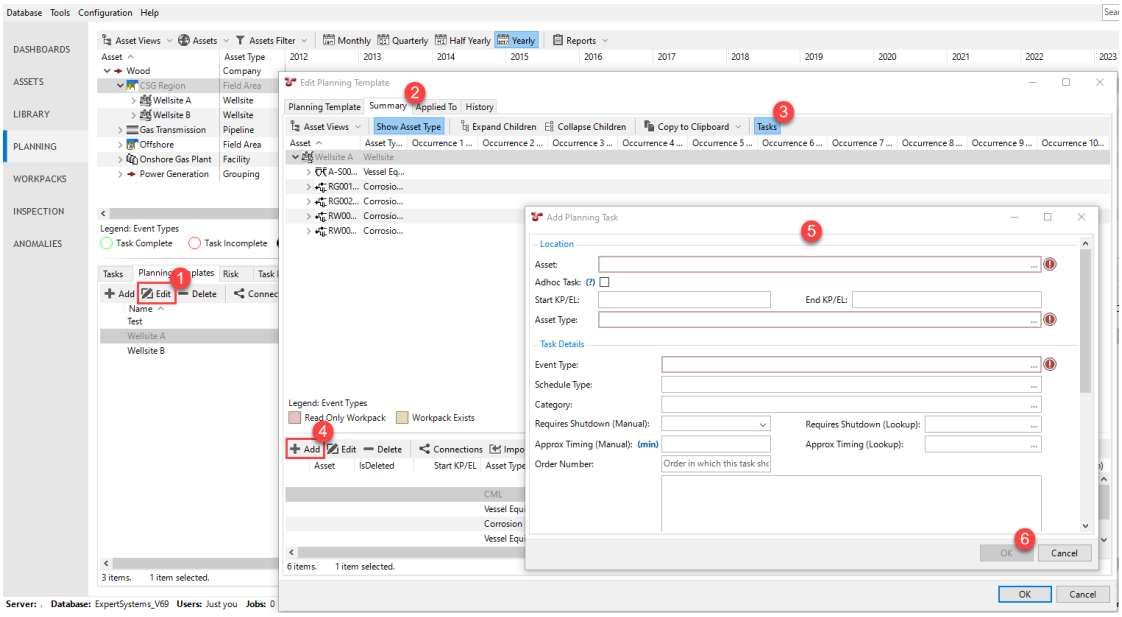
   - You must define either the **Asset** or the **Asset Type** to which you want to assign the planning task. If you specify an asset type, tasks will be created for all assets of the specified type using the frequency.
   - You must select an event type. This can be an Event or a Continuous Event.

6. Specify other parameters as required. For more information about specifying the parameters, see *Add/Edit Planning Task Dialog*.

7. Click **OK** to save the planning task 6.

Result

The planning task is created and displayed on the **Summary** tab of the **Edit Planning Template** dialog.



13.5.1.3.2 Create Planning Tasks from Anomaly Actions

In case a planning task needs to be created as a result of an anomaly action, you can create the planning task directly from the anomaly action. For more information, see *Assign Planning Task to Anomaly Action*.

13.5.1.3.3 Update Planning Tasks

1. On the **ASSETS** or **PLANNING** screen, go to the **Planning Templates** tab.
2. Select the planning template that contains the planning task and choose **Edit** from the toolbar.
3. In the **Edit Planning Template** dialog, go to the **Summary** tab and ensure that **Tasks** in the toolbar is toggled on.
4. In the bottom part of the dialog, select the required planning task and choose **Edit** from the toolbar.

5. In the **Edit Planning Task** dialog, make your updates as required. For more information, see *Add/Edit Planning Task Dialog*.
6. Click **OK** to save the planning task.
7. After each update of a planning task, you must update the relevant planning template as well. For more information, see *Update Planning Templates*.

13.5.1.3.4 Delete Planning Tasks

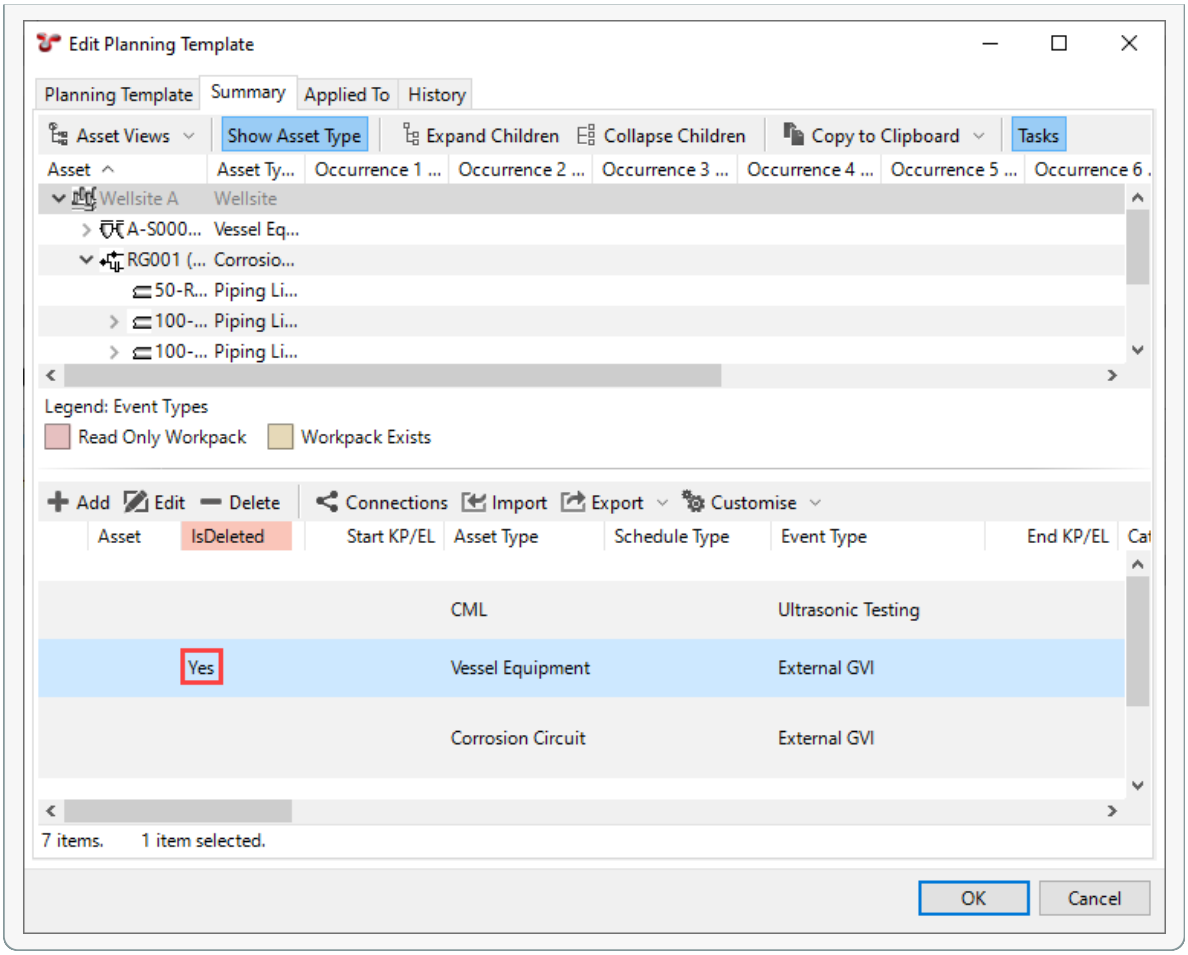
Deletion of a planning task works slightly differently to the deletion of other items within NEXUS. For all other types of items in NEXUS, clicking the **Delete** button deletes the item. However, if you have applied the planning task to create one or more tasks, the planning task is not deleted directly but instead, an *IsDeleted* flag is applied to the planning task. This ensures that NEXUS knows that those tasks were created from this planning task. Once all the tasks that were created from that planning task are deleted, the planning task will also be removed from the underlying database table.

Consider the case where you want to delete an event definition. First, you must delete everything that depends on that event definition. This includes planning tasks which use this event definition, but the way to remove those planning tasks is to remove the tasks that in turn relied on that planning task. Once this is done, you should be able to delete the event definition (which will delete all events of that type, and so on).

To delete a planning task, proceed as follows:

1. On the **ASSETS** or **PLANNING** screen, go to the **Planning Templates** tab.
2. Select the planning template that contains the planning task and choose **Edit** from the toolbar.
3. In the **Edit Planning Template** dialog, go to the **Summary** tab and ensure that **Tasks** in the toolbar is toggled on.
4. In the bottom part of the dialog, select the required planning task and choose **Delete** from the toolbar.

> **Result**
>
> If you have not applied the planning task to create one or more tasks, the planning task gets deleted. If, however, you have tasks created based on the planning task, the planning task gets the *IsDeleted* flag:



13.5.1.3.5 Assign Anomaly Action to a Planning Task

In case you have an existing planning task, you can link an anomaly action to it as described below.

1. On the **ASSETS** or **PLANNING** screen, go to the **Planning Templates** tab.
2. Select the planning template that contains the planning task and choose **Edit** from the toolbar.
3. In the **Edit Planning Template** dialog, go to the **Summary** tab and ensure that **Tasks** in the toolbar is toggled on.
4. In the bottom part of the dialog, select the required planning task and choose **Edit** from the toolbar.
5. In the **Edit Planning Task** dialog, in the **Anomaly Action** field, click ... to select the anomaly action as required.

> **Note**
>
> You can create a new anomaly and anomaly action from here or you can choose an existing one. You can only assign an anomaly action that is linked to the same asset.

6. Click **OK** to save your changes.

Note

You can also assign a planning task to an anomaly action when editing the relevant action on the **ANOMALIES** or **ASSETS** screen. For more information, see *Assign Planning Task to Anomaly Action*.

See also

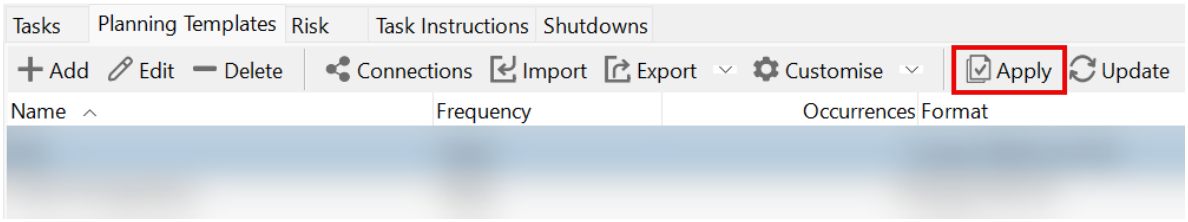
- *Worked Examples*
- *Planning Templates*

13.5.1.4 Apply Planning Templates

When a planning template is applied, tasks are created based on the planning tasks and they are assigned to a workpack.

To apply a planning template, proceed as follows:

1. On the **ASSETS** or **PLANNING** screen, go to the **Planning Templates** tab and select the planning template.
2. Click **Apply** in the toolbar to launch the **Apply Planning Template** wizard.



3. Set up the Occurrences to define how far into the future you want to create workpacks. Specify either of the following:
   - In the **Specific Date** field, enter the end date when the last workpack needs to be created. This will automatically calculate the number of occurrences to apply based on the frequency that you have set up for the planning template.
   - In the **Number of Occurrences** field, define how many future workpacks you want be created. This will automatically calculate the future dates for the workpacks based on the frequency that you have set up for the planning template. For example, if you enter *10*, and the frequency is Yearly, 10 years of future workpacks will be created.
4. Click **Next**.
5. Specify the workpack for each occurrence. You can choose either of the following:
   - Create a new workpack for the tasks to be created in. In this case, leave the value *<New>* in the **Workpack** column.
   - Choose an existing workpack. In this case, double-click the field in the **Workpack** column, and choose the ellipsis ⋯ to select a workpack.
6. Click **Apply**.

Result

The tasks and workpacks (if relevant) are created. You can now see them on the **PLANNING** and **WORKPACKS** screens. You can check the workpacks that a planning template has been applied to on the **Applied To** tab of the **Edit Planning Template** dialog when editing a planning template.

Note

You can also use multi-select to apply several planning templates at once. In this case, all the selected planning templates must have the same frequency, and you won't be able to select workpacks to apply the planning templates to, new workpacks will be created for each.

See also

- *Worked Examples*
- *Planning Templates*

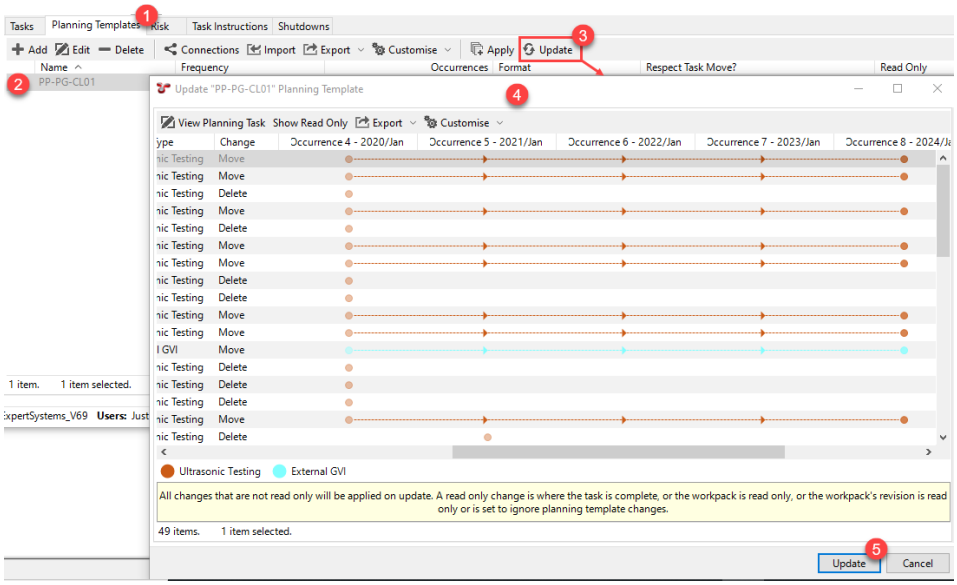
13.5.1.5 Update Planning Templates

Whenever you change the schedule or frequency of planning tasks, you must update the relevant planning template to ensure that previously generated workpacks and tasks are updated accordingly. To update the planning template, proceed as follows:

1. On the **ASSETS** or **PLANNING** screen, go to the **Planning Templates** tab (1) and select the relevant planning template (2).
2. Choose **Update** from the toolbar. (3)
3. In the dialog that pops up, review the proposed changes to existing tasks and view new tasks. (4) The dialog shows all changes that will be applied once you click the **Update** button.
4. Click **Update**. (5)

Result

Changes to the tasks are applied and the planning template is updated accordingly.



Note

- You can also use multi-select to update several planning templates at once. In this case, updates to each planning template are represented on separate tab pages in the **Update Planning Template** dialog.
- When you update a planning template, the changes are made inside a database transaction. This means that changes can be rolled back in the event of a problem (such as loss of database connection partway through the process). However, since SQL Server can handle at most one open transaction at a time, any other copy of NEXUS IC that attempts to carry out updates (or potentially other planning template changes) will be blocked until the update process completes.

See also

- *Worked Examples*
- *Planning Templates*

13.5.1.6 Worked Examples

See below for worked examples about managing planning templates and planning tasks:

- *Example: Create Planning Template and Asset Task with Manual Repeat*
- *Example: Update Frequency for Planning Task*
- *Example: Change Manual Repeat to Lookup Repeat*
- *Example: Create Task for Asset Type with Lookup Repeat*

13.5.1.6.1 Example: Create Planning Template and Asset Task with Manual Repeat

In the following example, we create a ultrasonic testing inspection planning template for a subset of CML assets with manual repeat.

1. Create a planning template.

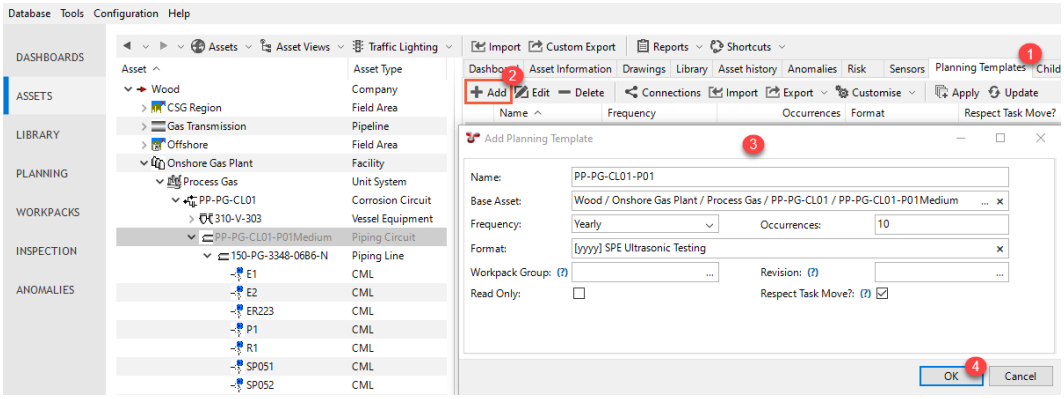
   a. On the **ASSETS** or **PLANNING** screen, go to the **Planning Templates** tab (1) and choose **Add** (2).

   b. In the **Add Planning Template** dialog, enter data as follows: (3)

   - **Name**: Choose a name that best describes your planning template.
   - **Base Asset**: Select a parent asset, which will behave as a filter in later screens.
   - **Frequency**: Select *Yearly*, which means that a task will be created on a yearly basis.
   - **Occurrences**: Enter *10*, which means that we will be able to view **10** columns on the **Summary** tab (see next step).
   - **Format**: Enter *[yyyy] SPE Ultrasonic Testing*, which means that when the workpacks are automatically generated, they will be named **2024 SPE Ultrasonic Testing**, **2025 SPE Ultrasonic Testing**, **2026 SPE Ultrasonic Testing** and so on.

   For more information about the parameters in this dialog, see *Add/Edit Planning Template Dialog*.

   c. Click **OK** to save the planning template. (4)



2. Create the planning template tasks.

   a. Select the planning template you created in the previous step on the **Planning Templates** tab and choose **Edit** from the toolbar (1).

   b. In the **Edit Planning Template** dialog, go to the **Summary** tab (2) and ensure that **Tasks** in the toolbar is toggled on (3).

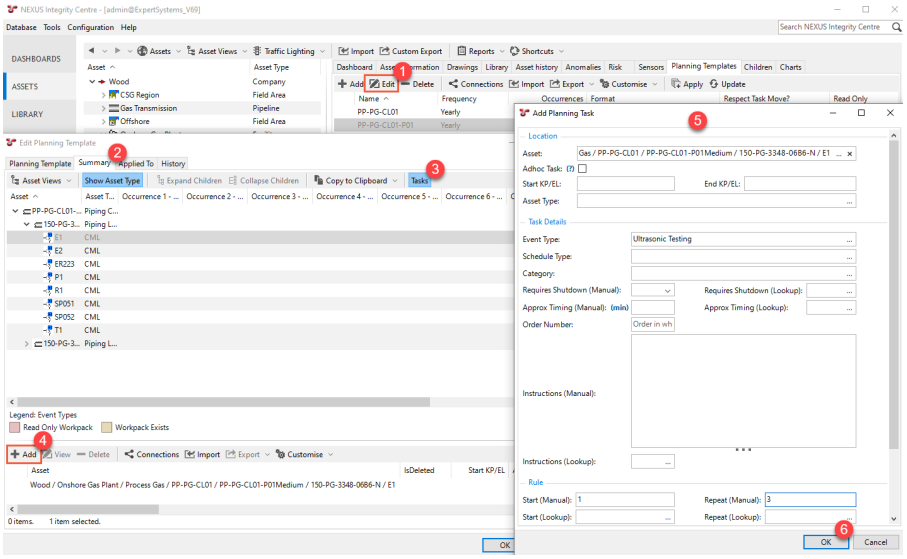
c. In the bottom part of the dialog, choose **Add** from the toolbar 4.

d. In the **Add Planning Task** dialog, specify the following: 5

- **Asset** - Select the asset for which you want to create the task.
- **Event Type** - Select the *Ultrasonic Testing* event type.
- **Start** - Enter *1* as the first occurrence that this task should occur.
- **Repeat** - Enter *3* to indicate that you want this task to be created at every third occurrence. In this case, since the planning template's frequency is yearly, a task will be created every third year after the first occurrence.

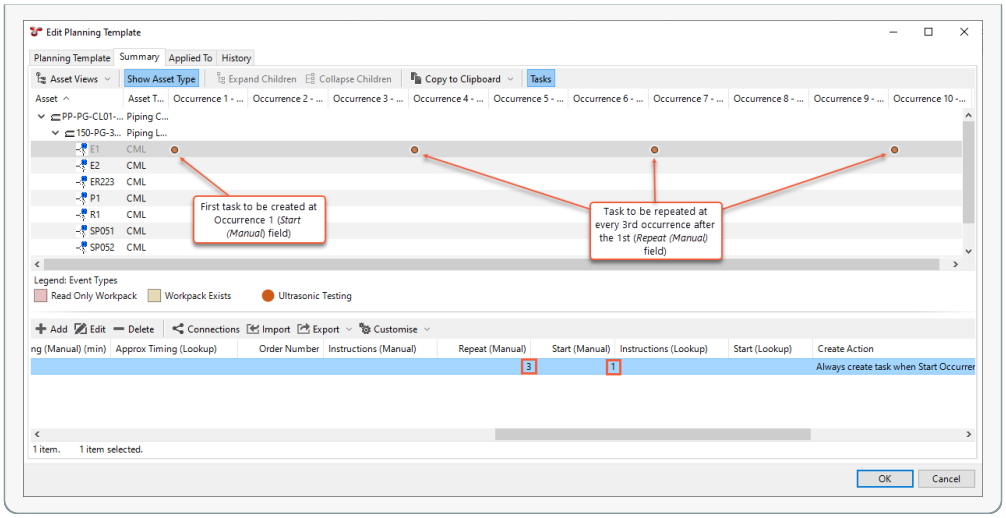
For more information about specifying the parameters, see *Add/Edit Planning Task Dialog*.

e. Click **OK** to save the planning task 6.



Result

On the **Summary** tab, you can see where the tasks will be created once the planning template is applied. Note that there are altogether 10 occurrences shown on the screen, as we have defined 10 occurrences for the planning template.



3. Apply the planning template.

   Applying the planning template creates the workpack and task records.

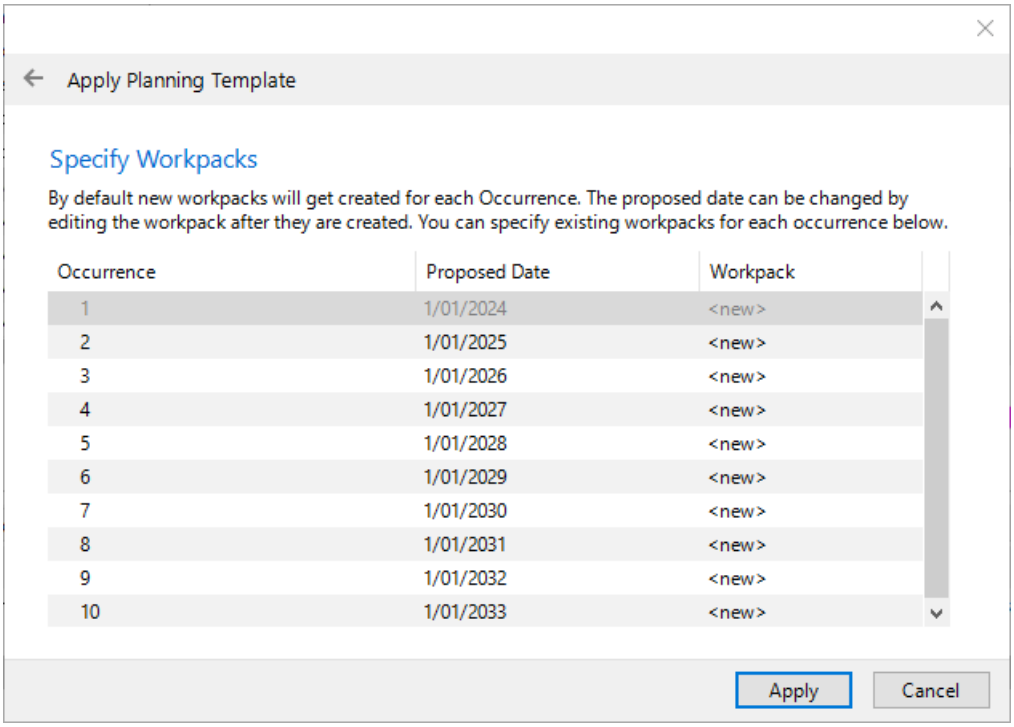
   a. On the **ASSETS** or **PLANNING** screen, go to the **Planning Templates** tab and select the planning template.

   b. Click **Apply** in the toolbar to launch the **Apply Planning Template** wizard.

   c. Set up the Occurrences to define how far into the future you want to create workpacks. In this example, we want to create 10 years of future workpacks, thus, we enter *10* in the **Number of Occurrences** field. All future dates will be will automatically calculated.

   d. Click **Next**.

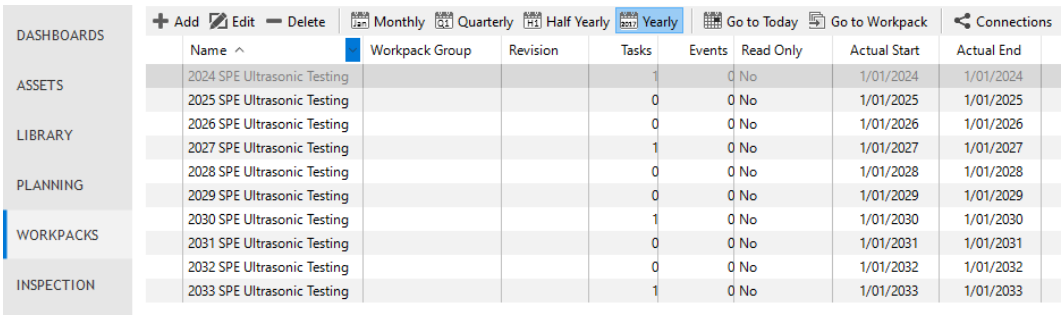
   e. In the next dialog, we can specify the workpacks for each occurrence, either by choosing an existing workpack or electing to create a new workpack for the tasks to be created in. In this example, we want to create new workpacks, one in each occurrence (year) for 10 occurrences (years), thus, we leave the value <*New*> in the **Workpack** column for each occurrence.



f. Click **Apply**.

4. Check the workpacks.

   Select the newly created workpacks on the **WORKPACKS** screen and view the tasks in that workpacks. In this example, tasks have been created in the **2024 SPE Ultrasonic Testing**, **2027 SPE Ultrasonic Testing**, **2030 SPE Ultrasonic Testing** and **2033 SPE Ultrasonic Testing** workpacks (the 1st occurrence, then every 3rd occurrence after that).



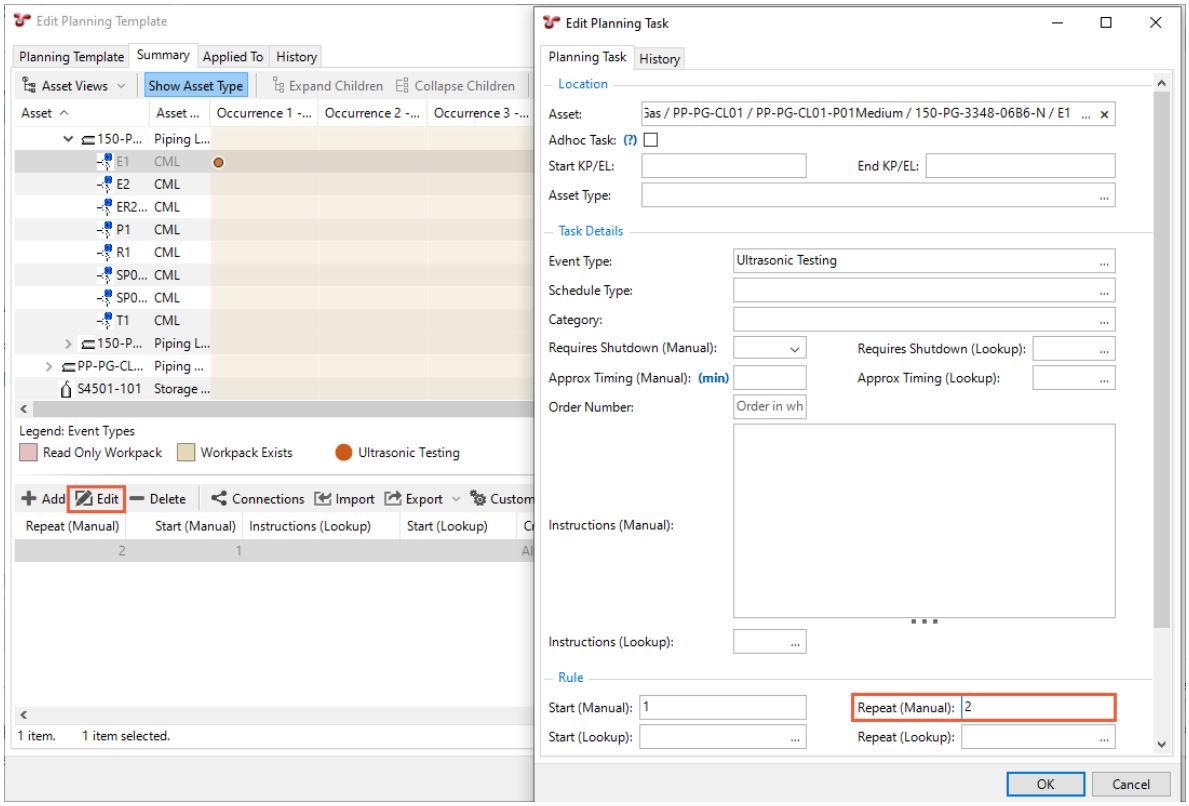
See also

- *Planning Templates*
- *Create Planning Templates*
- *Apply Planning Templates*

13.5.1.6.2 Example: Update Frequency for Planning Task

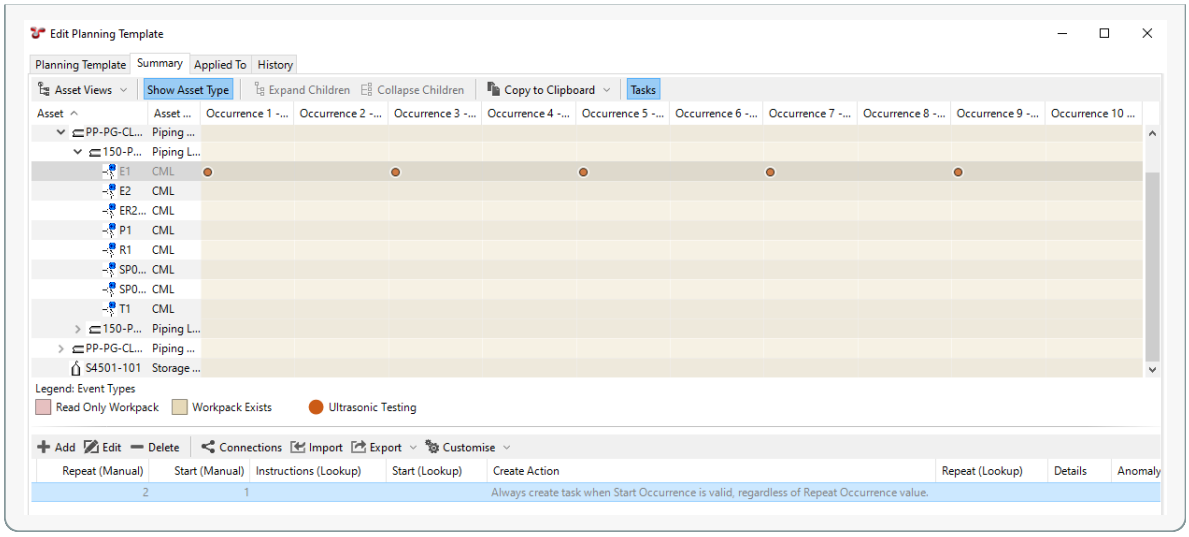
In this example, we want to update the planning task that we created in the *previous example* by increasing the frequency of the UT inspection campaigns to every second year instead of every third. To do this, we edit the planning template task by editing the **Repeat** field from 3 to 2, as follows:

1. Edit the relevant planning template to get to the **Edit Planning Template** dialog and go to the **Summary** tab.
2. Edit the required planning task (double-click it or select it and choose **Edit**).
3. In the **Edit Planning Task** dialog, change the value of the **Repeat (Manual)** field to *2*).



4. Click **OK**.

> **Result**
>
> On the **Summary** tab, you can see that a task will be created every second year now:



5. Update the planning template to ensure that previously generated workpacks and tasks are updated with the revised frequency.

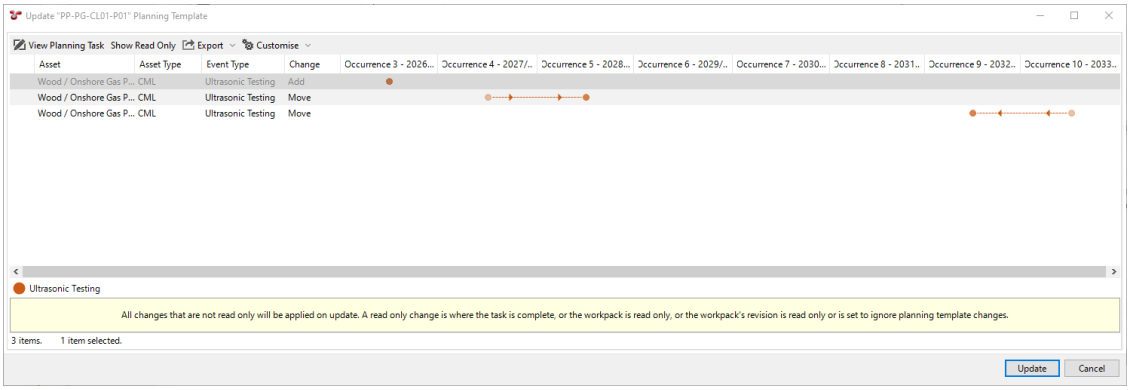
   Follow the steps below:

   a. On the **Planning Templates** tab, select the planning template that contains the updated task.

   b. Click **Update** in the toolbar.

   c. In the dialog that appears, review the proposed changes.

      You can see that a new task will be created for 2026, which will be the second repeat now that we've changed the frequency to every second year and the first occurrence was in 2024. You can also see that the task that was created for 2027 will be moved to 2028 and the task that was created for 2033 will be moved to 2032. Tasks that are unchanged are not shown, thus, we do not see the tasks for 2024 and 2030.



6. Click **Update** to apply the changes to the workpacks and tasks.

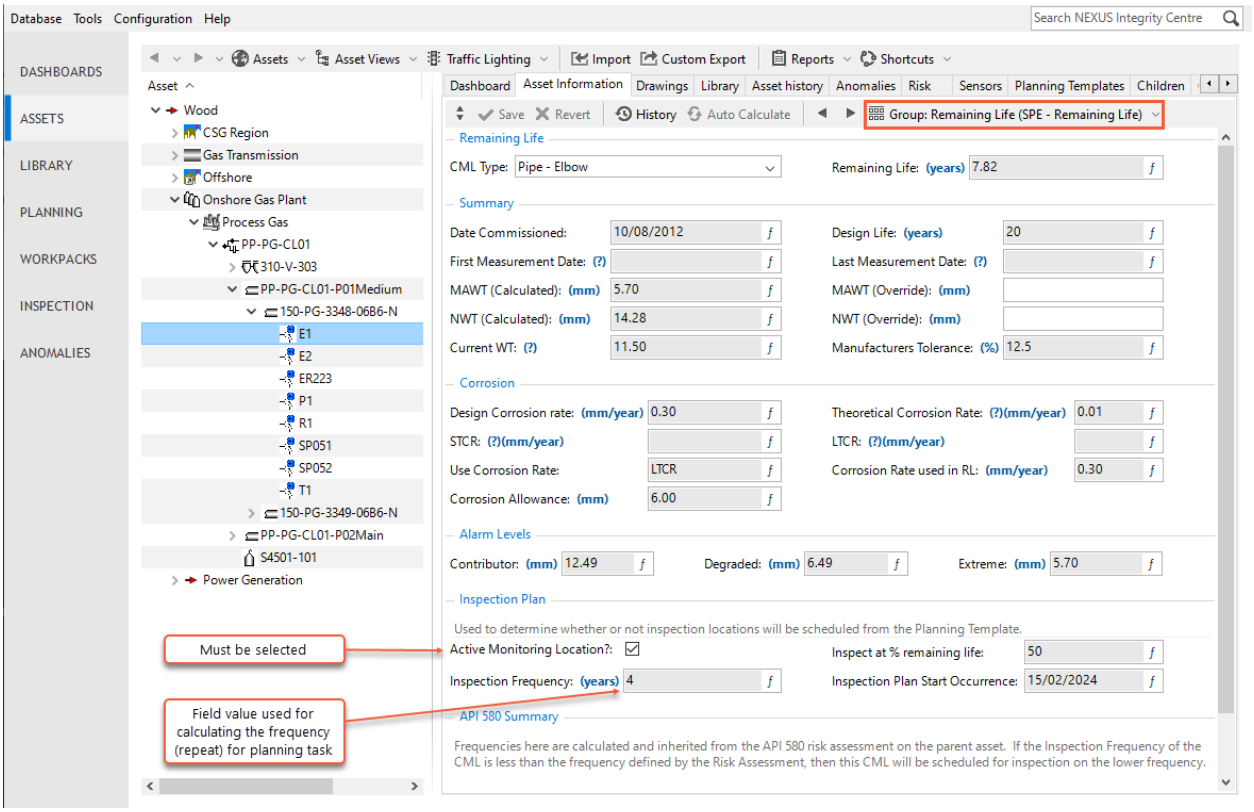
See also

- *Update Planning Templates*
- *Manage Planning Tasks*
- *Planning Templates*

13.5.1.6.3 Example: Change Manual Repeat to Lookup Repeat

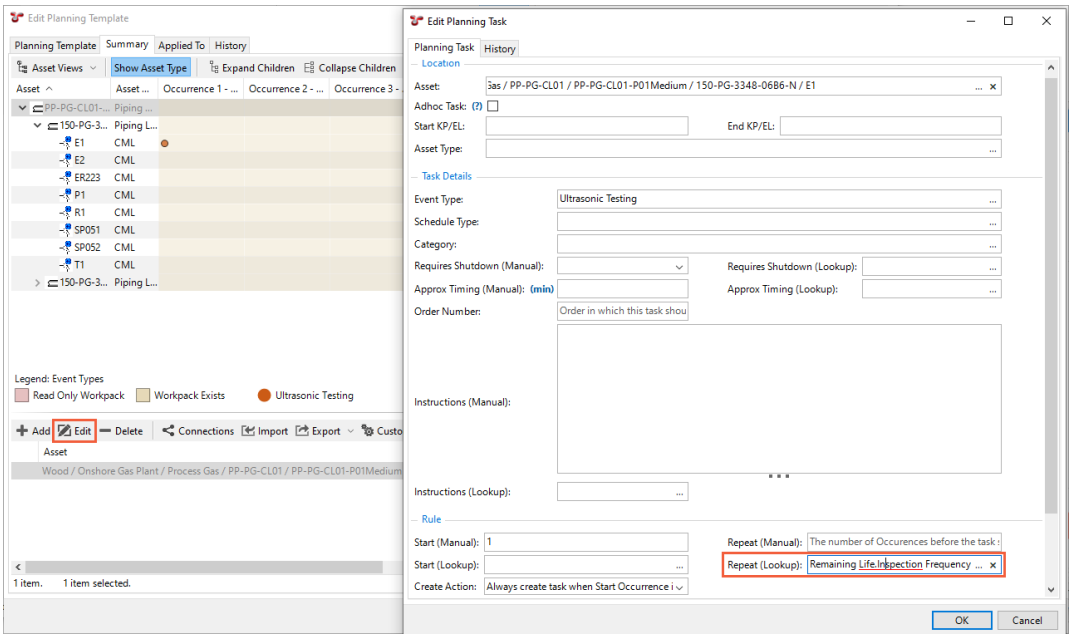
Most commonly, inspection frequencies are a moving target, in that frequencies tend to increase or reduce depending on inspection results. Where corrosion rates are low, then inspection can be less often; when high, then inspection needs to occur more often.

NEXUS IC allows for the frequency (Repeat) field to be an input from a field in an Asset Information Group (AIG). Using the *previous example*, we will change the Repeat from static 3 to use a field from the **Remaining Life** AIG. Note that frequency will only be calculated if the CML is identified as an Active Monitoring Location:



To update the planning task with the new frequency, proceed as follows:

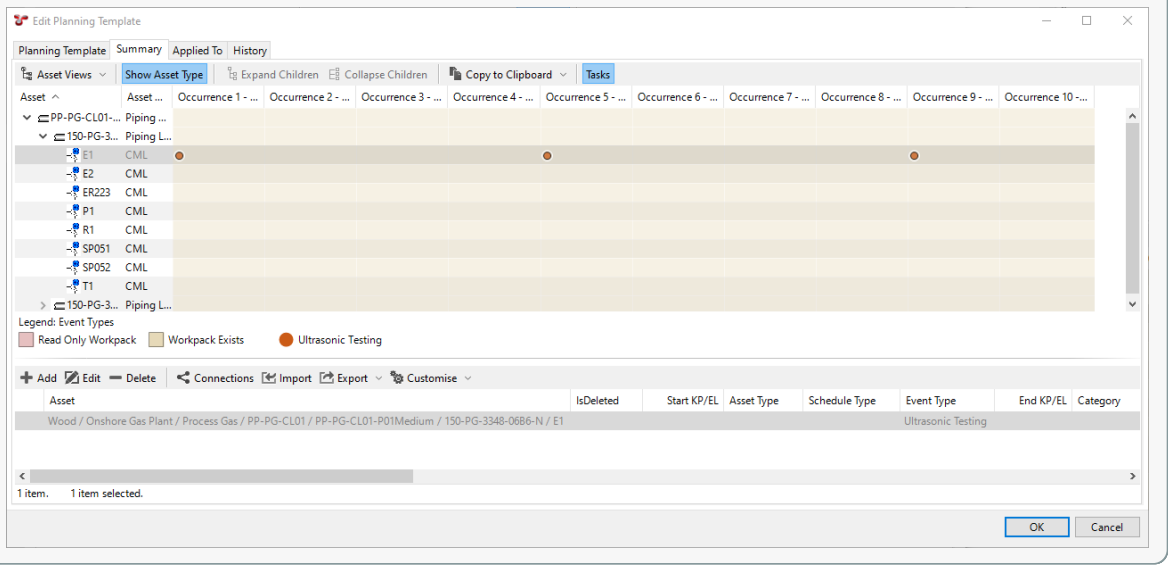
1. Edit the relevant planning template to get to the **Edit Planning Template** dialog and go to the **Summary** tab.
2. Edit the required planning task (double-click it or select it and choose **Edit**).
3. In the **Edit Planning Task** dialog, remove the value from the **Repeat (Manual)** field and in the **Repeat (Lookup)** field, select the field **Inspection Frequency** under the AIG **Remaining Life**.



4. Click **OK**.

Result

On the **Summary** tab, you can see that a task will be created every fourth year now, since the **Inspection Frequency** field in the **Remaining Life** AIG was defined to be performed every fourth year.



5. Update the planning template to ensure that previously generated workpacks and tasks are updated with the revised frequency.

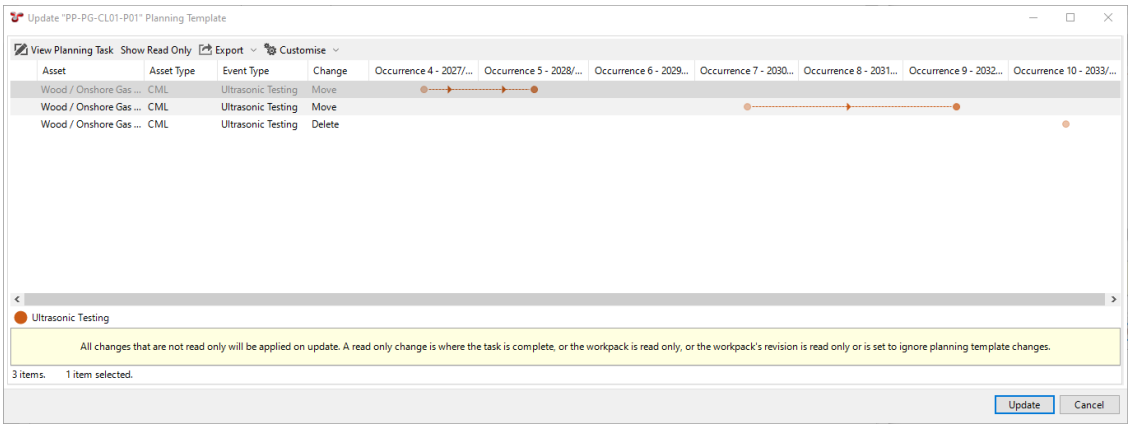
   Follow the steps below:

   a. On the **Planning Templates** tab, select the planning template that contains the updated task.

   b. Click **Update** in the toolbar.

   c. In the dialog that appears, review the proposed changes.

You can see that the task that was created for 2027 will be moved to 2028 and the task that was created for 2030 will be moved to 2032. The task for 2033 will be deleted. Tasks that are unchanged are not shown, thus, we do not see the task for 2024.



6. Click **Update** to apply the changes to the workpacks and tasks.

See also

- *Update Planning Templates*
- *Manage Planning Tasks*
- *Planning Templates*

13.5.1.6.4 Example: Create Task for Asset Type with Lookup Repeat

You can also configure planning tasks for asset types, so that instead of defining the particular asset, you define the asset type, and tasks will be created for all assets of the specified type using the frequency.

In this example, we use the planning template that we created in our *previous example* and create a new planning task for the asset type **CML**. Thus, every asset with the asset type CML under our planning template's base asset (PP-PG-CL01-P01Medium) will have Ultrasonic Testing tasks created based on the frequency that we define. In this example, we set the first occurrence to *1* and for the frequency, we set up a lookup repeat using the same **Inspection Frequency** field in the **Remaining Life** AIG as in our *other example*.

In this way, a single asset type planning task can potentially configure tasks for thousands of individual assets, based on the data in each one of those assets.

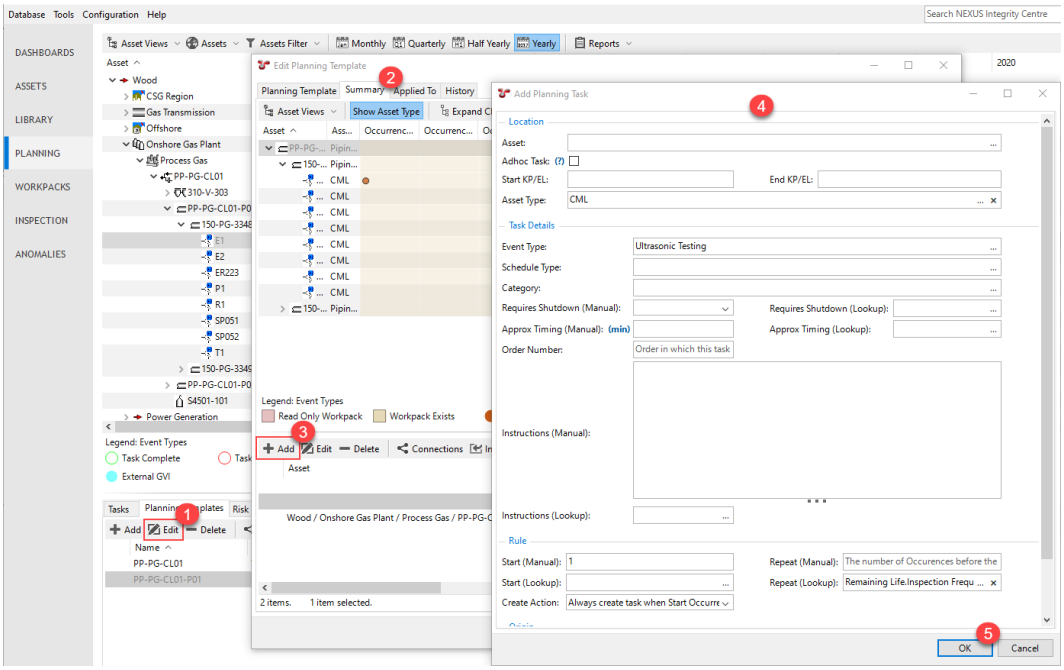
To create the planning task, proceed as follows:

1. On the **ASSETS** or **PLANNING** screen, go to the **Planning Templates** tab and edit the planning template for which you want to create the planning task (1).
2. In the **Edit Planning Template** dialog, go to the **Summary** tab (2) and ensure that **Tasks** in the toolbar is toggled on.
3. In the bottom part of the dialog, choose **Add** from the toolbar (3).
4. In the **Add Planning Task** dialog, specify the following: (4)
    - **Asset** - Select the asset for which you want to create the task.

- **Event Type** - Select the *Ultrasonic Testing* event type.
- **Start** - Enter *1* as the first occurrence that this task should occur.
- **Repeat** - Enter *3* to indicate that you want this task to be created at every third occurrence. In this case, since the planning template's frequency is yearly, a task will be created every third year after the first occurrence.

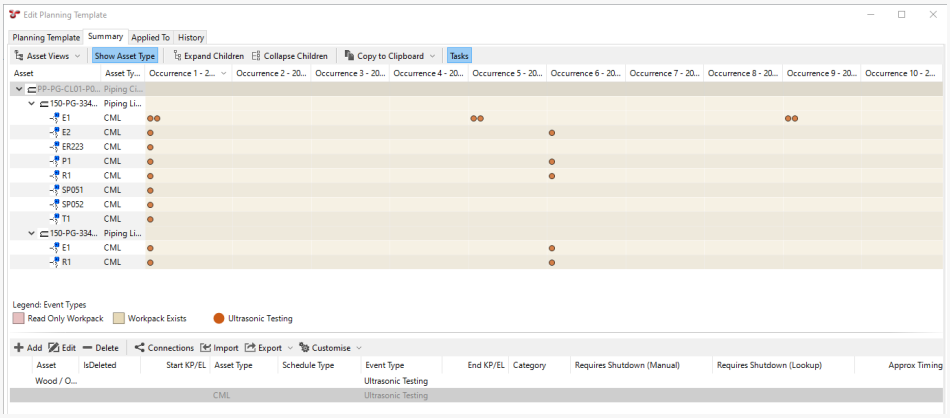
For more information about specifying the parameters, see *Add/Edit Planning Task Dialog*.

5. Click **OK** to save the planning task 5.



Result

On the **Summary** tab, you can see where the tasks will be created once the planning template is applied. You can see that under the base asset, each asset that had the asset type *CML* now has a new task created for the first occurrence and based on the frequency that was defined for the specific asset in the **Inspection Frequency** field on the **Remaining Life** AIG, additional tasks have been added. For assets that had no value in this field, no additional tasks have been created.



6. Update the planning template to update the workpacks and create the new tasks as required.

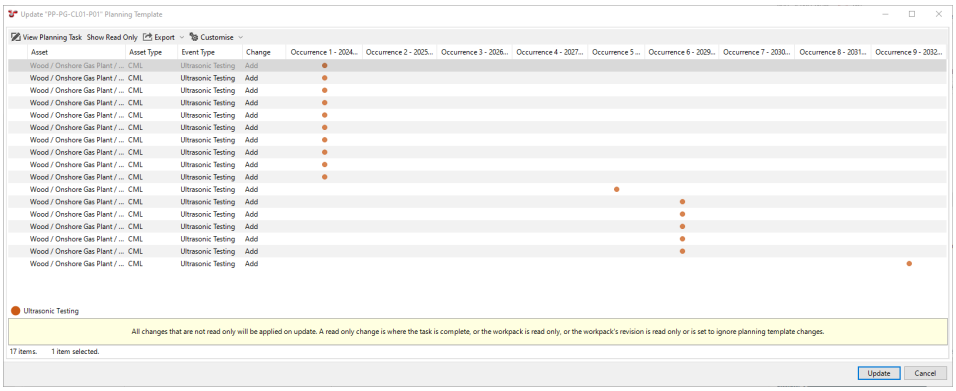
   Follow the steps below:

   a. On the **Planning Templates** tab, select the planning template that contains the new planning task.

   b. Click **Update** in the toolbar.

   c. In the dialog that appears, review the proposed changes.

      You can see that new tasks will be created for each asset with the asset type *CML*.



   d. Click **Update** to apply the changes to the workpacks and tasks.

See also

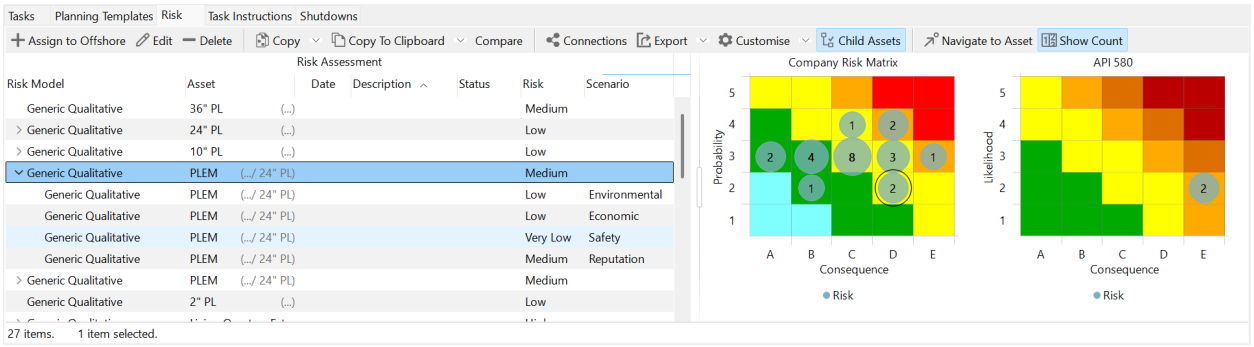
- *Manage Planning Tasks*
- *Update Planning Templates*
- *Planning Templates*

13.6 Risk

You can display risk assessment results on the **Risk** tab of the **PLANNING** and **WORKPACKS** screen:

- On the **PLANNING** screen, you can display the risk assessment results for the assets that you have selected in the asset tree above, and, if you choose the **Child Assets** toolbar button, results are also shown for all that asset's children.
- On the **WORKPACKS** screen, you can display the risk assessment results for the currently selected workpack's assets, and, if you choose the **Child Assets** toolbar button, results are also shown for all that asset's children.

Risk assessment results are displayed in preconfigured risk matrices and in a data grid, as shown below:



13.6.1 Prerequisites

To enable displaying risk models for assets, you must ensure the following:

- Risk charts and risk models have been configured (see *Configure Risk Charts* and *Configure Risk Models*).
- The relevant risk models have been assigned to the asset type of the asset (see *Assign Risk Models to Asset Type*).
- Risk models have been assigned to the asset (see *Assign Risk Models*).

13.6.2 Display Options

When viewing risk assessment results, note the following:

- Where multiple risk assessments occupy the same position in the matrix, the corresponding indicator is displayed larger.
- Selecting a row in the grid highlights the corresponding indicator in the matrix.
- Selecting an indicator in the matrix highlights the corresponding row or rows in the grid.
- If you are using scenarios, each scenario is displayed in its own colour.
- Scenario indicators may be offset slightly within the same matrix square. This is for readability only and does not indicate a difference in risk.
- Selecting a scenario indicator highlights the corresponding scenario in the grid and also highlights the same asset's other scenarios in the matrix.
- Select **Show Count** to display the number of risk assessments at each matrix location.

13.6.3 Managing Risk Assessments and Scenarios

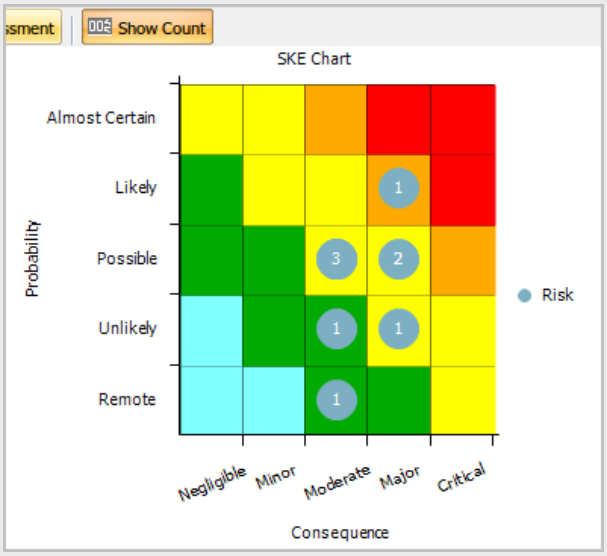
The **Risk** tab supports the following activities:

- Assigning risk models to assets. For more information, see *Assign Risk Models*.
- Reviewing and updating risk assessments. For more information, see *Edit Risk Assessments*.
- Creating and managing scenarios for risk assessments. For more information, see *Manage Risk Assessment Scenarios*.

Risk assessments are created when a risk model is assigned to an asset. You can then update assessment values, compare the results of different scenarios and analyse the resulting risk positions in the risk matrix.

13.6.4 Risk Toolbar

Toolbar Option	Description
Assign to <name of asset>	Choose from the list of pre-configured risk models in the drop-down menu to assign a risk model to the currently selected asset. For more information, see *Assign Risk Models*.
Edit	Opens the risk assessment editor (**Edit Risk Assessment** dialog), where you can review and update risk assessment values and manage scenarios. For more information, see *Manage Risk Assessments and Scenarios*.
Delete	Removes the selected risk assessment or scenario from the asset. The asset itself and any associated asset information remain unchanged.
Copy → Risk Assessment Only	Copies the selected risk assessment to one or more assets without any associated scenarios. For more information, see *Assign Risk Models*.
Copy → Risk Assessment and Scenarios	Copies the selected risk assessment together with all associated scenarios to one or more assets. For more information, see *Assign Risk Models*.
Copy → To Scenario	Creates a scenario from the selected risk assessment. For more information, see *Manage Risk Assessment Scenarios*.
Copy To Clipboard	Copies the displayed risk matrix to the clipboard as an image.
Connections	See *Connections*.
Export	See *Export*.
Customise	See *Customise*.
Child Assets	Includes risk assessments for child assets of the currently selected asset.
Navigate to Asset	Changes the active asset in the hierarchy to the asset associated with the selected risk assessment. The Risk grid is then filtered to display only assessments for the selected asset.
Show Count	Displays the total number of risk assessments at each position in the matrix, as shown below:



See also

- *PLANNING Screen*

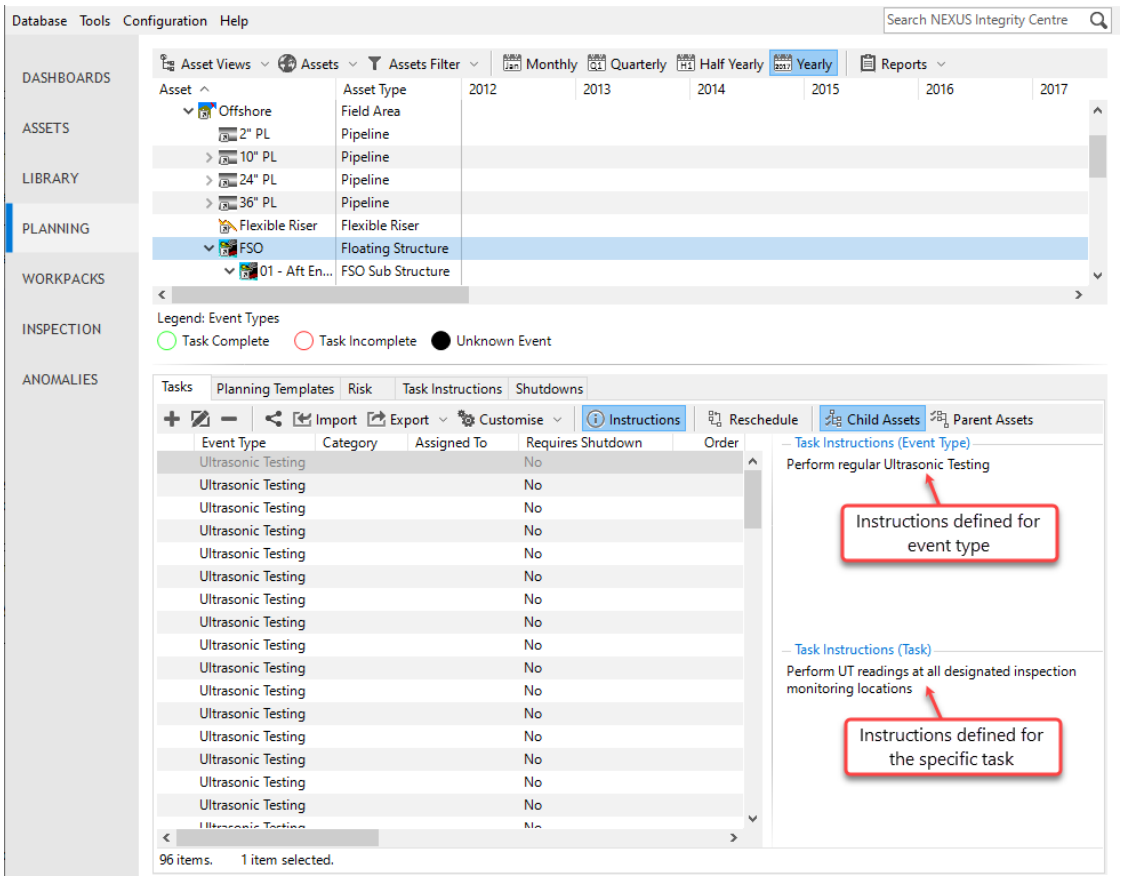
- *WORKPACKS Screen*

13.7 Task Instructions

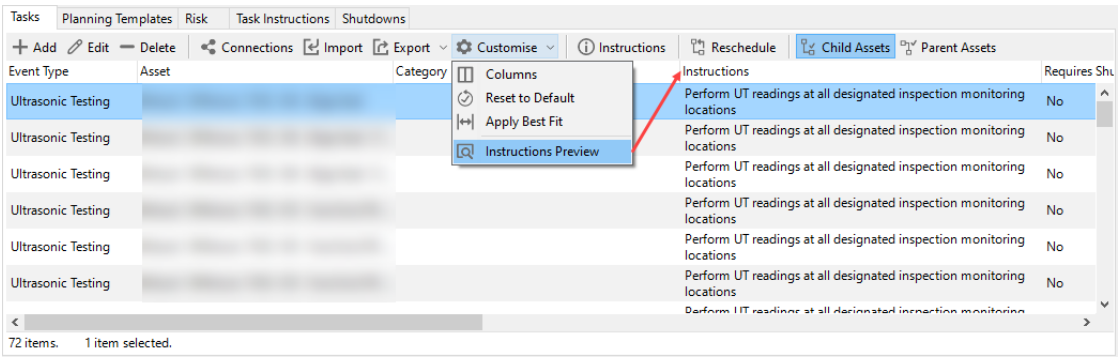
In NEXUS IC, you can define instructions for tasks in the following ways:

- You can set up task-specific instructions for individual tasks when you create or edit tasks in the **Add Task/Edit Task** dialog. For more information, see *Create Tasks* and *Add/Edit Task Dialog*.
- Task-specific instructions can also be derived from the planning template task that a task originates from. In this case, the instructions are defined when creating or editing planning tasks (see *Create Planning Tasks from Planning Templates* and *Add/Edit Planning Task Dialog*).
- You can specify instructions for each event type on each asset type. For example, you might specify one set of instructions for a GVI on a pressure vessel, and different instructions for a GVI on a piece of piping. For more information, see *Define Task Instructions by Event Type*.

Instructions defined for a specific task, event type or derived from a planning template are all visible on the **Tasks** tab of the **PLANNING** and **WORKPACKS** screens when you click the **Instructions** toolbar button:



You can also have task instructions displayed in an additional column on the **Tasks** tab by choosing *Customise* → *Instructions Preview* from the toolbar:



13.7.1 Define Task Instructions by Event Type

You can define instructions for each event type on each asset type on the **Task Instructions** tab of the **PLANNING** screen.

This tab shows each event type that is associated with the asset type selected in the asset tree in the top half of the screen. That is, if you've selected an asset of type Corrosion Loop, on this tab, you'll see one row for each event type that is associated with the Corrosion Loop asset type.

If you see nothing in the list on this tab, that likely means that there are no event types associated with the asset type of the selected asset. You can change the associations between asset types and event types from *Configure Asset Types* or *Configure Event Types*.

To change the instructions for a particular event type on a particular asset type, follow the steps below:

1. In the top half of the **PLANNING** screen, select an asset that has the required asset type from the asset tree.
2. Go to the **Task Instructions** tab, which shows all the event type associated with that asset type, and select the event type required.
3. Choose **Edit** from the toolbar and enter your required instructions. There is no limit to the amount of text you can enter.
4. Optionally, enter an estimated time for this event type. This will be used to estimate the total duration of workpacks.
5. Click **OK** to save your changes.

> **Result**
>
> On the **Task** tab, you can see the instructions you entered under *Task Instructions (Event Type)* for each relevant event type.

> **See also**
>
> - *PLANNING Screen*
> - *Planning and Workpacks*

13.8 Shutdowns

You can record planned shutdown data against each asset on the **Shutdown** tab of the **PLANNING** or **WORKPACKS** screen.

To record a new shutdown, proceed as follows:

1. On the **PLANNING** or **WORKPACKS** screen, go to the **Shutdowns** tab and choose **Add**.
2. In the **Add Shutdown** dialog, enter data as follows:
    - **Name**: Enter a short name for the shutdown. The character limit is 50 characters.
    - **Asset**: Specify the asset that will be shut down. You should choose as specific an asset as you can. This field is mandatory.
    - **Start Date**: This is the date the shutdown is scheduled to begin.
    - **End Date**: This is the date the shutdown is scheduled to end.
3. Click **OK** to save the shutdown.

See also

- *PLANNING Screen*
- *WORKPACKS Screen*

13.9 Workpack Summary

You can review tasks that belong to a given workpack by a list of assets on the **Workpack Summary** tab of the **WORKPACKS** screen.

On this tab, you can see the list of assets that have been tasked within the selected workpack. For each asset, you can see the relevant asset type and the associated tasks shown by their event types in a grid view. You can also export this list to an HTML, RTF or Text file.

See also

- *Workpacks*
- *WORKPACKS Screen*

13.10 Anomalies

The **Anomalies** tab on the **WORKPACKS** screen allows you to review and manage anomaly records that are associated with the asset of the currently selected workpack.

By default, the tab shows anomalies that belong directly to the relevant asset. If the *Filter → Child Assets* toolbar option is enabled, anomalies linked to the relevant asset *and its child assets* are also included.

The functionality available on the **Anomalies** tab is largely the same as on the **ANOMALIES** screen (see *ANOMALIES Screen*). However, some toolbar options differ slightly. For details, see *Anomalies Toolbar*.

> **Note**
>
> On the **Anomalies** tab, only the anomaly grid is displayed. The **Actions**, **Findings** and **Library** tabs that appear at the bottom of the **ANOMALIES** screen are not available here.
>
> However, when you create or edit an anomaly from the **Anomalies** tab, these related records are available within the **Add/Edit Anomaly** dialog, allowing you to manage associated actions, findings and library items as required.

For detailed information about the anomalies functionality, see *Anomaly Management*.

13.10.1 Anomalies Toolbar

Toolbar Option	Description
Add	Creates a new anomaly. See *Create Anomalies* and *Add/Edit Anomaly Dialog*.
Edit	Updates the selected anomaly record. See *Add/Edit Anomaly Dialog*. You can also bulk update anomalies using the standard grid functions (see *Multi-Edit*).
Delete	Deletes the selected anomaly records from the database. You can also bulk delete records using the standard grid functions (see *Multi-Edit*).
Filter → Child Assets	Toggles the inclusion of anomalies associated with child assets of the selected asset.
Filter → Show Closed	Toggles the visibility of closed anomalies in the grid. By default, closed anomalies are hidden.
View → Risk Chart	Toggles the visibility of the **Risk Chart** pane on the right-hand side of the tab. The pane shows the Anomalies Risk Matrix (see *Risk Chart*).
View → Show Count	If the **Risk Chart** pane is visible, it toggles the visibility of the anomaly count values shown on the Anomalies Risk Matrix.
View → Multimedia	Toggles the visibility of the **Multimedia** pane on the right-hand side of the tab.
Connections	Displays items that are linked to the selected anomaly. See *Connections*.
Import	Imports anomaly data into the database. See *Import*.
Export	Exports anomaly data from the active grid. See *Export*.
Customise	Customises the grid layout and columns. See *Customise*.
Shortcuts → Close Anomaly	Closes the selected anomaly. See *Close Anomalies*.

> **See also**
>
> - *Anomaly Management*

CHAPTER

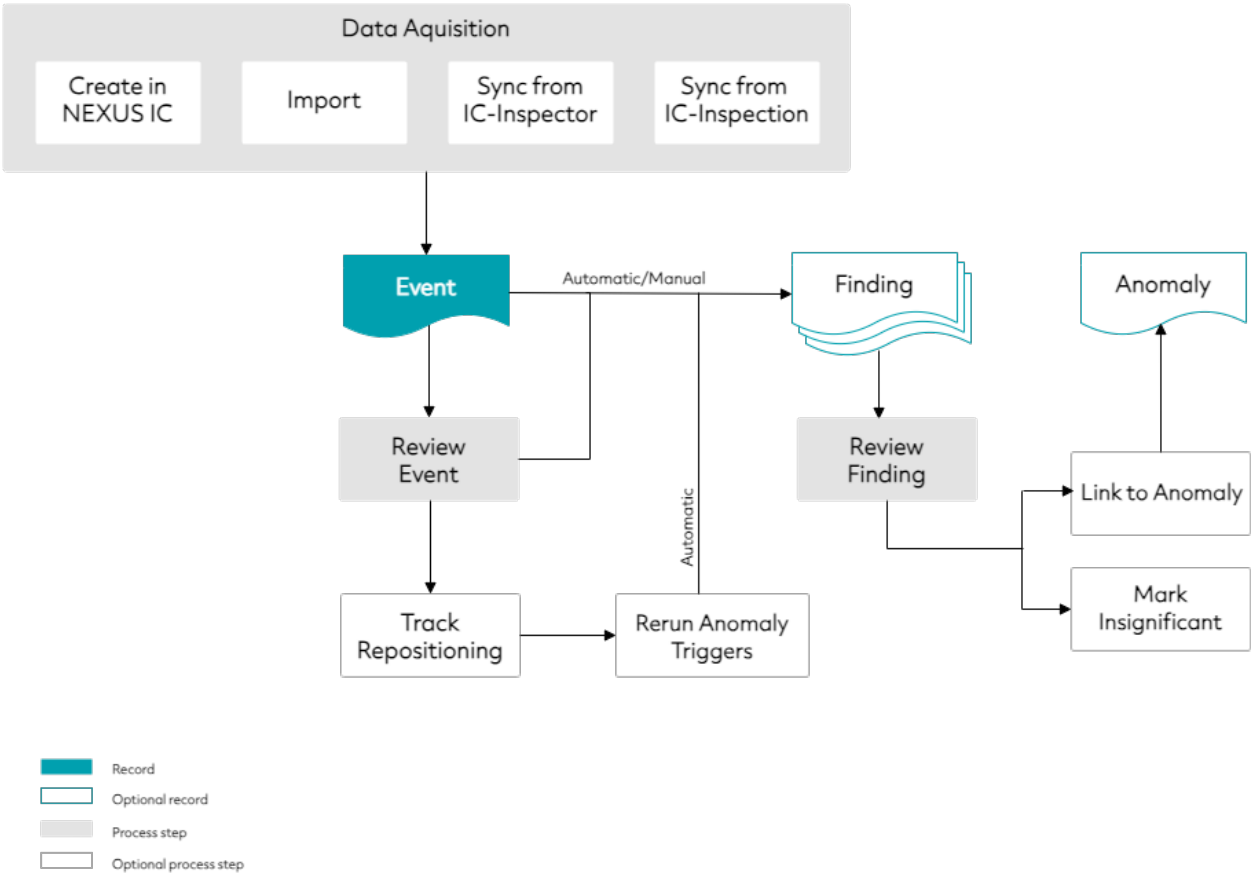
FOURTEEN

INSPECTION

Online inspection is generally carried out in IC-Inspection (see *IC-Inspection*) or IC-Inspector (see *IC-Inspector*) . Inspection data is then synchronised and transferred to NEXUS IC, where you can perform an offline review of inspection data on the **INSPECTION** screen.

The general process is depicted in the figure and described below.

> **Note**
>
> This workflow represents a simplified version of a basic inspection process. Your specific process may vary based on your unique business requirements and implementation.

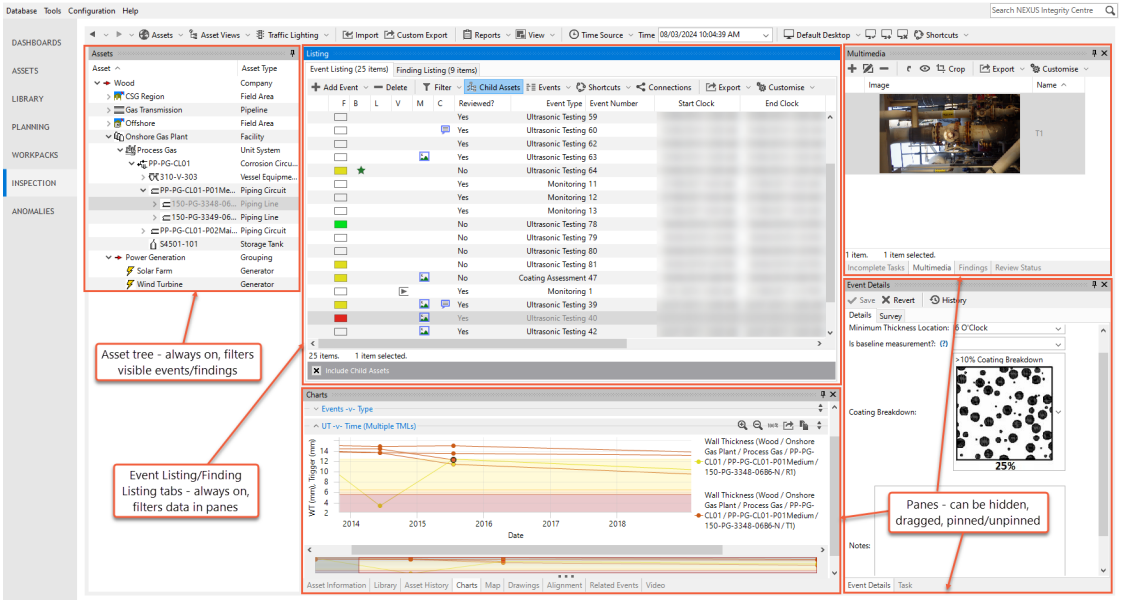


1. In general, inspectors complete tasks in IC-Inspector or IC-Inspection and from the tasks, events are created. Event data are then synchronised to NEXUS IC. However, it's also possible to import events or create them manually in NEXUS IC (see *Create Events*).
2. In case data in an event violates an anomaly trigger, a finding is automatically created.
3. Engineers or review teams review events in NEXUS IC (see *Review Events*) and if they have concerns or significant observations regarding an event, they can raise a finding manually (see *Create Findings*).
4. Findings are then reviewed to decide if they have to be escalated and linked to an anomaly (see *Link Finding to Anomaly*).
5. In case you use the services of a survey company that performs the post-processing of survey data, you need to perform track repositioning, that is, you need to update the survey data in the NEXUS IC database by importing the smoothed survey data that they provided (see *Track Repositioning*).
6. After track repositioning, we recommend that you re-run the anomaly triggers (see *Run Anomaly Triggers*).

14.1 INSPECTION Screen

On the **INSPECTION** screen, you can review, analyse, upload or create inspection event or finding data.

The **INSPECTION** screen is made up of the following main elements:



- The **asset tree** (see *Asset Tree*) is a pivotal element of the screen as all event or finding records will be filtered by the currently selected asset, or its children if *Child Assets* is enabled. You can also manage asset data directly on this screen and perform the same actions as you can do on the **ASSETS** screen.
- The **Listings** screen area contains the **Event Listing** (see *Event Listing*) and **Finding Listing** tabs (see *Findings Listing*), which are always visible. These tabs show all the event or finding records related to the selected assets and its children (if you've selected the **Child Assets** toolbar button). On

these tabs, you can review, create, update, delete or filter event or finding records. All data in the panes are filtered based on your selection on the **Event Listing** tab.

- All the **panes** on the **INSPECTION** screen show data relevant to the selected events on the **Event Listing** tab. These panes can be shown or hidden, dragged around, pinned or unpinned (see *Manage Your Desktop*). The following panes are available:
  - Alignment (see *Alignment*)
  - Asset History (see *Asset History*)
  - Asset Information (see *Asset Information Groups (AIGs)*)
  - Charts (see *Charts*)
  - Drawings (see *Drawings*)
  - Event Details (see *Event Details*)
  - Finding - this pane is only available if the **Finding Listing** tab is active (see *Findings*)
  - Findings - this pane is only available if the **Event Listing** tab is active (see *Findings*)
  - Incomplete Tasks (see *Incomplete Tasks*)
  - Library (see *Library*)
  - Map (see *Map*)
  - Multimedia (see *Multimedia*)
  - Related Events (see *Related Events*)
  - Review Status (see *Review Status*)
  - Task (see *Task*)
  - Video (see *Video*)

14.1.1 Manage Your Desktop

The **INSPECTION** screen offers a "desktop manager" functionality that allows you to set up your screen as required. For example, you can view or hide panes, drag and drop them and create different desktop layouts for different purposes. For more information, see *Manage Your Desktop*.

14.1.2 Inspections Toolbar

For detailed description about the options in the main toolbar of the **INSPECTION** screen, see *Inspections Toolbar*.

14.1.2.1 Manage Your Desktop

The desktop manager in IC-Inspection, and on the **INSPECTION** screen of NEXUS IC, works in the same way. It allows you to organise your screen to suit your workflow: you can show or hide panes, drag and dock them, and save your preferred layout as a desktop.

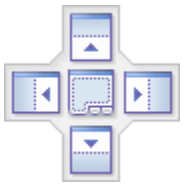
14.1.2.1.1 View/Hide Panes

You can show or hide panes by selecting or deselecting the relevant option under the **View** toolbar button. You can also close a pane by clicking the ✕ icon in its top right corner.

14.1.2.1.2 Drag and Dock Panes

You can drag panes to different areas of the screen and dock them as required.

When you drag a pane over another pane, a pale blue highlight and/or a set of docking icons appears:



Dragging a pane over one of the icons shows the position and size it will take when dropped. Dropping the pane onto:

- the **centre** icon adds it to the existing tab group.
- the **left**, **right**, **top** or **bottom** icons splits the existing pane and docks the dragged pane accordingly.

If you drop a pane outside the main pane, it becomes a *floating* pane.

Empty areas with no panes are treated as a *void*. Dropping a pane into the centre of the void fills it, and you can then split that pane with further drops. Dropping a pane on the edges of a void splits it while leaving part of the void intact.

14.1.2.1.3 Pin/Unpin Panes

Click to collapse a pane to the edge of the window. To restore an unpinned pane, click its name on the edge, then click .

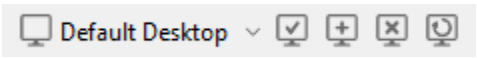
14.1.2.1.4 Resize Panes

You can resize panes using the splitter between two docked panes. When the pointer is over a splitter, it changes to a or cursor. Drag the splitter to adjust the size of adjacent panes.

The difference between floating and docked windows is that docked windows will resize together. When you drag a splitter, one window will get bigger while another gets smaller. Thus, docked windows never overlap each other. Typically most or all of your windows will be docked.

14.1.2.1.5 Create/Save/Delete Desktop Layout

Different tasks may require different desktop arrangements. For example, structural inspections may require multimedia panes, while reviewing corrosion growth rates and thickness readings may need charts to view the trend lines. You can create multiple desktops and switch between them using the toolbar buttons on the top of the screen:



- To **switch** between desktops, select the required desktop from the drop-down list available under the **Desktop** toolbar button.
- To **save** the changes that you've made to the current desktop, click the toolbar button for *Save the active desktop*. Settings are *not* automatically saved when you close the program.
- To **create** a new desktop, arrange the desktop as required and click the toolbar button for *Add a new desktop with the current layout* to save the current arrangement of panes. You can name the desktop as required.

- To **delete** an existing desktop layout, click the toolbar button for *Delete the currently active desktop*.
- To **restore** the desktop to the default layout pre-delivered with the system, click the toolbar button for *Restore the default desktops*. This option is available only in IC-Inspection.

Tip

If you use two monitors, you may wish to extend the application across both. You can do this by clicking the "Restore Down" button at the top right of the pane and then dragging the main application window larger, or by floating panes such as **Drawings** and then dragging the floating panes onto the second monitor.

14.1.2.2 Inspections Toolbar

The main toolbar of the **INSPECTION** screen allows you to perform generic functions on the screen. Individual panes have their own toolbar to perform functions specific to those panes.

Toolbar Option	Description
Back	Allows you to return to assets that you had previously selected in the asset tree.
Forward	Allows you to return to assets that you had previously selected in the asset tree, after you've used the *Back* button.
Assets	See *Assets Toolbar*.
Asset Views	See *Asset Views*.
Traffic Lighting	See *Traffic Lighting*.
Import	See *Import Events*.
Custom Export	See *Custom Export Events*.
Reports	See *Reports*.
View → Toggle Event/Findings	Switches between the **Event Listing** and the **Finding Listing** tabs. Equivalent to clicking on the **Event Listing** tab or the **Finding Listing** tab. The menu item allows attaching a shortcut key to this action: *F10*.
View	The items under this menu option show the various panes available on the **INSPECTION** screen. Click a menu item to show or hide them. Checked items are visible.
Time Source	If set to *System Time*, the date and time field visible to the right of this button shows the current time according to this PC's clock. If set to *Video Time*, it shows time from the video player. As you move backwards and forwards through the video, you will see this time move backwards and forwards in unison.
Time Source → Synchronise KP	If selected, then as the video plays, KP on appropriate charts will be updated from the video time. As the video plays, the system checks what time the video is up to, then it checks what KP is associated with that time, and it updates charts that have a KP axis to that KP. This only works if there is suitable survey data in the database, allowing us to get KP from the current time. Updated charts include Event type -v- KP, CP -v- KP, and Pipeline View, as these all have a KP axis. It does not include the Cross-Profile chart, as this does not have a KP.
Desktops	If you have several saved desktop configurations for this screen, select which one is active here.
Save Desktop	If you have made changes to the currently selected desktop, click this to save them. Otherwise, when you restart the application, your changes will be lost.
Add Desktop	You can add a new desktop layout using this option. Any changes that you made to the visible/invisible panes and their location on the screen will be saved under the name that you specify.
Delete Desktop	Deletes the currently selected desktop from the list.

14.2 Events

Events are data records created during an inspection or maintenance activity on specific assets. Events can be created in IC-Inspection, IC-Inspector, NEXUS IC and IC-Web (see *Create Events*).

Event data are synchronised or imported to NEXUS IC, where findings are automatically created in case the recorded data violates any preconfigured anomaly triggers.

Reviewing engineers or review teams can then check and review events (see *Review Events*) on the **INSPECTION** screen of NEXUS IC (see *INSPECTION Screen*) and if required, create a finding, if it hasn't been created earlier. The list of all event records can be viewed and managed on the **Event Listing** tab (see *Event Listing*) once the relevant asset is selected in the asset tree.

See also

- *Event Listing*
- *Create Events*
- *Import Events*
- *Edit Events*
- *Review Events*
- *Delete Events*
- *Review and Update Event Times*
- *Change Event Type*
- *Match Tasks to Events*
- *Survey Data Processing*
- *Run Anomaly Triggers*
- *Custom Export Events*

14.2.1 Event Listing

You can see the list of all events on the selected asset (and it's children, if it's enabled) on the **Event Listing** tab of the **INSPECTION** screen.

14.2.1.1 Filter Events

The **asset tree** acts as the main filter for the events listed in the **Event Listing** grid. When you select an asset in the asset tree, you can see the list of events recorded on the selected asset, and, if you selected **Child Assets**, the list will include the events for all the children of the selected asset too.

You can further filter events in the grid based on:

- **Workpacks**: Choose *Filter* → *By Workpack* from the toolbar of the tab to select the workpacks based on which you want to filter the events.
- **Event Type**: Choose *Filter* → *By Event Type* from the toolbar of the tab to select the event types based on which you want to filter the events. If you have no event types selected, then all events will be shown, and no continuous events will be shown. To view continuous events, you must explicitly select those event types in the filter.

> **Note**
>
> When filtering by a single event type, the **Event Summary** grid will automatically display additional columns for fields specific to that event type. This enhanced view allows you to further sort and filter events based on those specific fields, providing a more detailed and focused analysis.

All columns in the grid can also be filtered and sorted using the standard filtering (see *Filtering*) and sorting (see *Sorting*) functionality.

14.2.1.2 Columns

By default, the **Event Listing** tab displays columns that are common to all event types displayed. The first six columns in the grid represent the following:

Column	Description
F	Shows a colour that indicates the existence and status of the **Finding** that is associated with the event. See below for more information.
B	Indicates if the event has been **bookmarked** with a star sign.
L	An icon is shown if there's a **library item** attached to the event.
V	An icon is shown if there's a **video** attached to the event.
M	An icon is shown if there's **multimedia** attached to the event.

14.2.1.2.1 Finding Statuses

The colours of the icons in the **Finding** column indicate the status of the finding, which can be the following:

Colour	Meaning
(White)	There are no findings on this event.
(Yellow)	The finding needs to be reviewed.
(Green)	The finding has been deemed insignificant and is not linked to an anomaly.
(Grey)	The finding is linked to a closed anomaly.
(Red)	The finding is linked to an open anomaly.

14.2.1.3 Perform Actions on Events

From the **Event Listing** tab, you can perform actions on events using the relevant toolbar buttons or right-clicking any of the events, which offers most of the options that the **Events** toolbar menu has.

You can perform the following actions:

- Create events (see *Create Events*)
- Update events (see *Edit Events*)
- Bookmark events - Select **Toggle Bookmark** from under the **Events** toolbar button or from the context menu of the event (available by right-clicking). This sets a star icon next to the event in the grid.
- Review events (see *Review Events*)
- Delete events (see *Delete Events*)
- Update event times (see *Review and Update Event Times*)
- Change event type (see *Change Event Type*)
- Match tasks to events (see *Match Tasks to Events*)
- Run anomaly triggers (see *Run Anomaly Triggers*)

14.2.1.4 Event Listing Toolbar

For information about the toolbar menu options in the **Event Listing** tab, see below:

Toolbar Option	Description
Add Event	See *Create Events*.
Delete	See *Delete Events*.
Filter → By Workpack . . . /By Event Type . . .	See *Filter Events*.
Child Assets	When enabled, events for the currently selected asset and all sub-assets will be included in the **Event Listing** tab. When disabled, only events that have been recorded on the currently selected asset will appear in the grid.
Events → Event Reviewed. . .	See *Review Events*.
Events → Navigate to the event asset	Changes the focus in the asset tree to the asset on which this event has been recorded. To change back, click on the back arrow (*Previous Asset*) in the main toolbar above the asset tree.
Events → Update Start/Update End	See *Review and Update Event Times*.
Events → Toggle Bookmark	Bookmarks are flags on an event. Bookmarked events are identified by a star symbol in the **B** column of the **Event Listing** tab. The use of bookmarks and the workflow around setting and removing bookmarks depends on your own specific requirements.
Shortcuts → Anomaly Triggers	See *Run Anomaly Triggers*.
Shortcuts → Change Type	See *Change Event Type*.
Shortcuts → Match Task	See *Match Tasks to Events*.
Connections	See *Connections*.
Export	See *Export*.
Customise	See *Customise*.

14.2.2 Create Events

Events in NEXUS IC can be created through three main methods, depending on your workflow and tools:

- **Synchronisation from Other Applications**

  In general, events are created during inspection campaigns using:

  - **IC-Inspector**: See *Sync to IC-Inspector* for details on syncing event data from IC-Inspector to NEXUS IC.
  - **IC-Inspection**: See *Manage Subscriber Databases* for syncing event data from IC-Inspection.

  These tools allow inspectors to generate events directly from completed tasks or create ad hoc events during inspections.

- **Import from Excel**

  You can import event records into NEXUS IC from an Excel file. See *Import Events* for details instructions.

- **Creation in NEXUS IC**

  If required, events can be created directly in NEXUS IC in one of the following ways:

  - By manually adding events from the **Event Listing** tab of the **INSPECTION** screen (see below).
  - By launching a task from the **Tasks** tab from any supported location such as the **PLANNING** screen, the **WORKPACKS** screen, when editing tasks in supported dashboards or when editing anomaly actions linked to tasks. (see *Launch Tasks*).
  - By completing a task in the **Incomplete Tasks** pane of the **INSPECTION** screen (see *Incomplete Tasks*).

14.2.2.1 Prerequisites

To be able to create event records, the required event types must have been configured (see *Configure Event Types*).

14.2.2.2 Add Events Manually

1. On the **INSPECTION** screen, select the relevant asset in the asset tree and on the **Event Listing** tab, click **Add Event** in the toolbar.
2. From the drop-down list, select the event type for which you want to create the event. The available event types depend on your configuration settings under *Configure Event Types*.

   The submenu lists all event types stored in the database, grouped by event category. Event types that are not permitted for recording on the currently selected asset are automatically disabled. The definition of 'allowable' event types depends on the asset type associated with the currently selected asset. This is configured in *Configure Asset Types*.

   At the top of the drop-down menu, you'll see **Hide Unavailable**. If you select this, event types not relevant to the asset type of the currently selected asset will be hidden. If you unselect it, those irrelevant event types will be shown, but disabled. If you have too many event types to fit on your monitor, select **Hide Unavailable**.
3. Enter the event data in the event form as required.

   The fields available in the dialog depend on the event type configuration settings. You can also enter additional notes, such as a quick summary about the inspection activity that the event relates to or comments about anything of interest or concern about this event. On the **Summary** tab, you must ensure that a workpack is linked to the event and that the correct date and time is specified.

   When adding a new event, the *Workpack*, *Asset*, and *Survey Set* fields will be pre-filled to match the event you previously selected in the grid before clicking **Add Event**. You can also enter survey data for the new event. If you specify a *Start Clock* or *End Clock* for which data already exists in the selected survey set, that existing data will be displayed. Otherwise, you'll have the option to manually enter survey data.
4. Click **OK**.

> **Result**
>
> The new event record is added to the list in the **Event Listing** tab.

14.2.2.3 Event Numbering

Whenever an event is created, either manually or through import, it is assigned an event number automatically. The event number is incremented by one as compared to the last event created with the same event type. Thus, each event has a unique number assigned to it based on its event type.

14.2.3 Import Events

You can import or bulk update events by choosing **Import** from the toolbar on the **INSPECTION** screen.

The format of the Excel workbook needs to be specific. We recommend that you use the **Example** button on the first page of the Import wizard, to generate the workbook in the correct format for importing data.

During the import process, anomaly trigger checks are run on each event and if required, findings are automatically generated. For more information, see *Run Anomaly Triggers*.

> **Note**
>
> If you do not specify a *survey set* for event survey data to be imported into, it will be imported into Raw Survey Data, which is the default set. If two different events have the same date/time, the second one imported will overwrite the survey values of the first. To avoid this, don't have two different events in the same survey set at the same time with different survey data.

> **Caution**
>
> When creating a new event, Event.Start Clock must be earlier in time than Event.End Clock for the import to succeed.

14.2.3.1 Import Files

Prepare Data for Import

Before you start the import, you must prepare the files in the required format. Compatible file types include .zip, .xlsx (Excel), .csv, and .txt. Zip files can contain the xlsx/csv/txt file plus any additional files, for example, multimedia images or electronic documents for importing into the library.

> **Tip**
>
> - For very large imports, saving your Excel file as a .csv and then importing from the .csv may be faster.
> - The `Asset Location.Full Location` data can be defined in one of the following ways (you can use only one option, not both):
>   - As a single column, where each level of the asset location is separated by the string " / ", for example, 'My Field / My Platform / My Member'
>   - As multiple columns, where each level of the asset location is stored in a separate sequential column, that is, for each node in the hierarchy, you create a separate column with the name `Asset Location.Full Location` and with one asset hierarchy level in each.

> **Note**
>
> Importing directly from .xlsx files is not supported for SaaS customers using the new virtualisation technology (see *Software as a Service (SaaS)*). We recommend using .csv files instead.

Sub-Rows in Import Sheet

Sometimes a single row may have several sub-rows. For example, an AIG row might have several sub-AIG rows; or an event might have several findings or several multimedia images or both. When this occurs, you must create separate rows in the import sheet for each sub-item, with different "detail" values in each.

For example, if you have several multimedia images to import against a single event, your Excel sheet should have several rows that are identical except for the Multimedia.Name and Multimedia.Image columns. If you have specified an event number, and you use the same event number on each row, NEXUS will only create the event once, but will

create several multimedia items. If you do not specify an event number, NEXUS will instead create several different events with one multimedia item each.

You can also leave event fields blank for all except the last row. Under the hood, NEXUS is importing each Excel row into the event, and only the last Excel row imported will "stick". Note that if your event has a finding, you should *not* repeat the finding data on each event row; if you do, NEXUS will create one finding for each Excel row that has finding data filled in.

In some cases, you *do* want multiple findings on one event, and in that case you must fill in several rows as appropriate. Similarly for sub-event data or sub-AIG data: if you want several different sub-events or sub-AIG rows imported, you should repeat the event row or AIG row with different sub-event or sub-AIG data in each case. If you are repeating an Excel row for another reason and you do *not* want several sub-event or sub-AIG rows imported, you should fill in sub-event or sub-AIG data in only one of the Excel rows.

Tip

You can find the next available event number for a given event type by creating an event of that type using *Add Event*, noting the event number, then deleting that event. If you want the next available event numbers for several event types, create a report template with a Simple Source on table Event and a Pivot Table with a pivot row on Event Type and a value field on Event Number with aggregate Max, then add 1.

Perform Data Import

1. Choose **Import** from the toolbar.
2. In the **Import File** dialog, choose ... to navigate to the file that you want to import and select it.

   Note

   By default, the dialog shows only CSV files.

3. If required, you can also verify the date and time format in this dialog and you can choose whether you want to skip blank cells:
   - If you select skipping blank cells, then any cells that are blank will be ignored during the import.
   - If you do not select skipping blank cells, then blank cells will update any existing data and make it blank.
4. Click **Next**.

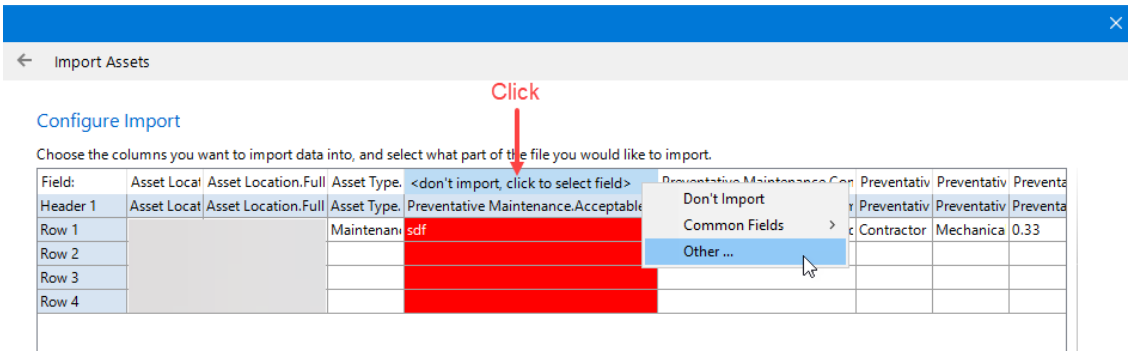
   Result

   The system reads the import file and uses the `<table name>.<field name>` naming convention to map the headers in the import file to database fields in the NEXUS system.

5. In the **Configure Import** dialog, you can review the mapping proposed by the system and make changes, if required:
   - In the top **Field** row, you can see the fields to which the system proposes to map the column headers from the import file. You can manually change the default mapping option for each column by clicking on the title of the column in the top **Field** row and selecting one of the following options:
     - *Don't Import* - Does not import the selected column to the database.

- *Common Fields* - Allows you to select common fields in the database to which you want to map the selected column instead of the database field proposed by the system.
- *Other ...* - Allows you to search and select a field from a list of your field definitions as required.

Note that if the system couldn't match a column to a database field for some reason, the column is displayed in red colour. By default, the system does not map these columns, you can manually map them if required.



- In case there are required fields in the database for which the system couldn't find any values in your import sheet, the system prompts you to set these values in this dialog. In this case, the relevant fields will be displayed on the right-hand side of the dialog under **Required Fields**, where you have the option to set the value globally for this import as required.
- Under **Settings**, you can specify how many header rows your import sheet contains. For example, you may have the table name as the first header row and the field name in the second header row, in which case, instead of having a column title like `Asset Location.Asset View`, you'd have a header row for Asset Location and second header row for Asset View.
- If your import file contains multiple worksheets, ensure that you select the correct worksheet in the **Worksheet** field.

Note that if the field type is set to change for an existing field, the import will abort as data loss may occur.

6. Click **Next**.

Result

The system tests every single row in the import file and shows if there are any issues with importing. You can abort the test import at any time by clicking **Skip**.

7. Once the import test is finished, you can see a log that shows any errors or warnings that the system may have found during test import. In case of errors, you cannot proceed with the import and the **Import** button will be inactive. In this case, you must rectify the errors in the import file and start the import process again.

Tip

You can copy and select import results from the dialog for review. For instance, it can be helpful to paste all errors into a spreadsheet to make it simpler to methodically update them.

8. If the import test is finished without errors, you can click **Import** to complete the process.

Result

Depending on your client, the following happens:

- If using a SaaS client, the import job is offloaded to the SaaS server and is started remotely. It is then possible to close the current NEXUS IC session while the active import job continues.
- If using a non-SaaS client, the import job is executed in the current NEXUS IC session and you may continue using NEXUS IC. Closing the current NEXUS IC session will cancel the active import job.

In both cases, the UI will refresh intermittently throughout the import, and there will be delays between the import finishing and final refresh as NEXUS IC does not directly monitor changes.

Note

When importing inspection event data, anomaly triggers are checked during the import and findings created automatically from data which falls outside the data bounds.

9. Check the status and result of the import in the *Job Management Console*, which records the status and history of all import jobs.

   The import job banner at the bottom of the window shows the status of the import job and provides the option to dismiss the job or check the details. You can double-click the job, which triggers a dialog that summarises the import. From this dialog, you can click **Details** to show how many rows have been added to various forms or tables. If you have multiple rows in your import sheet that update the same row, these rows will be counted by the test import individually, whereas the final import statistics will only show 1 updated row.

   You can also save the summary to file.

Tip

- We highly recommend that you scrutinise the summary to ensure that the import has performed the actions that you expected. Take note of the total rows for a specific item, that is, add together the number added and updated and make sure that is equal to the number you expect.
- If the importer encounters a completely blank row in an Excel file, it will stop importing at that point, even if there are non-blank rows further down. This can provide an easy way to test an import sheet: set it up, and then after just one or two rows of data, insert a blank. Run the import to see if it's doing what you expect, and if so, delete the blank and run again. Similarly, if the importer encounters a blank column in an Excel file, columns to the right of this will not be imported.

Note

During an import, NEXUS communicates with Excel in the background. NEXUS commands Excel to open the file you want to import, and asks Excel what's in each cell. If you use Excel to modify the file while we're importing it, even if you don't hit *Save*, you may confuse the import process. The same happens if you take a variety of other actions, such as *Save As*, closing the Excel, and so on. If you see the error text "Call was rejected by callee", it means that Excel has stopped answering calls from NEXUS.

14.2.4 Edit Events

You can update and edit the data of existing events on the **Event Details** pane (see *Event Details*) as follows:

1. On the **Event Listing** tab, select the events that you want to update. You can also multi-select events.
2. On the **Event Details** pane, update event-specific data on the **Details** tab, or survey data on the **Survey** tab as required.
3. Click **Save** to save your changes, or, if you want to revert the changes back to the last saved state, click **Revert**.

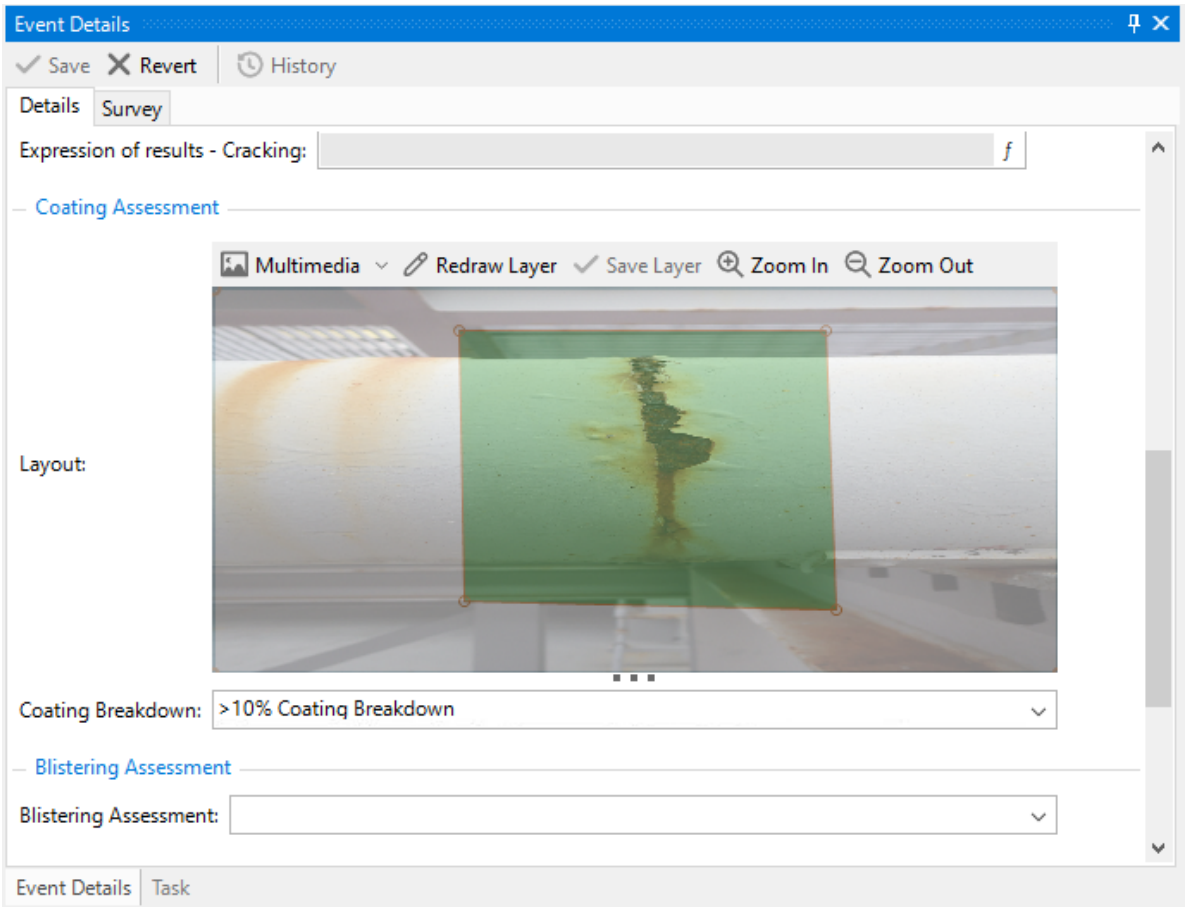
14.2.4.1 Edit Graphical Markup On Images In Events

If one or more event types are configured to show graphical markup (see *Enable Images with Graphical Markup for Event Fields*), you will see a region on the event form showing any multimedia attached to this event.

If there are no multimedia attached to this event, this region will show as white. If there are several multimedia, you will see them all overlaid translucently, and you can use **Multimedia** toolbar option to untick the ones you don't want.

You can perform the following actions on the image:

- You can pan the photo by using the left mouse button to drag it.
- You can zoom with the **Zoom In/Zoom Out** buttons, or by using the mouse wheel. You may need to click in the image region before the mouse wheel will zoom for you; this is a focus issue related to Windows.
- You can do graphical markup on the photo. To do that, click the **Redraw Layer** button, then click in the drawing region to mark up. If your markup type is Point, click just once, otherwise click several times. Then click **Save Layer** to complete the shape.



14.2.5 Review Events

Once event records are in NEXUS IC, the reviewing engineer or review team can review the inspection data. Typically, a review of events may include ensuring the following:

- Any inspection events with findings have sufficient supporting evidence attached (for example, photos/videos and event information)
- The date/timestamp of the inspection events recorded match the actual start date/timestamp and end date/timestamp indicated on the digital video. If required, the event start/end time must be updated (see *Review and Update Event Times*)
- The event form is complete and that all data and comments are accurate and concise. (see *Event Details*)
- Multimedia attached to inspection events are of good quality.
- Inspection events that have been specifically bookmarked by the online inspection engineers are reviewed.

The reviewer can then decide if a finding needs to be created from the event (if it hasn't been created automatically) or the event can be considered as insignificant.

14.2.5.1 Set Review Status for Events

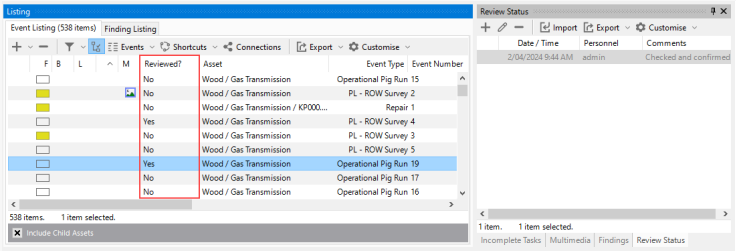
To set the review status of an event or events, proceed as follows:

1. On the **INSPECTION** screen, select the relevant asset in the asset tree.
2. On the **Event Listing** tab, select the event or events that you want to review.
3. From the toolbar, choose *Events* → *Event Reviewed* and select the required review status. You can also access the same menu option from the context menu of the event (available when right-clicking). You have the following options:
    - *Mark Event as reviewed* - Sets the status of the selected events to reviewed.
    - *Mark Event as reviewed (move next)* - Sets the status of the selected events to reviewed and selects the next event in the event list.
    - *Mark Event as reviewed (with comment)* - Sets the status of the selected events to reviewed and shows a dialog where you can enter additional comments for the event. We recommend that you keep your comments under 8000 characters.
    - *Mark Event as not reviewed* - If an event has been reviewed, you can set its status back to not reviewed using this option. In this case, the review record will be deleted and will disappear from the **Review Status** pane.

> **Tip**
>
> You can set up keybindings if you want to use keyboard shortcuts for the different review actions under *Tools* → *Options* → *Inspection*. For example, when the **Ins** keybinding is set up for the *Mark Event as reviewed* action, you can quickly set the selected event to reviewed by pressing the **Ins** keyboard button instead of navigating to the action from the toolbar. For more information about setting up keybindings, see *Setting Up Keybindings*.

> **Result**

- The status of the event gets updated in the **Reviewed** column of the **Event Listing** tab.
- A new review record is created in the **Review Status** pane with your user and the date and time when you set the status to reviewed. You can update this record or add comments to it anytime. If you delete this record, the status of the event changes back to not reviewed again.



Note

You can also add, update or delete review records for events on the **Review Status** pane on the **INSPECTION** screen. For more information, see *Review Status*.

14.2.6 Delete Events

You can delete existing event records on the **Event Listing** tab of the **INSPECTION** screen as follows:

1. On the **Event Listing** tab, select the events that you want to delete. You can also multi-select events.
2. Click **Delete** in the toolbar. You can also choose **Delete** from the context menu of the events (available when right-clicking the events).
3. In the confirmation dialog that opens, you can check the existing connections before deleting the event. If you are sure you want to delete the event, click **Delete**.

14.2.6.1 Delete Events in Bulk

If you want to delete events in bulk, we recommend that you follow the steps below:

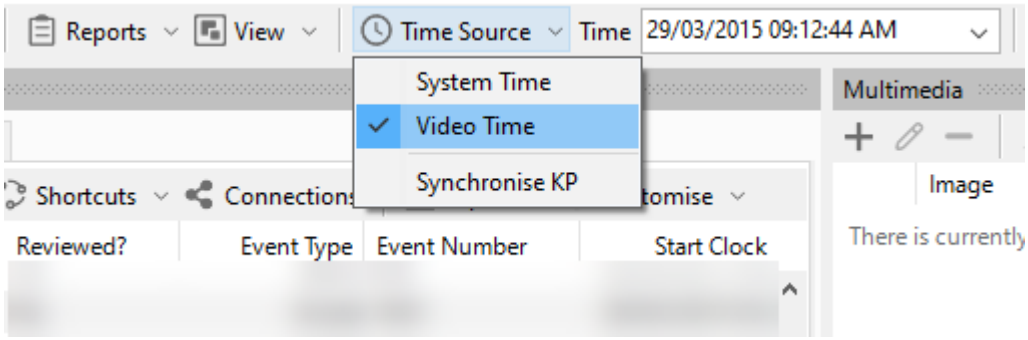
1. Go to the **WORKPACKS** screen and create a workpack called *DeleteMe* (see *Workpacks*).
2. Return to the **INSPECTION** screen and on the **Event Listing** tab, multi-select the events you want to delete.
3. On the **Event Details** pane (see *Event Details*), go to the **Survey** tab.
4. In the **Workpack** field, click the ... ellipsis button and select the *DeleteMe* workpack.
5. Go to the **WORKPACKS** screen again.
6. From the mail menu, go to *Database* → *Close*, then *Database* → *Reopen* or *Database* → *Connect...* to clear those events from NEXUS IC's cache.
7. Delete the *DeleteMe* workpack from the **WORKPACKS** screen by selecting the workpack from the list and choosing **Delete** from the toolbar.

14.2.7 Review and Update Event Times

When you're reviewing events, you must ensure that the timestamps for the start event and end event match the actual start and end timestamps indicated on the digital video. The start and end time of the event can be automatically updated from the date and time of the digital video currently playing.

You can check the timestamps for the start and end of an event in the **Start Clock** and **End Clock** columns on the **Event Listing** tab, or, in the respective fields on the **Survey** tab of the **Event Details** pane.

When reviewing events by video, ensure that in the main toolbar, the time source is set to **Video Time**. Else, the local current time is displayed.



14.2.7.1 Update Event Times

To update the start and end time of the event based on the date and time of the digital video currently playing, on the **Event Listing** tab, select the relevant event record and proceed as follows:

- To update the start time of the event, choose **Events** from the toolbar of the **Event Listing** dialog or right-click the event, and select **Update Start** from the drop-down menu.
- To update the end time of the event, choose **Events** from the toolbar of the **Event Listing** dialog or right-click the event, and select **Update End** from the drop-down menu.

14.2.8 Change Event Type

You can change the event type of selected events while retaining the link to all associated survey data, multimedia, and manually created findings. You can change the event type to any other preconfigured event types (see *Configure Event Types*). Any auto-generated findings will be unlinked from the event, but not deleted.

To change the event type, follow the steps below:

1. On the **Event Listing** tab, select one or more events as required.
2. From the tab's toolbar, choose *Shortcuts* → *Change Type*. You can also select the same option from the context menu of the events (available by right-clicking).
3. In the dialog that appears, select the event type to which you want to switch.
4. Click **OK**.

> **Result**
>
> The type of the selected events get updated to the new event type. If the field names across event types match, the data is retained. If the field names do not match, the values are added to the **Notes**, which you can check on the **Event Details** pane. Note that if you change the event type back to the original, these values will not be populated back to the original fields but will remain in the **Notes** section.

14.2.9 Match Tasks to Events

In general, when tasks are completed in IC-Inspection or IC-Inspector, an event is automatically created from the task and they're linked together.

In some cases, for example, when you created events manually, there may be no tasks associated with the event. In NEXUS IC, you can check associated tasks when selecting the event on the **Event Listing** tab of the **INSPECTION** screen and checking the record on the **Task** pane (see *Task*).

You can link incomplete tasks to an event in case they belong to the same asset and the same workpack and they have the same event type. The same functionality is available on the **Event Listing** pane in IC-Inspection. To match tasks, follow the steps below:

1. On the **Event Listing** tab, select one or more events as required.
2. From the tab's toolbar, choose *Shortcuts* → *Match Task*. You can also select the same option from the context menu of the events (available by right-clicking).

Result

The system automatically matches incomplete tasks to events in case all the following conditions are met:

- The task doesn't already have an event assigned to it.
- The task and the event have the same **asset**.
- The task and the event have the same **workpack**.
- The **event type** of the event and the task match.

The task gets completed and disappears from the **Incomplete Tasks** pane. You can now see the associated task on the **Task** pane.

Note

You can also manually link incomplete tasks to events. For more information, see *Incomplete Tasks*.

14.2.10 Survey Data Processing

Survey data - including KP, Easting, Northing, Latitude, Longitude, and Elevation - is stored in a survey set. Each event in NEXUS references a survey set, and its positional data is retrieved by matching the Start Clock timestamp of the event with a corresponding Date Time Stamp in the survey set.

In most cases, raw survey data is imported or synchronised to the NEXUS IC database together with the event records. You can also import survey data manually. All survey data must be assigned to a survey set. For more information, see *Configure Survey Sets*.

You can check survey data associated with specific events on the **Event Details** pane of the **INSPECTION** screen (see *Event Details*).

14.2.10.1 Matching Survey Sets to Events

Events are matched to imported survey data based on time proximity. The matching behaviour is controlled by the **Survey Threshold** setting, which defines the time window around an event within which survey data can be considered a valid match.

The **Survey Threshold** is configured in the **Properties** dialog under *Database* → *Properties*, and is specified in **seconds**.

For each event, NEXUS creates a time window before and after the event timestamp based on the configured survey threshold. Survey points that fall within this window are candidates for matching, and the event is matched to the **nearest** available survey point within the range.

14.2.10.1.1 Even Threshold Values

When the threshold value is an even number, the time window is split evenly before and after the event. For example:

- **Survey Threshold:** 4 seconds
- **Match range:** 2 seconds before to 2 seconds after the event

14.2.10.1.2 Odd Threshold Values

When the threshold value is an odd number, the time window cannot be divided evenly. In this case, the additional second is applied **after** the event timestamp. For example:

- **Survey Threshold:** 5 seconds
- **Match range:** 2 seconds before to 3 seconds after the event

14.2.10.1.3 Survey Data Requirements

To ensure reliable matching, imported survey data should include entries at intervals smaller than the configured survey threshold. For example, with a threshold of 5 seconds, survey data should be recorded at least every 4 seconds to guarantee a suitable match for each event.

Note

- Gaps in survey data are acceptable, provided there are no events within the time span of the gap that require survey matching.
- Within a single survey set, each timestamp can only have **one set of survey values**. If you need to associate different survey values with multiple events occurring at the same time, those events must reference **different survey sets**.

14.2.10.2 Track Repositioning

In case you use the services of a survey company that performs the post-processing of survey data, you need to update the survey data in the NEXUS IC database by importing the smoothed survey data that they provided. This is called track repositioning.

When performing track repositioning, you create a new survey set for the smoothed survey data and reassign that survey set to the relevant events. Track repositioning requires a CSV or MS Excel file of the processed survey data, most likely in the format originally provided in the survey string.

Note

Once you've performed track repositioning, consider re-running the anomaly triggers (see *Run Anomaly Triggers*).

To perform the update of survey data in NEXUS IC based on the smoothed survey data, follow the steps below:

1. Create a new survey set for the smoothed data. You can create a new survey set in the following ways:

- In the main menu, go to *Configuration* → *Events* → *Survey Sets* and in the **Configuration - Survey Sets** dialog, click **Add** to create a new survey set (see *Configure Survey Sets*)
- On the **INSPECTION** screen:
  1. Select the relevant events on the **Event Details** tab.
  2. On the **Event Details** pane, go the **Survey** tab.
  3. In the **Survey Set** field, click ....
  4. In the **Select Survey Set** dialog, click **Add** and specify the name of the survey set.

2. Import the smoothed survey data into the new survey set. To do that, in the **Configuration - Survey Sets** or **Select Survey Set** dialog (see step above), select the new survey set and click **Import**. Follow the steps in the import wizard (see *Import Events*).
3. On the **Event Details** tab of the **INSPECTION** screen, select the events that you want to reposition. You can filter events in the dialog (for example, by workpack) as required.
4. On the **Event Details** pane, go the **Survey** tab.
5. In the **Survey Set** field, click ....
6. In the **Select Survey Set** dialog, select the new survey set.

Result

The survey data gets updated for all the selected events.

See also

Configure Survey Sets

14.2.11 Run Anomaly Triggers

In most cases, whenever anomaly triggers are violated, findings are automatically generated at the time when events are added or *imported*. However, there are some scenarios in which you must run anomaly triggers manually, including:

- Anomaly triggers are updated and anomaly trigger limits have changed
- Anomaly triggers exist on a calculation field
- Before any finding review sessions
- After a bulk import of event data (particularly when anomaly triggers rely on events other than itself)

You can run anomaly triggers manually on the **Event Listing** tab of the **INSPECTION** screen by choosing *Shortcuts* → *Anomaly Triggers* from the toolbar. This will run the anomaly triggers functionality for the filtered events listed in the **Event Listing** tab. If required, the system automatically creates findings on those events where the event data exceeds specified criteria. If findings exist and event data no longer exceeds the criteria, then findings will be deleted. For more information, see the process below.

14.2.11.1 Prerequisites

Anomaly triggers have been defined in either of the following ways:

- Generic anomaly triggers have been set up for fields in AIG forms or event forms as described in *Set Up Anomaly Triggers*.
- Asset-specific anomaly triggers have been set up as described in *Set Up Anomaly Triggers for Assets*.

14.2.11.2 Run Anomaly Triggers Manually

1. On the **INSPECTION** screen, go to the **Event Listing** tab.
2. If required, filter the events or select those for which you want to run the anomaly triggers.
3. Choose *Shortcuts* → *Anomaly Triggers* from the toolbar.
4. In the confirmation dialog, choose **Run Triggers**.
5. The system uses the filtered list of events shown on the **Event Listing** tab to check event data against pre-configured anomaly triggers and performs the following:
   - If the event data exceeds specified criteria in the anomaly triggers:
     a. It checks the following data to see if a finding already exists from this trigger for this event:
        – Anomaly Trigger rule (Bound_ID)
        – Is Auto Generated = true
     b. If it finds no such finding, it **creates a new finding**.
   - If the event data is within the specified limits in the anomaly triggers:
     a. It checks if there's a need to delete an existing finding by trying to match a finding based on the following data:
        – Anomaly Code (Code_ID)
        – Anomaly Severity (Severity_ID)
        – Reason (if there is an error message provided in the anomaly trigger)
        – Anomaly Trigger rule (Bound_ID)
        – Is Auto Generated = true
        – That it has not been linked to an anomaly (Anomaly_ID is null)
        – Anomaly Required is null
     b. If it finds a matching finding, it **deletes the finding**.

        This means that if a finding was automatically generated from a particular anomaly trigger rule, and the event data no longer exceeds that rule (because the event data has been changed or because the rule has been changed), and the error message in that rule still matches the Reason in this finding, and the finding has not been linked to an anomaly and the user has not marked *whether* it needs to be linked to an anomaly, the system will delete it.

> **Note**
>
> If you delete an anomaly trigger, findings created from it won't be deleted. If you *want* to delete all findings created from an anomaly trigger, don't delete the anomaly trigger. Instead, modify it so that no data will be marked as anomalous (for example, you can set it

to only flag data between -2 and -1 on a field with no negative values), then run the anomaly triggers functionality. *Then*, as a second step, you can delete the anomaly trigger.

14.2.12 Custom Export Events

The Custom Export functionality allows you to choose a subset of event data and export that to an Excel file.

You can perform custom export by choosing **Custom Export** from the toolbar on the **INSPECTION** screen.

The format in which the data is exported to Excel is the same format in which the data can be reimported (with some exceptions). See *Import Events* for more information on importing data from Excel.

14.2.12.1 Perform Custom Export

1. On the **INSPECTION** screen, choose **Custom Export** from the toolbar.

   Result

   The **Event Export Wizard** opens.

2. Specify the name of the file and the location where you want it to be saved to. NEXUS proposes a default path and name, which you can overwrite as required.
3. Click **Next**.
4. In the next dialog, specify the export options:

Field	Description
Columns	Select one of the following options: • *All columns* - includes all the relevant columns in the exported file. • *All visible columns* - columns that have the Visible Grid or Visible Form options ticked will be exported. Workflow rules affecting field visibility will not be run. • *User selected* - you can select which columns to include in the export. A subsequent dialog will be shown later select those columns.
Asset Location	Select one of the following options: • *Single column* - the location of the assets will be included in a single column, each node separated by " / " (note the space), for example, "Field / Asset / Elevation / Member / Anode" • *Multiple columns* - each node in the asset location hierarchy will have its own column in the exported file.
Findings	Select one of the following options: • *Include* - finding data will be included in the export, in which case they will get their own worksheet. • *Exclude* - finding data will not be included in the exported file. • *Only export Findings* - only finding data will be included in the exported file.
Images	Select whether you want to include the attached images in the exported file, and if so, how. You can *Embed thumbnails* at various resolutions, *Embed full size images*, *Hyperlink to external images*, or *Do not export images*. If an event has several images, you will get several sets of Multimedia columns, with images for an event shown horizontally within the event's row.
Calculated fields	Indicate whether you want to include calculated fields in the export.
Sub events	Indicate whether you want to include sub-event data in the export. If you export sub-events, the event data will be repeated in several rows, one for each sub-event.
Worksheets/One per event type	When ticked, a separate worksheet will be created for each event type. If you untick this option, you will get one Excel worksheet with (potentially) many different event types mixed together.
Worksheets/Hide Lookup Lists	By default, extra worksheets are created for each lookup list used in the forms. You can choose to hide these worksheets.
Date	Specify the formatting of dates in the exported file.
Time	Specify the formatting of times in the exported file.
Cell formatting	If you select this option, some cell formatting options will be applied, for example, cells with invalid values will be shown in red, cells not relevant to this event form will be greyed out, and so on.

5. Click **Next**.
6. In the next dialog, choose the Asset View and select which subset of assets you want to include in the export.

> **Note**
>
> Use the **Select Children** and **Unselect Children** toolbar buttons to include and exclude the visible and non-visible child assets. Simply selecting an asset at the top level will not automatically select all the child assets beneath it.

7. Click **Next**.
8. In the next dialog, select the workpacks that you want to include in the exported file.
9. Click **Next**.
10. In the next dialog, select the event types that you want to include in the exported file.
11. Click **Export**.

> **Result**
>
> The system generates the Excel file to the location that you specified. If required, you can choose to open the document immediately.

> **Hint**
>
> - The column order within the exported sheet is determined by the grid column order set within each form under *Configuration* → *Assets* → *Information* (see *Configure Asset Information Groups*).
> - The exported Excel sheet contains a **Legend** tab, which shows the meaning of various cell and row colours.

14.3 Findings

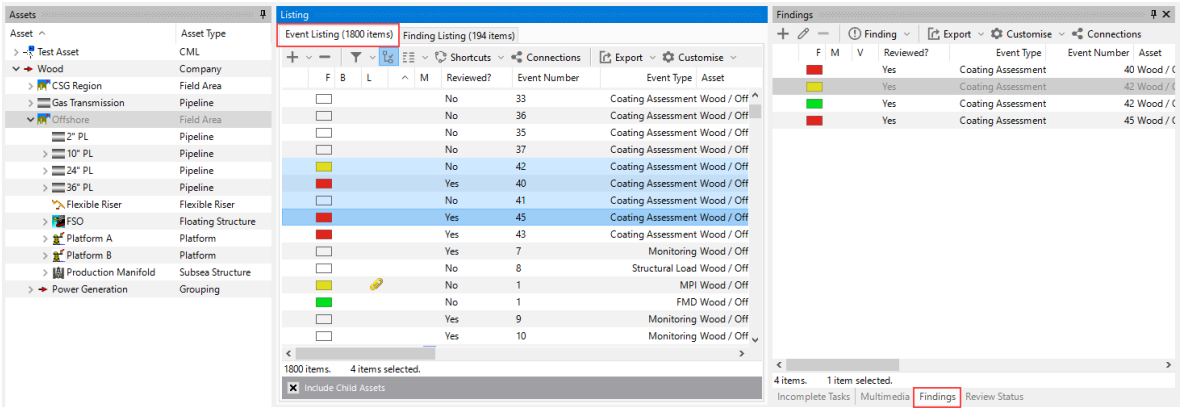
A *finding* is the link between an *anomaly* and an inspection or survey event. Findings are either escalated and linked to an anomaly (see *Link Finding to Anomaly*) or deemed "insignificant" and remain simply as an observation on the source event.

Findings are automatically created on events when event data meets or exceeds the pre-configured anomaly triggers. Findings can be created also manually in IC-Inspection or NEXUS IC (see *Create Findings*).

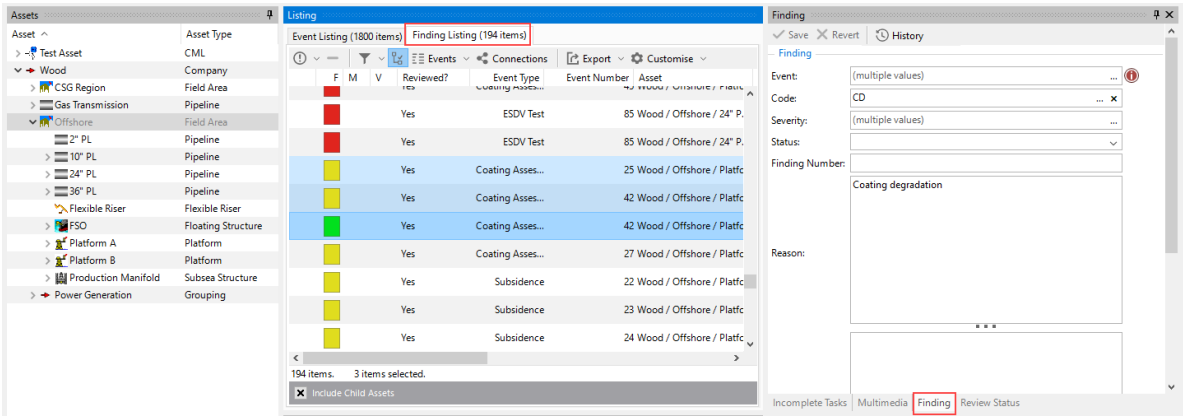
The list of all finding records can be viewed and managed on the **Finding Listing** tab (see *Findings Listing*) of the **INSPECTION** screen once the relevant asset is selected in the asset tree.

On the **INSPECTION** screen, you can view or manage data of finding records in two ways:

- If you want to review all the finding records created for specific events, you can select the events on the **Event Listing** tab and check and manage the relevant findings on the **Findings** tab:



- If you want to review the data of specific finding records, on the **Finding Listing** tab, you can select the findings and check and update their data on the **Finding** tab:



Note

When the **Finding Listing** tab is active, then the **Findings** pane is hidden and the **Finding** pane is shown. When the **Event Listing** tab is active, then the **Finding** pane is hidden and the **Findings** pane is shown.

14.3.1 Report Table Sources

To extract Finding data into a report template, use the System Table titled **Finding** as the primary Table Source, or use the System Tables titled **Event** or **Anomaly** and then add fields from the **Finding** table. For more information see *Configure Report Templates*.

See also

- *Findings Listing*
- *Create Findings*
- *Edit Findings*
- *Review Findings*
- *Link Finding to Anomaly*

14.3.1.1 Findings Listing

You can see the list of all events that have associated findings on the selected asset (and it's children, if it's enabled) on the **Finding Listing** tab of the **INSPECTION** screen.

> **Note**
>
> If you have selected an event with a finding on the **Event Listing** tab and you switch to the **Finding Listing** tab, your selection will be carried over to the **Finding Listing** tab.

14.3.1.1.1 Filtering Findings

The asset tree acts as the main filter for the findings listed in the grid. When you select an asset in the asset tree, you can see the list of events with findings recorded on the selected asset, and, if you selected **Child Assets**, the list will include the findings for all the children of the selected asset too.

You can filter findings in the grid based on:

- Workpacks - Choose *Filter* → *By Workpack* from the toolbar of the tab to select the workpacks based on which you want to filter the findings.
- Event Type - Choose *Filter* → *By Event Type* from the toolbar of the tab to select the event types based on which you want to filter the findings. If you have no event types selected, then all findings will be shown.

  > **Note**
  >
  > When findings are filtered by event type from the toolbar menu, and there are only events of a single event type displayed in the grid, the fields of the specific event type will get added as columns in the finding listing grid.

All columns in the grid can also be filtered and sorted using the standard filtering (see *Filtering*) and sorting (see *Sorting*) functionality.

14.3.1.1.2 Columns

By default, the **Finding Listing** tab displays columns that are common to all findings displayed. The first columns in the grid represent the following:

Column	Description
F	Shows a colour that indicates the status of the **Finding**. See below for more information.
M	An icon is shown if there's **multimedia** attached to the event.
V	An icon is shown if there's a **video** attached to the event.

14.3.1.1.2.1 Finding Statuses

The colours of the icons in the **Finding** column indicate the status of the finding, which can be the following:

Colour	Meaning
(Yellow)	The finding needs to be reviewed. By default, all new findings get this status.
(Green)	The finding has been deemed insignificant and is not linked to an anomaly. A finding gets this status if you mark it as not requiring an anomaly when editing the finding.
(Grey)	The finding is linked to a closed anomaly.
(Red)	The finding is linked to an open anomaly.

14.3.1.1.3 Perform Actions on Findings

From the **Finding Listing** tab, you can perform actions on findings using the relevant toolbar buttons or right-clicking any of the events, which offers most of the options that the **Finding** toolbar menu has.

You can perform the following actions:

- Create findings (see *Create Findings*)
- Update findings (see *Edit Findings*)
- Review findings (see *Review Findings*)
- Link finding to an anomaly (see *Link Finding to Anomaly*)
- Delete findings - To delete findings, you can select or multiselect findings on the **Finding Listing** tab and click **Delete** in the toolbar or choose this option from the context menu (available by right-clicking the item).

14.3.1.1.4 Findings Listing Toolbar

For information about the toolbar menu options in the **Finding Listing** tab, see below:

Toolbar Option	Description
Finding → Mark finding as reviewed/reviewed (with comment)/not reviewed	See *Review Findings*.
Finding → Launch Anomaly	See *Launch Anomaly*.
Finding → Link Anomaly	See *Link Finding to Anomaly*.
Finding → Unlink Anomaly	See *Unlink Anomaly*.
Delete	Deletes the currently selected finding records. If multiple findings have been selected, then a dialog will show how many findings will be deleted and prompt you to confirm by clicking on the **Delete** button.
Filter → By Workpack . . . /By Event Type . . .	See *Filtering Findings*.
Child Assets	When enabled, findings for the currently selected asset and all sub-assets will be included in the **Finding Listing** tab. When disabled, only findings that have been recorded on the currently selected asset will appear in the grid.
Events → Event Reviewed. . .	See *Review Events*.
Events → Navigate to the event asset	Changes the focus in the asset tree to the asset on which this event has been recorded. To change back, click on the back arrow (*Previous Asset*) in the main toolbar above the asset tree.
Events → Toggle Bookmark	Bookmarks are flags on an event. Bookmarked events are identified by a star symbol in the **B** column of the **Event Listing** tab. The use of bookmarks and the workflow around setting and removing bookmarks depends on your own specific requirements.
Connections	See *Connections*.
Export	See *Export*.
Customise	See *Customise*.

14.3.1.2 Create Findings

Findings can be created in the following ways:

- In case anomaly triggers have been set up for specific event fields and those triggers are violated (see *Configure Event Types*), findings are automatically created when event data is created, saved or imported. For example, when an anomaly trigger is defined on a CP event, where the CP reading value is outside -800mv and -1200mv, NEXUS IC will automatically create a finding on that event when the event is created.
- Findings can be imported together with event import (see *Import Events*)
- Findings can be synchronised from IC-Inspection in case an inspection engineer created findings there.
- You can also manually create a finding from an event in NEXUS IC as described below.

14.3.1.2.1 Add Findings Manually

1. On the **INSPECTION** screen, select the relevant event on the **Event Listing** tab.
2. Go to the **Findings** pane and click **Add** in the toolbar.
3. In the **Add Finding** dialog, enter the details of the finding as required. For information about filling the fields in this dialog, see *Add/Edit Finding Dialog*.
4. Click **OK**.

Result

The new finding record is added to the list on the **Finding Listing** tab. On the **Event Listing** tab, the colour of the icon in the **F** column becomes yellow and when selecting the event here, the finding record is visible on the **Findings** pane.

14.3.1.3 Edit Findings

You can update the details of existing findings either on the **Finding** or on the **Findings** pane of the **INSPECTION** screen, but only one of them is visible at a time:

- When the **Event Listing** tab is active, the **Findings** pane is visible, where you can see several findings for the currently selected event (if they exist). This pane is hidden when the **Finding Listing** tab is active. You can select a single event or multi-select events as required.
- When the **Finding Listing** tab is active, the **Finding** pane is visible, where you can see the details of the findings that you selected in the **Finding Listing** grid. This pane is hidden when the **Event Listing** tab is active. You can select a single finding or multi-select findings as required.

14.3.1.3.1 With *Event Listing* Tab Active

1. On the **INSPECTION** screen, select the relevant events on the **Event Listing** tab.
2. Go to the **Findings** pane and select the findings that you want to update. You can multi-select findings.
3. Choose in the toolbar.
4. In the **Edit Finding** dialog, update the details of the finding as required. You can also link the findings to an anomaly or mark them as insignificant here using the **Anomaly Required** field. For information about filling the fields in this dialog, see *Add/Edit Finding Dialog*.
5. Click **OK** to save your changes.

14.3.1.3.2 With *Finding Listing* Tab Active

1. On the **INSPECTION** screen, select the relevant findings on the **Finding Listing** tab. You can multi-select findings.
2. Go to the **Finding** pane and update the details of the fields as required. You can also link the findings to an anomaly or mark them as insignificant here using the **Anomaly Required** field. For information about filling the fields on this pane, see *Add/Edit Finding Dialog*.

   If you want to undo your changes, before choosing **Save**, you can set the values back to their original values by choosing **Revert**.
3. Choose **Save** to save your changes.

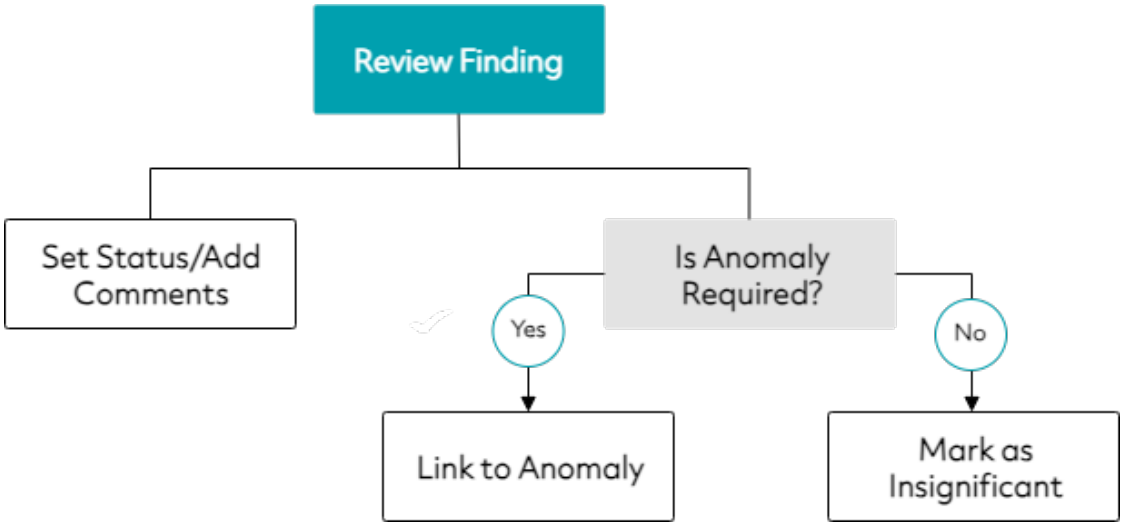
14.3.1.4 Review Findings

Once findings have been created, the reviewing engineer or review team can review the findings to determine whether the finding needs to be escalated to an anomaly or it can be deemed insignificant and remain simply as an observation on the source event.

In NEXUS IC, you can perform the following actions during a finding review:

- If the finding needs to be escalated, you can link it to an anomaly as described in *Link Finding to Anomaly*.

- If the finding can be considered insignificant, you can indicate it by setting the value of the **Anomaly Required** field to *No* when editing the finding (see *Edit Findings*).
- You can also track the status of findings by setting their review status and if necessary, add comments to the review records created (see *Set Review Status for Findings*).



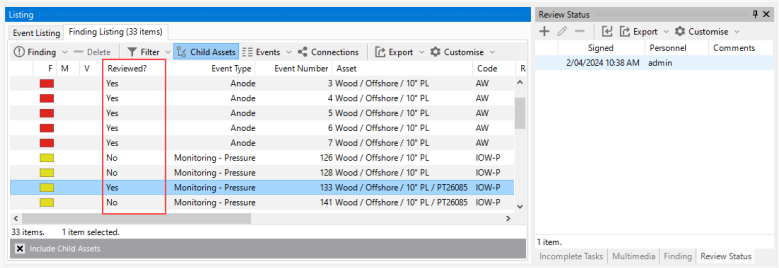
14.3.1.4.1 Set Review Status for Findings

1. On the **INSPECTION** screen, select the relevant asset in the asset tree.
2. On the **Finding Listing** tab, select the finding or findings that you want to review.
3. From the toolbar, choose **Finding** and select the required review status. You have the following options:
    - *Mark Finding as reviewed* - Sets the status of the selected findings to reviewed.
    - *Mark Finding as reviewed (with comment)* - Sets the status of the selected findings to reviewed and shows a dialog where you can enter additional comments for the finding. We recommend that you keep your comments under 8000 characters.
    - *Mark Finding as not reviewed* - If a finding has been reviewed, you can set its status back to not reviewed using this option.

> **Tip**
>
> You can set up keybindings if you want to use keyboard shortcuts for the different review actions under *Tools* → *Options* → *Inspection*. For example, when the **F8** keybinding is set up for the *Mark Finding as reviewed* action, you can quickly set the selected finding to Reviewed by pressing the **F8** keyboard button instead of navigating to the action from the toolbar. For more information about setting up keybindings, see *Setting Up Keybindings*.

Result

- The status of the finding gets updated in the **Reviewed** column of the **Finding Listing** tab.
- A new review record is created in the **Review Status** pane with your user and the date and time when you set the status to reviewed. You can update this record or add comments to it anytime. If you delete this record, the status of the finding changes back to not reviewed again.



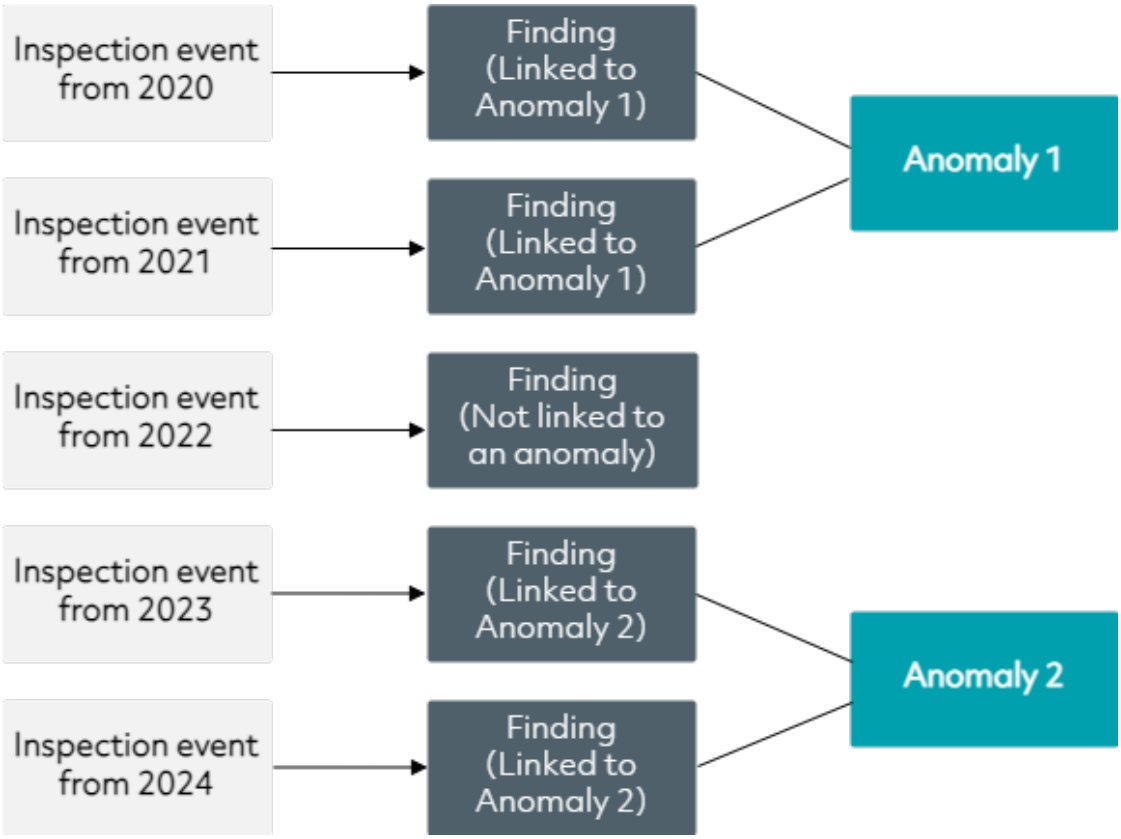
Note

You can also add, update or delete review records for findings on the **Review Status** pane on the **INSPECTION** screen. For more information, see *Review Status*.

14.3.1.5 Link Finding to Anomaly

When reviewing findings, the reviewing engineer has to decide whether the finding needs to be escalated to an anomaly. To do that, the finding record has to be linked to an anomaly.

If an event is recorded and raised to a finding over different inspection years, these findings can all be linked to the same anomaly.



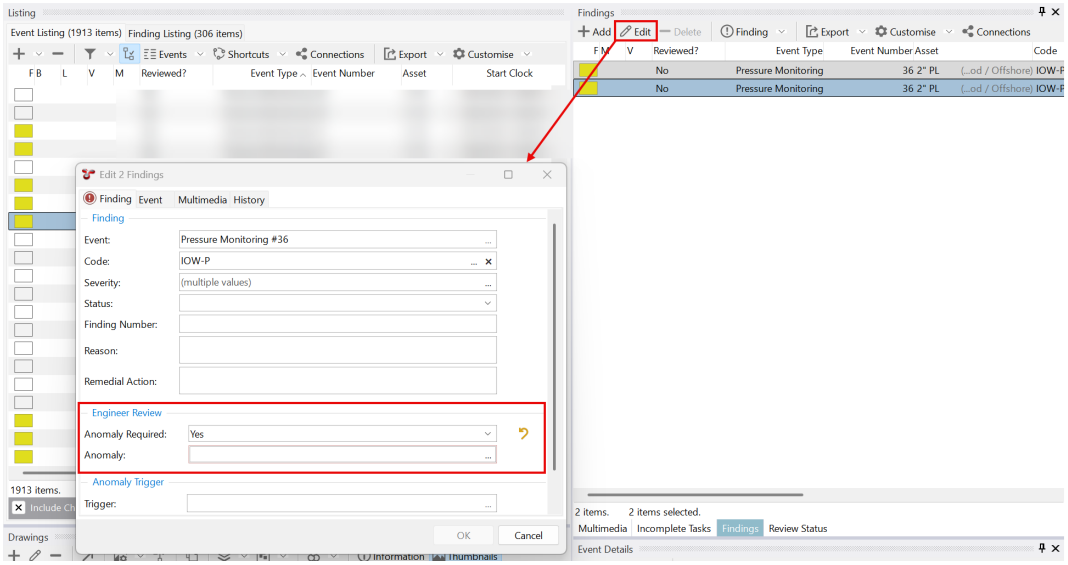
Once linked, you can launch the anomaly from the **INSPECTION** screen to edit it (see *Launch Anomaly*), or you can also unlink it (see *Unlink Anomaly*) any time.

Findings can be linked to anomalies from the **INSPECTION** screen in a number of ways:

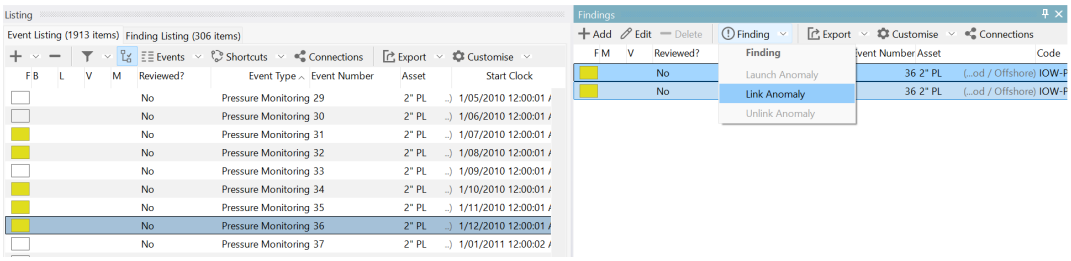
14.3.1.5.1 Create Link With *Event Listing* Tab Active

When the **Event Listing** tab is active, the **Findings** pane is visible, where you can link findings to an anomaly in the following ways:

- You can create the link whenever you create (see *Create Findings*) or edit (see *Edit Findings*) findings. To add the link, in the **Add/Edit Finding** dialog, select **Yes** in the **Anomaly Required** field and from the **Anomaly** field, click ... to select the anomaly or create a new one as required. You can also multiselect findings in the **Findings** pane to add the link to multiple findings at once:



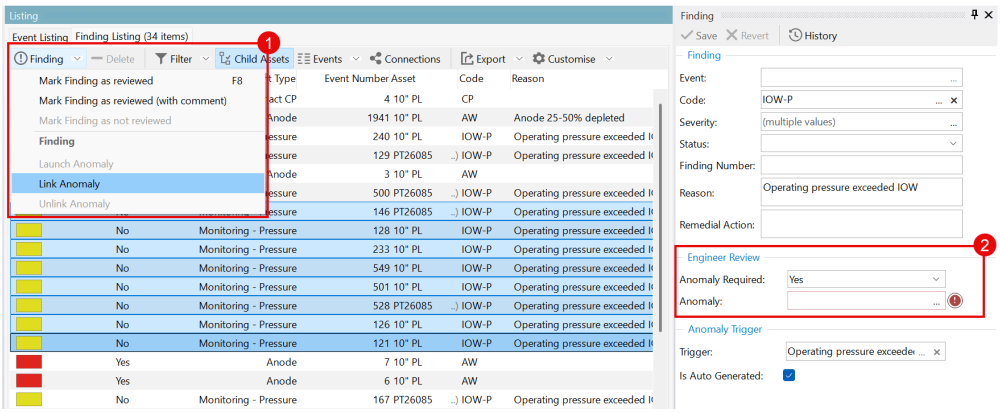
- You can also select one or more findings directly in the **Findings** pane and choose **Link Anomaly** under the **Finding** toolbar button. From the dialog that opens, you can select existing anomalies or create a new anomaly as required:



14.3.1.5.2 Create Link With *Finding Listing* Tab Active

When the **Finding Listing** tab is active, you can select one or more findings in the grid and link them to an anomaly in either of the following ways:

- You can select one or more findings directly in the **Finding Listing** tab and choose **Link Anomaly** under the **Finding** toolbar button. From the dialog that opens, you can select existing anomalies or create a new anomaly as required. (1)
- You can select one or more findings in the **Finding Listing** tab, then on the **Finding** pane (visible only if the **Finding Listing** tab is active), select **Yes** in the **Anomaly Required** field and from the **Anomaly** field, click ... to select the anomaly or create a new one as required. (2)



14.3.1.5.3 Launch Anomaly

If a finding has been linked to an anomaly, you can launch the **Edit Anomaly** dialog for the linked anomaly and edit the anomaly as required. You can do that in the following ways:

- When the **Event Listing** tab is active, you can choose **Launch Anomaly** under the **Finding** toolbar button on the **Findings** pane.
- When the **Finding Listing** tab is active, you can directly choose **Launch Anomaly** under the **Finding** toolbar button on the **Finding Listing** tab.

14.3.1.5.4 Unlink Anomaly

If a finding has been linked to an anomaly, you can unlink it any time as follows:

- When the **Event Listing** tab is active, you can choose **Unlink Anomaly** under the **Finding** toolbar button on the **Findings** pane.
- When the **Finding Listing** tab is active, you can directly choose **Unlink Anomaly** under the **Finding** toolbar button on the **Finding Listing** tab.

This will disassociate the linked anomaly from the currently selected finding. The previously linked anomaly will not be deleted, and the finding will remain unchanged (other than not having a linked anomaly).

> **Note**
>
> **Link Anomaly**, **Unlink Anomaly** and **Close Anomaly** are Shortcuts. As such, if necessary, they can be debugged using the Shortcut debugger. When you select the menu item, hold down the Control key on the keyboard. After you have given any necessary input (such as selecting an anomaly for **Link Anomaly**) the Debug Shortcut dialog will appear. You can step through shortcut items one at a time, which may help to narrow down any problems.

14.4 Alignment

On the **Alignment** pane of the **INSPECTION** screen, you can align events in one workpack with events in another. If you have carried out multiple inspections on an asset with KP (such as a pipeline), survey may have been cali-

brated differently in different years. Thus, the same physical object may be logged at slightly different KPs in different inspections. This tool lets you bring all those subtly different KP measurements into alignment with each other.

To perform the alignment, follow the steps below:

1. Ensure that the events that you want to align on are visible on the **Event Listing** tab (see *Event Listing*), by setting filters as required.

2. On the **Alignment** pane, choose a baseline workpack 1 and an alignment workpack 2 using the toolbar buttons.

3. Check the suggestions of NEXUS for alignment.

   The chart shows events from both workpacks, with the **Provide Suggested Control Points** section at the right. This section lists the event types that NEXUS IC believes might be suitable for matching on, essentially, events that have KP. Each event type has a checkbox and a slider. If you select the checkbox next to a given event type, NEXUS IC suggests control points, in that event type's colour.

   The slider at the right of each event type controls sensitivity. If the slider is all the way to the left, it will only suggest pairs of events that have identical KP. As you move the slider to the right, it suggests points that have more and more KP difference, up to a maximum of 25 metres. The default slider position is 5 metres.

4. Select one or more event types by ticking the relevant checkboxes 3:

   - We recommend that you select event types that represent static objects, such as pipeline features, anodes, field joints.
   - We don't recommend selecting event types that represent things that might change location over time, such as freespans and burials.

5. Adjust sliders as required 4. If the survey variation from one workpack to the other is more than 5 metres, you will need to adjust sliders upwards.

6. NEXUS IC displays some suggestions for the pairing of events by connecting them with a line. These are only suggestions, as yet, no links have been made.

7. To make the actual link, proceed as follows:

   a. Zoom in on the chart (put the mouse over the KP axis and spin the mouse wheel, or adjust the zoom bar at the bottom of the pane) far enough that you can select that individual point.

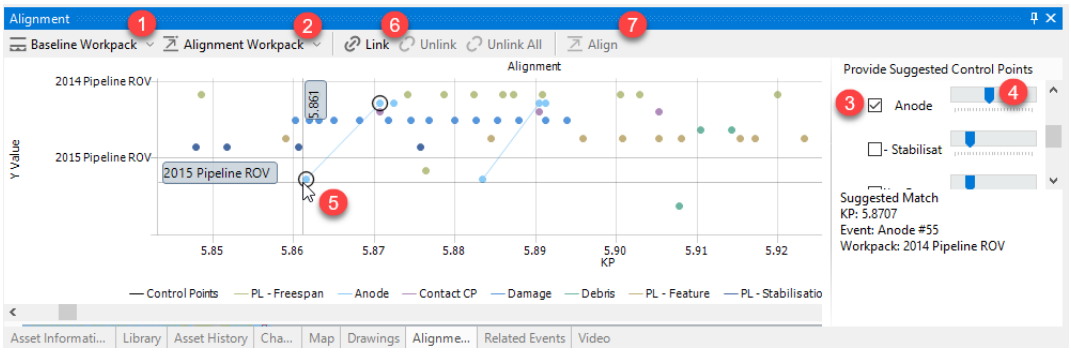
   b. Click on one of the points to select the pair 5.

   c. Click **Link** in the toolbar 6.

   You can also make a link that is not based on a suggestion. For example, suppose that a particular object has been logged one year as a Feature and the next year as a Survey Note. NEXUS IC will not automatically suggest a link if the event types are different, but you can still manually click those two events and click **Link**.

   > **Tip**
   >
   > If you change your mind, you can click **Unlink** to unlink a single pair of events, or **Unlink All** to start again from scratch.

8. Once you are happy with the links you have made, click **Align** 7.



Result

NEXUS IC aligns events between the lowest and highest KPs you have created links for. Adjustments will be made to the KPs of events in the Alignment Workpack. This may take some time, depending on the number of events involved. If you are carrying out a test, we recommend that you do so on a small KP range.

Events will be adjusted based on the linked points nearest them. For example, if you have a point at KP 0 linked to a point at KP 0.004, and another point at KP 1 linked to a point at KP 1.004, all points in the Alignment Workpack between KP 0.004 and KP 1.004 will have their KP decreased by 0.004 km. If your low points were at KP 0 and KP 0.004 and your high points were at KP 1 and KP 1.008, then weighted scaling would occur: a point halfway between at KP 0.506 would have a scaling halfway between 0.004 and 0.008 (that is, 0.006) applied; a point at KP 0.252 would have a scaling of 0.005 applied, and so on.

14.5 Asset History

See *Asset History*.

14.6 Asset Information

See *Asset Information Groups (AIGs)*.

14.7 Charts

On the **Charts** pane of the **INSPECTION** screen, you can review all the chart templates that are relevant for the events listed on the **Event Listing** tab or the findings listed on the **Findings Listing** tab, whichever is active.

If you don't see any charts listed, try different types of events, by changing the asset or by changing your filters. Charts only show event data included in your filters (workpacks, event types, column-specific filters, etc), it doesn't show data for events or findings that you have filtered out on the **Event Listing** or **Finding Listing** tabs. If your chart template is on continuous event data (such as cross-profiles), ensure that you select that Continuous Event in your event type filter.

14.7.1 Prerequisites

Charts are generated from preconfigured chart templates. To enable displaying charts for an asset, the relevant chart templates must have been configured as described in *Configure Chart Templates*.

14.7.2 Display Charts

To expand/collapse each chart, click the button at the top left of that chart, or click the chart's grey header row.

> **Tip**
>
> Click on the chart area and then, with the mouse cursor still inside the chart area, use your mouse wheel to increase/decrease the chart scale.

Note the following:

- Available charts are listed alphabetically. The first chart will be automatically expanded.
- Events with findings are shown on the chart in red.
- For some chart templates, at the right or the bottom of the chart is the chart legend. If you hover the mouse over an item on the legend, other series on the chart will fade out temporarily. If you click an item on the legend, that series will be toggled on/off. If you export the chart, only series currently visible will be exported.

Every client database includes:

- Baseline Chart, which shows events' Easting and Northing, and optionally also shows a pipeline baseline track (if you've set one up)
- Cross-Profile chart, which shows seabed profile for a single KP (if you have any PL - Cross Profile data imported)
- Event Type -v- KP chart, which shows what events are logged at what KP of a pipeline (if you have any KP-based assets such as pipelines)
- Events by Type, a pie chart showing how many events you have of each type
- Longitudinal Profile, which shows top of pipe, bottom of pie, and left and right seabed versus KP (if you have any PL - Profile data imported)
- Pipeline View, which shows events along your pipeline in a 3D view. This view can also show seabed profile (if you have any PL - Cross Profile data imported), and animates motion along the pipeline as you select events. See Charts Toolbar below for details of buttons that are used by the Pipeline View.

14.7.3 Chart Width

When the **Charts** tab is 1000 pixels wide or less, all charts are shown at the full width of the tab. When the **Charts** tab is over 1000 pixels wide, some charts are shown full width, and some are shown half width, in order to fit more charts side-by-side onto your screen.

Charts that have an X axis of type string, date, or date/time, or whose X axis includes 'KP' are always shown full width. You can adjust the width of all charts by adjusting the width of the whole application window, adjusting other elements such as the asset tree wider/narrower, and so on.

14.7.4 Zooming

At the bottom of most chart templates, below the horizontal scrollbar (if visible) is the Zoom Bar. You can hover the mouse over the left or right end of the selected part of the Zoom Bar and drag to change the selection. Initially the entire Zoom Bar will be selected, so hover the mouse over the left or right end of the bar and drag. Once a subset of the chart is selected, you can use the scroll bar or the Zoom Bar to drag the whole selection area without zooming.

You can also zoom in or out by clicking in the chart area and (with the mouse cursor still inside the chart area) spinning the mouse wheel. For charts with a lot of data (thousands of events) this can be slow, so the Zoom Bar may be faster. You can zoom on a single axis by putting the mouse pointer over that axis and spinning the mouse wheel. Not all charts support zooming in both axes.

You can also control zoom with toolbar buttons Zoom In, Zoom Out, and Reset Zoom.

14.7.5 Charts Toolbar

There is no toolbar for the whole **Charts** tab. Instead, each chart has its own toolbar.

Button	Description
	Zooms the image in.
	Zooms the image out.
	Resets to default zoom level.
	Opens the **Export** dialog, from which you can generate images from the chart. Ensure the range you want is set correctly using the Zoom Bar. Ensure the series you want to export are visible. If you want to export the chart as a series of images, each covering a smaller horizontal range, enter the range you would like each chart to cover in the **Range of X Axis per image** field. For example, if you have a 300 km pipeline and you enter "10" as the range per image, it will be broken into 30 images, each covering 10 km.
	Copies the chart, as you see it displayed, without the "zoom" section at the bottom, to the clipboard.
	Expands/collapses the display of this chart.

The following buttons are specific to the **Pipeline View** chart:

Button	Description
	Tracks the current KP. This button is only available in IC-Inspection. When selected, the pipeline view will move in time with the KP value coming in from survey. For NEXUS IC, see *Time Source → Synchronise KP* on the *Inspections Toolbar*.
	Exaggerates the scale to show more of the pipeline. When selected, the scale of the pipeline will be distorted to make a greater KP range visible.
	Toggles stacked series mode. When selected, events above the pipeline will be moved to make them more obvious. Different events will be moved up different distances so that all are easily distinguishable.
	Toggles 3D perspective mode. When unselected, you will see the pipeline viewed from the side. When selected, you will see the pipeline viewed from above and slightly off to one side.

14.7.6 Report Table Sources

To extract chart template data into a report template, use a Chart Template element in the report, and use the appropriate Asset table or Event table as a source. For more information see *Configure Report Templates*.

14.8 Drawings

On the **Drawings** pane of the **INSPECTION** screen, you can view and manage drawings in the same way as you do on the **ASSETS** screen. For more information, see *Drawings*.

On the **INSPECTION** screen, the following additional features are available:

- If you left-click on a drawing layer, you can create a new event on that layer's asset.
- The additional **Finding Status** menu option is available from under the **Layer Colour** toolbar button. This shows the following colours:
  - *Green* - No findings, but events exist.
  - *Grey* - No events exist.
  - *Yellow* - Findings exist, but no severity.
  - *Other* - Finding severity colour is shown.

See also

- *Drawings*
- *Charts and Drawings*

14.9 Event Details

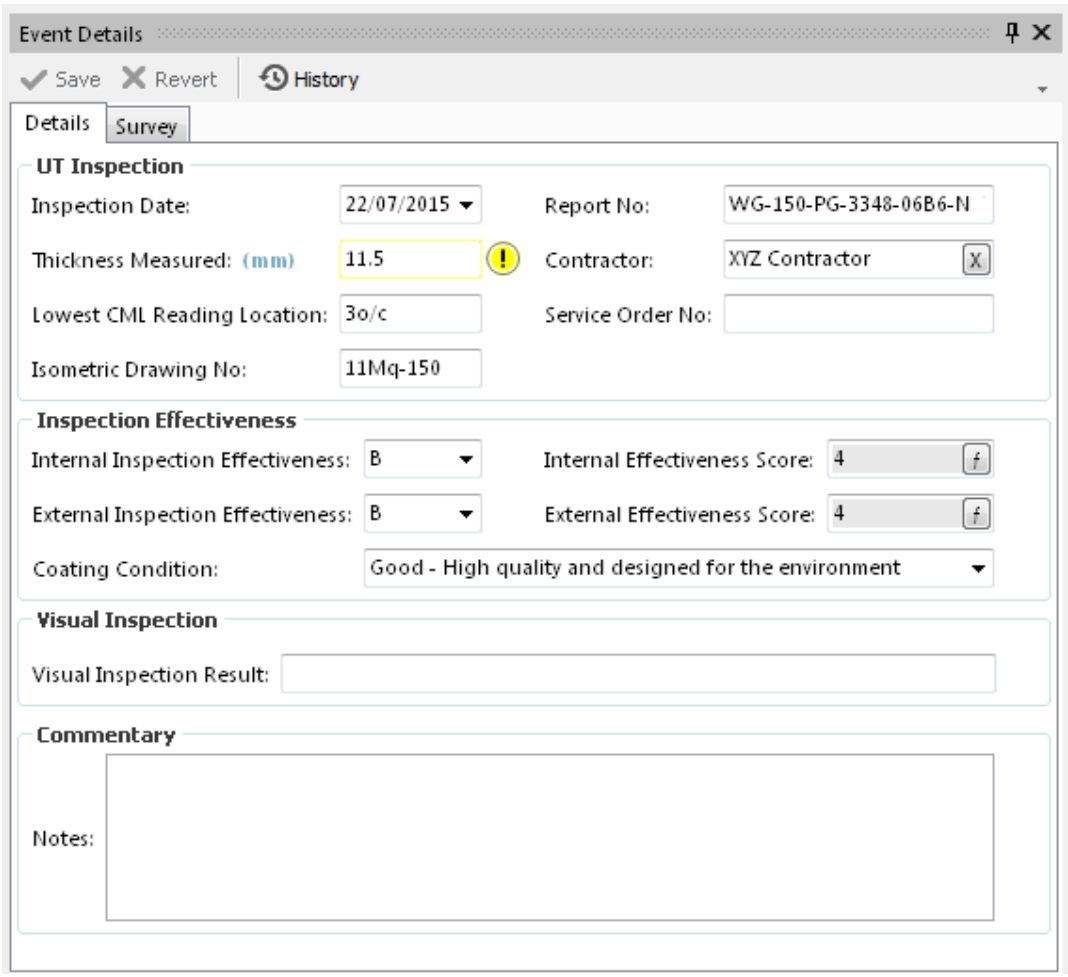
You can review all the data related to events on the **Event Details** pane once you have selected the relevant event or events on the **Event Listing** tab.

An event represents a discrete inspection or survey item. Each event record has (as a minimum) the following data linked to it:

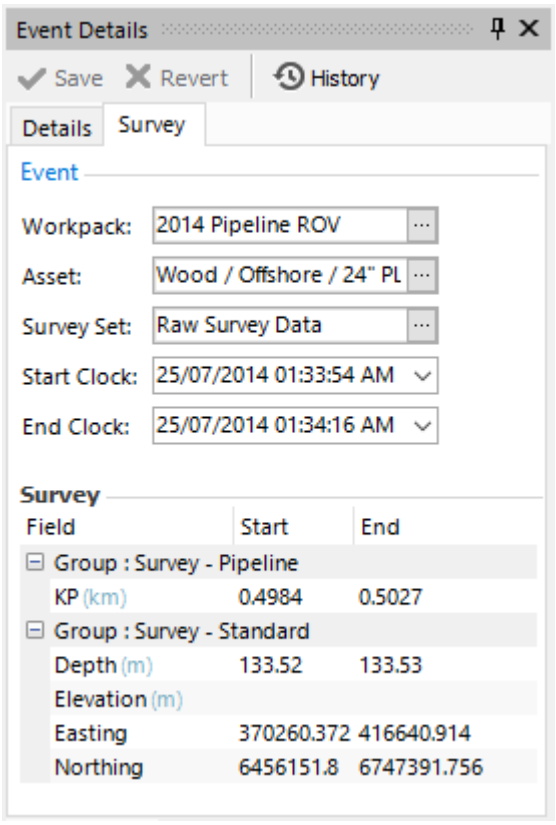
- Asset
- Workpack
- Start Date/Time
- End Date/Time
- Survey Set

The **Event Details** pane contains two tabs:

- The **Details** tab shows the fields in the event form and a notes section.



- The **Survey** tab contains key data and survey values.



14.9.1 The Event Form

The event form contains all the data fields specific to the event and is visible on the **Details** tab of the **Event Details** pane. All the fields on the form are user-definable and can be configured from *Configure Event Types*.

Fields on event forms and sub-event forms follow the same rules and have the same features as fields on asset information forms (see *Field Types*).

Event-specific data can be edited and saved on this tab as described in *Edit Events*.

The lower part of the **Details** tab contains a notes section where you can enter free text relating to this event.

14.9.2 Survey Data

At the top of the **Survey** tab, you can see the key data associated with this event. You can update all the values in these fields.

Under the key fields, you can see the **Survey** section. This shows data for each survey field assigned to this asset type (see *Assign Survey Data to Asset Type*). The data shown is related to the Start Clock and End Clock: if another event has the same Start or End Clock, it will have the same survey data.

For information about how survey sets are matched to events, see *Matching Survey Sets to Events*.

Event forms for survey sets can be configured as described in *Configure Event Types*.

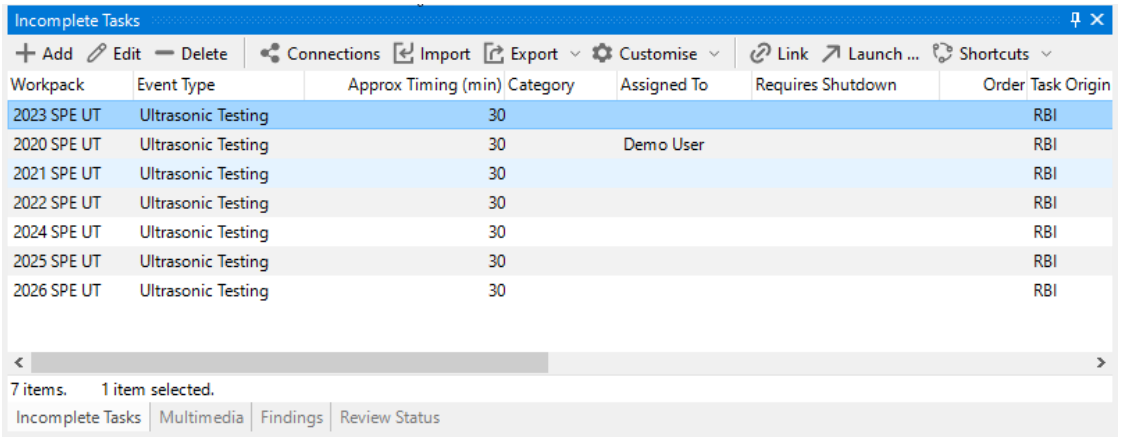
14.9.3 Report Table Sources

To extract event data (common to all events) into a report template, use the System Table titled **Event** as the primary Table Source. To extract additional data from specific events, add fields from the relevant events that exist in the **Event** category.

For more information see *Configure Report Templates*.

14.10 Incomplete Tasks

In general, tasks are completed in IC-Inspection or IC-Inspector when an event is created from the task. In case tasks haven't been completed there, you can check them on the **Incomplete Tasks** pane of the **INSPECTION** screen in NEXUS IC. This pane lists all tasks for the currently selected asset that have not been flagged as completed. Note that the list is only valid for the selected asset in the asset tree and doesn't include the incomplete tasks for its children.



14.10.1 Complete Tasks

From the **Incomplete Task** pane, you can complete tasks as follows:

- You can choose **Link** in the toolbar to link the currently selected event in the **Event Listings** pane to the currently selected task in the **Incomplete Tasks** pane. When clicked, the task will be linked to the event, flagged as completed and no longer shown in the **Incomplete Tasks** pane. Please note that the event type of the event and the event type of the task need not necessarily match for them to be linked together.
- You can choose **Launch** in the toolbar to launch the event form for the currently selected task. Once you have completed and saved the details in the event form, the task will be linked to the event, flagged as completed and no longer shown in the **Incomplete Tasks** pane.

You can also match incomplete tasks to events on the **Event Details** tab, see *Match Tasks to Events*.

For more information, see *Complete Tasks*.

You can also use the standard grid toolbar buttons to add, edit or delete tasks, use the import or export functionality, check connections, or customise layout. For more information, see *Using the Grid*.

14.10.2 Report Table Sources

To extract task data into a report template, use the System Table titled **Task** as the primary Table Source. For more information see *Configure Report Templates*.

14.11 Library

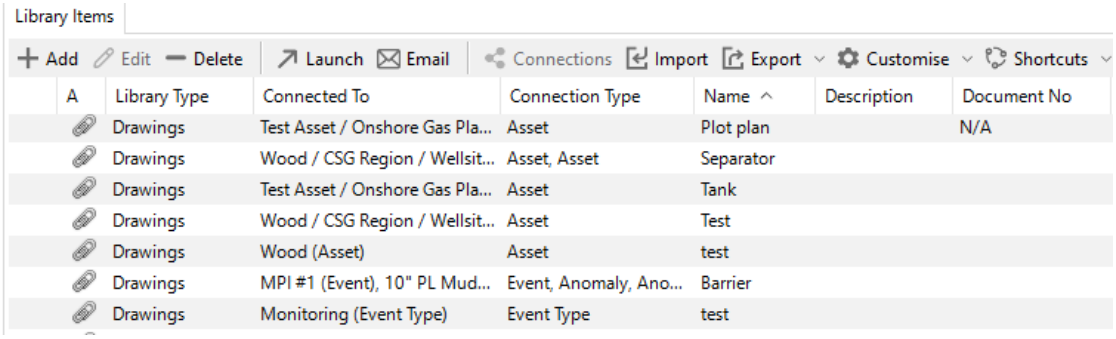
On the **Library** pane of the **INSPECTION** screen, library items are shown based on the event selected on the **Event Listing** tab (see *Event Listing*).

If you have events in the event listing, and you select one, those library items will be displayed that are associated with either of the following:

- Event
- Event type of the selected event
- Workpack of the selected event
- Asset of the selected event

14.11.1 Library Items

Library items are electronic documents that can be linked to data and data types in NEXUS IC using connections (see *Library Connections*).



The electronic documents can be uploaded directly into the NEXUS IC database, or can be referenced using URL or UNC paths.

14.11.2 Manage Library Items

You can manage library items from several screens within NEXUS IC, including:

- **Library Items** tab on the **LIBRARY** screen (see *Library*)
- **Library** tab on the **ASSETS** screen (see *Library*)
- **Library** tab on the **INSPECTION** screen (see *INSPECTION*)
- **Library** tab on the **ANOMALIES** screen (see *ANOMALIES*)
- **Library** tab under *Configuration* → *General* → *Functions* → *Edit Function Definition*
- **Library** tab on the **Edit Asset Type** dialog under *Configuration* → *Assets* → *Types*
- **Library** tab in various dialogs where library items can be managed for the relevant record, including the *Edit Anomaly*, *Edit Table Definition*, *Edit Task* and *Edit Workpack* dialogs

> **Example**
>
> If you upload company piping specifications to the NEXUS IC Library and assign it to the asset type "Pipework", the piping specifications will be available from the **Library** tab of the **ASSETS** screen whenever the active asset is of type "Pipework".

You can also manage library items on the **Library** pane of IC-Inspection.

You use the standard toolbar functions on the **Library/Library Items** tab to add, edit, delete, import, export library items or customise the grid layout. For more information about these functions, see *Using the Grid*.

Note

- You can edit the properties of the selected library item from the toolbar, but not the document itself.
- Deleting a library item will also delete all its associated connections.
- The **Export** option only exports the grid contents, not the actual library documents.

See below for more information about some actions you can perform on library items:

Add Library Items

To create a new library item, proceed as follows:

1. Start adding a new library item in one of the following ways:
   - On the *Library*/*Library Items* tab, choose **Add** from the toolbar.
   - Drag files from your file explorer onto the *Library*/*Library Items* tab.

   Note

   Drag-and-drop is not supported in remote environments (e.g., Remote Desktop).

2. Depending on the screen from which you accessed the **Library** tab, you may be prompted to select a connection type. You can connect a library item to different types of data records:

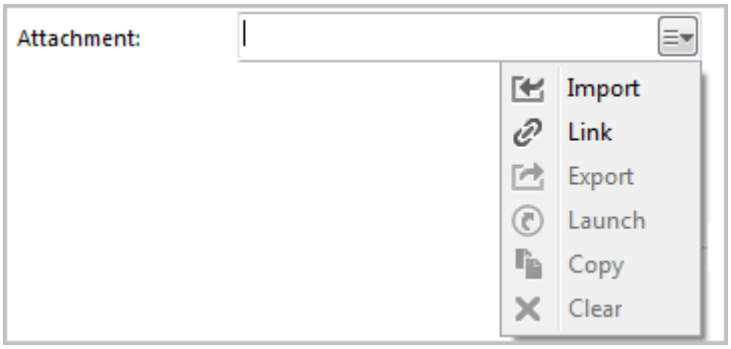
Screen	Connection Type
ASSETS	• Asset • Asset Type
INSPECTION	• Asset • Asset Type • Event • Event Type • Workpack
ANOMALIES	• Anomaly • Asset

Note

If you're adding a library item from the **LIBRARY** screen, you add the connection to a data record from the **Connections** tab after you have created the library item. For more information, see *Add Library Connections*.

3. In the **Add/Edit Library** dialog, select the library type, enter a name for the library item (mandatory) and enter other parameters as required. For information about filling in all the parameters, see *Add/Edit Library Dialog*.

   - If the document is to be uploaded into NEXUS IC, then click on the **Attachment** button, else enter a **Hyperlink** location.
   - When adding an attachment, you can either **Import** or **Link** it:
     - If you *import*, the item will be saved to the database. If you subsequently change the original on disk, the item in the database will not change to match.
     - If you *link* the item, then when you change the original on your disk, the next time you view the item within NEXUS IC, you'll see the updated item.



> **Note**
>
> - NEXUS IC still loads a copy of a linked item into the NEXUS database. This ensures that if the original is unavailable (for example, because you are away from your network), NEXUS IC can display the cached copy.
>
>   When you view the item, if the original has been updated, the database cached copy is updated too. You can't link items that are on your local hard disk, only items on network drives can be linked. The Link feature is designed to keep you up-to-date with items that may have been changed by others, and that is not possible on your local drive.
> - If you drag and drop multiple files, they will be added, and then multi-selected in the grid. You can then click **Edit** to multi-edit them (see *Multi-Edit*). Drag and drop will *import* items, not *link* them.

4. Click **OK**.

   On the **LIBRARY** screen, you can view the details of the library item by selecting it and checking the *Details* tab under the *Library Items* tab.

Edit Library Items

To edit an existing library item, proceed as follows:

1. On the *Library/Library Items* tab, select the library item.
2. Choose **Edit** from the toolbar.
3. In the **Edit Library** dialog, update data as required. For more information, see *Add/Edit Library Dialog*.
4. Click **OK** to save your changes.

Delete Library Items

To delete an existing library item, proceed as follows:

1. On the *Library/Library Items* tab, select the library item.
2. Choose **Delete** from the toolbar.
3. In the confirmation dialog, click **Check Connections** if you want to review any connections to this library item before deletion.
4. If you want to proceed deleting the library item, click **Delete**, else, choose **Cancel**.

Launch Library Items

Use the **Launch** toolbar button to launch library items on the local machine. By default, NEXUS only launches files with the following extensions: doc, docx, xls, xlsx, jpg, png, jpeg, jfif, bmp, tiff, gif, mpg, mp3, wav, ppt, pptx, txt, pdf, emf, zip, dwg, avi, rtf, mp4, csv.

Hint

Use the Space Bar on your keyboard to launch the currently selected library item.

Note that if the local machine does not have an associated viewer for the document type (for example, AutoCad viewer for DWG type), then the document can not be launched.

Email Library Items

Use the **Email** toolbar button to send an email message with the selected library items attached to it. You can select multiple library items to be sent in the same email message. Note that you must have properly configured your email settings (see *Set Up Email*) for this option to function.

Warning

If the size of the attachment exceeds your organization's attachment size limit, you may get an "Out of memory" error message.

Import Library Items

You can import library items using the standard **Import** toolbar option (see *Import*). You can download the MS Excel Import Template, which shows the required format for importing library items.

You can also import the *Connections* in the same import as the library items, so in addition to the Library Import columns, you can additionally define the Connection information using the following column headings:

- *Library Connection.Connect To*
- *Library Connection.Workpack*
- *Library Connection.Asset Type*
- *Library Connection.Asset*
- *Library Connection.Event Type*
- *Library Connection.Event*
- *Library Connection.Anomaly*
- *Library Connection.Risk Model*

- `Library Connection.Function

Note that the *Connect To* column should only contain one of the following text items:

- Anomaly
- Asset
- Asset Type
- Event
- Event Type
- Function
- Risk Model
- Workpack

14.11.2.1 Double-click

The first time you double-click on a library item, NEXUS asks you whether you want to launch the library item in an external editor, or edit the library item. If you want your choice to become permanent, tick the **Always do this** checkbox. Note that if you hold down the **Alt** key while double-clicking, you will be asked again.

14.12 Map

On the **Map** pane, you can see the events visible on the **Event Listing** tab (see *Event Listing*) on a two-dimensional map, based on their easting (x-coordinate) and northing (y-coordinate). Each event is a dot, coloured with the event type's colour. You can set the colour for each event as described in *Configure Event Types*.

14.12.1 Filtering

The **Map** pane only shows event data included in the filters you applied on the **Event Listing** tab (for example, workpacks, event types, column-specific filters). You can also filter by event type using the **Event Types** toolbar button options. If the events you are interested in are Continuous Event data (such as cross-profiles), ensure that you select that Continuous Event in your event type filter.

14.12.2 Zooming

You can zoom in or out by clicking in the map area and (with the mouse cursor still inside the map area) spinning the mouse wheel. You can also control zoom with the relevant toolbar buttons.

14.12.3 Maps Toolbar

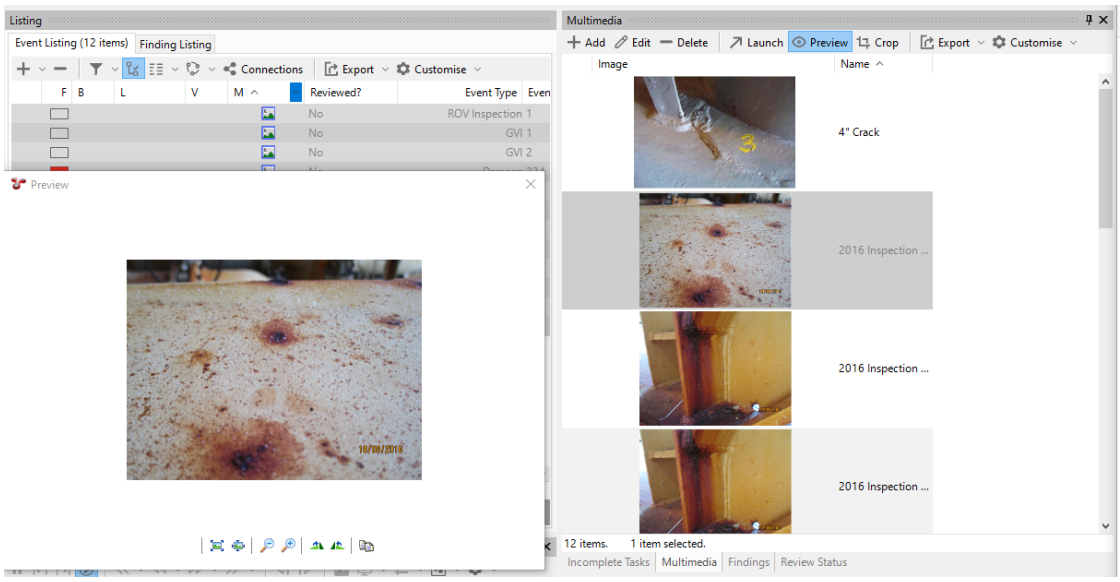
You can use the following toolbar menu options on the **Map** pane to manage the appearance of the map:

Toolbar Option	Description
Zoom In	Zooms the map in.
Zoom Out	Zooms the map out.
Reset Zoom	Resets the zoom so that all data points are visible.
Copy	Copies the map, as currently displayed, to the clipboard.
Legend	Shows or hides the legend of the events on the map either on the side or at the bottom. The legend includes the event types that are selected and the layers that have their opacity set to anything above 0%. Layers and event types can be switched off by clicking on the layer or event on the legend. If you hover the mouse over an item on the legend, other series on the map will fade out temporarily. If you export the map, only series currently visible will be exported.
Map Layers	Shows or hides layers on the map and controls their opacity. The menu options include free-to-use map layers from the web, such as ESRI World Imagery, ESRI World Topographic, ESRI Ocean Base Map, ESRI Street Map, and so on. The available map servers can be configured under *Configuration* → *General* → *Map Servers* from the main menu. Each of these layers has an opacity drop-down list to be selected from 0% to 100%. If you select 0% for any of the layers, it will not be included in the map legend.
Event Types	Selects what event types are displayed. This is more persistent than clicking/unclicking series on the map legend.
Inspection Track	Selecting a workpack from under this toolbar option will show a line on the map connecting events in the order they were logged. If the events were logged by a single ROV (or a single human inspector), this track will show the path that the ROV (or inspector) took.
Baseline	Shows or hides the baseline coordinates of the assets behind the events on the map. For example, in case of a pipeline, a black line can be displayed that shows the position of the pipeline. This is shown based on your settings for the asset's coordinates under *Assets* → *Coordinates* (also available in the context menu (right-click) of the selected asset).
Configure	Shows the sources of the various fields used by the **Map** pane to display pipeline baseline data and map data. "As Built - Easting", "As Built - Northing" and "As Built - Order" should all point to the same table, which is the table used to supply the pipeline baseline track. Typically you would point these three fields at a sub-AIG. If you don't configure these, no as-built track will be displayed. If your pipeline has many events on it, not showing an as-built may be OK. Users may be able to get a sense of the pipeline track from the events on it. "Coordinates - Datum" and "Coordinates - UTM Zone" should point to fields that provide these values. Typically they will be in an AIG. Only one datum and one UTM Zone are necessary for an entire asset. Ask your surveyors for the values that you should fill in to these fields.
Export Image	Saves the map to an image file.

14.13 Multimedia

Multimedia are electronic files that have been uploaded against an event.

You can view, add, edit or delete multimedia images associated with events on the **Multimedia** pane of the **INSPECTION** screen after selecting the relevant events on the **Event Listing** tab. Multimedia items are then displayed as thumbnails for the currently selected events.



> **Note**
>
> The following file formats are supported: GIF, JPG, JPEG, JFIF, TIF, BMP, PNG, PDF, DWG, CGM, DXF, SVG, WMF or EMF.

14.13.1 Add Multimedia Items

Follow the steps below to add new multimedia items to events:

1. Select the relevant event or events on the **Event Listing** tab.

   > **Note**
   >
   > If you select multiple events, the multimedia file will be attached to all selected events.

2. Open the **Multimedia** pane.
3. Use one of the following methods to upload the file:

   - Choose **Add** on the **Multimedia** pane to upload the file manually.
   - Drag & drop the multimedia file from Windows Explorer onto the **Multimedia** pane.

4. In the **Add Multimedia** dialog, enter a name for the multimedia (mandatory) and enter other parameters as required. For details, see *Add/Edit Multimedia Dialog*.

   When adding the multimedia file manually, you can choose to **Import** or **Link** the file:

   - **Import**: Saves the file to the NEXUS IC database. Changes made to the original file on disk will not affect the stored version.

- **Link**: Links to the original file on disk. Any changes made to the file will be reflected the next time it is viewed in NEXUS IC.

> **Note**
>
> If you drag and drop multiple files, they will be added, and then multi-selected in the grid. You can then click **Edit** to modify them in buld (see *Multi-Edit*). Drag and drop will *import* items, not *link* them.

5. Click **OK**.

14.13.2 Edit Multimedia Items

To edit an existing multimedia item, proceed as follows:

1. On the **Multimedia** pane, select the multimedia item.
2. Choose **Edit** on the toolbar.
3. In the **Edit Multimedia** dialog, update data as required. For more information, see *Add/Edit Multimedia Dialog*.
4. Click **OK** to save your changes.

14.13.3 Preview Multimedia Items

If you click the **Preview** button on the **Multimedia** pane, you can open a floating window to display the selected image in full size. If the selected events contain more images and you scroll from image to image on the **Multimedia** pane, the **Preview** window gets refreshed with whatever image is selected.

14.13.4 Crop Multimedia Items

You can crop image files in the **Multimedia** pane as follows:

1. Select the file and click **Crop** in the toolbar.
2. Click **Crop** in the toolbar of the **Edit Image** dialog.
3. Click and drag a rectangle on the image as required.
4. Before completing the crop, click **Keep Original** if you want the new cropped image to be added to the event's collection of images without overwriting the existing image. If you want to replace the existing image with the new cropped version, ensure **Keep Original** is **not** selected.
5. To complete the crop, click the button, or choose **Crop To Selection** from the toolbar.

14.13.5 Multimedia Toolbar

You can use the following options in the toolbar of the **Multimedia** pane to perform actions on multimedia files:

Toolbar Option	Description
Add	See inspections.multimedia.add. You can only add new multimedia files to events on the **INSPECTION** screen, you cannot add new multimedia files on the **ANOMALIES** screen.
Edit	Launches the **Edit Multimedia** dialog. You can update and save the properties of the multimedia file. See *Add/Edit Multimedia Dialog*.
Delete	Deletes the currently selected multimedia records. If multiple multimedia items have been selected, then a dialog pops up that shows how many multimedia items will be deleted and prompts you to confirm by clicking **Delete**.
Launch	Launches the currently selected multimedia file into the default Windows viewer for the selected file type. Note that if your image viewer supplies "Next" and "Previous" buttons, these will show you the next and previous files in the temp folder, which may not be the next and previous images in NEXUS.
Preview	See inspections.multimedia.preview.
Crop	See inspections.multimedia.crop.
Export	See *Export*.
Customise	See *Customise*.

14.14 Related Events

On the **Related Events** pane of the **INSPECTION** screen, you can check events that are related to the currently selected event on the *Event Listing* tab. Related events fulfil the following criteria:

- They have the same event type
- They are from a different workpack
- Their start and end KP overlap

If you click **Navigate Event** in the toolbar, the event selected on the **Related Events** pane will be selected on the **Event Listing** tab.

14.15 Review Status

You can review the status of events or findings on the **Review Status** pane of the **INSPECTION** screen.

Whenever an event or a finding is marked as Reviewed (see *Review Events* and *Review Findings*), a review record is automatically created in the **Review Status** pane. If you mark an event or finding as Not Reviewed, the review record is automatically deleted.

The review record shows the date and time when the record was created and the username of the person who created the record. If a comment has been entered, it is also shown there.

The list in the **Review Status** pane is dynamically refreshed based on your selection in the **Event Listing** or **Finding Listing** tabs and only shows the review records for the selected event or finding. If you have selected multiple events or findings, review records for all of them will be shown.

On this pane, you can do the following:

- Add new review records for the selected events or findings by choosing **Add**. If you select multiple events or findings, a review record will be created for each. This is useful for marking numerous events as reviewed at once.
- Update review records by choosing **Edit**.

- Delete review records by choosing **Delete**. This will set the status of the selected items to not reviewed.

14.15.1 Report Table Sources

To extract review data into a report template, use the System tables titled **Event Review** and **Finding Review** as the primary Table Source. For more information, see *Configure Report Templates*.

See also

- *Review Events*
- *Review Findings*

14.16 Task

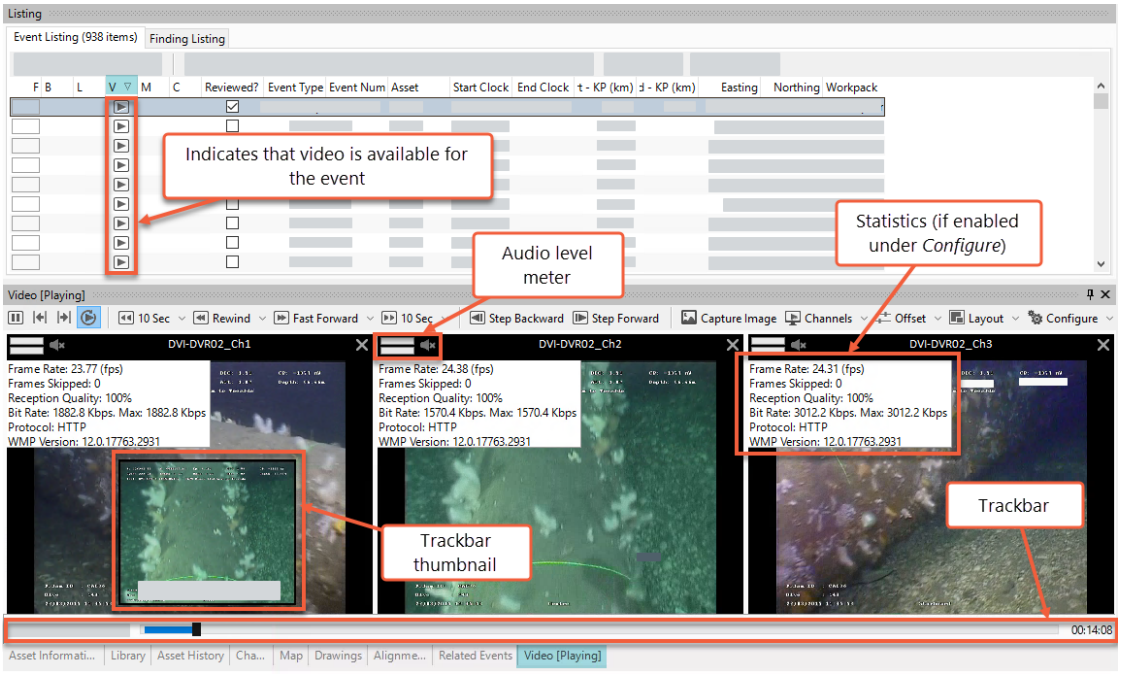
On the **Task** pane of the **INSPECTION** screen, you can check the *task* that is linked to the event currently selected on the **Event Listing** tab. In general, this is the source task based on which the event was created when the task was completed.

From this pane, you can also edit task data (see *Add/Edit Task Dialog*) by choosing **Edit** and unlink the task from the event by choosing **Unlink** from the toolbar. If you unlink a task, it will appear on the **Incomplete Tasks** pane (see *Incomplete Tasks*).

14.17 Video

The **Video** pane allows the playback of centrally stored videos, which are linked via date-time stamp from the currently selected event.

Events with associated video are identified with a small play icon on the **Event Listing** tab. When you select an event on the **Event Listing** or **Finding Listing** tab, all videos associated with the relevant event are shown on the **Video** pane:



Tip

- The **Video** pane can be undocked, resized and placed outside of the NEXUS application, on another monitor for example.
- If you are experiencing degradation of video quality due to frame dropouts caused by insufficient bandwidth, then disable one or more channels.

14.17.1 Configuration

You can tell NEXUS IC where to look for videos by setting the Global Video Path and/or Temporary Video Path in your database properties settings (see *Properties*).

You can then parse the video files (see *Parse Video*) to store their properties in the database. You can further manage video files under *Tools* → *Video...* (see *Video...*).

For more information, see *Managing Videos*.

14.17.2 Video Toolbar

You can use the following toolbar menu options on the **Video** pane to manage videos:

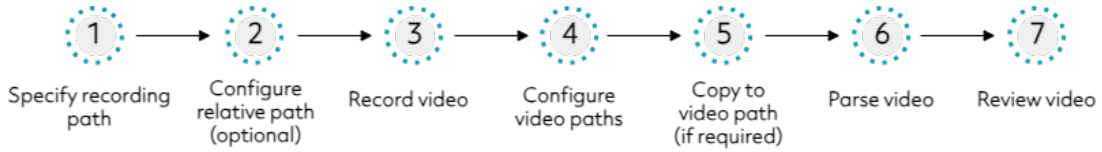
Toolbar Option	Description
Play/Pause	Starts playback at the current point in time. The video can be paused by pressing this button again.
Play from Event Start Time	Plays the video for the selected event starting at that event's Start Clock time.
Play from Event End Time	Plays the video for the selected event starting at that event's End Clock time.
Auto Play	When this button is toggled OFF, you will be required to click on one of the Play toolbar buttons to start video playback. When toggled ON, then video playback will automatically start when you select an event on the **Event Listing** tab.
Leap Backwards	Steps back in the video by the selected time frame. You can choose the time frame from 1 second, 5 seconds, 10 seconds, 30 seconds, 1 minute or 5 minutes from the drop-down menu.
Rewind	Rewinds the video with preview using the selected speed. Choose the required speed from the drop-down menu. Depending on how the video has been encoded, some speeds may not be available. When the required position is reached, the video can be played by pressing the Play button. You can also set fast forward/rewind speed by putting the mouse cursor over the video pane and using the mouse wheel.
Fast Forward	Fast forwards the video with preview using the selected speed. Choose the required speed from the drop-down menu. Depending on how the video has been encoded, some speeds may not be available. When the required position is reached, the video can be played by pressing the Play button. You can also set fast forward/rewind speed by putting the mouse cursor over the video pane and using the mouse wheel.
Leap Forward	Steps forward in the video by the selected time frame. Choose the required time frame (for example, 1 second, 5 seconds, 10 seconds, 30 seconds, 1 minute or 5 minutes) from the drop-down menu.
Step Backward	Steps backward in the video by one frame. Depending on how the video has been encoded, this button may step the video back to the previous key frame, which might be several seconds back.
Step Forward	Steps forward in the video by one frame.
Capture Image	Captures an image from each of the playing video channels and attaches them to the currently selected event as a multimedia item. Multimedia can be viewed from the **Multimedia** pane (see *Multimedia*). Within the **Video Frames** dialog, you can select, unselect and crop images. To crop, click the **Crop** button or Ctrl-X, then click and drag a rectangle on the image. To complete the crop, click the ✓ button or **Crop To Selection**. If you have selected **Keep Original** before cropping, the cropped image will be saved as a new image and the original image will be kept too.
Channels	If multiple channels of video exist for a selected event, they will be listed in this drop-down menu. For each channel, you may enable or disable the video and/or audio. To enable or disable the audio or video, select or unselect the video or audio from the drop-down menu. You can enable or disable each channel's audio by clicking the speaker icon next to the audio level meter. Also, you can disable a video channel quickly using the X in the top right corner of each playing video.
Offset	Offsets the playback of an individual video channel with the selected number of seconds (+/-). This is useful in case you have multiple video channels and their playback is out of sync. Use the drop-down menu to select the required number of seconds with which you want to offset the playback of a given video channel. This setting is then automatically saved for the selected video channel until you change it.
Layout → Automatic	This option will automatically size and position the channels (minimising unused space) based on the size and proportions of the video pane.
Layout → Horizontal	The channels will be displayed horizontally by selecting this option.
Layout → Vertical	The channels will be displayed vertically by selecting this option.
Layout → Square	The channels will be displayed in a square shape by selecting this option.

See also

- *Managing Videos*
- *Troubleshooting - Videos*

14.17.2.1 Managing Videos

NEXUS allows you to record, parse and review video files during inspections. A typical process of managing video files during inspections is depicted in the figure below and is followed by an explanation:



1. Specify the path to the project folder where videos will be recorded.

   You must specify the recording folder location in your video device's settings. For more information, see *Specify Project Path for Recording*.

2. Optionally, you can configure relative asset-specific recording folder paths in NEXUS IC.

   This allows videos to be recorded in separate folders for each asset. For more information, see *Configure Relative Recording Paths*.

3. Record the videos files.

   Use your video device to record video files. In IC-Inspection, you can set up video devices as described in *Add Video Devices*.

4. Configure a Global or Temporary Video Path from where NEXUS IC should parse the video files.

   For more information, see *Configure Video Paths*.

5. Ensure that the video files are accessible under the video paths that you configured for parsing.

   If required, copy the video files under the relevant video path. For more information, see *Copy Files to Video Paths*.

5. Parse the video files in NEXUS IC.

   To ensure that NEXUS IC can play video for specific events, each new video file must be parsed. For more information, see *Parse Videos*.

6. Play back and review the video files as required.

   Once NEXUS has parsed the video files, it can determine which inspection events have associated video and allows you to play the video from the **INSPECTION** screen. For more information, see *Video Playback*.

See also

- *Specify Project Path for Recording*

- *Configure Relative Recording Paths*
- *Configure Video Paths*
- *Copy Files to Video Paths*
- *Parse Videos*
- *Video Playback*
- *Filename Formats*
- *Troubleshooting - Videos*

14.17.2.1.1 Specify Project Path for Recording

Before you start recording your videos, you must define where you want the video files to be saved by your video device.

You must configure the project folder path for recording videos in the settings of the video device that you use.

If you use IC-Recorder, you specify the project path as follows:

1. In IC-Recorder, navigate to the *Tools* → *Options* menu option.
2. Go to the **Project** tab.
3. Enter the path to the video recording folder in the **Project Location** field.
4. Click **OK** to save your settings.

> **Tip**
>
> We recommend that you record video to a local drive rather than a network drive to avoid issues related to bandwidth, latency, and dropouts.

For more information, see *Project Location*.

14.17.2.1.2 Configure Relative Recording Paths

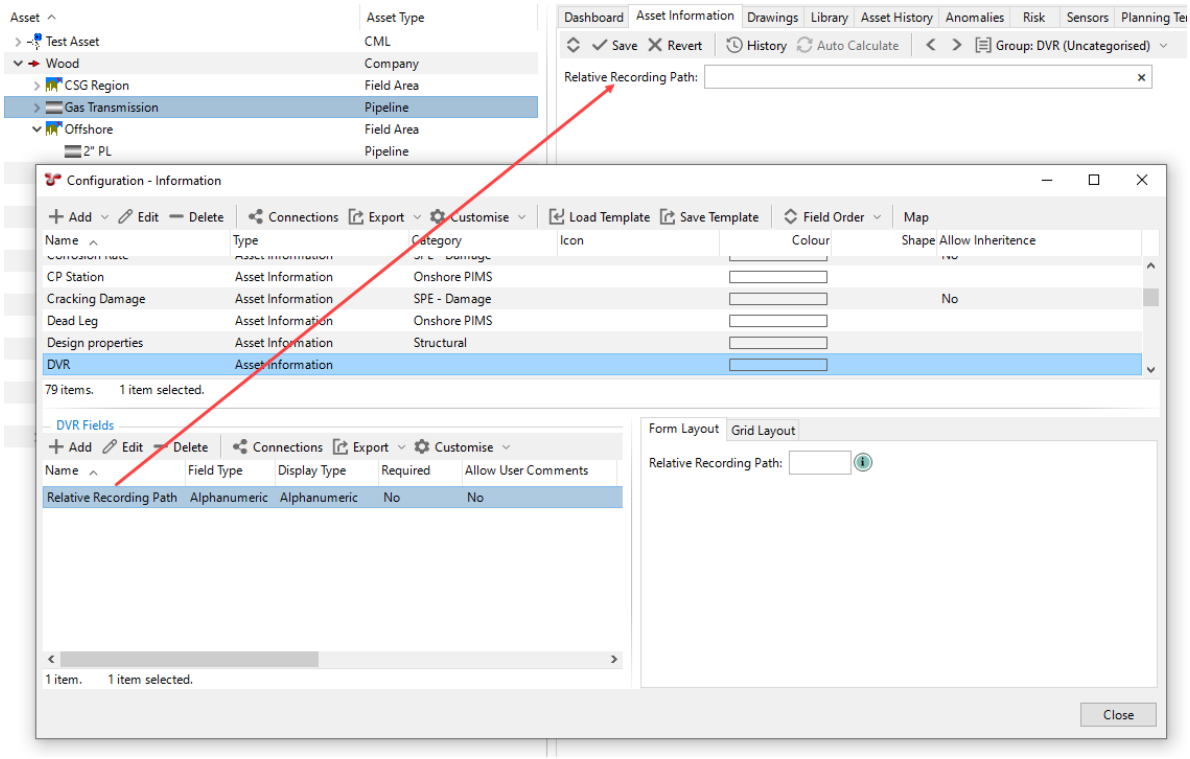
You can configure relative video recording folders in NEXUS IC, in which case, you specify an asset-specific folder path to record video into for each asset. This path is then appended to the project path (configured in the video device's settings) as a subfolder. For example, if you use IC-Recorder, where you configured the recording folder path as "E:\Video\," and in NEXUS IC, you configured the "Main Pipeline" subfolder for a specific asset, videos will be recorded to "E:\Video\Main Pipeline\".

When you switch assets during an inspection and if a new relative recording folder is set, the video device will stop recording any current video and start recording a new a video file in the folder for the current asset.

To set up a relative asset-specific recording folder path, proceed as follows:

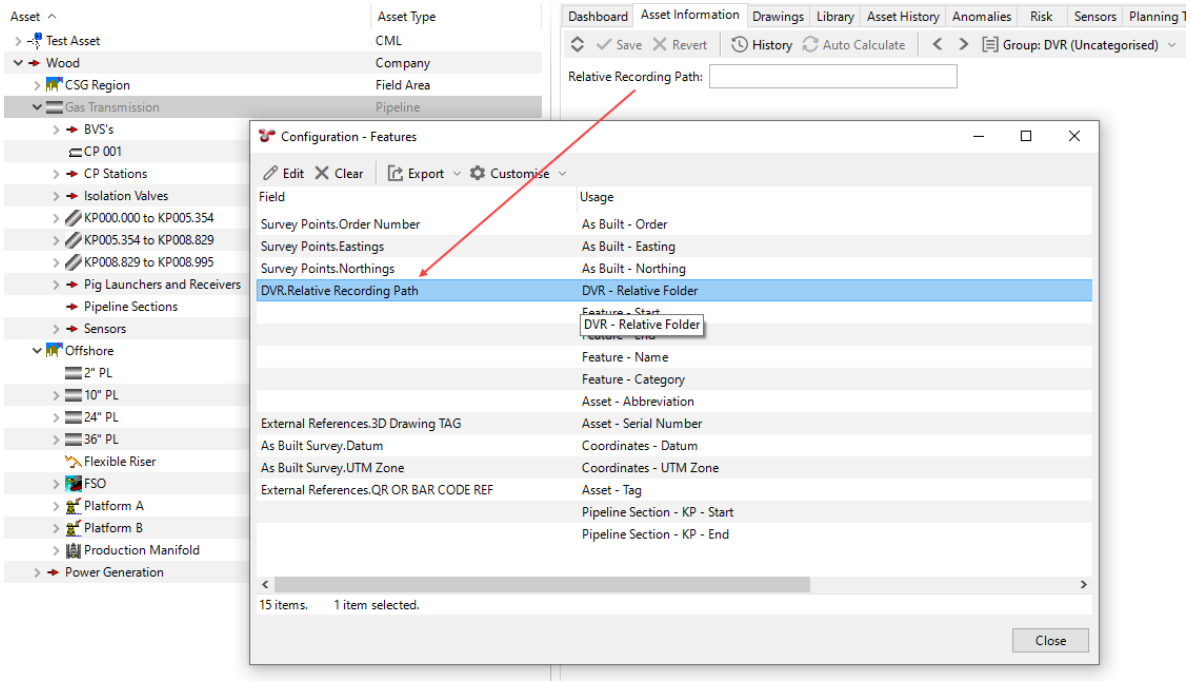
1. Ensure that an Asset Information Group (AIG) field has been configured for storing the subfolder where the videos should be recorded and that this AIG field is assigned to an AIG. You can configure AIGs in NEXUS IC under *Configuration* → *Assets* → *Information*. For information, see *Configure Asset Information Groups*.

   For example, the AIG called **DVR**, which is assigned to the asset type *Pipeline*, contains the field **Relative Recording Path** and thus the field can be accessed for the *Gas Transmission* asset, which has this asset type:



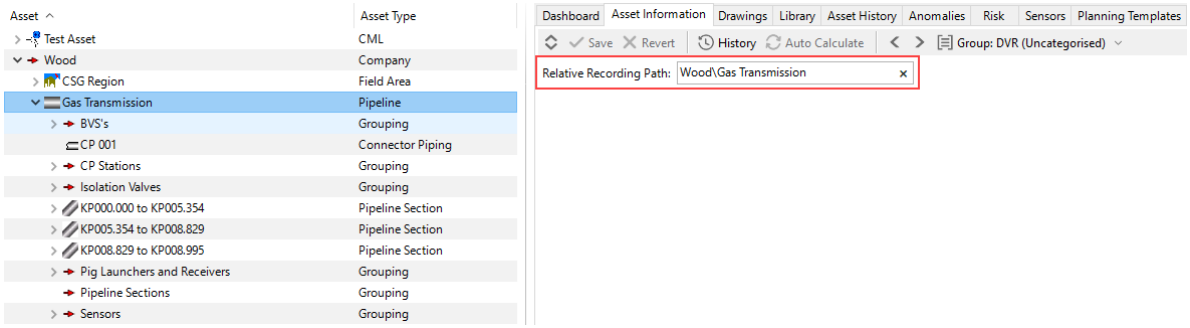
2. Under *Configuration* → *Assets* → *Features*, make sure that the AIG field above has been assigned to the Usage **DVR - Relative Folder**. For more information, see *Configure Features*.

   See below for an example:



3. In the relevant AIG field, specify the relative folder path for each asset for which you want to record videos in a specific subfolder. If you leave this field blank for an asset, the video file will be created under the project folder path that you configured for your video device.

   In the example below, you enter *Wood\Gas Transmission* in the **Relative Recording Path** field, which you have configured above:



> **Note**
>
> When specifying the relative folder path, you must adhere to the standard naming rules for Windows folder paths, for example, you must use backslashes to separate components, avoid spaces before and after the backslashes, and so on.

Result

Using the example above, if you have specified the generic recording folder name **F:\Recording** in the settings of your video device, video files will be stored under **F:\Recording\Wood\Gas Transmission** for this specific asset.

14.17.2.1.3 Configure Video Paths

To ensure that NEXUS IC can parse video files, the electronic video files (wmv, mp4 etc.) must be stored in one or more sub-folders under a network share location called the **Global Video Path**. Video files are NOT stored in the NEXUS database.

If you are working offshore, in a subscriber database, or are otherwise working with video that has not yet been uploaded to the Global Video Path, you can configure the **Temporary Inspection Video Path** to point to these video files.

To configure these video paths, follow the steps below:

1. In NEXUS IC, choose *Database* → *Properties*.
2. Go to the **Properties** tab.
3. Specify the video path for parsing as follows:
   - In case of a hosted or on-premise environment, specify the global video path in the **Global Video Path** field.

- In case you're working in an offshore environment, specify the local path where you store the videos in the **Temporary Inspection Video Path** field. This will allow reviewing the videos offshore.

4. Click **OK** to save your changes.

14.17.2.1.4 Copy Files to Video Paths

Once you have specified the video paths from which NEXUS can parse videos (see *Configure Video Paths*), you must ensure that the video files are available under these video paths. This can be done as follows:

- For hosted clients, videos are copied to the Global Video Path as part of the service.
- For clients on-premise, copying video files to the Global Video Path must be performed manually.
- If you use the Temporary Inspection Video Path in an offshore environment, you may have specified the Temporary Inspection Video Path as the folder location where videos are actually recorded, in which case, no copying is required. However, you may have specified a secondary video location to which you're copying the video files, in which case, you must perform the copying to this location. It is recommended to copy the video files to a secondary location to ensure that you have backups of them.

14.17.2.1.5 Parse Videos

Videos need to be parsed by NEXUS to ensure that NEXUS can extract key data.

14.17.2.1.5.1 Prerequisites

Before you start parsing videos, you must make sure that the video files are accessible to NEXUS IC. For information about how you do that, check the sections below:

- *Configure Video Paths*
- *Copy Files to Video Paths*

14.17.2.1.5.2 Parsing

When new files are added under the **Global Video Path** or **Temporary Inspection Video Path** (usually after a subsea or drone inspection has taken place), these need to be re-parsed by NEXUS. You can do this under *Tools* → *Parse Video* from the main menu (see *Parse Video*). Already-parsed video will not be reparsed.

When a video is parsed, NEXUS incrementally searches all folders under the **Global Video Path** and/or **Temporary Inspection Video Path** (if configured), searching for valid video files. NEXUS parses video files with specific filename formats (see *Filename Formats*). As each file is found, NEXUS extracts the key information from each video file and stores that key information in the database. Key information includes:

- **Date-time**: This information is compared with the date/time data of events to determine which events contain the video.
- **ROV name**: This information is extracted from the video file name (for example, "Tiger"), and is compared with the *ROV* associated with the event's survey set to determine which videos to play for the event.
- **Channel name**: This information is extracted from the video file name (for example, "Centre", "Port", "Starboard"), and is used to determine which videos to turn on or off during video playback.
- **Video attributes**: Size, duration, and other data about the video file is retrieved.

> **Example**
>
> A video has the following name:

```
2019-01-01 123456 - Port - [MINI ROV].wmv
```

From this file name, NEXUS IC determines the following:

- **Date and time**: 12:34 AM (and 56 seconds) on the 1st of January 2019
- **Channel**: 'Port'
- **ROV**: 'MINI ROV'. If the ROV name does not exist in the database, the ROV will be left empty when the video is parsed.

Once parsed, NEXUS IC can determine which inspection events have associated video and allows the user to play the *Video* from the **INSPECTION** screen. For more information, see *Video Playback*.

14.17.2.1.5.3 Tracking Parsing Progress

Video parsing is executed as a background job. When parsing is initiated, a blue ribbon appears above the Status Bar, showing job progress and providing access to job actions.

You can also monitor and manage parsing jobs through the Job Management Console, which provides detailed status, messages, and control options. For more information, see *Job Management Console*.

14.17.2.1.6 Video Playback

To review video files in NEXUS IC, you can play them back on the **INSPECTION** screen.

14.17.2.1.6.1 Prerequisites

You have parsed all the video files as described in *Parse Videos*.

14.17.2.1.6.2 Playback

When you select an event with video on the **Event Listing** tab of the **INSPECTION** screen, NEXUS will automatically play the relevant part of the inspection video on the **Video** pane. Videos appear on this pane in case the following event data and data extracted from the video match:

- Event start time
- Event end time
- ROV name

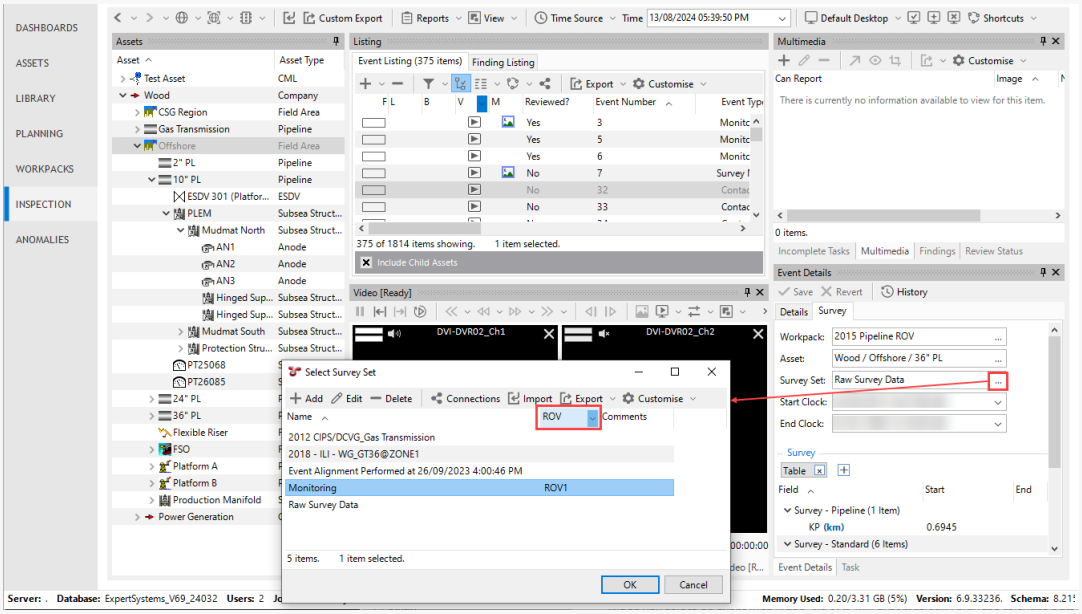
When comparing the ROV name, the following scenarios are possible:

Scenario	Video Playback
The video file and the event both have no ROV set.	The video plays.
Either the video file or the event has an ROV set, the other doesn't.	The video doesn't play.
Both the video file and the event have an ROV set, but their ROVs are different.	The video doesn't play.
Both the video file and the event have the same ROV set.	The video plays.

An event has an ROV set if it is linked to a survey set that is associated with an ROV. The ROV and event start/end date of a video file is extracted by NEXUS IC from the filename (see *Filename Formats*).

Tip

To check if an event is associated with an ROV, select the event, go to the **Survey** tab of the **Event Details** pane, and click [...] in the **Survey Set** field. In the **Select Survey Set** dialog, you can see the associated ROVs for each survey set in the **ROV** column:



You can also play back a series of still images. For more information, see *Still Image Playback*.

14.17.2.1.6.3 Still Image Playback

A series of individually timestamped images (image sequences captured via Fast Digital Imaging) can be played back through NEXUS as if it were a video. NEXUS will play each frame at the correct time offset from the last. The maximum acceptable gap between images is 10 seconds.

To enable NEXUS to play back the images, you must ensure the following:

- The images must be stored locally (on a computer hard drive or network drive) for self-hosted users, or are hosted in the cloud for hosted users.
- Images must be named according to their timestamps (see *Filename Formats* for more information). If an image timestamp can't be parsed, the date/time can also be extracted from the image EXIF data. If neither of these are present, it falls back to using the file creation time similar to parsing videos.

Depending on your environment, NEXUS can find image files as follows:

- For self-hosted users, point NEXUS to the files by setting the Global Video Path under *Database → Properties...* to the folder containing the images. All images in this folder and its subfolders will be included.
- For hosted clients, NEXUS will stream files from the cloud location in the Global Video Path under *Database → Properties...*. Only **jpg** format images are supported.

To view the image stream as a video, set an event within the time constraints of the series of images, and play the media on that event.

This feature was showcased in a video as part of What's New 6.8.

14.17.2.1.7 Filename Formats

NEXUS IC parses the following filename formats:

- YYYY-MM-DD hhmmss - Channel Name.extension
- YYYY-MM-DD hhmmss - Channel Name - Ignored Text.extension
- YYYY-MM-DD hhmmss - Channel Name - [ROV Name].extension
- YYYY-MM-DD hhmmss - Channel Name - Optional Ignored Text[ROV Name]Optional Ignored Text.extension
- YYYY-MM-DD_hhmmss_Channel Name.extension
- DD-MM-YYYY hhmmss - Channel Name.extension
- DD-MM-YYYY hhmmss - Channel Name - Ignored Text.extension
- DD-MM-YYYY hhmmss - Channel Name - [ROV Name].extension
- DD-MM-YYYY hhmmss - Channel Name - Optional Ignored Text[ROV Name]Optional Ignored Text.extension

Note that day (DD) and month (MM) should be in double-digit format.

VisualSoft style:

- yyyymmddhhmmss.extension
- yyyymmddhhmmss@Channel Name.extension
- Ignored Text_yyyymmddhhmmss.extension
- Ignored Text_yyyymmddhhmmss@Channel Name.extension

  The above formats may contain additional text or digits after the 'ss', which will be ignored.
- Recorded on yyyy-mm-dd at hhmmss with Channel Name.extension

PKT style:

- Ignored Text_yy-mm-dd_hh-mm-ss_z.extension
- Ignored Text_Channel Name~Ignored Text_yy-mm-dd_hh-mm-ss_z.extension
- Ignored Text~Ignored Text_Channel Name~Ignored Text_yy-mm-dd_hh-mm-ss_z.extension

In the above three formats, the '_z' must be present, but 'z' represents a single character which will be ignored.

- Ignored Textyyyy-mm-dd hhmmssIgnored Text.extension
- Ignored Textyyyy-mm-dd_hhmmssIgnored Text.extension
- Ignored Textyyyy-mm-ddThhmmssIgnored Text.extension
- Ignored Textyyyy-mm-dd hhmmIgnored Text.extension
- Ignored Textyyyy-mm-dd_hhmmIgnored Text.extension
- Ignored Textyyyy-mm-ddThhmmIgnored Text.extension
- Ignored Textyyyymmddhhmmss_Channel Name.extension
- Ignored Textyy-mm-dd hh.mm.ss.extension
- Ignored Textyy-mm-dd hh.mm.ss_Channel Name.extension
- Ignored Textyyyy-mm-dd hh.mm.ss_Channel Name.extension

ROV-first style:

- ROV Name_Optional Ignored Textdd-mm-yyyy hh-mm-ss.extension
- ROV Name_Optional Ignored Textyyyymmdd-hhmmss.extension

Filename formats that do not include a channel name are assigned to the channel “Digital Video”.

The ROV Name, if present, must be enclosed in square brackets. Any “Ignored Text” above may contain such a ROV Name.

14.17.2.1.7.1 Exclude Characters

Some characters need to be excluded from filenames to ensure media Azure URLs can be constructed. If any of the following characters are present in a video filename or anywhere in the full file path, your file may fail to upload, except when these characters are used in the accepted filename formats.

These characters are not allowed and will cause an error:

Name	Character	Name	Character	Name	Character	Name	Character
ampersand	“&”	dollar	“$”	plus sign	“+”	comma	“,”
forward slash	“/”	colon	“:”	semi-colon	“;”	equals	“=”
question mark	“?”	‘At’ symbol	“@”	pound	“#”		

These characters are considered ‘unsafe’ and may cause an error:

Name	Character	Name	Character	Name	Character	Name	Character
less than/greater than	“<>”	open/close brackets	“[]”	open/close braces	“{}”	pipe	“|”
backslash	“\ “	caret	“^”	percent	“%”		

14.17.2.2 Troubleshooting - Videos

14.17.2.2.1 Video Icon Not Showing for Events with Video

Possible Causes:

The video may not have finished copying or parsing.

Solution:

- Wait for the video to be copied from your recorders to the network (if applicable).
- Check whether NEXUS can see the required video files under *Tools* → *Video…* (see *Video…*).
- Confirm that the videos have been parsed successfully (see *Parse Video*).

14.17.2.2.2 Expected Videos Not Playing for Events with ROV

Possible Causes:

- If the event has a survey set associated with an ROV, only videos from that ROV will be played back (see *Video Playback*). Your event may be associated with a survey set that specifies an ROV, but the available videos are not from that ROV.

- The required video files are not visible to NEXUS.
- The videos have not been parsed successfully.
- The filenames of the expected videos do not contain the name of the associated ROV.

Solution:

- Check whether NEXUS can see the required video files under *Tools* → *Video…* (see *Video…*).
- Confirm that the videos have been parsed successfully (see *Parse Video*).
- Ensure that the filenames of all expected videos contain the name of the ROV associated with the survey set of the selected event.

14.17.2.2.3 Expected Next Video Is Not Playing

Possible Causes:

NEXUS automatically plays the next video in a sequence if the following conditions are met:

- The start time of the next video file is **less than 10 seconds** after the end time of the current video, **or**
- The start clock of the next event is **less than 10 seconds** from the end clock of the current event, **and**
- The channel names in the video filenames match.

If the next video is not playing as expected, it may be due to one or more of the following:

- The time gap between the end of one video or event and the start of the next exceeds 10 seconds.
- The channel names in the video filenames do not match.

Solution:

- Ensure that the time gap between the end of one video and the start of the next is less than 10 seconds.
- Ensure that the start clock of the next event is less than 10 seconds from the end clock of the current event.
- Check that each video filename includes a channel name.
- Confirm that the channel names match exactly between the video files.

14.17.2.2.4 Video Plays on One Machine but Not on Another

Possible Causes:

This issue is most likely related to a missing or incompatible codec. NEXUS relies on Windows Media Player to play videos within its video frame, and playback is limited to formats that Windows Media Player can decode. Many video file extensions (such as *.avi*) are container formats that can encapsulate video streams encoded in various ways. As a result, one *.avi* file may play successfully while another with the same extension may not, depending on the internal encoding and available codecs on the system.

Solution:

Install the appropriate codec on the affected machine.

To determine which codec is required, use **GSpot** (GSpot), a reliable tool for inspecting codec details for a particular file:

1. Run GSpot on both a machine where the video plays and one where it does not.
2. Drag the video file into GSpot on each machine.
3. Click the '1' and '2' buttons near the bottom (there are multiple sets - try them all).
4. Compare the output to identify differences in codec support.

If the required codec cannot be identified, try installing the Shark Codec pack, which supports a wide range of video formats.

14.17.2.2.5 Issues with the Audio

NEXUS allows you to control which channels play audio during video playback. This is useful when multiple channels contain identical audio that may be slightly out of sync. For example, if filenames specify start times only to the nearest second, two files could easily play 0.9 seconds apart. The audio controls also allow you to disable audio entirely or selectively mute channels that contain audio.

Solution:

Try the following:

- If too many channels are playing audio simultaneously, turn off audio on all but one. You can do this using the **Channels** toolbar menu options on the **Video** pane of the **INSPECTION** screen, or by clicking the speaker icon on each channel to mute or unmute it.
- If no audio is playing, ensure that audio is enabled in the **Video** pane.
- If you're using a headset or external speakers, try unplugging and reconnecting them. This can prompt Windows to route audio correctly.
- Check the system volume controls in the Windows system tray (bottom-right corner of the screen). To determine whether the issue is with NEXUS or your PC, try playing audio from another application (such as Windows Media Player).

14.17.2.2.6 When Playing Video for an Event, Multiple Copies of a Single Video Channel Appear

Possible Causes:

This typically occurs when multiple copies of the same video file exist in one or both of the configured video paths. For example, if your Global Video Path contained `Folder1\\Video1.wmv` and `Folder2\\Video1.wmv` (that is, two copies of the same file), or there is one copy of `Video1.wmv` in the Global Video Path and another in the Temporary Inspection Video Path, NEXUS will identify "both" files as being appropriate for the time range covered by that event, and will therefore display both.

Solution:

Remove any duplicate video files from the configured video paths. The Windows Explorer search feature can help locate files with the same name across multiple folders.

CHAPTER

FIFTEEN

ANOMALY MANAGEMENT

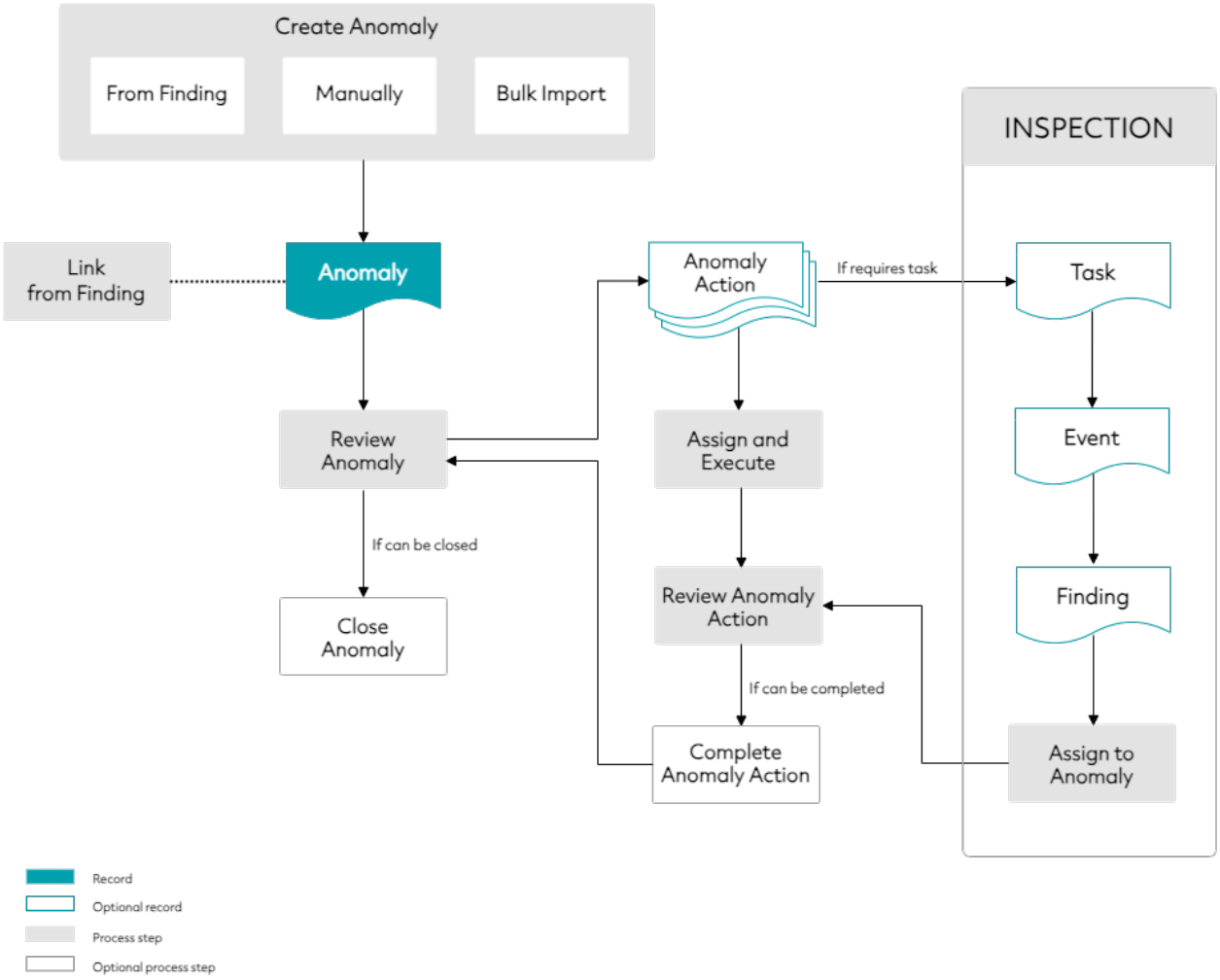
Anomalies are records that identify discrete items or areas of concern. An anomaly may originate from an inspection item (in which case it will have an associated finding), or it may be created as an ad-hoc record within the integrity and inspection cycle.

Once the inspection process is completed and anomalies have been identified from findings, anomalies can be reviewed and managed in NEXUS IC.

The general process is depicted in the figure and described below.

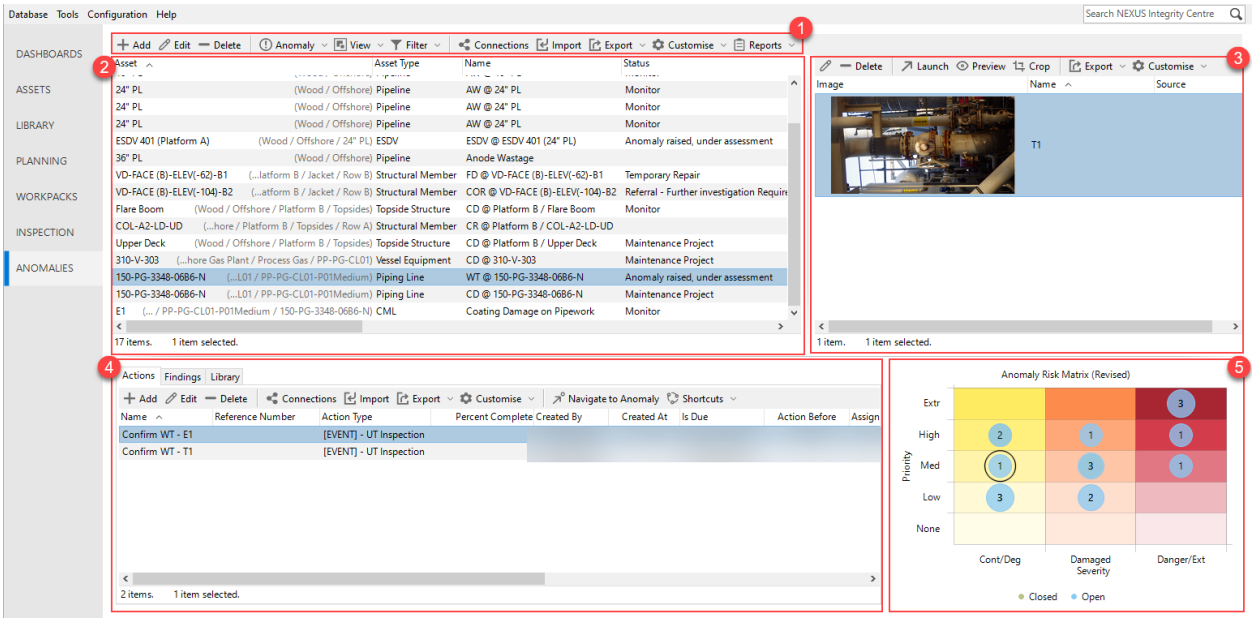
> **Note**
>
> This workflow represents a simplified version of a basic anomaly management process. Your specific process may vary based on your unique business requirements and implementation.

1. Reviewing engineers can create anomalies directly from findings, in which case, a link is automatically created, or they can create individual anomalies (see *Create Anomalies*) and link them from findings later (see *Link Finding to Anomaly*). Anomalies can also be bulk imported to NEXUS IC.
2. Reviewing engineers must review each anomaly and create anomaly actions as required (see *Anomaly Actions*).
3. Anomaly actions can be assigned directly to an individual for execution with a specific due date. Alternatively, if required, a task can be assigned to initiate an inspection process (see *Assign Task to Anomaly Action*).
4. The anomaly action or the task must be executed. In case of a task, once the inspector has completed it, an event is generated, and the finding resulting from this event must be linked back to the original anomaly.
5. Once the anomaly action or task has been executed, a reviewing engineer must review the anomaly action and determine if it can be marked as completed (see *Complete Anomaly Actions*).
6. After the anomaly actions have been completed, the anomaly undergoes another review to assess whether it can be closed.
7. If the anomaly has been remediated, it can be closed (see *Close Anomalies*), signifying the end of the anomaly management process.


Create Anomaly
From Finding
Manually
Bulk Import
INSPECTION
Link from Finding
Anomaly
Anomaly Action
If requires task
Task
Review Anomaly
Assign and Execute
Event
If can be closed
Close Anomaly
Review Anomaly Action
Finding
If can be completed
Complete Anomaly Action
Assign to Anomaly
Record
Optional record
Process step
Optional process step

15.1 ANOMALIES Screen

The **ANOMALIES** screen consists of the following main parts:



Screen Area	Description
1 **Toolbar**	See *Anomalies Toolbar*.
2 **List of anomaly records**	This grid allows you to review and manage anomaly records (see *Anomalies*). It contains columns for the main anomaly parameters and additional calculated columns, such as *Action Status* and *Action Overdue*.
3 **Multimedia files**	Shows multimedia files that belong to the anomaly record selected on the left part of the screen (see *Multimedia*). You can toggle the visibility of this pane under the **View** toolbar option.
4 **Associated records**	Shown on the following tabs: • **Actions**, where you can manage the actions linked to the anomaly selected at the top of the screen (see *Anomaly Actions*). • **Findings**, where you can review and manage findings linked to the anomaly selected at the top of the screen (see *Findings*). You can toggle the visibility of this tab under the **View** toolbar option. • **Library**, where you can manage library items linked to the anomaly selected at the top of the screen (see *Library*). You can toggle the visibility of this tab under the **View** toolbar option.
5 **Risk chart**	See *Risk Chart*. You can toggle the visibility of the **Risk Chart** pane under the **View** toolbar option.

15.1.1 Filter Anomalies

You can filter anomaly records in the grid based on:

- **Workpacks** - Choose *Filter* → *Workpack* . . . from the toolbar to select the workpacks based on which you want to filter the anomalies. Workpacks are linked to anomalies via the linked findings and events.
- **Event Type** - Choose *Filter* → *Asset* . . . from the toolbar to select the assets based on which you want to filter the anomalies. Assets are linked to anomalies by the asset chosen in the anomaly record itself AND by the linked findings and events.
- **Show Closed** – Choose *Filter* → *Show Closed* to toggle the visibility of closed anomalies in the grid.
  - When enabled, closed anomalies are shown.
  - When disabled (default), closed anomalies are hidden.

To clear all the filters by choosing *Filter* → *No Filter* from the toolbar.

> **Tip**
>
> Use the grid *Grouping* functionality to group and filter anomaly records. It is a quick and easy way to drill down to the anomalies that you are particularly interested in reviewing. All columns in the grid can also be filtered and sorted using the standard filtering (see *Filtering*) and sorting (see *Sorting*) functionality.

15.1.2 Anomalies Toolbar

For information about the main toolbar menu options on the **ANOMALIES** screen, see below:

Toolbar Option	Description
Add	Creates a new anomaly. See *Create Anomalies* and *Add/Edit Anomaly Dialog*.
Edit	Allows you to update the anomaly record. See *Add/Edit Anomaly Dialog*. You can also bulk update anomalies using the standard grid functions (see *Multi-Edit*).
Delete	Deletes the records from the database. You can also bulk delete records using the standard grid functions (see *Multi-Edit*).
Anomaly → Close Anomaly	Closes the anomaly. See *Close Anomalies*.
View → Findings	Toggles the visibility of the **Findings** tab at the bottom of the screen.
View → Library	Toggles the visibility of the **Library** tab at the bottom of the screen.
View → Multimedia	Toggles the visibility of the **Multimedia** pane on the top right part of the screen.
View → Risk Chart	Toggles the visibility of the **Risk Chart** pane on the bottom right part of the screen. The pane shows the Anomalies Risk Matrix (see *Risk Chart*).
View → Show Count	If the **Risk Chart** pane is visible, it toggles the visibility of the anomaly count values shown on the Anomalies Risk Matrix.
Filter	Opens the anomaly filter options. See *Filter Anomalies*.
Connections	Displays items that are linked to the selected anomaly. See *Connections*.
Import	Imports anomaly data into the database. See *Import*.
Export	Exports anomaly data from the active grid. See *Export*.
Customise	Customises the grid layout and columns. See *Customise*.
Reports	Generates reports based on anomaly data. See *Reports*.

15.2 Anomalies

Anomalies are records that identify discrete items or areas of concern. An anomaly is created when the finding is deemed serious enough to require action, for example, monitoring, fabric maintenance, repair, replacement, and so on. Anomalies are created and ranked in NEXUS IC to record areas of concern and prioritise actions to remediate to ensure no further significant degradation.

An anomaly record may have been originated from an inspection item (which means that it will have a finding linked to it) or it may be a stand alone record created outwith the integrity and inspection cycle (ad-hoc).

In NEXUS IC, you can manage anomalies either from the **Anomalies** tab on the **ASSETS** screen (see *Anomalies*), or on the **ANOMALIES** screen (see *ANOMALIES Screen*).

You can perform the following actions on anomalies:

- Create, edit, or delete anomalies (see *Create Anomalies* and *Add/Edit Anomaly Dialog*).

> **Tip**
>
> To bulk update or delete anomalies, use the *Multi-Edit* grid functionality.

- Import (see *Import*) or export (see *Export*) anomalies.
- Close anomalies (see *Close Anomalies*).
- Create anomaly actions for anomalies (see *Anomaly Actions*).
- Check and edit findings associated with anomalies (see *Findings*).
- Attach or review library items associated with anomalies (see *Library*).

15.2.1 Report Table Sources

To extract anomaly data into a report template, use the System Table titled **Anomaly** as the primary Table Source. For more information on Report Templates see *Configure Report Templates*.

15.2.1.1 Create Anomalies

Anomalies can be created in a number of ways within NEXUS IC, including:

- You can bulk import anomalies (see *Import*).
- You can create a new anomaly whenever you want to link it from a record, such as a finding record (see *Link Finding to Anomaly*) or a library item in NEXUS IC, and you click **Add** in the dialog from which you want to link it. This triggers the **Add Anomaly** dialog (see *Add/Edit Anomaly Dialog*).
- You can create new anomalies independently as described below.

15.2.1.1.1 Add Anomalies Manually

1. Start adding the anomaly in either of the following ways:
   - On the **ASSETS** screen, choose **Add** on the **Anomalies** tab.
   - On the **ANOMALIES** screen, choose **Add** from the main toolbar.
2. In the **Add Anomaly** dialog, enter the details of the anomaly as required. For information about filling the fields in this dialog, see *Add/Edit Anomaly Dialog*.

   When creating the anomaly, you must assign it to an asset and specify a unique name for that. The **Severity** and **Priority** parameters are used for scoring the anomaly and thus, it's recommended to specify them to ensure the anomaly is correctly prioritised and can be accurately assessed.
3. Click **OK**.

> **Result**
>
> The new anomaly record is added to the list on the **ANOMALIES** screen and is also visible on the **Anomalies** tab of the **ASSETS** screen if you select the asset which you linked the anomaly to.

15.2.1.2 Close Anomalies

Once the anomaly actions have been completed and the anomaly has been remediated, you can close the anomaly. To do that, follow the steps below:

1. Select the anomaly and proceed in either of the following ways:
   - On the **ASSETS** screen, choose *Shortcuts* → *Close Anomaly* on the **Anomalies** tab.
   - On the **ANOMALIES** screen, choose *Anomaly* → *Close Anomaly* from the main toolbar.
2. In the **Edit Anomaly Action** dialog that appears, you can specify properties for the close-out anomaly action that will be created, such as the reason and person responsible for the close-out, and so on. The date of completion is automatically filled with the current date and the percentage of completion is set to 100.
3. Click **OK**.

Result

The close-out status of the anomaly changes to *Closed* and is visible in the **Closed Out** column. The **Closed Out** checkbox in the **Edit Anomaly** dialog gets ticked. A new anomaly action is created for the close-out, which you can see on the **Actions** tab on the **ANOMALIES** screen.

Note

It is also possible to close an anomaly by ticking the **Closed Out** checkbox in the **Edit Anomaly** dialog (see *Add/Edit Anomaly Dialog*), however, that does not create an anomaly action for the close-out, thus, it is not recommended.

15.3 Anomaly Actions

An anomaly may have one or more anomaly actions associated with it. These actions can be assigned to individuals, teams, or departments, and may include a due date to ensure timely resolution of the anomalies.

You can assign *tasks* to anomaly actions that triggers an inspection process. However, anomaly actions are not necessarily inspection type actions (for example, confirm WT reading). The anomaly actions functionality can be used as a reminder to initiate a study with a vendor, or to have a discussion with an OIE about access.

You can perform the following actions on anomaly actions:

- Create, edit, or delete anomaly actions (see *Create Anomaly Actions*, *Add/Edit Anomaly Action Dialog* and *Add/Edit/Delete*).

  Tip

  To bulk update or delete anomaly actions, use the *Multi-Edit* grid functionality.

- Import (see *Import*) or export (see *Export*) anomaly actions.
- Assign tasks to anomaly actions (see *Assign Task to Anomaly Action*).
- Assign planning tasks to anomaly actions (see *Assign Planning Task to Anomaly Action*).
- Complete anomaly actions (see *Complete Anomaly Actions*).

15.3.1 Report Table Sources

To extract anomaly action data into a report template, use the System Table titled **Action** as the primary Table Source. For more information see *Configure Report Templates*.

15.3.1.1 Create Anomaly Actions

Anomaly actions can be created through bulk import (see *Import*) or following the process below.

1. Start adding the anomaly action in either of the following ways:
   - On the **ANOMALIES** screen, select the relevant anomaly and on the **Actions** tab, choose **Add** from the tab's toolbar.
   - Edit the anomaly (either from the **ASSETS** or the **ANOMALIES** screen) and in the **Edit Anomaly** dialog (see *Add/Edit Anomaly Dialog*), on the **Actions** tab, choose **Add**.

2. In the **Add Anomaly Action** dialog, enter the details of the anomaly action as required. For information about filling the fields in this dialog, see *Add/Edit Anomaly Action Dialog*.

   You can assign a due date for the action in the **Action Before** field and assign it to a user or user group in the **Assigned To** field.

   If you want to assign a task to the anomaly action later, you must assign an event type to the action type in the **Action Type** field. To do that, when you select the action type using the in the **Action Type** field and you add or edit an action type, ensure that you select an event type in the **Event Type** field of the **Edit Action Type** dialog.

3. Click **OK**.

Result

The new action item gets listed on the **Actions** tab of the **ANOMALIES** screen and on the **Actions** tab of the **Edit Anomaly Action** dialog.

15.3.1.2 Navigate to Anomaly

In case you have several anomaly actions displayed on the **Actions** tab of the **ANOMALIES** screen, which belong to multiple anomalies in the anomaly list above, you can use the **Navigate to Anomaly** toolbar button to navigate directly to an anomaly from a selected anomaly action.

On the **Actions** tab, select an anomaly action, and click **Navigate to Anomaly**.

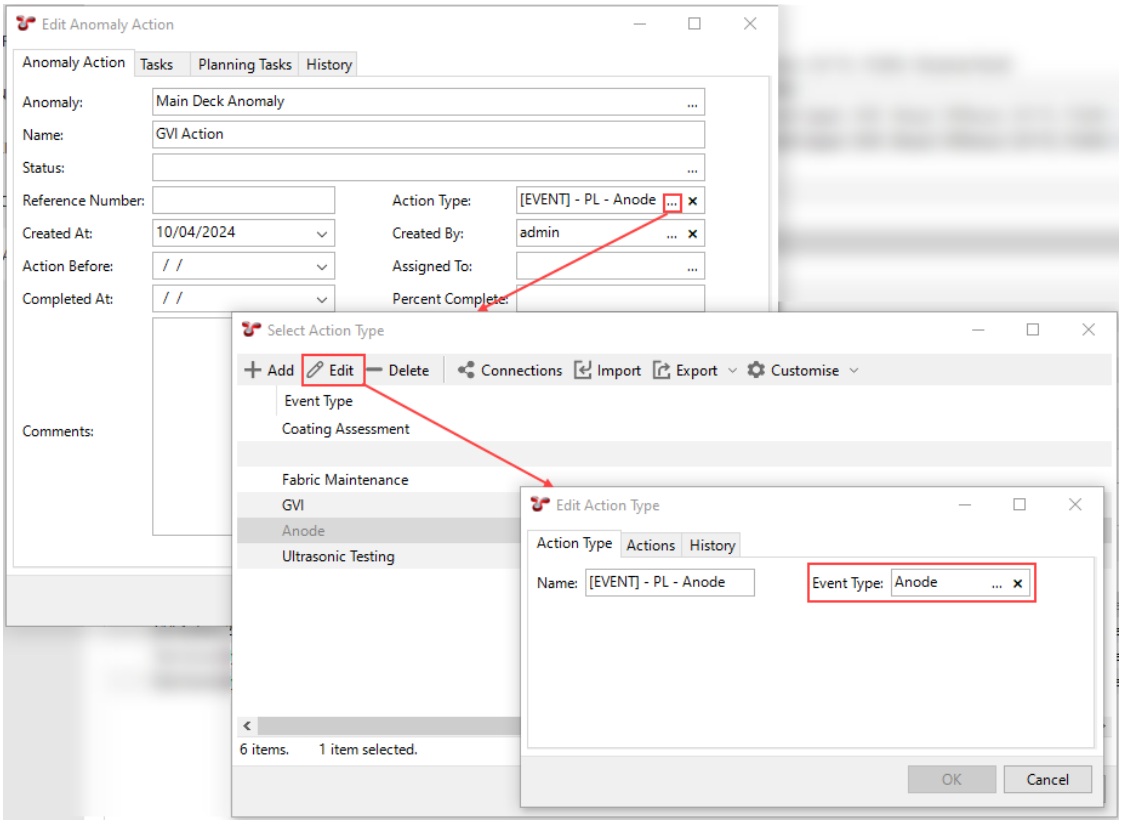
In the anomaly list above, the grid will change so that the relevant anomaly gets selected. The actions tab will now show only the anomaly actions related to the selected anomaly.

15.3.1.3 Assign Task to Anomaly Action

If required, you can assign one or more *tasks* to an anomaly action to trigger an inspection process. This task can then be assigned to inspectors, who can execute the task and create the respective events. Findings created from these events must be linked back to the original anomaly so that you can follow up the status of the anomaly action.

15.3.1.3.1 Prerequisites

To be able to link a task to an anomaly action, you must assign an event type to the action type of the anomaly action in the **Add/Edit Anomaly Action** dialog (see *Add/Edit Anomaly Action Dialog*):



15.3.1.3.2 Assign Task

1. Start assigning the task to the anomaly action in either of the following ways:
   - On the **ANOMALIES** screen, select the relevant anomaly and on the **Actions** tab, choose *Shortcuts* → *Assign Task* from the tab's toolbar.
   - Edit the anomaly action (either from the **ASSETS** or the **ANOMALIES** screen) and in the **Edit Anomaly Action** dialog (see *Add/Edit Anomaly Action Dialog*) go to the **Tasks** tab.
2. Choose **Add** to create a new task.
3. In the **Add Task** dialog, enter the parameters of the task (see *Add/Edit Task Dialog*). You must assign the task to a workpack.
4. Click **OK**.

Result

The task gets assigned to the anomaly task and it is visible on the **Tasks** tab of the **Edit Anomaly Action** dialog. On the **Actions** tab of the **ANOMALIES** screen, the value of the **Is Tasked?** column changes to **Yes**.

Note

You can also assign an anomaly action to an existing task on the **PLANNING** or **WORKPACKS** screen by editing the task and selecting the relevant anomaly action from the **Anomaly Action** field (see *Add/Edit Task Dialog*). Note

that the task's asset and the anomaly action's asset must match.

15.3.1.4 Assign Planning Task to Anomaly Action

If required, you can create and manage *planning tasks* directly from an anomaly action.

1. Start editing the anomaly action using one of the following methods:
   - On the **ANOMALIES** screen, select the anomaly associated with the anomaly action and on the **Actions** tab, select the required anomaly action.
   - Edit the anomaly from either the **ASSETS** or the **ANOMALIES** screen and, in the **Edit Anomaly** dialog, (see *Add/Edit Anomaly Dialog*) go to the **Actions** tab to select the required anomaly action.
2. Choose **Edit** in the toolbar.
3. In the **Edit Anomaly Action** dialog, open the **Planning Tasks** tab.
4. Click **Add** in the toolbar and enter the parameters of the planning task (see *Add/Edit Planning Task Dialog*).
5. Click **OK**.

Result

The planning task is assigned to the anomaly action and appears on the **Planning Tasks** tab of the **Edit Anomaly Action** dialog.

Note

You can also assign an anomaly action to an existing planning task when editing the relevant planning template on the **ASSETS** or **PLANNING** screen. For more information, see *Assign Anomaly Action to a Planning Task*.

15.3.1.5 Complete Anomaly Actions

Once the anomaly action has been completed, you can set its status to completed as follows:

1. On the **ANOMALIES** screen, select the anomaly action on the **Actions** tab and click **Edit**.
2. In the **Edit Anomaly Action** dialog (see *Add/Edit Anomaly Action Dialog*), enter the completion date in the **Completed At** field.
3. Click **OK**.

Result

The status of the anomaly action changes to completed and the **Completed At** column on the **Actions** tab displays the completion date you have specified. The status in the **Is Due** column of the **Actions** tab changes to *Action is complete* and the status in the **Action Status** column in the anomaly grid changes to **Complete**.

See also

- *Create Anomaly Actions*
- *Navigate to Anomaly*
- *Assign Task to Anomaly Action*
- *Assign Planning Task to Anomaly Action*
- *Complete Anomaly Actions*

15.4 Findings

A *finding* is the link between an *anomaly* and an inspection or survey event. Findings are either escalated and linked to an anomaly (see *Link Finding to Anomaly*) or deemed "insignificant" and remain simply as an observation on the source event. For more information, see *Findings*.

You can review findings associated with the selected anomalies on the **Findings** tab of the **ANOMALIES** screen. Findings that have been escalated and linked to the selected anomalies are displayed here. The visibility of this tab can be toggled on or off under the **View** toolbar option.

The columns displayed on this tab mostly correspond to those on the **Findings Listing** tab of the **INSPECTION** screen (see *Findings Listing*). On the right-hand side of the tab, you can see the details of the source event associated with the finding, as well as the relevant survey data. This corresponds to the **Event Details** pane on the **INSPECTION** screen (see *Event Details*).

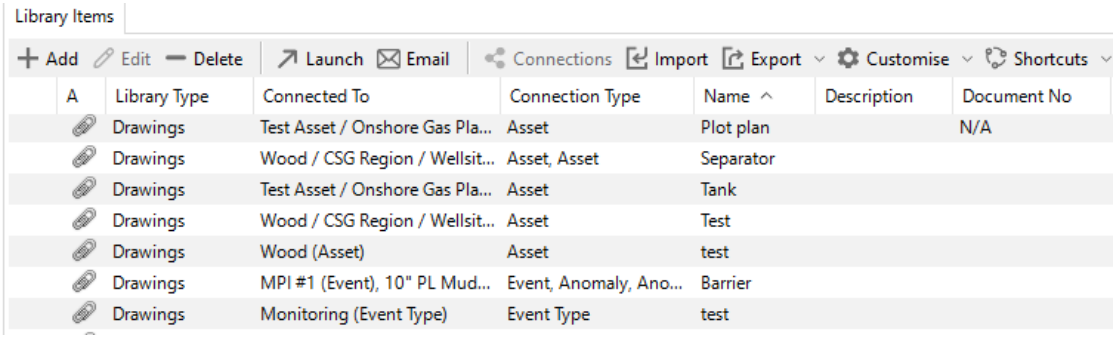
15.5 Library

On the **Library** tab of the **ANOMALIES** screen, you can see and manage all the library items attached to the selected anomalies as well as library items that are linked to the anomaly's assets. This functionality corresponds to that of the **LIBRARY** screen. The visibility of this tab can be toggled on or off under the **View** toolbar option.

Note that library items for anomalies are not inherited from the related event. If you want to attach the same library item to an event and an anomaly, you can create a library connection from the library item to both the anomaly and the event (see *Library Connections*).

15.5.1 Library Items

Library items are electronic documents that can be linked to data and data types in NEXUS IC using connections (see *Library Connections*).



The electronic documents can be uploaded directly into the NEXUS IC database, or can be referenced using URL or UNC paths.

15.5.2 Manage Library Items

You can manage library items from several screens within NEXUS IC, including:

- **Library Items** tab on the **LIBRARY** screen (see *Library*)
- **Library** tab on the **ASSETS** screen (see *Library*)
- **Library** tab on the **INSPECTION** screen (see *INSPECTION*)
- **Library** tab on the **ANOMALIES** screen (see *ANOMALIES*)
- **Library** tab under *Configuration* → *General* → *Functions* → *Edit Function Definition*
- **Library** tab on the **Edit Asset Type** dialog under *Configuration* → *Assets* → *Types*
- **Library** tab in various dialogs where library items can be managed for the relevant record, including the *Edit Anomaly*, *Edit Table Definition*, *Edit Task* and *Edit Workpack* dialogs

> **Example**
>
> If you upload company piping specifications to the NEXUS IC Library and assign it to the asset type "Pipework", the piping specifications will be available from the **Library** tab of the **ASSETS** screen whenever the active asset is of type "Pipework".

You can also manage library items on the **Library** pane of IC-Inspection.

You use the standard toolbar functions on the **Library/Library Items** tab to add, edit, delete, import, export library items or customise the grid layout. For more information about these functions, see *Using the Grid*.

> **Note**
>
> - You can edit the properties of the selected library item from the toolbar, but not the document itself.
> - Deleting a library item will also delete all its associated connections.
> - The **Export** option only exports the grid contents, not the actual library documents.

See below for more information about some actions you can perform on library items:

Add Library Items

To create a new library item, proceed as follows:

1. Start adding a new library item in one of the following ways:
   - On the *Library/Library Items* tab, choose **Add** from the toolbar.
   - Drag files from your file explorer onto the *Library/Library Items* tab.

   > **Note**
   >
   > Drag-and-drop is not supported in remote environments (e.g., Remote Desktop).

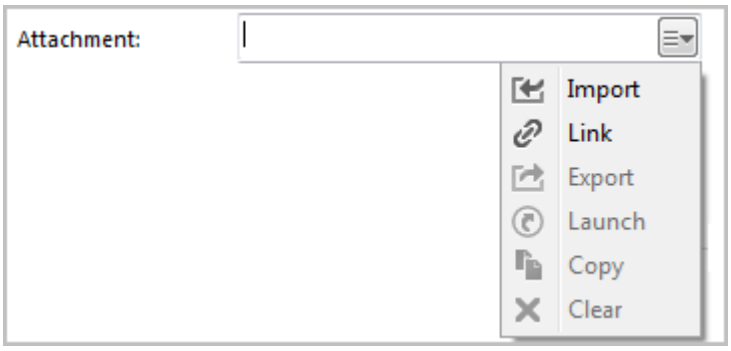
2. Depending on the screen from which you accessed the **Library** tab, you may be prompted to select a connection type. You can connect a library item to different types of data records:

Screen	Connection Type
ASSETS	• Asset • Asset Type
INSPECTION	• Asset • Asset Type • Event • Event Type • Workpack
ANOMALIES	• Anomaly • Asset

Note

If you're adding a library item from the **LIBRARY** screen, you add the connection to a data record from the **Connections** tab after you have created the library item. For more information, see *Add Library Connections*.

3. In the **Add/Edit Library** dialog, select the library type, enter a name for the library item (mandatory) and enter other parameters as required. For information about filling in all the parameters, see *Add/Edit Library Dialog*.
   - If the document is to be uploaded into NEXUS IC, then click on the **Attachment** button, else enter a **Hyperlink** location.
   - When adding an attachment, you can either **Import** or **Link** it:
     - If you *import*, the item will be saved to the database. If you subsequently change the original on disk, the item in the database will not change to match.
     - If you *link* the item, then when you change the original on your disk, the next time you view the item within NEXUS IC, you'll see the updated item.



> **Note**
>
> - NEXUS IC still loads a copy of a linked item into the NEXUS database. This ensures that if the original is unavailable (for example, because you are away from your network), NEXUS IC can display the cached copy.
>
> When you view the item, if the original has been updated, the database cached copy is updated too. You can't link items that are on your local hard disk, only items on network drives can be linked. The Link feature is designed to keep you up-to-date with items that may have been changed by others, and that is not possible on your local drive.
>
> - If you drag and drop multiple files, they will be added, and then multi-selected in the grid. You can then click **Edit** to multi-edit them (see *Multi-Edit*). Drag and drop will *import* items, not *link* them.

4. Click **OK**.

   On the **LIBRARY** screen, you can view the details of the library item by selecting it and checking the *Details* tab under the *Library Items* tab.

Edit Library Items

To edit an existing library item, proceed as follows:

1. On the *Library/Library Items* tab, select the library item.
2. Choose **Edit** from the toolbar.
3. In the **Edit Library** dialog, update data as required. For more information, see *Add/Edit Library Dialog*.
4. Click **OK** to save your changes.

Delete Library Items

To delete an existing library item, proceed as follows:

1. On the *Library/Library Items* tab, select the library item.
2. Choose **Delete** from the toolbar.
3. In the confirmation dialog, click **Check Connections** if you want to review any connections to this library item before deletion.
4. If you want to proceed deleting the library item, click **Delete**, else, choose **Cancel**.

Launch Library Items

Use the **Launch** toolbar button to launch library items on the local machine. By default, NEXUS only launches files with the following extensions: doc, docx, xls, xlsx, jpg, png, jpeg, jfif, bmp, tiff, gif, mpg, mp3, wav, ppt, pptx, txt, pdf, emf, zip, dwg, avi, rtf, mp4, csv.

> **Hint**
>
> Use the Space Bar on your keyboard to launch the currently selected library item.

Note that if the local machine does not have an associated viewer for the document type (for example, AutoCad viewer for DWG type), then the document can not be launched.

Email Library Items

Use the **Email** toolbar button to send an email message with the selected library items attached to it. You can select multiple library items to be sent in the same email message. Note that you must have properly configured your email settings (see *Set Up Email*) for this option to function.

> **Warning**
>
> If the size of the attachment exceeds your organization's attachment size limit, you may get an "Out of memory" error message.

Import Library Items

You can import library items using the standard **Import** toolbar option (see *Import*). You can download the MS Excel Import Template, which shows the required format for importing library items.

You can also import the *Connections* in the same import as the library items, so in addition to the Library Import columns, you can additionally define the Connection information using the following column headings:

- *Library Connection.Connect To*
- *Library Connection.Workpack*
- *Library Connection.Asset Type*
- *Library Connection.Asset*
- *Library Connection.Event Type*
- *Library Connection.Event*
- *Library Connection.Anomaly*
- *Library Connection.Risk Model*
- `Library Connection.Function

Note that the *Connect To* column should only contain one of the following text items:

- Anomaly
- Asset
- Asset Type
- Event
- Event Type
- Function
- Risk Model
- Workpack

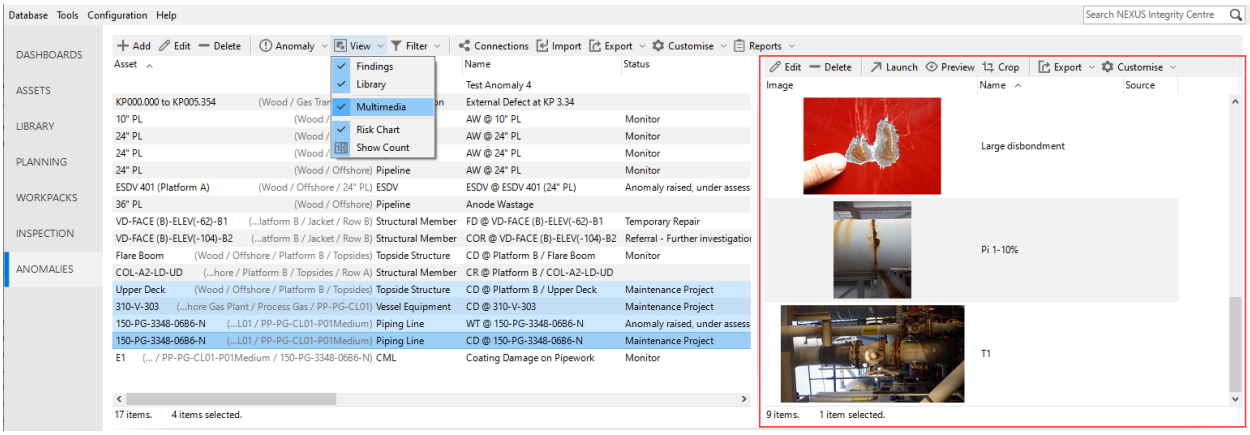
15.5.2.1 Double-click

The first time you double-click on a library item, NEXUS asks you whether you want to launch the library item in an external editor, or edit the library item. If you want your choice to become permanent, tick the **Always do this** checkbox. Note that if you hold down the **Alt** key while double-clicking, you will be asked again.

15.6 Multimedia

Multimedia are electronic images that have been uploaded against any of the events linked to the currently selected anomalies. Anomaly records inherit all multimedia images from the events associated with them.

Multimedia items are displayed as thumbnails on the right side of the **ANOMALIES** screen for the anomaly or anomalies that you have selected. The visibility of this pane can be toggled on or off under the **View** toolbar option.



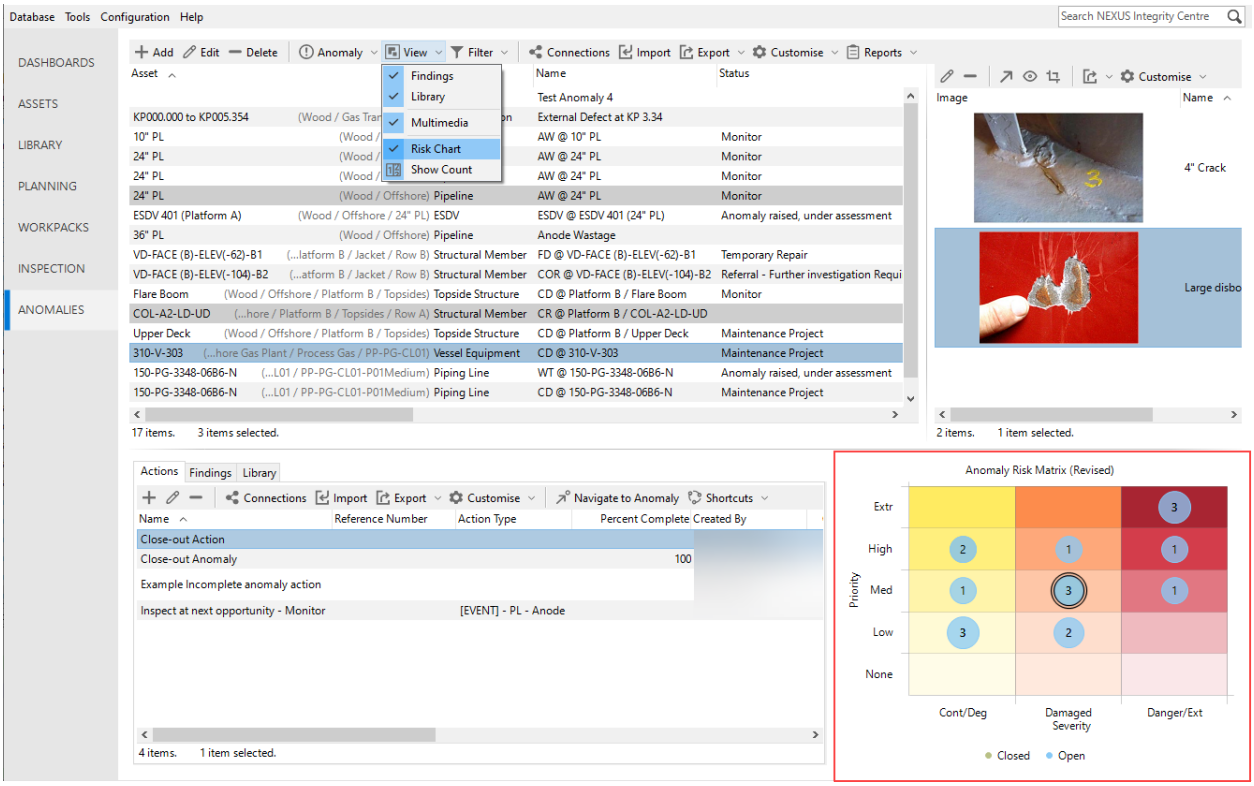
15.6.1 Multimedia Toolbar

You can use the following options in the toolbar of the **Multimedia** pane to perform actions on multimedia files:

Toolbar Option	Description
Add	See inspections.multimedia.add. You can only add new multimedia files to events on the **INSPECTION** screen, you cannot add new multimedia files on the **ANOMALIES** screen.
Edit	Launches the **Edit Multimedia** dialog. You can update and save the properties of the multimedia file. See *Add/Edit Multimedia Dialog*.
Delete	Deletes the currently selected multimedia records. If multiple multimedia items have been selected, then a dialog pops up that shows how many multimedia items will be deleted and prompts you to confirm by clicking **Delete**.
Launch	Launches the currently selected multimedia file into the default Windows viewer for the selected file type. Note that if your image viewer supplies "Next" and "Previous" buttons, these will show you the next and previous files in the temp folder, which may not be the next and previous images in NEXUS.
Preview	See inspections.multimedia.preview.
Crop	See inspections.multimedia.crop.
Export	See *Export*.
Customise	See *Customise*.

15.7 Risk Chart

On the **ANOMALIES** screen, you can display the risk assessment results for anomalies on a risk matrix, which is visible at the right or bottom right of the screen. The visibility of this pane can be toggled on or off under the **View** toolbar option.



15.7.1 Prerequisites

To enable displaying the risk matrix for anomalies, you must set it up as described in *Set Up Anomaly Risk Matrix*.

15.7.2 Display Options

When displaying the risk matrix, note the following:

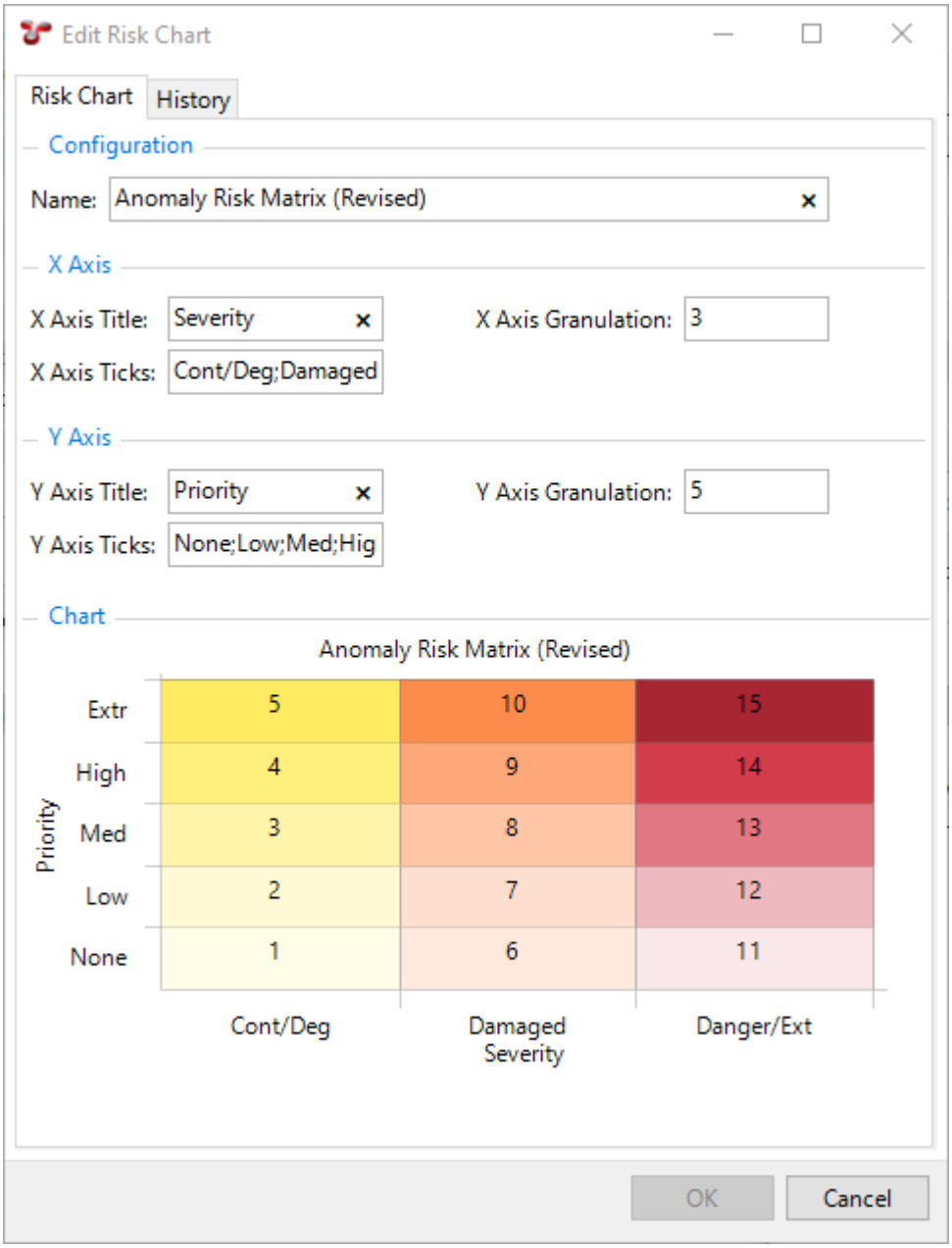
- Where there are several risks at the same location in the chart, the dot will be shown larger.
- Clicking on an anomaly or anomalies in the grid highlights that item in the risk matrix. Similarly, clicking on a result indicator in the matrix will highlight the relevant anomaly or anomalies in the grid.
- The matrix legend is displayed below the chart, with coloured indicators for open and closed anomalies. Legend keys can be clicked to toggle showing their corresponding anomalies on the matrix.
- If you want to see the total number of risk assessments at the specific locations of the risk models, click **Show Count** under the **View** toolbar option.

15.7.2.1 Set Up Anomaly Risk Matrix

To enable displaying the risk assessment results for anomalies on the **ANOMALIES** screen, you must set up the functionality as described below.

1. Set up the risk chart, which determines the axes and the number of squares on the risk matrix as well as the risk colours and risk values that belong to each square. For more information, see *Configure Risk Charts*.

   For example, in the risk chart below, you want to have *Severity* on the X axis with a granulation of 3, and on the Y axis, you want to have *Priority* on the Y axis with a granulation of 5.



Severity and *Priority* are parameters of the anomaly (defined in *Add/Edit Anomaly Dialog*), but you can use other parameters as required.

Note

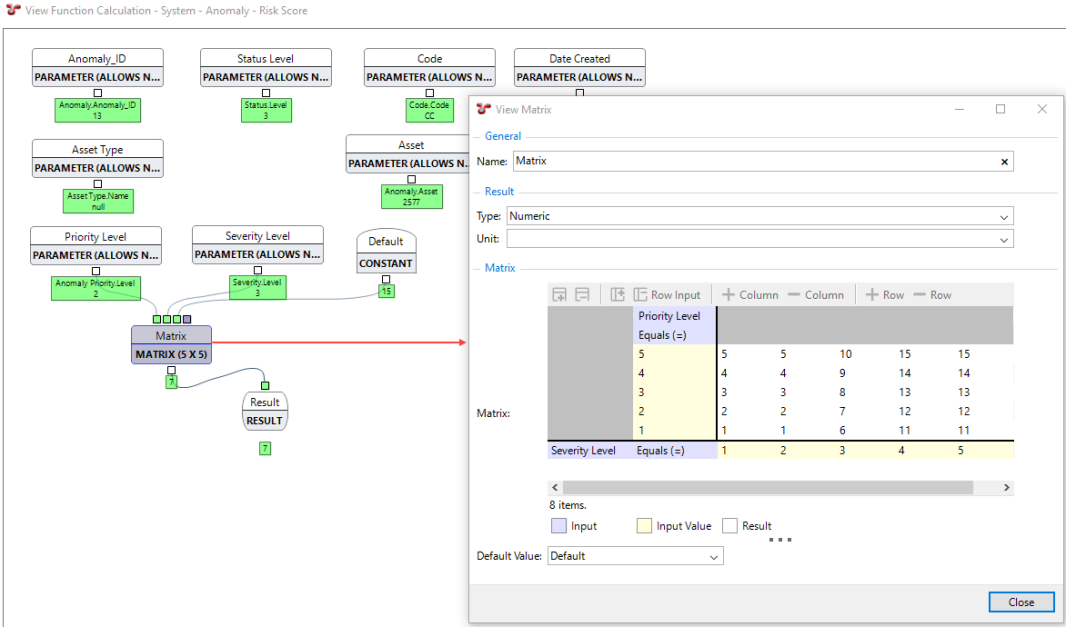
Anomalies do not have a Likelihood or Consequence to give them an X/Y position on the diagram. Instead, their placement is solely determined by the risk score, which is calculated using a specific function called **System - Anomaly - Risk Score** (see next step). The numerical value of the risk score corresponds to the

square in the risk matrix where the anomaly will be positioned. The matrix must be defined to only have unique values in each square.

2. Under *Configuration* → *General* → *Functions*, configure the **System - Anomaly - Risk Score** function, which calculates the actual risk score of each anomaly. For more information, see *Configure Functions*. The result of this function is a number that will be used to position the anomaly in the corresponding square inside the risk matrix.

   The **System - Anomaly - Risk Score** function is predelivered with the basic asset or anomaly parameters included. You cannot add new parameters to this function, however, you must set up the connections for the parameters that you want to use.

   Using the example from the previous step, if you want to use the *Severity* and *Priority* parameters of the anomaly, you can configure the function as follows:



   In this example, you draw a connection from the *Priority Level* and *Severity Level* parameters as well as a default constant value to a matrix element. In the matrix element, you set up the specific risk score values to be applied for each combination of the *Priority Level* and *Severity Level* parameter values. You can also set up a default value to be applied in case these input values are not accessible. From the matrix element, you draw a connection to the result element to complete the configuration of the function.

3. In your database properties, specify the anomaly risk chart to be used when you open the **ANOMALIES** screen.

   To do that, under *Database* → *Properties*, go to the **Settings** tab and select the risk chart defined above in the **Anomaly Risk Chart** field. For more information, see *Properties Dialog*.

CHAPTER

SIXTEEN

IC-INSPECTION

IC-Inspection is an on-line eventing software application optimised for use in the offshore environment. IC-Inspection is built around a Microsoft SQL Server relational database with events (items of inspection) referenced to positional data and assets.

16.1 Offshore Deployment

In the majority of cases, IC-Inspection is set up in an offshore environment.

IC-Inspection is typically installed on a computer or laptop, which can then be configured to interface with the following:

- Survey systems, showing time, date, and ROV position
- ROV video inputs, enabling image and video sequence references to events
- Digital video recorders, such as IC-Recorder
- Other computers/laptops with NEXUS IC installed for offline data review
- Instruments, such as CP Probes, FMD, providing automatic data input of results
- Other digital input devices, through customisation of the software to suit the input string

For more information about setting up IC-Inspection in an offshore environment, see *Offshore Deployment*.

16.2 Using IC-Inspection

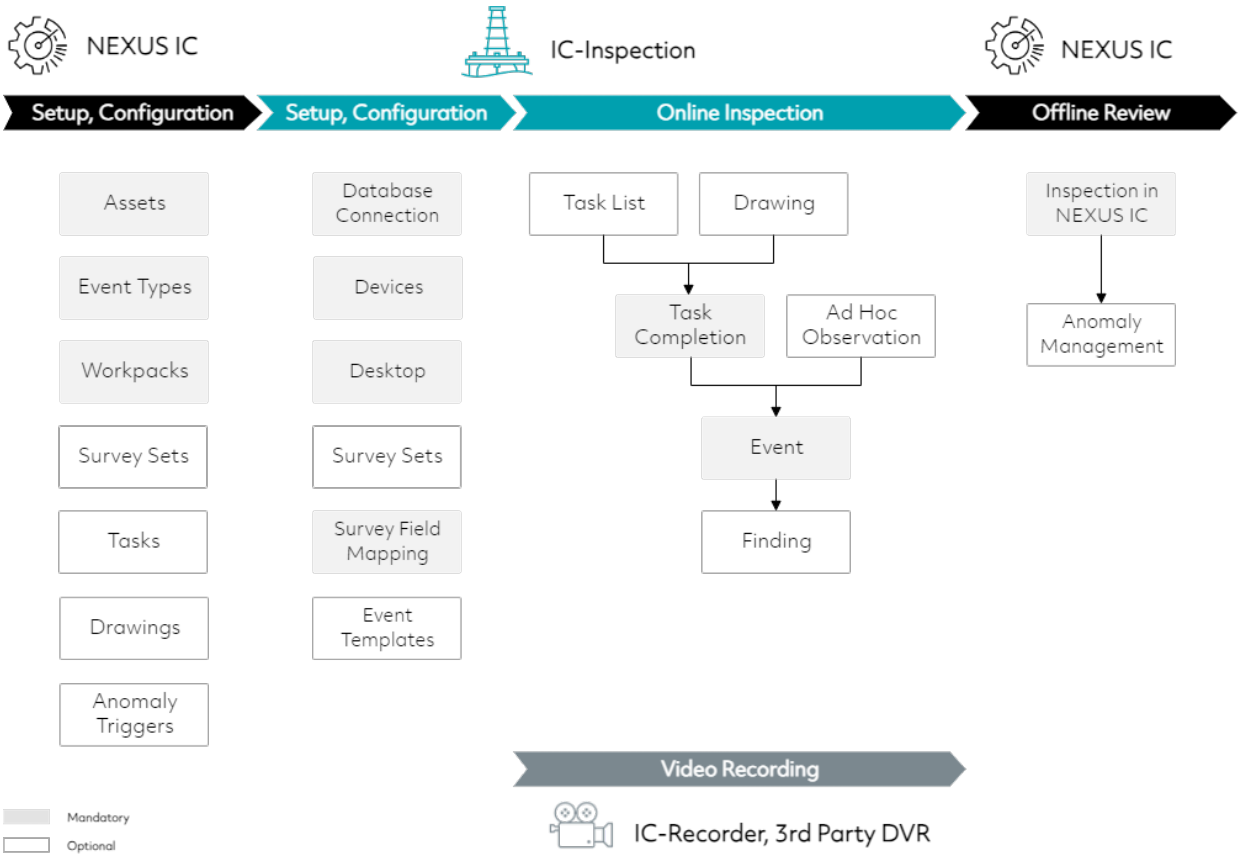
The IC-Inspection package is teamed with *IC-Recorder* to provide a digital recording package for real-time based online eventing. Multi-camera, sonar and profiling data can be recorded digitally with positional data displayed by IC-Recorder. NEXUS Integrity Centre (NEXUS IC) is used to configure the database, event definitions and other relationships used within IC-Inspection. It is also used to perform offline inspection and anomaly management after inspection has been completed in IC-Inspection.

See the image below for information about the whole inspection process using NEXUS IC, IC-Inspection and IC-Recorder:

To perform inspection, you use IC-Inspection together with NEXUS IC and IC-Recorder as follows:

1. **NEXUS IC Configuration:**

   Set up and configure the NEXUS IC database, including *assets*, *event types*, *workpacks* and optionally *tasks*, *drawings* and *anomaly triggers*.



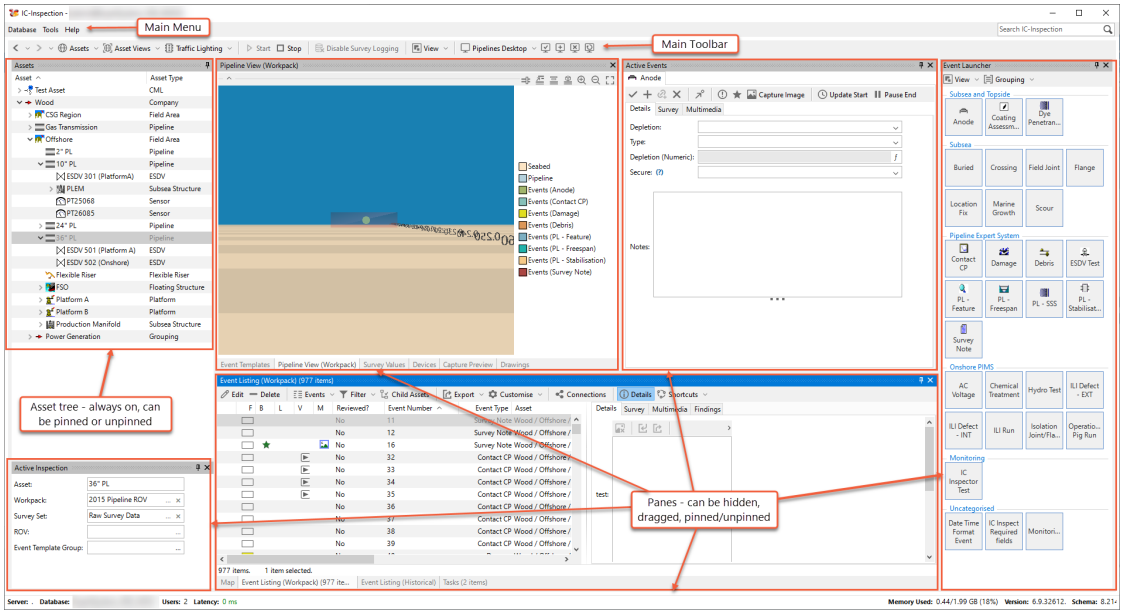
2. **IC-Inspection Setup and Configuration:**
   - Connect IC-Inspection to the same NEXUS IC database.
   - Configure IC-Inspection settings, including *desktops*, *devices*, *survey fields* and optionally *event templates*.
3. **Online Inspection in IC-Inspection:**
   - Use the task list or the drawings to drive the inspection, completing tasks until none remain (see *Create Event from Task*).
   - Launch ad hoc events when necessary (see *Create Ad Hoc Event*).
   - Fill out event forms in IC-Inspection, optionally attaching still images from digital video recorders (see *Attach Multimedia to Event*).
   - If needed, raise findings from the events (see *Create Findings*).
   - For video recording during online inspection, you can use IC-Recorder or third-party DVRs (see *IC-Recorder* and *Third-party DVRs*).
4. **Offline Review in NEXUS IC:**

   Perform an offline review of inspection data (see *Inspection*) and, if required, trigger an anomaly management process (see *Anomaly Management*).

A `training manual`, showing how to use IC-Inspection for offshore eventing and NEXUS IC for offshore review, is available.

16.2.1 IC-Inspection Screen

The IC-Inspection screen is made up of the following main elements:



16.2.1.1 Main Menu

The main menu is similar to the main menu of NEXUS IC except for the **Configuration** menu option, which is only available in NEXUS IC. In IC-Inspection, you can use the following menu options:

- **Database** (see *Database*)
- **Tools** (see *Tools*)
- **Help**

  Allows you to open the NEXUS Online Help, email Support, or navigate to the NEXUS website.

16.2.1.2 Main Toolbar

For more information, see *Main Toolbar*.

16.2.1.3 Asset Tree

The **asset tree** (see *Asset Tree*) is a pivotal element of the screen as all event records will be filtered by the currently selected asset, or its children if *Child Assets* is enabled. For more information, see *Assets*.

16.2.1.4 Panes

The **panes** on the IC-Inspection screen allow you to prepare and perform inspections and review inspection data. These panes can be shown or hidden, dragged around, pinned or unpinned (see *Manage My Desktop*). For detailed information about how to use the specific panes, see *IC-Inspection Panes*.

16.2.1.5 Manage Your Desktop

The **INSPECTION** screen offers a "desktop manager" functionality that allows you to set up your screen as required. For example, you can view or hide panes, drag and drop them and create different desktop layouts for different purposes. For more information, see *Manage My Desktop*.

16.2.1.6 General Features

To learn how the grids and toolbar buttons presented in many of IC-Inspection's panes work, see *General Features*.

16.2.1.6.1 Manage My Desktop

The desktop manager in IC-Inspection, and on the **INSPECTION** screen of NEXUS IC, works in the same way. It allows you to organise your screen to suit your workflow: you can show or hide panes, drag and dock them, and save your preferred layout as a desktop.

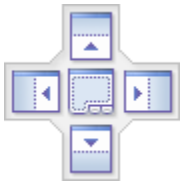
16.2.1.6.1.1 View/Hide Panes

You can show or hide panes by selecting or deselecting the relevant option under the **View** toolbar button. You can also close a pane by clicking the ✕ icon in its top right corner.

16.2.1.6.1.2 Drag and Dock Panes

You can drag panes to different areas of the screen and dock them as required.

When you drag a pane over another pane, a pale blue highlight and/or a set of docking icons appears:



Dragging a pane over one of the icons shows the position and size it will take when dropped. Dropping the pane onto:

- the **centre** icon adds it to the existing tab group.
- the **left**, **right**, **top** or **bottom** icons splits the existing pane and docks the dragged pane accordingly.

If you drop a pane outside the main pane, it becomes a *floating* pane.

Empty areas with no panes are treated as a *void*. Dropping a pane into the centre of the void fills it, and you can then split that pane with further drops. Dropping a pane on the edges of a void splits it while leaving part of the void intact.

16.2.1.6.1.3 Pin/Unpin Panes

Click to collapse a pane to the edge of the window. To restore an unpinned pane, click its name on the edge, then click .

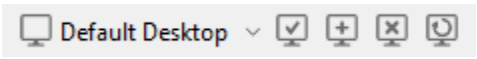
16.2.1.6.1.4 Resize Panes

You can resize panes using the splitter between two docked panes. When the pointer is over a splitter, it changes to a or cursor. Drag the splitter to adjust the size of adjacent panes.

The difference between floating and docked windows is that docked windows will resize together. When you drag a splitter, one window will get bigger while another gets smaller. Thus, docked windows never overlap each other. Typically most or all of your windows will be docked.

16.2.1.6.1.5 Create/Save/Delete Desktop Layout

Different tasks may require different desktop arrangements. For example, structural inspections may require multimedia panes, while reviewing corrosion growth rates and thickness readings may need charts to view the trend lines. You can create multiple desktops and switch between them using the toolbar buttons on the top of the screen:



- To **switch** between desktops, select the required desktop from the drop-down list available under the **Desktop** toolbar button.
- To **save** the changes that you've made to the current desktop, click the toolbar button for *Save the active desktop*. Settings are *not* automatically saved when you close the program.
- To **create** a new desktop, arrange the desktop as required and click the toolbar button for *Add a new desktop with the current layout* to save the current arrangement of panes. You can name the desktop as required.
- To **delete** an existing desktop layout, click the toolbar button for *Delete the currently active desktop*.
- To **restore** the desktop to the default layout pre-delivered with the system, click the toolbar button for *Restore the default desktops*. This option is available only in IC-Inspection.

Tip

If you use two monitors, you may wish to extend the application across both. You can do this by clicking the "Restore Down" button at the top right of the pane and then dragging the main application window larger, or by floating panes such as **Drawings** and then dragging the floating panes onto the second monitor.

In IC-Inspection, the following three desktop layouts are pre-delivered:

- **Setup Desktop**: Layout optimised for setting up IC-Inspection, including visible panes such us **Devices** or **Survey Values**.
- **Pipelines Desktop**: Layout optimised for the inspection of pipelines.
- **Structures Desktop**: Layout optimised for the inspection of structures.

16.2.1.6.2 Main Toolbar

The main toolbar on the IC-Inspection screen allows you to control IC-Inspection in general. Individual panes have their own toolbar to perform functions specific to those panes.

Toolbar Option	Description
Back	Allows you to return to assets that you had previously selected in the asset tree.
Forward	Allows you to return to assets that you had previously selected in the asset tree, after you've used the **Back** button.
Assets → Show Asset Type	Toggles the display of the asset type in the hierarchy.
Assets → Expand Children	Expands all subnodes (children, grandchildren) of the selected asset. You can also press the * key on the numeric keypad.
Assets → Collapse Children	Collapses all subnodes (children, grandchildren) of the selected asset.
Assets → Copy to Clipboard	Copies either the asset name or full hierarchy location of the selected asset to the clipboard.
Assets → Show on Drawing	Shows a list of drawings that have this asset as a layer. Click on a menu item to go to that drawing. If the drawing name has "(Different Asset)" after it, the drawing you will be taken to is not available on the current asset; thus, when you select the menu option, you will not only be taken to that layer on that drawing, you will also be navigated to the new asset. You can get back by using the **Back** toolbar button.
Assets → Other Locations	Shows a list of other locations that this asset exists in on the asset tree (including in other Asset Views). Click on a menu item to navigate there. If this asset does not appear in any other locations, you will not see any items in this list.
Assets → Connections	See *Connections*.
Asset Views	See *Asset Views*.
Traffic Lighting	See *Traffic Lighting*.
Start	Starts the inspection.
Stop	Stops the inspection.
Disable Survey Logging	Toggles on or off survey logging during an inspection. This option can only be toggled while an inspection is not running. IC-Inspection shows a warning if an inspection is started with Survey Logging disabled and a survey device is enabled (except for Scale devices).
View	The items under this menu option show the various panes available on the IC-Inspection screen. Click a menu item to show or hide them. Checked items are visible.
Desktops	If you have several saved desktop configurations for this screen, select which one is active here. For IC-Inspection, the **Setup Desktop**, **Pipelines Desktop** and **Structures Desktop** configurations are pre-delivered.
Save Desktop	If you have made changes to the currently selected desktop, click this to save them. Otherwise, when you restart the application, your changes will be lost.
Add Desktop	You can add a new desktop layout using this option. Any changes that you made to the visible/invisible panes and their location on the screen will be saved under the name that you specify.
Delete Desktop	Deletes the currently selected desktop from the list.
Restore Desktops	Restores desktops to the factory defaults.

16.2.1.6.3 Alerts

In specific situations, IC-Inspection provides notifications about changes in its status. Examples of such changes include inspection start/stop events, incoming survey start/stop events, and video recorder start/stop events. When these notifications are low priority, they briefly appear in the bottom right corner of IC-Inspection's main window. However, if they require your immediate attention during an inspection, they appear in the center of the window, flash red, and remain visible until the issue is resolved or you manually dismiss the warning.

If you start an inspection, but a DVR (Digital Video Recorder) fails to start recording, a modal dialog will inform you

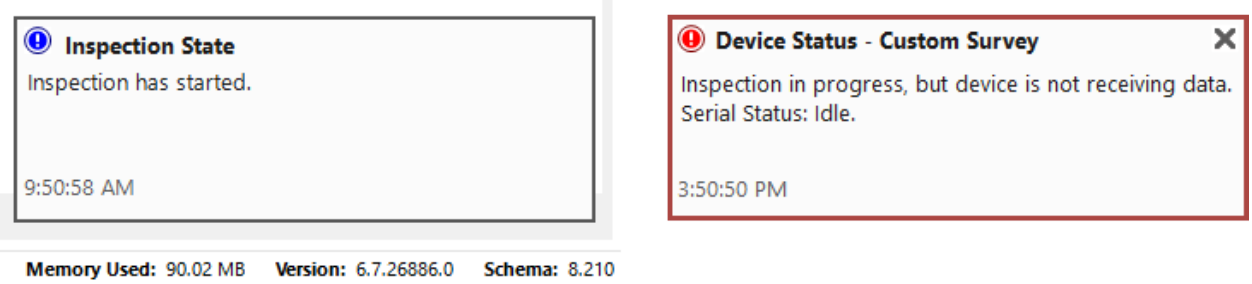


Fig. 1: A low-priority notification and a high-priority notification

of this issue. If you decide that you no longer need that recorder, cancel the dialog and disable the device in the *Devices* pane. Otherwise, every time you launch an event, IC-Inspection will warn you that the recorder is not started. These dialogs and notifications serve to prevent accidental event triggering without video recording.

Other reasons for alert notifications include:

- Invalid survey values: This occurs when the incoming survey value does not match the expected data type (for example, numeric, date/time).
- Survey database destination errors: These errors occur when unit conversions fail between the incoming value and the database field.
- No survey data received in the last five seconds.

You can find this information reflected both in the notification messages and in the **State** column of the **Survey Values** pane.

16.2.2 Configuration

Before you start using IC-Inspection, you must perform a number of configuration settings in IC-Inspection. These include:

- Configure the connections to video devices (IC-Recorder or a third-party DVR device), survey devices and any measurement or scale device that interface IC-Inspection. You must also set up text overlays. For more information, see *Set Up Devices*.
- Map survey fields coming from survey devices to the survey fields in the NEXUS database. For more information, see *Map Survey Fields*.
- Optionally, you can set up event templates to be used for creating ad hoc events. For more information, see *Set Up Event Templates*.

16.2.2.1 Set Up Devices

Before you start using IC-Inspection, you must configure the connections to video devices (IC-Recorder or a third-party DVR device), survey devices and any measurement or scale device that interface IC-Inspection. You must also set up text overlays to be applied on the recorded videos. You make these configurations on the **Devices** pane of IC-Inspection (see *Devices*).

On the **Devices** pane, you can set up the following:

- Add connections to video devices (see *Add Video Devices*)
- Add connections to survey devices (see *Add Survey Devices*)
- Add connections to measurement or scale devices, specifically, to a "Sartorius Entris Balance" device, which allows measuring the weight of very small things accurately. The device is usually connected through USB. This feature was developed for a specific area. You set this up similarly to survey devices (see *Add Survey Devices*),

but instead of the **Survey** tab, you have the **Input** tab available, where you specify the parameters required for getting the weight data from the device.

- Set up text overlays to be displayed on the videos (see *Set Up Text Overlays*)

In case of any issues with the connections, you can use the **Device Diagnostics** pane for debugging purposes (see *Device Diagnostics*).

16.2.2.1.1 Add Video Devices

The offshore NEXUS package comes with the default IC-Recorder video device for recording videos and is optimised to work with IC-Inspection. You can, however, also use a third-party video device that has implemented our standard DVR control protocol.

16.2.2.1.1.1 Add IC-Recorder

To enable communication between IC-Inspection and IC-Recorder, set up the connection as described below:

1. On the **Devices** pane, choose **Add** from the toolbar.
2. In the **Add New Device** wizard, choose **Video Device**, and click **Next**.
3. Select **IC-Recorder** and click **Next**.
4. Specify the properties of IC-Recorder as required.

   Note the following:

   - If you're adding several IC-Recorders, you should give each one a different **Display Name** so that you can tell them apart.
   - If IC-Recorder is running on the local machine, the **Address** value can be *Localhost*. If it's running on another machine, it can be the IP address of that machine.
   - If you have several instances of IC-Recorder running on one PC, they will each have a different port number. By default, the first run will have port 4500; the second, port 4501; and so on. You can change this in IC-Recorder under the *Tools* → *Options* → *Advanced* menu option.
5. Click **Finish** to complete the setup.

> **Result**
>
> The IC-Recorder device is added to the list of devices on the **Devices** pane and the value in the **Connection Status** column should show *Connected* in case of a successful connection. The **Enabled** toolbar button is on by default. If the value in the **Connection Status** column is not *Connected*, then click **Enabled** twice, to disable then re-enable the device. This forces a fresh attempt at connection.

When you click **Start** to start an inspection, all video devices will attempt to start recording. While the video devices are in the process of starting recording, you will see a progress dialog. If this dialog persists for more than a couple of seconds, this may indicate a problem with one or more of your video devices. Check the status of each device, both here in IC-Inspection, and on IC-Recorder's own window (which may be on a different PC). When you click **Stop** to stop the inspection again, all video devices will attempt to stop recording.

16.2.2.1.1.2 Add a Third-Party DVR Device

To enable communication between IC-Inspection and a third-party video recorder, follow the steps described above for IC-Recorder, with the only exception of choosing *Generic Video Recorder* in the **Add New Device** wizard in step 3.

Any device that has implemented our standard DVR control protocol is supported. For information about supported devices, see *Third-party DVRs*.

16.2.2.1.2 Add Survey Devices

16.2.2.1.2.1 Add a Custom Survey Device

Survey data is most often coming through a serial string from the ROV into the IC-Inspection machine. This is basically text including positional data, which may be submitted through a survey device. Sometimes a survey company is on board who smooths the data and sends us a clean serial string with exact positional information.

If there's a serial string coming from the ROV into IC-Inspection, you must set up the survey device as described below.

1. On the **Devices** pane, choose **Add** from the toolbar.
2. In the **Add New Device** wizard, choose **Survey Device**, and click **Next**.
3. Select **Custom Survey** and click **Next**.
4. On the **Properties** tab, select the relevant COM port and specify the properties of the survey device as required.

   Note the following:

   - If you're adding several survey devices, you should give each one a different **Display Name** so that you can tell them apart.
   - Most commonly, you use the following industry-standard attributes:
     - *Baud Rate*: 9600
     - *Data Bits*: 8
     - *Parity*: None
     - *Stop Bits*: 1

   Double-check the values with the company supplying the survey string to you.
5. On the **Survey** tab, you specify the parameters required for interpreting the survey values.
   - Under the **Survey** area, you can make entries as follows:
     - **End of Line Signal**: Set the value of this field to be compatible with whatever is coming down the survey string. To enter ASCII control characters, type a number prefixed with a `#`. For example, carriage return is `#13`, line feed is `#10`, and carriage return followed by line feed (the most common case) is `#13#10`.
     - **String Format**: The following string formats are supported by IC-Inspection:
       - *Character Delimited*: Each unique survey field in the incoming survey string is separated by a character delimiter (usually a comma), and each survey field is defined by its index in the survey string.
       - *Position and Length*: Each survey field has a fixed length. If the survey field is less than this defined length, it may be padded with either zeros or spaces as appropriate.
       - *Identifier and Length*: The start of each survey field is defined by an identifier, and the end of the survey field is defined by its length. Again, the field may be padded with zeros or spaces as appropriate.
       - *Identifier and Delimited*: The start of each survey field is defined by an identifier, and a character delimiter (usually a comma) separates each data field.

        * *Pre/Post Identifier and Delimited*: The start and end of each survey field is defined by an identifier, and a character delimiter (usually a comma) separates each survey field. Identifier and Delimited is the most common format for an incoming survey string. If this format is used, then in a noisy signal environment, IC- Inspection will still be able to correctly identify data even if only a partial string was received.

      – **Delimiter**: Set the value of this field to match whatever is coming down the survey string. Comma (`,`) is the most common delimiter.

  - Under the **Survey Fields** area, you can add survey fields to reflect the parts of the incoming survey string you're interested in. Exactly what you can configure for each field depends on the String Format selected, but they all have Name, Type and Unit. If Type is Numeric, you can select a Unit for this field.

    For example, if the survey string is sending you Depth in feet, select the unit to be Feet. In NEXUS IC, under *Configuration* → *Events* → *Configure Event Types*, find your "Survey - Standard" form, edit the **Depth** field, and ensure that its unit is set to metres. Now IC-Inspection will convert the incoming depth from feet to metres before logging it in the database. Similarly if the survey string is sending you Heading in hundredths of a degree or whatever, you can use Units to convert.

6. Click **Finish** to complete the setup.

> **Result**
>
> The custom survey device is added to the list of devices on the **Devices** pane and the value in the **Connection Status** column should show *Connected* in case of a successful connection. The **Enabled** toolbar button is on by default. If the value in the **Connection Status** column is not *Connected*, then click **Enabled** twice, to disable then re-enable the device. This forces a fresh attempt at connection.

16.2.2.1.2.2 Add a Survey Output Device

The survey output device lets you send survey data out a serial port, for downstream consumption by another system.

To add a survey output device, follow the steps below:

1. On the **Devices** pane, choose **Add** from the toolbar.
2. In the **Add New Device** wizard, choose **Survey Device**, and click **Next**.
3. Select **Survey Output** and click **Next**.
4. On the **Properties** tab, select the relevant COM port for output and specify the properties of the survey device as required.

   Note the following:

   - If you're adding several survey output devices, you should give each one a different **Display Name** so that you can tell them apart.
   - Most commonly, you use the following industry-standard attributes:
     – *Baud Rate*: 9600
     – *Data Bits*: 8
     – *Parity*: None
     – *Stop Bits*: 1
5. On the **Survey** tab, you make selections appropriate to what your downstream device is expecting.
   - Under the **Survey** area, you can make entries as follows:

- **Delimiter**: Set the value of this field to match whatever is expected from the downstream device. Comma (,) is the most common delimiter.
- **End of Line Signal**: Set the value of this field to be compatible with the requirements of the downstream device.
- **Include Identifiers**: Tick this checkbox if you want data to be sent with identifiers prepended, for example, "DateTime=01/01/2001 12:34:56, Depth=100".
- **Include null values**: Controls what happens if some fields are null: do you want several separators in a row in this case, for example, "1,,3"?
- **Null value replacement**: This field is for downstream devices that cannot cope with this case, so you can have the null field replaced with the value of your choice ("0", "nbsp", etc).

- Under the **Survey Fields** area, you can select fields that you want to be sent or deselect fields that you don't want to send. Use **Move Up** and **Move Down** to rearrange fields to suit the downstream device.

6. Click **Finish** to complete the setup.

Result

The survey output device is added to the list of devices on the **Devices** pane and the value in the **Connection Status** column should show *Connected* in case of a successful connection. The **Enabled** toolbar button is on by default. If the value in the **Connection Status** column is not *Connected*, then click **Enabled** twice, to disable then re-enable the device. This forces a fresh attempt at connection.

Note

Date and Time format come from Windows settings. To change them, go to the Windows' Region and Language control panel.

16.2.2.1.2.3 Add a Survey Simulator

IC-Inspection comes with a survey simulator for testing purposes, which you can set up in case you want to get survey data simulated by the system.

To add a survey simulator, follow the steps below:

1. On the **Devices** pane, choose **Add** from the toolbar.
2. In the **Add New Device** wizard, choose **Survey Device**, and click **Next**.
3. Select **Survey Simulator** and click **Next**.
4. On the **Properties** tab, specify basic parameters for the simulator, such as name or date and time settings.
5. On the **Survey** tab, you can set up how the actual survey values are to be generated by the simulator. There are some default settings delivered for a number of fields, which you can adjust, but you can also add additional fields or delete them.

   You can directly edit the values in each cell (including name, type, unit, value and increment) by double-clicking within the specific cell.
6. Click **Finish** to complete the setup.

Result

The survey simulator is added to the list of devices on the **Devices** pane and the value in the **Connection Status** column should show *Connected* in case of a successful connection. The **Enabled** toolbar button is on by default. If the value in the **Connection Status** column is not *Connected*, then click **Enabled** twice, to disable then re-enable the device. This forces a fresh attempt at connection.

16.2.2.1.3 Set Up Text Overlays

If you use IC-Recorder to record video with text overlays, you have two options for configuring the text overlays:

- **Configuration in IC-Inspection**:

  You can set up text overlays in IC-Inspection by using the **Text Overlays** button on the **Devices** pane.

  If you're using IC-Recorder alongside IC-Inspection, we highly recommend setting up text overlays within IC-Inspection. This ensures consistency when using multiple recorders since you can use the same overlay on each recorder (except for channel name). When you configure the overlay in IC-Inspection, you only need to do it once, and the settings will be applied to all connected recorders. If IC-Recorder is currently disconnected, it will receive the configuration upon reconnection.

- **Configuration in IC-Recorder**:

  You can also set up text overlays in IC-Recorder using the **Edit Overlays** button from the main toolbar.

  We recommend using this option only if you're using IC-Recorder as a standalone device. If you use IC-Recorder alongside IC-Inspection, make the configurations in IC-Inspection to maintain uniformity across recorders.

16.2.2.1.3.1 Create a New Overlay

1. Start creating a new overlay in either of the following ways:
   - In IC-Inspection, choose **Text Overlays** from the toolbar of the **Devices** pane.
   - In IC-Recorder, choose **Edit Overlays** from the mail toolbar.
2. In the **Edit Overlays** dialog, choose **Add**.
3. In the **Edit Overlay** dialog, specify a name for the new overlay on the top of the **Configuration** screen area. Here you can also select a background colour for designing the text overlay. By default, the colour is black.

   Tip

   Drag the window larger to make the black overlay region larger. It doesn't need to match the actual size of your video feed, but it's convenient for you if you drag it to approximately the same shape.

4. On the left-hand side of the screen, under the **Available Regions** section, ensure that you have all the fields that you want to include in your text overlay.
   - In **IC-Inspection**, you can add additional asset information fields by choosing the **Asset Information Fields** button on the top of the screen. Besides asset information, you can also see database fields, device information, survey fields, as well as static text or image elements that you can include. If a survey field you want is not shown in the list, ensure that the appropriate survey field is configured and has a value.
   - In **IC-Recorder**, you can see device information fields and static text or image elements that can be retrieved directly from IC-Recorder. Survey fields, database fields and asset information fields are all retrieved from IC-Inspection. You cannot add new asset information fields in IC-Recorder. If you want to add a new field, you have to do it in IC-Inspection.

5. Drag fields from the tree on the left onto the overlay layout region. Move them to the position where you want to see the fields on the recorded video screen.

   Any fields that you have dragged to the overlay layout region will appear in the list under the **Regions** section at the bottom of the screen.

6. Customise the appearance of the fields.

   When add your first field, you may want to customise it (colour, font, size, etc.), because additional fields you add will inherit their settings from the previous field.

   Once fields are on the overlay, you can configure them as follows:

   - **Selection**: You can select fields by clicking them on the overlay or selecting them from the grid under **Regions**.

     You can also multiselect fields as follows:

     – On the overlay, you can "lasso" several fields by click-dragging a box around them or use the **Ctrl** key to select fields one after the other.

     – In the grid, you can use the **Ctrl** key or **Shift** key to select multiple rows.

   - **Toolbar Buttons**: You can use the toolbar buttons at the top of the **Regions** screen area to perform actions on selected fields. You can nudge them, align them, change their font size, or delete them.

   - **In-grid editing**: You can adjust settings specific to individual fields by **double-clicking** in the cell for the required field and parameter. You can make the following settings:

     – Specify a text for static texts and images

     – Add a prefix or suffix text, for example, a short prefix "E: " for Easting, etc.

     – Define offset values for field placement (percentage from the top and left side of the captured screen).

     – Specify font type, font size and font colour for the texts. Note that a 10-point font on a 576-pixel high SD video will fill about 1/57th of the height of the image, which may be suitable, however, it would be too small on a 1080-pixel high HD feed.

     – Select a background colour for the field. By default, no background colour is applied (transparent). This conceals less of the video, but may be less clear on certain video colours. Consider enabling the **Show Overlay Text Shadow** option under *Tools* → *Options* → *Advanced* (see *Advanced*) for better legibility with transparent-background fields. This option consumes additional CPU power, so if your CPU is near 100% during recording, disable this option.

   If you add an "Image" region, a file dialog will appear immediately. If you choose a .PNG file, its transparency will be honoured. If the PNG has partial or full transparency, you'll see the video through the image. You can add multiple image regions if needed.

   > **Note**
   >
   > If you're using a Marshall Encoder rather than a system hardware, some overlay configuration options are ignored because the Marshall Encoder does not support them. Text, prefix, suffix, source, top, left, font size, and font color are supported, but font choice (for example, Courier, Arial) is not. Additionally, the Marshall Encoder supports a maximum of 16 overlaid fields.

7. Choose **OK** to save your changes and exit the dialog or **Apply** to save your changes and keep the dialog open.

   After confirming your settings and closing the chain of dialogs, you'll see real-time updates of survey values on your recorders.

16.2.2.1.3.2 Edit Overlays

You can edit overlays only within the application where they were originally created. That is, in IC-Inspection, you can edit overlays created in IC-Inspection, in IC-Recorder, you can only edit overlays created in IC-Recorder.

1. Start editing an overlay in either of the following ways:
   - In IC-Inspection, choose **Text Overlays** from the toolbar of the **Devices** pane.
   - In IC-Recorder, choose **Edit Overlays** from the mail toolbar.
2. In the **Edit Overlays** dialog, choose **Edit**.
3. Make your changes as required. For more information about the configuration options, see ic-inspection.devices.text_overlay.create above.
4. Choose **OK** to save your changes and exit the dialog or **Apply** to save your changes and keep the dialog open.

16.2.2.2 Map Survey Fields

Before you start inspections, you must ensure that survey fields coming from survey devices are mapped correctly to the survey fields in the NEXUS database and that survey values are coming through. You do that on the **Survey Values** pane of IC-Inspection (see *Survey Values*).

The **Survey Values** pane displays all survey fields that are coming through the serial string. Survey fields are defined in the Device Manager, within the device they are being received from. The system automatically maps these fields to the survey fields in the system, however, you must check if it could perform the matching correctly.

16.2.2.2.1 Prerequisites

To ensure that incoming survey fields can be mapped to survey fields in the NEXUS database, you must have an event type configured that contains the required database survey fields. This event type must have been created in NEXUS IC under *Configuration* → *Events* → *Event Types* with event form type **Survey Data**. For more information, see *Configure Event Types*.

16.2.2.2.2 Update the Source for a Survey Field

To change the source of a survey field, proceed as follows:

1. Select the field in the grid.
2. Choose **Source** from the toolbar of the pane.
3. Choose the relevant input device from the drop-down menu.

16.2.2.2.3 Update the Destination for a Survey Field

You can log data from a source survey field into one or more survey fields in the database. The system tries to automatically find a destination database field to which it can map the source survey field. To change the destination database field, follow the steps below:

1. Select the field in the grid.
2. Choose *Destinations* → *Database Fields* from the toolbar of the pane.
3. In the dialog that pops up, select one or more fields under **Survey Data** as required. The dialog shows all the fields that have been configured in NEXUS IC (see *Example: Set Up Filling Event Fields with Survey Data*).

   If you want incoming survey data to be automatically populated into event fields, you can choose the required event field in this dialog. For more information, see *Configure Event Types*.

4. If required, you can also set up several "meta" destinations, which can be used when a real survey field is not appropriate. To do that, choose **Destinations** from the toolbar of the pane and select one of the following options:

   - **Survey Date/Time**: You can use this as the destination for your DateTime field. Note that there is no field called *Survey - Standard.DateTime*, *Survey - Pipeline.DateTime*, etc. because date/time is the key value for every survey table, and it would be arduous and error-prone to force you to select them all separately.
   - **Survey Heading**: Use it if you do not wish to log Heading to a database field, but still want things that rely on Heading (such as the *Heading* pane) to work.
   - **Survey KP**: Use it if you do not wish to log KP to a database field but still want things that rely on KP (such as the *Charts* pane or the *Pipeline View* pane) to work.
   - **Survey Depth**: Use it if you do not wish to log Depth to a database field, but still want things that rely on Depth to work.

Result

Now, during an inspection, the value of this survey field will be logged into the selected destination survey field.

16.2.2.2.4 Worked Example

See *Example: Set Up Filling Event Fields with Survey Data*.

16.2.2.2.4.1 Example: Set Up Filling Event Fields with Survey Data

IC-Inspection allows you to configure automatic population of incoming survey data into discrete event fields. The following example demonstrates the steps to set up this feature:

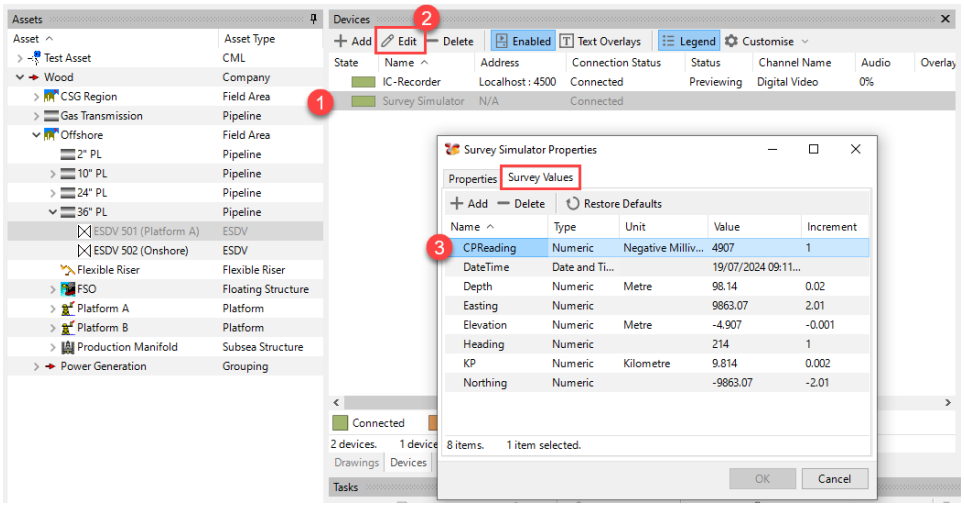
1. Configure the survey device.

   Ensure that one of your survey devices contains the survey field name you want to map to your event field:

   a. On the **Devices** pane, select the relevant survey device.

   b. Choose **Edit**.

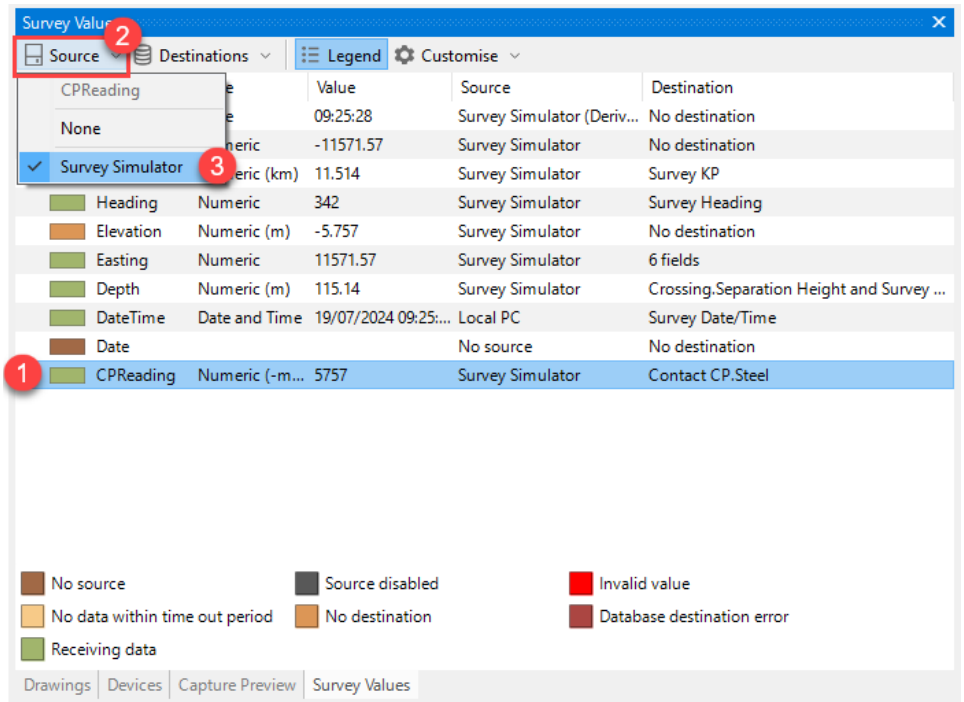
   c. In the **Survey Simulator Properties** dialog, on the **Survey Values** tab, ensure that the required survey field is added and configured.



2. Set the source for the survey field.

    a. On the **Survey Values** pane, select the relevant survey field.

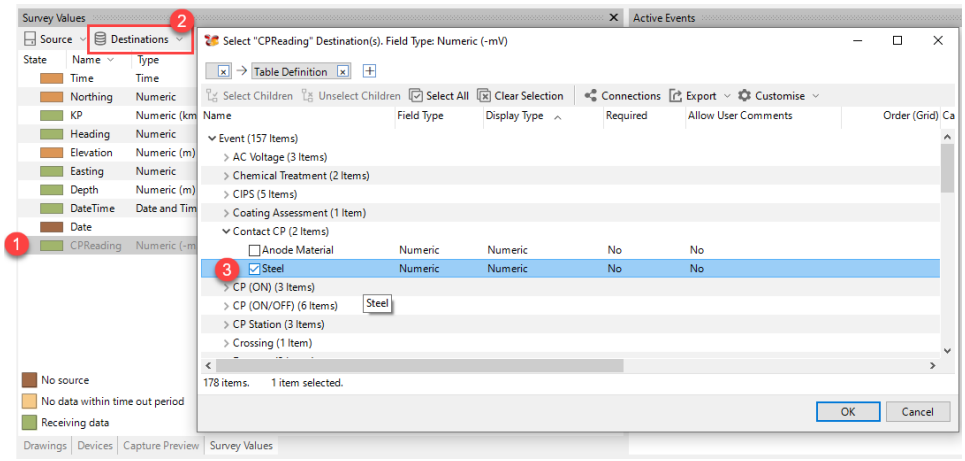
    b. In the toolbar of the pane, click *Source* and select the survey device you're using.



3. Set the destination for the survey field.

    a. On the **Survey Values** pane, select the relevant survey field.

    b. In the toolbar of the pane, click *Destinations* → *Database Fields...* and select the event field that you want to map to the survey field.



4. Test that the event field is automatically populated by the survey field value.

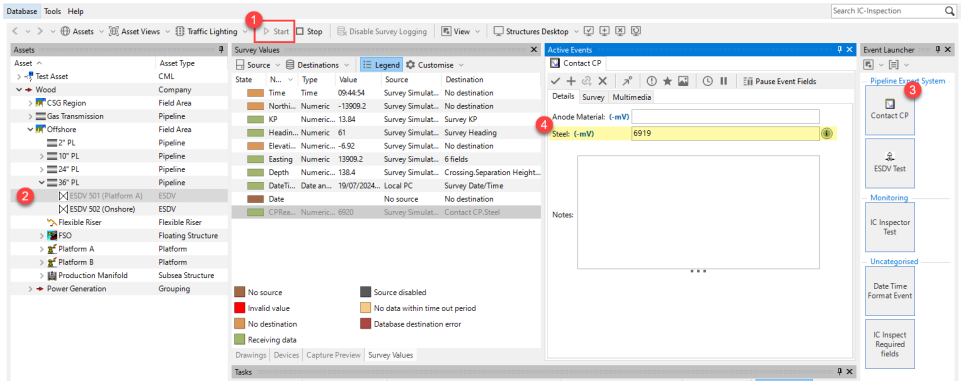
    a. Click **Start** in the main toolbar of IC-Inspection to start the inspection.

    b. Select an asset that has an asset type linked to the relevant event type.

    c. In the **Event Launcher**, click the event type to launch an event.

    d. In the **Active Events** pane, check that the database field that you mapped above gets updated with the survey field value being logged.

    You can choose **Pause Event Fields** in the toolbar to pause or resume automatic event field updates. Toggling the (i) button next to the field will also perform the same functionality.



Example Video

See the video below for a demonstration of a similar example.

16.2.2.3 Set Up Event Templates

Event templates allow you to pre-populate event forms with specific data, which enables the creation of ad hoc events without the need to manually specify all the field values. You can also assign Shortcut Keys to event templates to enable creating ad hoc events using shortcuts. For more information about creating ad hoc events, see *Create Ad Hoc Event*.

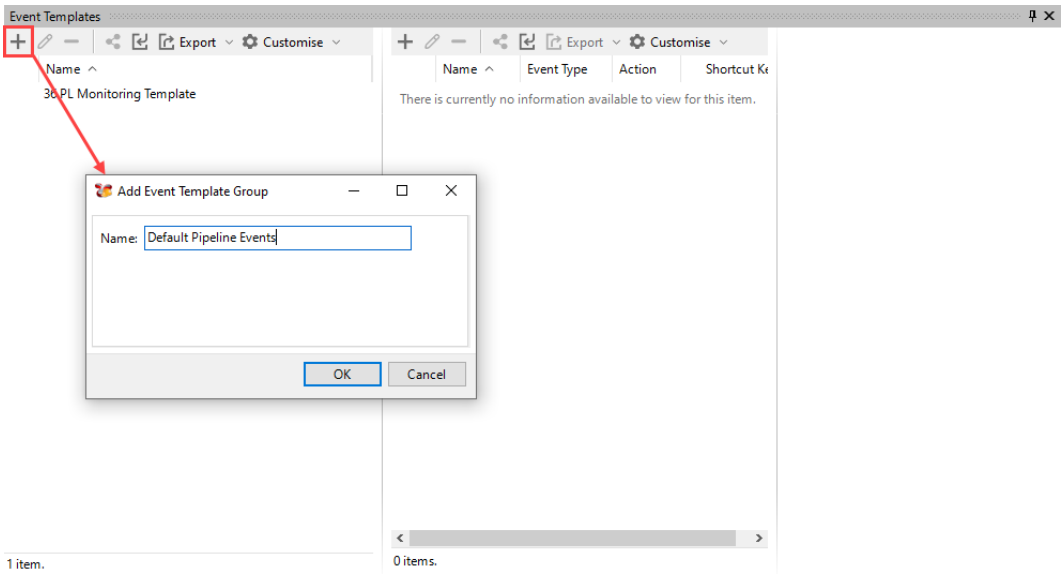
Once set up, event templates will be available in the **Event Launcher** (see *Event Launcher*), based on which you can create ad hoc events (see *Create Ad Hoc Event Using Event Templates*).

You set up event templates as follows:

1. In IC-Inspection, go to the **Event Templates** pane.
2. On the left-hand side of the pane, click **Add** to create an event template group and specify its name. The event template group is just a grouping of similar event templates.

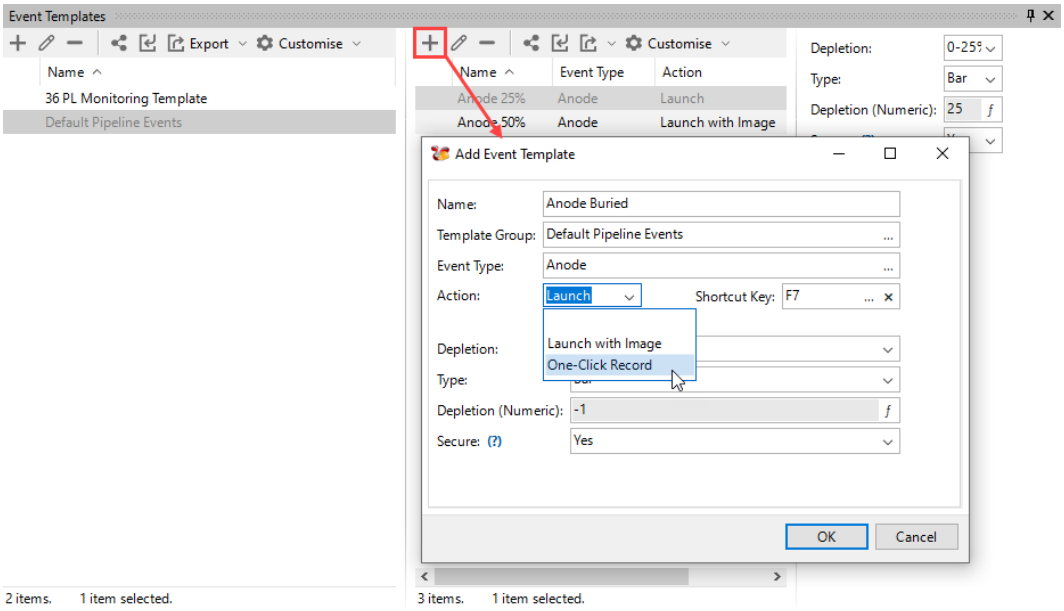
   When recording events, this event template group must be specified in the **Active Inspection** pane to enable creating ad hoc events using any of the event templates within this group.

   You can add different event template groups for different inspectors (for example, "Alice's Templates", "Bob's Templates"), different inspection types (for example, "Structures Templates", "Pipeline Templates", etc.), or any other groups that fit your specific needs.



3. In the middle section of the pane, click **Add** to create the event template. You can add as many or as few event templates to each group as you like. You can add multiple events of the same event type.
4. In the top part of the **Add Event Template** dialog, specify the following data:
   - In the **Name** field, enter a name that identifies the event template. Try to place key information near the start of the name, so that it's easily visible in the **Event Launcher** pane.
   - In the **Event Type** field, you must select the event type (preconfigured in NEXUS IC).
   - In the **Action** field, you select how you want to create ad hoc events based on the event template. Choose one of the following values:
     - *Launch*: When clicking the event template in the **Event Launcher** pane, the event form will appear in the **Active Events** pane pre-populated with the data you specified here. You can review and adjust the entries as needed before saving the event.
     - *Launch with Image*: When clicking the event template in the **Event Launcher** pane, the event form will appear in the **Active Events** pane pre-populated with the data you specified and it captures an instant image from the video recording to be attached to the event. You can review and adjust the entries as needed before saving the event.
     - *One-Click Record*: When clicking the event template in the **Event Launcher** pane, the event will be created instantly with the preconfigured values without the event form appearing in the **Active Events** pane for review.
   - In the **Shortcut Key** field, you can specify a shortcut key, which allows performing the actions above using a shortcut key instead of clicking the event template in the **Event Launcher**. To

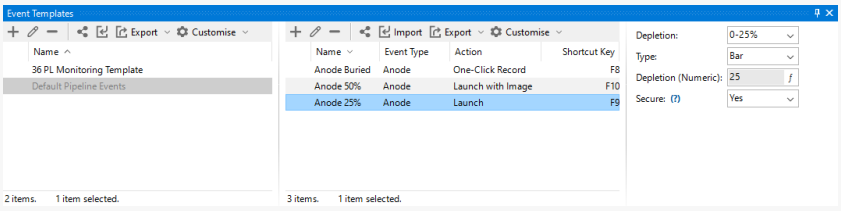
enter a key, click ... and press the required shortcut key on your keyboard. You can hold down Shift, Ctrl or Alt while choosing a key if you prefer.



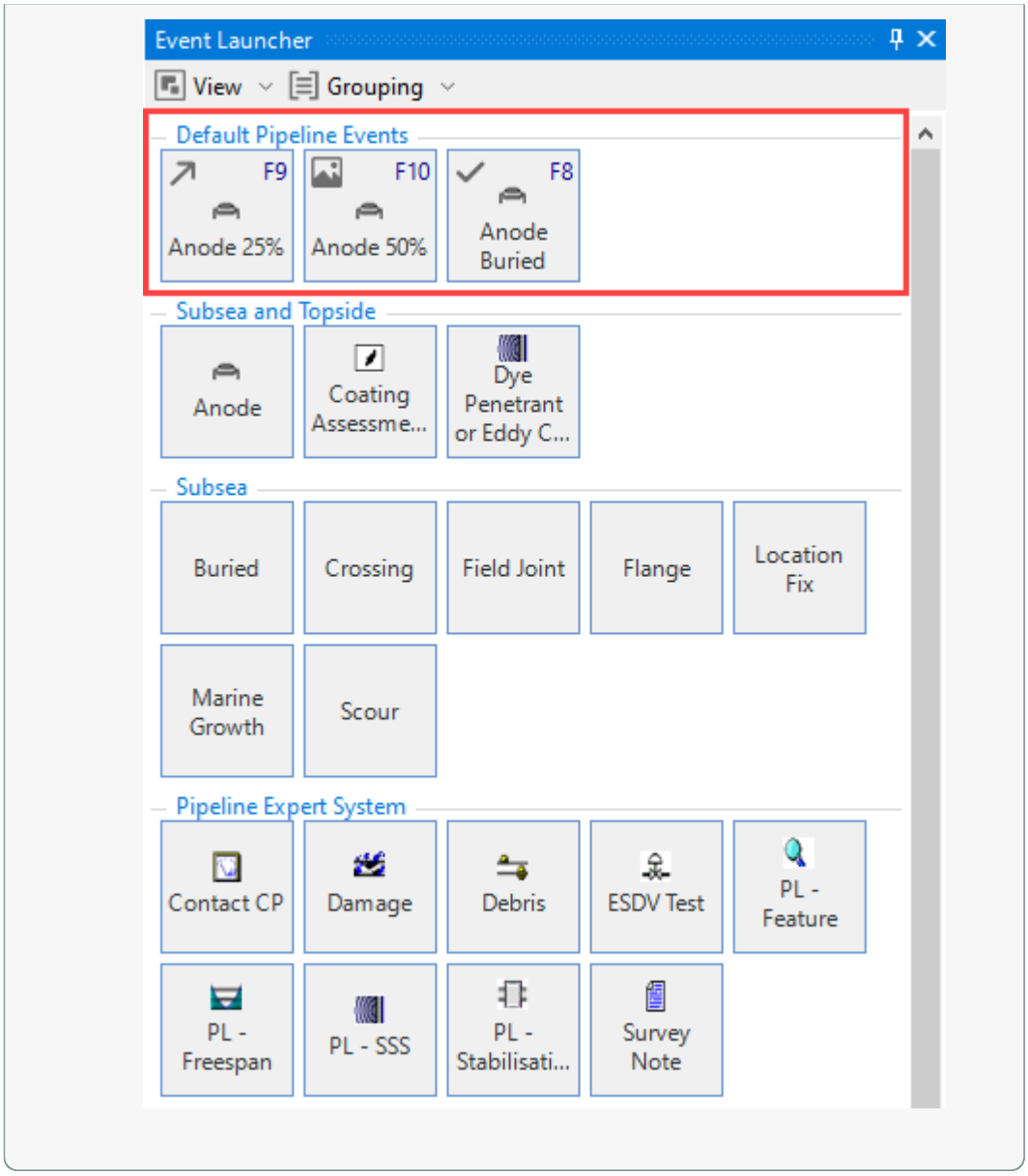
5. In the bottom part of the **Add Event Template** dialog, specify the default field values that you want to be pre-populated in the event form. These fields appear once you have selected the event type in the top part of the dialog. You can fill in as many or as few fields on each event form as you like.
6. Click **OK** to save the event template.

Result

- The new event template appears in the **Event Templates** pane and if you select it, the preconfigured values are shown on the right-hand side of the pane.



- The event template will be available in the **Event Launcher** pane when you start the inspection and select to show event templates under the **View** toolbar button.



16.2.3 General Features

IC-Inspection shares most of the general features with NEXUS IC, with only a few minor differences.

For a comprehensive overview of all the general features, see *General Features*. See below for **differences** in IC-Inspection.

16.2.3.1 Searching

Similarly to NEXUS IC, you can perform database-wide search or asset-specific search as required (see *Searching*). Note though that IC-Inspection searches the following items:

- Assets
- Asset Information
- Sub Asset Information

- Event Templates
- Event Template Groups
- Anomaly Triggers - Only asset based anomaly triggers.
- Tasks - Only if the Task Workpack matches the selected Active Workpack.
- Events - If the event is in the selected active workpack, the event will be shown on the **Event Listing (Workpack)** pane. If the event is not in the selected active workpack, the event will be shown on the **Event Listing (Historical)** pane.
- Library, ROV, Workpack and Survey Set - These results will open the editor dialog.

16.2.3.2 Using the Grid

You can use the same grid functionality in IC-Inspection, except for Reports (see *Using the Grid*). In IC-Inspection, you cannot generate reports.

16.2.3.3 Using the Status Bar

In IC-Inspection, you use the status bar in the same way as in NEXUS IC (see *Using the Status Bar*), except that in IC-Incpection, the Job Management Console is not available.

16.2.4 Online Inspection

During online inspection, you perform online data capture for the selected asset and log events when required.

16.2.4.1 Prerequisites

Before you commence inspecting and logging inspection data, ensure the following:

- IC-Inspection has been set up and deployed in the offshore environment (see *Offshore Deployment*).
- Assets (see *Asset Tree*), event types (see *Configure Event Types*) and, optionally, tasks and drawings have been set up and configured in NEXUS IC.
- In IC-Inspection, the necessary configurations have been performed:
  - Device connections (video recorder, survey devices) have been set up (see *Set Up Devices*).
  - Incoming survey fields have been mapped to survey fields in the database (see *Map Survey Fields*).
  - Optionally, event templates have been set up for one-click eventing (see *Set Up Event Templates*).
- Your IC-Inspection desktop has been configured in accordance with your inspection requirements (see *Manage My Desktop*).
- You have connected to the correct database (see *Connect to Database*).

16.2.4.2 Process

Follow the steps below to perform online inspection:

1. In the asset tree, select the asset for which you want to perform the inspection.
2. On the **Active Inspection** pane, ensure that the correct workpack and survey set is specified. These fields are mandatory. The workpack contains all of the tasks for the current inspection and any events created will be against this workpack. For more information, see *Active Inspection*.

3. From the main toolbar of the IC-Inspection screen, click **Start** to start the inspection.

   This action triggers the following:

   - Any video recording devices that have been configured start recording.
   - Survey data will commence logging.

4. You can commence video commentary and create events as required. If required, you can capture images to be attached to the events. For more information about creating events, see *Create Events*. You log event details in the **Active Events** dialog.
5. In case it's necessary, you can create findings from the events (see *Create Findings*).
6. When you've completed the online data capture, from the main toolbar of the IC-Inspection screen, click **Stop** to stop the inspection.

16.2.4.2.1 Create Events

During online inspection, you can create events in the following ways:

- You can create events by launching tasks (see *Create Event from Task*), which can be done using either of the following options:
  - Launch a task from the **Task** pane.
  - Launch a task from the **Drawing** pane.
- You can create ad hoc events from the **Event Launcher** (see *Create Ad Hoc Event*).

Before saving the event, you can decide if you want the event to complete a task. For more information, see *Complete Tasks*.

16.2.4.2.1.1 Create Event from Task

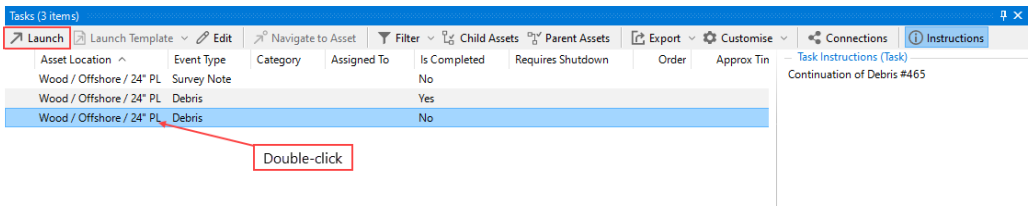
You can create an event from a task as described below.

16.2.4.2.1.2 Prerequisites

- A task exists for the relevant asset.
- You have selected the asset in the asset tree and ensured that data in the **Active Inspection** pane is filled correctly.
- You have started the inspection using the **Start** button in the main toolbar.
- The task has not been completed yet.

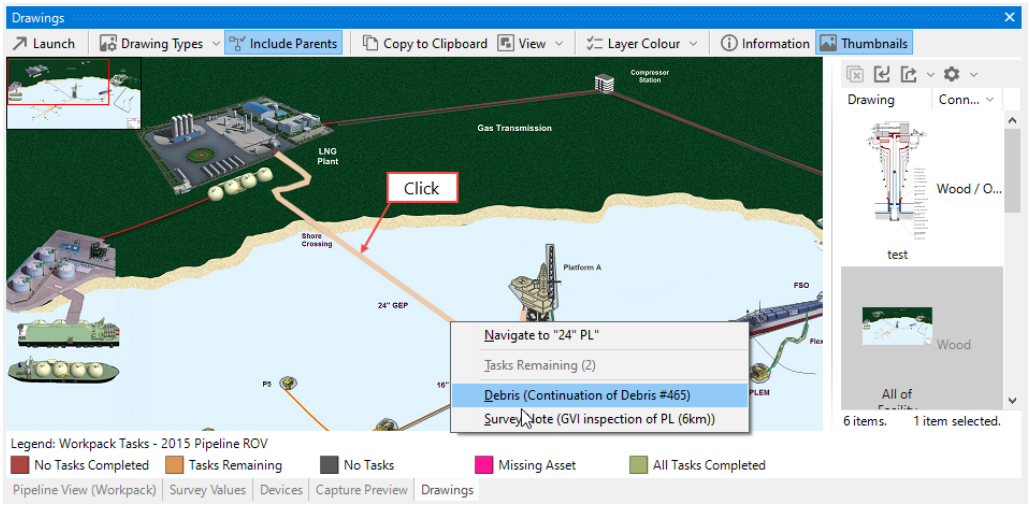
16.2.4.2.1.3 Process

1. Launch the task. You can launch a task in the following ways:
   - On the **Tasks** pane, select the task from the list and click **Launch** from the pane's toolbar, or double-click the task.



If you have set up an event template (see *Set Up Event Templates*) for the event type of the task, you can also use the **Launch Template** toolbar button to create the event with the preconfigured values added. Note that the relevant event template group must be assigned in the **Active Inspection** pane to enable this feature.

- On the **Drawings** pane, click the asset and click the task in the drop-down list.



> **Tip**
>
> In the toolbar of the **Drawings** pane, click *Layer Colour* → *Workpack Tasks* to see layers coloured according to the status of tasks assigned to specific assets in that workpack.

2. In the **Active Events** pane, a new event gets added. Enter event data on the **Details** tab. You can also capture images or raise a finding as required. For more information about what you can do on this pane, see *Active Events*.
3. If you want the task to be completed when the event is created, ensure that the **Complete Task** checkbox is selected at the top of the tab. This is selected by default.
4. To create the event record, save the active event in either of the following ways:
   - Click **Save** in the toolbar to save the new event entry, which will be visible in the **Event Listing** pane. The event gets closed in the **Active Events** pane.
   - Click **Save & New** to save the new event entry and immediately create a new one with the same event type. The created event will be visible in the **Event Listing** pane and disappears from the **Active Events** pane and a new empty event record is added to the **Active Events** dialog.
   - Click **Save & Hold** if you could not complete the work required by the task (for example, you have inspected part of an asset but had to stop for some reason). This option saves the event, which will be visible in the **Event Listing** pane and completes the task, however, it creates a new continuation task for the asset. For the original task, the **Is Held** field gets the value **Yes** in the task's parameters. The new task that is created will have reference to the original task in its instructions and the **Previous Task** field will be populated with reference to the original task.

16.2.4.2.1.4 Create Ad Hoc Event

You are not restricted to eventing only from tasks. At any time, whilst IC-Inspection is in inspection mode, you can log events against the currently selected asset, which is called ad hoc eventing.

You can create ad hoc events from the **Event Launcher** pane of IC-Inspection (see *Event Launcher*), which shows tiles for each event type assigned to the asset type of the currently selected asset, as well as preconfigured event templates. Based on the type of the tile in the *Event Launcher**, you can create ad hoc events in one of the following ways:

- By manually entering all field values in the event form (see *Create Ad Hoc Event with Manual Data Entry*)
- By using event templates (if configured) that pre-populate some or all of the fields in the event form (see *Create Ad Hoc Event Using Event Templates*)

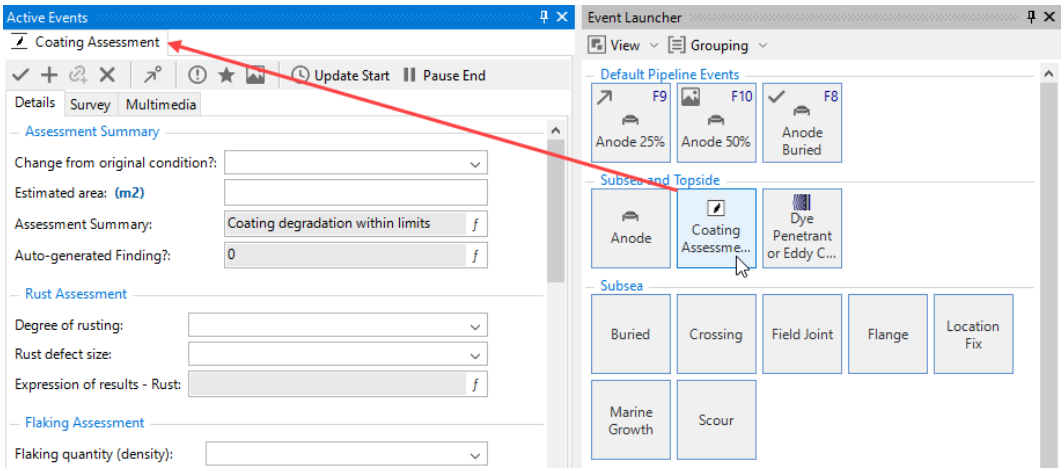
16.2.4.2.1.5 Prerequisites

- You have selected the asset in the asset tree and ensured that data in the **Active Inspection** pane is filled correctly.
- You have started the inspection using the **Start** button in the main toolbar.
- If you're using event templates, these event templates must have been set up (see *Set Up Event Templates*).

16.2.4.2.1.6 Create Ad Hoc Event with Manual Data Entry

1. In the **Event Launcher**, click the tile for the required event type.

   This action opens the event form in the **Active Events** pane.

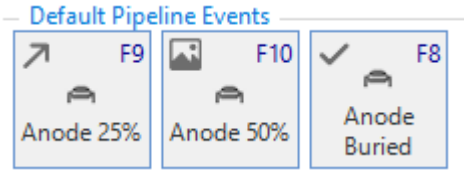


2. Enter event data on the **Details** tab. You can also capture images or raise a finding as required. For more information about what you can do on this pane, see *Active Events*.
3. If the event can be matched to one or more existing tasks, you will see a *Task Completion* section at the top of the event form indicating that this event can complete a task and a *Task* section with the specific tasks listed. You can choose which tasks to complete using the checkboxes.
4. To create the event record, save the active event in either of the following ways:
   - Click **Save** in the toolbar to save the new event entry, which will be visible in the **Event Listing** pane. The event gets closed in the **Active Events** pane.
   - Click **Save & New** to save the new event entry and immediately create a new one with the same event type. The created event will be visible in the **Event Listing** pane and disappears from the **Active Events** pane and a new empty event record is added to the **Active Events** dialog.

16.2.4.2.1.7 Create Ad Hoc Event Using Event Templates

1. In the **Active Inspection** pane, ensure that you select the **Event Template Group** that contains the required event template.
2. In the **Event Launcher**, make sure that the **Show Event Templates** option is enabled under the **View** toolbar button.
3. In the **Event Launcher**, click the tile for the required event template or press the shortcut key indicated on the tile.

   You can identify event template tiles by the additional icons on the tile. If a shortcut key exists, that is also shown on the tile. The icons indicate the type of the action assigned to the event template, which can be one of the following:



   - (tick): Indicates a *One-Click Record* action type.
   - (arrow): Indicates a *Launch* action type.
   - (image): Indicates a *Launch with Image* action type.

4. Depending on the event template type that you selected, you can proceed as follows:
   - If you have selected an event template with a *One-Click Record* action type, the event will be created instantly with the preconfigured values without the event form appearing in the **Active Events** pane. You can review or update the event record from the **Event Listing** pane if required. The event creation process ends here, ignore the next steps.
   - If you have selected an event template with a *Launch* action type, a new event appears in the **Active Events** pane, pre-populated with the preconfigured data. You can review and adjust the entries as needed, capture images or raise a finding as required. For more information, see *Active Events*.
   - If you have selected an event template with a *Launch with Image* action type, a new event appears in the **Active Events** pane pre-populated with the data you specified and an instant image is captured from the video recording to be attached to the event. You can review and adjust the entries as needed. For more information, see *Active Events*.
5. If the event can be matched to one or more existing tasks, you will see a *Task Completion* section at the top of the event form indicating that this event can complete a task and a *Task* section with the specific tasks listed. You can choose which tasks to complete using the checkboxes.
6. To create the event record, save the active event in either of the following ways:
   - Click **Save** in the toolbar to save the new event entry, which will be visible in the **Event Listing** pane. The event gets closed in the **Active Events** pane.

- Click **Save & New** to save the new event entry and immediately create a new one with the same event type. The created event will be visible in the **Event Listing** pane and disappears from the **Active Events** pane and a new empty event record is added to the **Active Events** dialog.

See also

- *Create Events*
- *Set Up Event Templates*
- *Event Templates*
- *Event Launcher*

16.2.4.2.2 Complete Tasks

Tasks in IC-Inspection can be completed once you have started creating an event (see *Create Events*) and in the **Active Events** pane, you make the following selections before saving the event:

- If the event is launched from a task, it will have a *Task* section at the top of the event form with a **Complete Task** checkbox. If you leave this checkbox selected, the task will be marked as completed when you save the event.
- If the event is not launched from a task, but matches an existing task, you will see a *Task Completion* section at the top of the event form indicating that this event can complete a task and a *Task* section with the specific task and a checkbox. Select this checkbox if you intend to use this event to complete the task. The task will be marked as completed when you save the event.
- If there are multiple tasks that this event could complete, you will see a *Task Completion* section at the top of the event form indicating that this event can complete a task and a *Task* section with the specific tasks listed. You can choose which tasks to complete using the checkboxes. The selected task will be marked as completed when you save the event.

16.2.4.2.3 Create Findings

In case an event records a situation that is out of specification or out of range, a *finding* can be raised for the event. If a field has an anomaly trigger defined (see *Anomaly Triggers*), and the value for that field meets or exceeds the pre-configured anomaly triggers, a finding is automatically raised. In case you deem it necessary, you can also manually create a finding.

Note

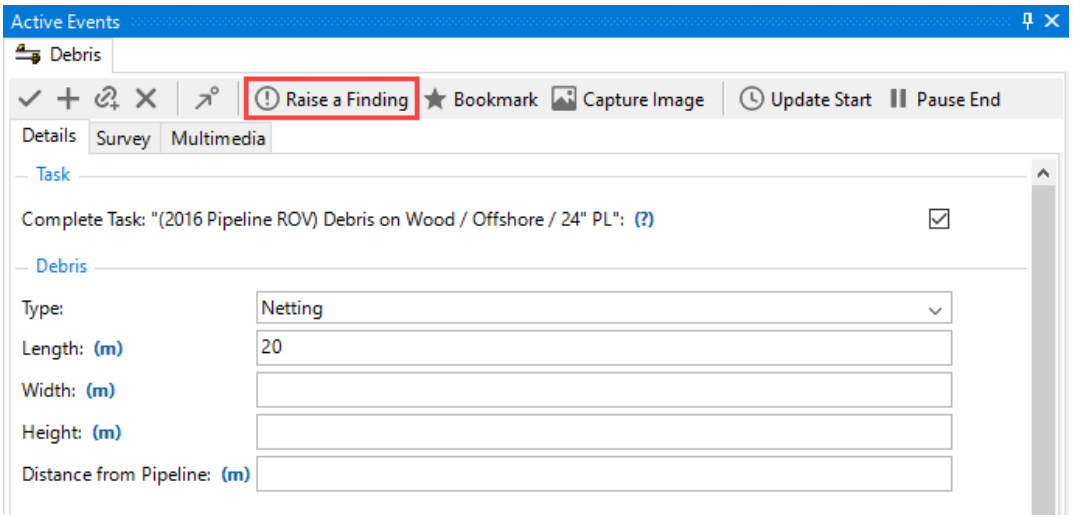
Only one finding can be manually created for an event. Multiple findings can be created automatically by anomaly triggers. If you see a yellow exclamation mark ( ) next to one or more fields in your event form, this is because one or more anomaly triggers have been violated, and a finding will be automatically created for each.

You can manually create findings in IC-Inspections as described below.

16.2.4.2.3.1 Create Finding from Active Event

You can raise a finding right when you're recording an event in the **Active Events** pane:

1. In the **Active Events** pane, click **Raise a Finding** in the toolbar. This action adds the new **Finding** tab to the **Active Events** pane.

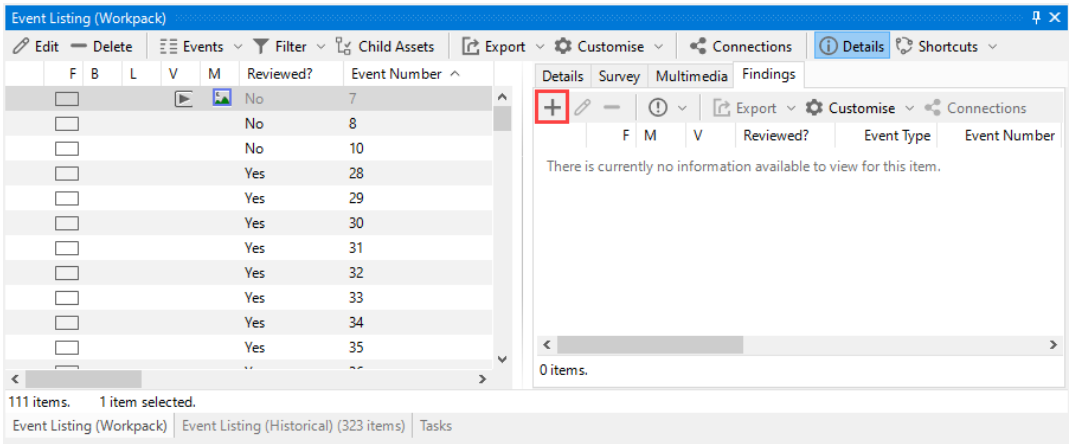


2. On the **Finding** tab, enter the details of the finding as required. For more information about the specific fields, see *Add/Edit Finding Dialog*.
3. Save the event. When you save the event, the finding is created with the event record and is automatically attached to it.

16.2.4.2.3.2 Create Finding from Event Listing

You can also create findings to existing event records created earlier as follows:

1. In the **Event Listing (Workpack)** pane, select the required event.
2. On the right side of the pane go to the **Findings** tab.
3. Click **Add** in the toolbar to start creating a finding.



4. In the **Add Finding** dialog, enter the details of the finding. For more information, see see *Add/Edit Finding Dialog*.
5. Click **OK** to save the finding.

16.2.4.2.4 Edit Events

To modify data for existing events in IC-Inspection, follow these steps:

1. On the **Event Listing (Workpack)** pane, select the event record that you want to update (only one at a time).
2. Click **Edit** in the pane's toolbar.
3. The event record opens in the **Active Events** pane. Update data as required.
4. Save your changes.

> **Note**
>
> Event data cannot be modified directly on the **Details** tab of the **Event Listing (Workpack)** pane; that tab is for display purposes only.

16.2.4.2.5 Attach Multimedia to Event

Multimedia are electronic files that have been uploaded against an event.

In IC-Inspection, you can attach multimedia to events as described below.

16.2.4.2.5.1 Add Images from Active Events

If your digital video recorders support it, you can capture images from the video recorder and attach it to the event while creating events in the **Active Events** pane. Multimedia types can include images or video files. To add an image, follow the steps below:

1. Start creating the event as described in *Create Events*.
2. In the **Active Events** pane, click the **Capture Image** toolbar button to capture a snapshot from the incoming video signal. You can capture as many snapshots as you prefer.
3. If required, you can review and edit the image on the **Multimedia** tab of the **Active Events** pane. For more information, see *Active Events*.
4. Select the images that you want to be attached to the event on the **Multimedia** tab.
5. Save the event record.

> **Result**
>
> The selected images are stored in the database against the event, which you can see on the **Event Listing** pane.

16.2.4.2.5.2 Add Multimedia from Event Listing

You can attach multimedia to existing event records on the **Multimedia** tab of the **Event Listing** pane. To make the **Multimedia** tab visible, ensure that you enable the **Details** toolbar button on the **Event Listing** pane.

> **Note**
>
> The following file formats are supported: GIF, JPG, JPEG, JFIF, TIF, BMP, PNG, PDF, DWG, CGM, DXF, SVG, WMF or EMF.

16.2.4.2.5.3 Add Multimedia Items

Follow the steps below to add new multimedia items to events:

1. Select the relevant event or events on the **Event Listing** tab.

   > **Note**
   >
   > If you select multiple events, the multimedia file will be attached to all selected events.

2. Open the **Multimedia** pane.
3. Use one of the following methods to upload the file:

   - Choose **Add** on the **Multimedia** pane to upload the file manually.
   - Drag & drop the multimedia file from Windows Explorer onto the **Multimedia** pane.

4. In the **Add Multimedia** dialog, enter a name for the multimedia (mandatory) and enter other parameters as required. For details, see *Add/Edit Multimedia Dialog*.

   When adding the multimedia file manually, you can choose to **Import** or **Link** the file:

   - **Import**: Saves the file to the NEXUS IC database. Changes made to the original file on disk will not affect the stored version.
   - **Link**: Links to the original file on disk. Any changes made to the file will be reflected the next time it is viewed in NEXUS IC.

   > **Note**
   >
   > If you drag and drop multiple files, they will be added, and then multi-selected in the grid. You can then click **Edit** to modify them in buld (see *Multi-Edit*). Drag and drop will *import* items, not *link* them.

5. Click **OK**.

16.2.4.2.5.4 Edit Multimedia Items

To edit an existing multimedia item, proceed as follows:

1. On the **Multimedia** pane, select the multimedia item.
2. Choose **Edit** on the toolbar.
3. In the **Edit Multimedia** dialog, update data as required. For more information, see *Add/Edit Multimedia Dialog*.
4. Click **OK** to save your changes.

16.2.4.2.5.5 Preview Multimedia Items

If you click the **Preview** button on the **Multimedia** pane, you can open a floating window to display the selected image in full size. If the selected events contain more images and you scroll from image to image on the **Multimedia** pane, the **Preview** window gets refreshed with whatever image is selected.

16.2.4.2.5.6 Crop Multimedia Items

You can crop image files in the **Multimedia** pane as follows:

1. Select the file and click **Crop** in the toolbar.
2. Click **Crop** in the toolbar of the **Edit Image** dialog.
3. Click and drag a rectangle on the image as required.
4. Before completing the crop, click **Keep Original** if you want the new cropped image to be added to the event's collection of images without overwriting the existing image. If you want to replace the existing image with the new cropped version, ensure **Keep Original** is **not** selected.
5. To complete the crop, click the ✓ button, or choose **Crop To Selection** from the toolbar.

16.2.4.2.6 Change Event Type

You can change the event type of selected events while retaining the link to all associated survey data, multimedia, and manually created findings. You can change the event type to any other preconfigured event types (see *Configure Event Types*). Any auto-generated findings will be unlinked from the event, but not deleted.

To change the event type, follow the steps below:

1. On the **Event Listing** tab, select one or more events as required.
2. From the tab's toolbar, choose *Shortcuts* → *Change Type*. You can also select the same option from the context menu of the events (available by right-clicking).
3. In the dialog that appears, select the event type to which you want to switch.
4. Click **OK**.

> **Result**
>
> The type of the selected events get updated to the new event type. If the field names across event types match, the data is retained. If the field names do not match, the values are added to the **Notes**, which you can check on the **Event Details** pane. Note that if you change the event type back to the original, these values will not be populated back to the original fields but will remain in the **Notes** section.

16.2.4.2.7 Match Tasks to Events

In general, when tasks are completed in IC-Inspection or IC-Inspector, an event is automatically created from the task and they're linked together.

In some cases, for example, when you created events manually, there may be no tasks associated with the event. In NEXUS IC, you can check associated tasks when selecting the event on the **Event Listing** tab of the **INSPECTION** screen and checking the record on the **Task** pane (see *Task*).

You can link incomplete tasks to an event in case they belong to the same asset and the same workpack and they have the same event type. The same functionality is available on the **Event Listing** pane in IC-Inspection. To match tasks, follow the steps below:

1. On the **Event Listing** tab, select one or more events as required.
2. From the tab's toolbar, choose *Shortcuts* → *Match Task*. You can also select the same option from the context menu of the events (available by right-clicking).

> **Result**
>
> The system automatically matches incomplete tasks to events in case all the following conditions are met:
>
> - The task doesn't already have an event assigned to it.
> - The task and the event have the same **asset**.
> - The task and the event have the same **workpack**.
> - The **event type** of the event and the task match.
>
> The task gets completed and disappears from the **Incomplete Tasks** pane. You can now see the associated task on the **Task** pane.

> **Note**
>
> You can also manually link incomplete tasks to events. For more information, see *Incomplete Tasks*.

16.2.5 IC-Inspection Panes

In IC-Inspection, you utilise different panes on the screen to review data, make configuration and perform inspections. To learn how to set up your screen, see *Manage My Desktop*.

For detailed information about the specific panes, see the sections below:

16.2.5.1 Active Events

The **Active Events** pane displays all the events that have been launched but not saved, called the "active" events, and the data entry tabs for the currently selected active event. If more than one event is active (that is, they have been launched but not as yet saved), then you will see tabs on the top of the pane, with one tab for each active event. Each tab has the name of the event type it contains, but no event number, since unsaved events do not yet have an event number.

An active event is created in the **Active Events** pane whenever an event is created either ad hoc, or from a task (see *Create Events*).

To record details for the event, the following tabs are available:

- **Details**: On this tab, you can fill in event fields that are coming from the event form.
- **Survey**: This tab displays survey positional data. This survey data is filled automatically by the incoming survey strings. When an event is triggered (the moment when the creation of the event started), the start information is filled and when the event is saved, or when you click **Pause Event Fields**, the end information is filled.
- **Multimedia**: Shows any multimedia files (normally photos) against the current event. Multimedia types can include images or video files. If your digital video recorders support it, you can capture images from each video recorder (**Capture Image** toolbar button) and store those images directly in the database. When you capture an image, it instantly opens in the **Multimedia** tab.

  To edit the image, click **Image Editor** in the toolbar, which allows you to crop the image as required. Note the following:

  - If you want to keep the original image as well as the edited image, click **Keep Original** in the toolbar.
  - To crop, select **Image Editor** from the toolbar and click the **Crop** button or Ctrl-X, then click and drag a rectangle on the image. To complete the crop, click the ✓ button, or **Crop To Selection** from the toolbar.
  - If you want the captured image to be attached to the event, ensure that you select it before saving the active event.

- **Finding** (if finding has been created): Shows the details of a finding associated with the event if such exists. The fields on this tab correspond to the **Findings** dialog in NEXUS IC (see *Add/Edit Finding Dialog*).

> **Hint**
>
> IC-Inspection can be configured to auto-populate event fields with incoming survey data. See *Example: Set Up Filling Event Fields with Survey Data* for more information.

16.2.5.1.1 Active Events Toolbar

You can perform actions on an active event using the following toolbar buttons:

Toolbar Option	Description
Save	Commits the active event and associated data to the database. Once the event has been saved, then it will no longer appear in the **Active Events pane** and a new event record will be created in the **Event Listing** pane.
Save & New	Saves the active event and associated data to the database and creates a new active event of the same event type. Note that they will be two distinct events.
Save & Hold	Saves the active event and associated data to the database and creates a new task to represent the outstanding work. Use this button when you have completed some but not all of the work represented by a single task; for example, you have inspected part of an asset but have stopped because of bad visibility, etc. Save and Hold is only available on events that were launched from tasks, not on events that were launched ad hoc from the Event Launcher. When you use this option, the current task will be completed (unless you deselect this default option) and the **Is Held** field gets the value **Yes** in the task's parameters. The new task that is created will have reference to the original task in its instructions and the **Previous Task** field will be populated with reference to the original task.
Cancel	Cancels the active event without saving to the database.
Navigate to Asset	This menu item will change the active asset in the asset tree to the asset of the current event. By navigating to a different asset in the tree, this will also update the tasks shown in the task list, the asset shown on the overlay, and so on.
Raise a Finding	Launches the **Findings** tab in the **Active Events** pane. You can record the details of the finding there, which will be saved against the current event.
Bookmark	Creates a bookmark on the current event as a reference for the data reviewer.
Capture Image	Captures a snapshot from the incoming video signal and attaches it to the active event. The image will open on the **Multimedia** tab, where you can select/unselect and crop images. If you want the captured image to be attached to the event, ensure that you select it before saving the active event.
Update Start	Updates the start survey information of the active event with the survey data gathered at the time of the button click.
Pause End	Pauses the end survey information of the active event. By default, the end survey information is updated whilst the event is visible on the **Active Events** pane and is updated by incoming serial survey information whilst the event is active. If you don't want survey data to keep updating, you can pause it using this option.
Pause Event Fields	Pauses automatic updating of the value linked to the event's survey field. By default, the value is updated by incoming serial survey information whilst the event is active. This option is only available if you have assigned an event field to a source survey field on the **Survey Values** pane (see *Map Survey Fields*).

See also

- *Create Events*
- *Attach Multimedia to Event*

16.2.5.2 Active Inspection

The **Active Inspection** pane displays the main inspection details for the currently selected asset. Once configured, these selections persist across sessions based on the logged-in user ID. If you log out and log in as a different user, their settings may differ.

When viewing data in any panes of IC-Inspection, it typically pertains to the active entities displayed in the **Active Inspection** pane.

When you enter new data, the data is recorded against the active entities displayed in the **Active Inspection** pane, relevant to the specific entity. For example, if you launch an event, the event's workpack and survey set will be the ones selected here (if applicable).

Before you start an inspection, fill in the fields on this pane:

Field	Description
Asset	Displays the currently selected asset.
Workpack	You must select the workpack against which inspection data is recorded. This field is mandatory. Click the … (ellipsis) in the field and select a workpack from the list.
Survey Set	You must select the survey set in which survey data is stored. Click the … (ellipsis) in the field and select a survey set from the list, or, create a survey set by clicking **Add** in the toolbar. In general, survey sets are preconfigured in NEXUS IC (see *Configure Survey Sets*).
ROV	If you use multiple ROVs during an inspection, you can select the relevant ROV in this field to make it clear to inspectors what ROV their video is being recorded against. Click the … (ellipsis) in the field, which takes you to the same **Select Survey Set** dialog as above. If a ROV has been linked to the survey set (in the **Edit Survey Set** dialog), it is displayed in the **ROV** column.
Event Template Group	If you want to use event templates to create ad hoc events, you must select the relevant event template group here. For more information, see *Create Ad Hoc Event Using Event Templates* and *Set Up Event Templates*.

Warning

If you attempt to start inspections from two different IC-Inspection copies on the same survey set simultaneously, an error message is triggered: "Another session is open with the same survey set selected."

This practice is forbidden because both IC-Inspections would write to the same survey set concurrently, making it impossible to associate events with accurate survey data afterward. To avoid this, move at least one of the IC-Inspection instances to log data in a different survey set. Even if two events are logged at the exact same time, correct survey data can be associated with each event because they draw from the appropriate survey set. For clarity, ensure that you fill out the ROV value in each concurrent survey set, allowing reviewers to understand the intended connections.

16.2.5.3 Anomalies (Task Related)

The **Anomalies (Task Related)** pane displays anomaly records associated with the task selected in the **Tasks** pane.

Note

For anomaly records to be displayed, they must be linked to the task through an anomaly action and the relevant task must be selected in the **Tasks** pane.

From this pane, you can view the details of anomaly records, including any associated multimedia files. Creating, editing and deleting anomaly records is not available in IC-Inspection.

16.2.5.3.1 Anomalies (Task Related) Toolbar

Toolbar Option	Description
Add	This option is disabled in IC-Inspection.
View	Opens a dialog displaying the details of the selected anomaly record, including any associated findings, anomaly actions and library items.
Delete	This option is disabled in IC-Inspection.
View → Multimedia	Toggles the visibility of the **Multimedia** section on the right-hand side of the pane.
Connections	See *Connections*.
Import	This option is disabled in IC-Inspection.
Export	See *Export*.
Customise	See *Customise*.
Shortcuts → Close Anomaly	Closes the selected anomaly. See *Close Anomalies*.

16.2.5.4 Anomaly Triggers

The **Anomaly Triggers** pane shows anomaly triggers assigned to the selected asset. It may also include a preview chart indicating which triggers apply at specific KPs (Key Points) or depths.

This pane only shows asset-specific anomaly triggers; it does not display triggers that apply to event fields independently of the asset. For example, if your Anode event is configured to raise a finding whenever its depletion exceeds 75%, that information **won't** appear on this pane.

Anomaly triggers consist of predefined upper and lower bounds applied to event data. When these bounds are exceeded, IC-Inspection automatically generates a finding for the event.

The **Is Active** column indicates whether the anomaly trigger is currently triggered (Yes) or not (No). This is determined based on the following criteria:

- The survey KP value will be compared against the *Start KP* and *End KP* values of the anomaly trigger.
- The survey Date/Time will be compared against the *Date From* and *Date To* values specified for the anomaly trigger.

16.2.5.4.1 Prerequisites

You can see asset-specific anomaly triggers only if they have been configured and enabled in NEXUS IC (see *Set Up Anomaly Triggers for Assets*).

16.2.5.5 Assets

On the **Assets** pane, you can see the asset tree (see *Asset Tree*). The asset tree provides a visual representation of assets in a hierarchical view, including their parent-child relationships. This hierarchy is set up in NEXUS IC.

When you select an asset in the asset tree, it filters event records based on that asset or its child assets (if *Child Assets* is enabled on the pane). The asset tree's selection affects other panes on the screen. For example, in the **Event Launcher**, available buttons change based on the selected asset, the **Tasks** pane displays tasks related to the chosen asset, the **Drawings** pane shows relevant drawings associated with the asset.

This pane cannot be hidden, but you can drag it or pin it to a specific location for convenience.

The toolbar at the top of the IC-Inspection screen has several items relevant to the asset tree. These toolbar options are similar to the asset toolbar options in NEXUS IC (see *Assets Toolbar*), however, in IC-Inspection, you cannot directly modify the asset tree; that capability is exclusive to NEXUS IC.

16.2.5.6 Asset Information

You can check asset-specific information for the currently selected asset on the **Asset Information** pane of IC-Inspection. This pane corresponds to the **Asset Information** tab in NEXUS IC (see *Asset Information Groups (AIGs)*) except that the pane in IC-Inspection is read-only and you are not allowed to add or edit data.

16.2.5.7 Capture Preview

During inspection, if you're using a device that is capable of showing still images (for example, it's a DVR), you can get IC-Inspection to capture a preview of the video as still images on the **Capture Preview** pane of IC-Inspection.

You can capture a preview in one of the following ways:

- If you want to capture a preview of the video instantly, you can choose **Capture Now** from the toolbar and IC-Inspection will capture a snapshot of what is playing in the video recorder at the exact moment.
- You can specify a capture interval, and IC-Inspection will request an image from the device every time that interval elapses. In this case, you:
    1. Select the required interval under the **Refresh: ..** toolbar button, for example, 5 seconds.
    2. Choose **Start Preview**. You'll start seeing the captured image, which is refreshed every time the specified interval elapses.
    3. Choose **Stop Preview** to stop taking capture images.

You can export the captured image using the **Export** button visible at the top of the captured image.

16.2.5.8 Charts

The **Charts** panes show all the chart templates that are relevant for the events selected on the **Event Listing** panes (see *Event Listing*).

There are two **Charts** panes in IC-Inspection:

- **Charts (Workpack)**: This pane shows charts for the events selected on the **Event Listing (Workpack)** pane .
- **Charts (Historical)**: This pane shows charts for the events selected on the **Event Listing (Historical)** pane.

Charts only show event data included in the filters applied on the **Event Listing** panes (workpacks, event types, column-specific filters and so on). If you don't see any charts listed, try different types of events, by changing the asset or by changing your filters. If your chart template is on continuous event data (such as cross-profiles), ensure that you select that Continuous Event in your event type filter.

16.2.5.8.1 Prerequisites

Charts are generated from preconfigured chart templates. To enable displaying charts for an asset, the relevant chart templates must have been configured as described in *Configure Chart Templates*.

16.2.5.8.2 Display Charts

To expand/collapse each chart, click the button at the top left of that chart, or click the chart's grey header row.

> **Tip**
>
> Click on the chart area and then, with the mouse cursor still inside the chart area, use your mouse wheel to increase/decrease the chart scale.

Note the following:

- Available charts are listed alphabetically. The first chart will be automatically expanded.
- Events with findings are shown on the chart in red.
- For some chart templates, at the right or the bottom of the chart is the chart legend. If you hover the mouse over an item on the legend, other series on the chart will fade out temporarily. If you click an item on the legend, that series will be toggled on/off. If you export the chart, only series currently visible will be exported.

16.2.5.8.3 Chart Width

When the **Charts** tab is 1000 pixels wide or less, all charts are shown at the full width of the tab. When the **Charts** tab is over 1000 pixels wide, some charts are shown full width, and some are shown half width, in order to fit more charts side-by-side onto your screen.

Charts that have an X axis of type string, date, or date/time, or whose X axis includes 'KP' are always shown full width. You can adjust the width of all charts by adjusting the width of the whole application window, adjusting other elements such as the asset tree wider/narrower, and so on.

16.2.5.8.4 Zooming

At the bottom of most chart templates, below the horizontal scrollbar (if visible) is the Zoom Bar. You can hover the mouse over the left or right end of the selected part of the Zoom Bar and drag to change the selection. Initially the entire Zoom Bar will be selected, so hover the mouse over the left or right end of the bar and drag. Once a subset of the chart is selected, you can use the scroll bar or the Zoom Bar to drag the whole selection area without zooming.

You can also zoom in or out by clicking in the chart area and (with the mouse cursor still inside the chart area) spinning the mouse wheel. For charts with a lot of data (thousands of events) this can be slow, so the Zoom Bar may be faster. You can zoom on a single axis by putting the mouse pointer over that axis and spinning the mouse wheel. Not all charts support zooming in both axes.

You can also control zoom with toolbar buttons Zoom In, Zoom Out, and Reset Zoom.

16.2.5.8.5 Charts Toolbar

There is no toolbar for the whole **Charts** tab. Instead, each chart has its own toolbar.

Button	Description
	Zooms the image in.
	Zooms the image out.
	Resets to default zoom level.
	Opens the **Export** dialog, from which you can generate images from the chart. Ensure the range you want is set correctly using the Zoom Bar. Ensure the series you want to export are visible. If you want to export the chart as a series of images, each covering a smaller horizontal range, enter the range you would like each chart to cover in the **Range of X Axis per image** field. For example, if you have a 300 km pipeline and you enter "10" as the range per image, it will be broken into 30 images, each covering 10 km.
	Copies the chart, as you see it displayed, without the "zoom" section at the bottom, to the clipboard.
	Expands/collapses the display of this chart.

16.2.5.9 Devices

On the **Devices** pane, you can check or manage connections to video devices (IC-Recorder or a third-party DVR device), survey devices and any measurement or scale device that interface IC-Inspection.

On this pane, you can use the respective toolbar buttons to do the following:

- Add, edit or delete connections to control video devices. For more information about adding a new device, see *Add Video Devices*.
- Add, edit or delete connections to survey devices. For more information about adding a new device, see *Add Survey Devices*.
- Add, edit or delete connections to measurement or scale devices, specifically, to a "Sartorius Entris Balance" device, which allows measuring the weight of very small things accurately. For more information, see *Set Up Devices*.
- Enable or disable any of the above connections by toggling the **Enabled** toolbar button on or off.
- Set up text overlays to be applied on the recorded videos. For more information, see *Set Up Text Overlays*.

In case of any issues with the connections, you can use the **Device Diagnostics** pane for debugging purposes (see *Device Diagnostics*).

16.2.5.10 Device Diagnostics

You can use the **Device Diagnostics** pane to check the data flow and the status of any of the devices set up on the **Devices** pane (see *Devices*). This feature is particularly useful when you encounter connection problems and need to diagnose issues.

To verify the status, select the required device on the **Devices** pane and review all the details on the **Device Diagnostics** pane. You can see there information about the device status as well as the incoming and outgoing messages coming in or out of the device.

Scrolling down to the bottom of this pane reveals buttons that allow you to export incoming or outgoing messages, apply filters, pause data flow, or clear messages as needed.

16.2.5.11 Drawings

Drawings are essentially *library* records where the library type has the "Show as Drawings" flag selected.

IC-Inspection uses the same drawing functionality as NEXUS IC (see *Drawings*), except the following:

- In IC-Inspection, you can only view drawings and its layers, you cannot edit them.
- If you left-click on a drawing layer, you can create events by completing the tasks associated with the relevant asset (see *Create Event from Task*).
- The additional **Workpack Tasks** menu option is available from under the **Layer Colour** toolbar button. It displays distinct colours for layers based on the completion status of tasks assigned to the corresponding assets. This is dependent on the workpack selected on the **Active Inspection** pane (see *Active Inspection*).

16.2.5.11.1 Drawings Toolbar

Toolbar Option	Description
Launch	Opens the drawing on the local machine using the default viewer.
Drawing Type	You can select which library types appear here. To control what appears on this list, go to *Library*, edit the library types in question, and tick or untick **Show As Drawings**.
Include Parents	If you tick *Include Parents*, drawings on this asset's parents will be shown in the thumbnail list for you to select.
Copy to Clipboard	Copies the drawing to your clipboard at the current scale and offset shown. The drawing thumbnail and layers will also be included.
Information	Toggles a panel at the bottom of the **Drawings** tab showing EXIF data for the drawing. Information is shown only for drawings with EXIF data.
Thumbnails	Toggles a panel at the right side of the **Drawings** tab showing thumbnails for all the images associated with the selected asset. You can customise the layout of this panel using the **Customise** button in its toolbar.

16.2.5.11.1.1 View Menu

Toolbar Option	Description
View → Fit Width	Changes the pan and zoom on the drawing so that it fits within the width available on the *Drawings* tab.
View → Fit Height	Changes the pan and zoom on the drawing so that it fits within the height available in the *Drawings* tab.
View → Default Size	Sets zoom to 100%. This may or may not fit in your *Drawings* tab, depending on how big the drawing is.
View → Zoom In	Zoom In.
View → Zoom Out	Zoom Out.
View → Zoom Selection	Click this, then in the drawing click and drag a rectangle. NEXUS IC will then zoom to the area you've selected.
View → Increase Caption Size	Increases the size of *all* captions on the drawing: on captions, buttons, and regions.
View → Decrease Caption Size	Decreases similarly.
View → Caption → ...	If you select **Default**, captions will display the text you have set in **Layer Properties**. If you select **Asset Information** or **Event**, NEXUS IC will display a picker. You pick a field, and NEXUS IC will use values from that field to fill captions. This only works for layers that have an asset set in **Layer Properties**.

16.2.5.11.1.2 Layer Colour Menu

Toolbar Option	Description
Layer Colour → Default	Shows layers on drawings in the colours that you have selected in the Properties of each layer.
Layer Colour → Traffic Lighting	Shows layers on drawings in the colours specified by the currently selected Traffic Light.
Layer Colour → Transparent	Shows layers on drawings as just an outline, in the colours that you have selected in the Properties of each layer.
Layer Colour → Unknown Asset	Shows layers that have an asset in the **Known Asset Colour**, and layers that don't have an asset assigned in the **Missing Asset Colour**. You can configure these in *Database → Properties*.
Layer Colour → Workpack Tasks - [Selected Workpack]	Displays distinct colours for layers based on the completion status of tasks assigned to the corresponding assets. This is dependent on the workpack selected on the **Active Inspection** pane (see *Active Inspection*).

16.2.5.12 Event Launcher

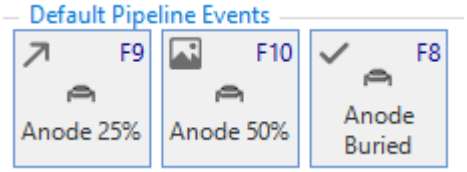
From the **Event Launcher** pane, you can launch ad hoc events while performing online inspection. For detailed information about how to create ad hoc events from the **Event Launcher**, see *Create Ad Hoc Event*.

The tiles in the **Event Launcher** only get enabled when you are inspecting (you have clicked the **Start** button in the main toolbar). If you are not inspecting, all tiles are disabled.

The **Event Launcher** contains the following two types of tiles:

- A tile is visible for each **event type** that is assigned to the asset type of the currently selected asset. This assignment is configured in NEXUS IC, as described in *Assign Event Types to Asset Type*.
- A tile is visible for predefined **event templates** (see *Set Up Event Templates*) in case the following conditions are fulfilled:
  - In the **Active Inspection** pane, you have selected the **Event Template Group** that contains the required event template.
  - The event type of the event template is assigned to the asset type of the currently selected asset.
  - Under the **View** toolbar option of the **Event Launcher** pane, you have enabled the **Show Event Templates** option.

  You can identify event template tiles by the additional icons on the tile. If a shortcut key exists, that is also shown on the tile. The icons indicate the type of the action assigned to the event template, which can be one of the following:



  - ✓ (tick): Indicates a *One-Click Record* action type.
  - ↗ (arrow): Indicates a *Launch* action type.
  - (image): Indicates a *Launch with Image* action type.

16.2.5.12.1 Event Launcher Toolbar

Toolbar Option	Description
View → Grid Layout	Each event type is shown as a square tile arranged adjacent to each other in a grid of items.
View → List Layout	Each event type is shown as a tile as tall as the text or icon, and as wide as the Event Launcher, creating a vertical list of items.
View → Show Event Templates	Shows tiles for event templates that have been preconfigured (see *Set Up Event Templates*)
View → Captions & Icons	Shows captions and icons on the tiles. Captions and icons are retrieved from the name and icon configured for the event type in NEXUS IC (see *Configure Event Types* and *Add/Edit Table Definition Dialog*).
View → Only Captions	Shows only captions on the tiles without icons. Captions are retrieved from the name of the event type configured in NEXUS IC (see *Configure Event Types* and *Add/Edit Table Definition Dialog*).
View → Only Icons	Shows only icons on the tiles without captions. Icons are retrieved from icon configured for the event type in NEXUS IC (see *Configure Event Types* and *Add/Edit Table Definition Dialog*).
Grouping → None	Shows the event type tiles in the **Event Launcher** in alphabetical order without grouping. Only tiles for event templates are grouped separately.
Grouping → Category	Shows the event type tiles in the **Event Launcher** grouped by the category of the event type configured in NEXUS IC (see *Configure Event Types* and *Add/Edit Table Definition Dialog*).

See also

- *Create Ad Hoc Event*
- *Set Up Event Templates*

16.2.5.13 Event Listing

The **Event Listing** panes allow you to view existing events for the selected asset (and it's children, if it's enabled) and in the selected workpack.

There are two **Event Listing** panes in IC-Inspection:

- **Event Listing (Workpack)**: This pane shows event records for the workpack selected on the **Active Inspection** pane. On this pane, you can perform various actions on event records (see *Perform Actions on Events*)
- **Event Listing (Historical)**: This pane allows you to select one or more workpacks to view event records from. This is used only for reviewing data, you cannot perform any actions on the event records here.

16.2.5.13.1 Filter Events

You can filter events in the grid based on:

- **Workpacks**
  - On the **Event Listing (Workpack)** pane, you can only see events associated with the workpack selected on the **Active Inspection** pane. If you want to change the workpack, you must do it on the **Active Inspection**

pane.

  - On the **Event Listing (Historical)** pane, choose *Filter* → *By Workpack* from the toolbar to select the workpacks based on which you want to filter the events.

- **Event Type** - Choose *Filter* → *By Event Type* from the toolbar of the pane to select the event types based on which you want to filter the events. If you have no event types selected, then all events will be shown, and no continuous events will be shown. To view continuous events, you must explicitly select those event types in the filter.

> **Note**
>
> When events are filtered by event type from the toolbar menu, and there are only events of a single event type displayed in the grid, the fields of the specific event type will get added as columns in the event listing grid.

- **Time** - This option is available only on the **Event Listing (Workpack)** pane. You can filter events based on the time they were created. For example, you can choose to display only events created within specific hours or days.

All columns in the grid can also be filtered and sorted using the standard filtering (see *Filtering*) and sorting (see *Sorting*) functionality.

16.2.5.13.2 Columns

By default, the **Event Listing** tab displays columns that are common to all event types displayed. The first six columns in the grid represent the following:

Column	Description
F	Shows a colour that indicates the existence and status of the **Finding** that is associated with the event. See below for more information.
B	Indicates if the event has been **bookmarked** with a star sign.
L	An icon is shown if there's a **library item** attached to the event.
V	An icon is shown if there's a **video** attached to the event.
M	An icon is shown if there's **multimedia** attached to the event.

16.2.5.13.2.1 Finding Statuses

The colours of the icons in the **Finding** column indicate the status of the finding, which can be the following:

Colour	Meaning
(White)	There are no findings on this event.
(Yellow)	The finding needs to be reviewed.
(Green)	The finding has been deemed insignificant and is not linked to an anomaly.
(Grey)	The finding is linked to a closed anomaly.
(Red)	The finding is linked to an open anomaly.

16.2.5.13.3 Perform Actions on Events

From the **Event Listing (Workpack)** tab, you can perform actions on events using the relevant toolbar buttons or right-clicking any of the events, which offers some of the options from the toolbar menu.

You can perform the following actions:

- Update events (see *Edit Events*)
- Bookmark events - Select **Toggle Bookmark** from under the **Events** toolbar button or from the context menu of the event (available by right-clicking). This sets a star icon next to the event in the grid.
- Delete events
- Update event times - Allows you to update the **Start Clock/End Clock** survey data based on the incoming survey data.
- Change event type (see *Change Event Type*)
- Match tasks to events (see *Match Tasks to Events*)

16.2.5.13.4 Event Listing Toolbar

For information about the toolbar menu options on the **Event Listing** tab, see below:

Toolbar Option	Description	Available on Panes
Edit	See *Edit Events*.	**Event Listing (Workpack)**
Delete	Deletes the currently selected event. If multiple events are selected, it deletes all selected events.	**Event Listing (Workpack)**
Events → Navigate to the event asset	Changes the focus in the asset tree to the asset on which this event has been recorded. To change back, click on the back arrow (*Previous Asset*) in the main toolbar above the asset tree.	**Event Listing (Workpack)**
Events → Update Start/Update End	Updates the **Start Clock/End Clock** in the survey data of the currently selected event based on the incoming survey data.	**Event Listing (Workpack)**
Events → Toggle Bookmark	Bookmarks are flags on an event. Bookmarked events are identified by a star symbol in the **B** column of the **Event Listing** tab. The use of bookmarks and the workflow around setting and removing bookmarks depends on your own specific requirements.	**Event Listing (Workpack)**
Filter	See *Filter Events*.	**Event Listing (Workpack)** and **Event Listing (Historical)**
Child Assets	When enabled, events for the currently selected asset and all sub-assets will be included on the **Event Listing** tab. When disabled, only events that have been recorded on the currently selected asset will appear in the grid.	**Event Listing (Workpack)** and **Event Listing (Historical)**
Export	See *Export*.	**Event Listing (Workpack)** and **Event Listing (Historical)**
Customise	See *Customise*.	**Event Listing (Workpack)** and **Event Listing (Historical)**
Connections	See *Connections*.	**Event Listing (Workpack)** and **Event Listing (Historical)**
Event Details	Toggles the display of additional tabs within the pane, including **Event Details**, **Survey**, **Multimedia** and **Finding**.	**Event Listing (Workpack)** and **Event Listing (Historical)**
Shortcuts → Change Type	See *Change Event Type*.	**Event Listing (Workpack)**
Shortcuts → Match Task	See *Match Tasks to Events*.	**Event Listing (Workpack)**

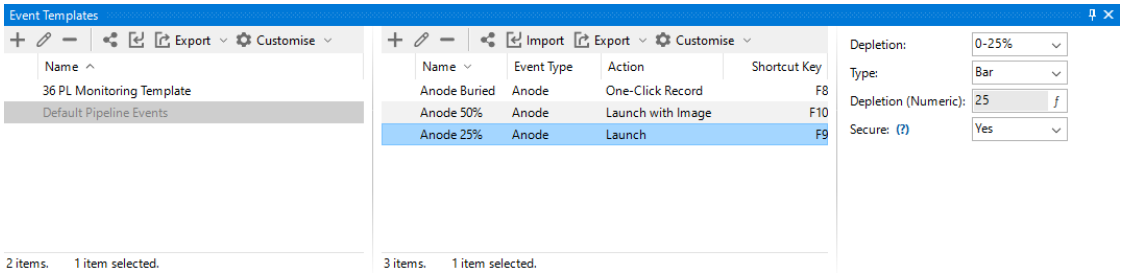
16.2.5.14 Event Templates

On the **Event Templates** pane, you can set up event templates that allow you to pre-populate event forms with predefined values when creating ad hoc events. For detailed instructions about setting up event templates, see *Set Up Event Templates*.

Once set up, event templates will be available in the **Event Launcher** (see *Event Launcher*), based on which you can create ad hoc events (see *Create Ad Hoc Event Using Event Templates*).

The **Event Templates** pane is divided in three parts:

- The list of event template groups on the left-hand side
- The list of event templates within the selected group in the middle
- The event form for the selected template on the right-hand side. This section is read-only, to edit, double-click the template or select it and click **Edit**.



See also

- *Set Up Event Templates*
- *Create Ad Hoc Event Using Event Templates*

16.2.5.15 Heading

The **Heading** pane provides a visual representation of the serial data collected in the Heading field, typically representing the ROV (Remotely Operated Vehicle) heading.

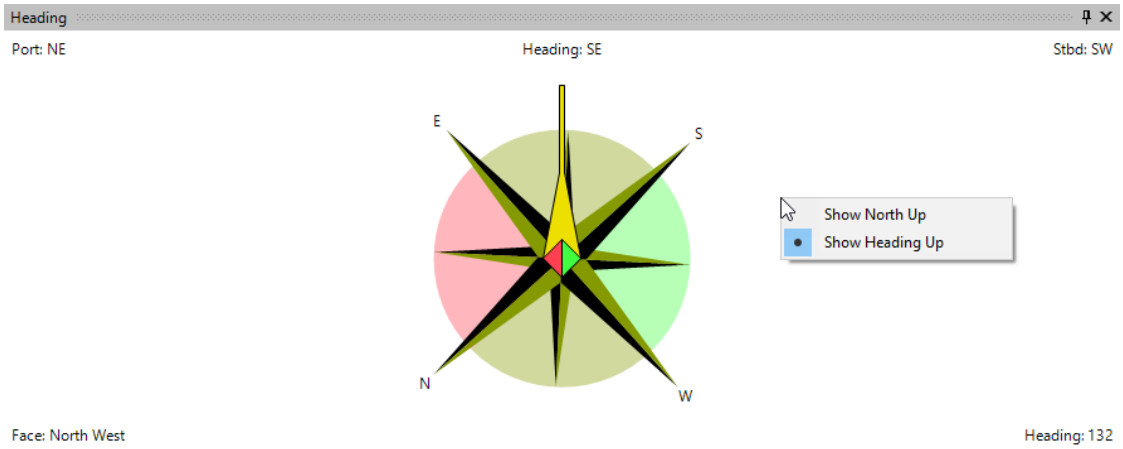
This view allows you to quickly determine compass directions, including:

- Compass direction relative to the ROV: You can easily identify which direction is left of the ROV and which is to the right. This information is particularly useful during pipeline inspections.
- Structure orientation: You can determine which face of a structure you are likely looking at. This feature is valuable for structure inspections.

The **Heading** pane offers two viewing modes:

- **North Up**: In this mode, the yellow heading indicator moves, ensuring that north remains at the top of the pane.
- **Heading Up**: In this mode, the yellow heading indicator remains stationary at the top of the pane, while the compass points rotate accordingly.

To switch between North Up and Heading Up modes, simply right-click in the white space anywhere within the Heading panel and choose the desired mode from the drop-down menu:

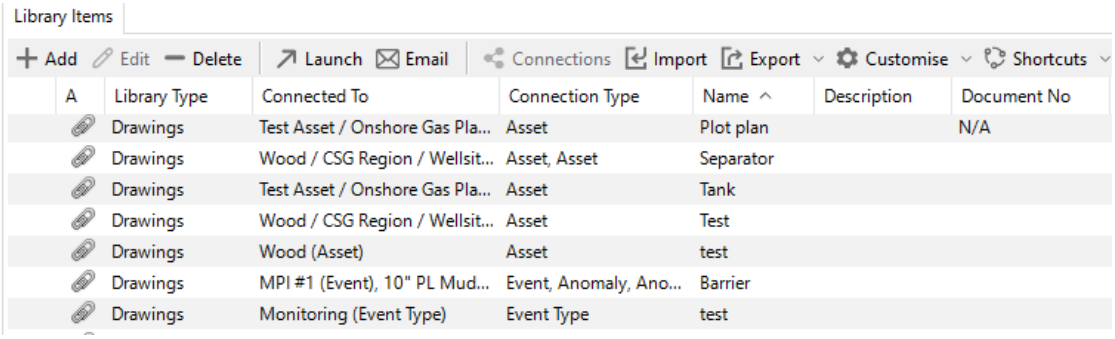


16.2.5.16 Library

The **Library** pane shows all the library items attached to:

- The asset currently selected in the asset tree.
- The event currently selected on the **Event Listing (Workpack)** pane.

Library items are electronic documents that can be linked to data and data types in NEXUS IC using connections (see *Library Connections*).



The electronic documents can be uploaded directly into the NEXUS IC database, or can be referenced using URL or UNC paths.

16.2.5.16.1 Manage Library Items

You can manage library items from several screens within NEXUS IC, including:

- **Library Items** tab on the **LIBRARY** screen (see *Library*)
- **Library** tab on the **ASSETS** screen (see *Library*)
- **Library** tab on the **INSPECTION** screen (see *INSPECTION*)
- **Library** tab on the **ANOMALIES** screen (see *ANOMALIES*)
- **Library** tab under *Configuration* → *General* → *Functions* → *Edit Function Definition*
- **Library** tab on the **Edit Asset Type** dialog under *Configuration* → *Assets* → *Types*
- **Library** tab in various dialogs where library items can be managed for the relevant record, including the *Edit Anomaly*, *Edit Table Definition*, *Edit Task* and *Edit Workpack* dialogs

> **Example**
>
> If you upload company piping specifications to the NEXUS IC Library and assign it to the asset type "Pipework", the piping specifications will be available from the **Library** tab of the **ASSETS** screen whenever the active asset is of type "Pipework".

You can also manage library items on the **Library** pane of IC-Inspection.

You use the standard toolbar functions on the **Library/Library Items** tab to add, edit, delete, import, export library items or customise the grid layout. For more information about these functions, see *Using the Grid*.

> **Note**
>
> - You can edit the properties of the selected library item from the toolbar, but not the document itself.
> - Deleting a library item will also delete all its associated connections.
> - The **Export** option only exports the grid contents, not the actual library documents.

See below for more information about some actions you can perform on library items:

Add Library Items

To create a new library item, proceed as follows:

1. Start adding a new library item in one of the following ways:
   - On the *Library/Library Items* tab, choose **Add** from the toolbar.
   - Drag files from your file explorer onto the *Library/Library Items* tab.

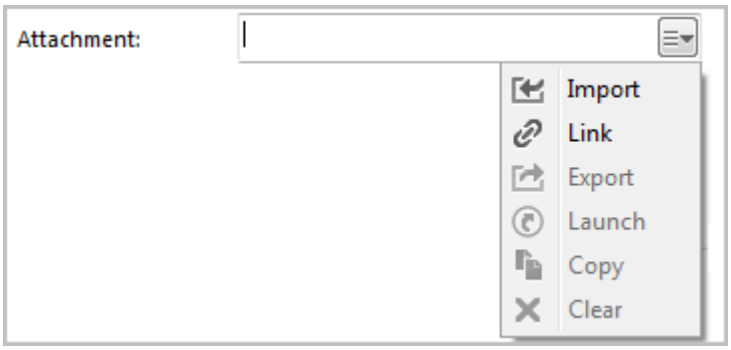
   > **Note**
   >
   > Drag-and-drop is not supported in remote environments (e.g., Remote Desktop).

2. Depending on the screen from which you accessed the **Library** tab, you may be prompted to select a connection type. You can connect a library item to different types of data records:

Screen	Connection Type
ASSETS	• Asset • Asset Type
INSPECTION	• Asset • Asset Type • Event • Event Type • Workpack
ANOMALIES	• Anomaly • Asset

> **Note**
>
> If you're adding a library item from the **LIBRARY** screen, you add the connection to a data record from the **Connections** tab after you have created the library item. For more information, see *Add Library Connections*.

3. In the **Add/Edit Library** dialog, select the library type, enter a name for the library item (mandatory) and enter other parameters as required. For information about filling in all the parameters, see *Add/Edit Library Dialog*.
   - If the document is to be uploaded into NEXUS IC, then click on the **Attachment** button, else enter a **Hyperlink** location.
   - When adding an attachment, you can either **Import** or **Link** it:
     - If you *import*, the item will be saved to the database. If you subsequently change the original on disk, the item in the database will not change to match.
     - If you *link* the item, then when you change the original on your disk, the next time you view the item within NEXUS IC, you'll see the updated item.



> **Note**
>
> - NEXUS IC still loads a copy of a linked item into the NEXUS database. This ensures that if the original is unavailable (for example, because you are away from your network), NEXUS IC can display the cached copy.
>
>   When you view the item, if the original has been updated, the database cached copy is updated too. You can't link items that are on your local hard disk, only items on network drives can be linked. The Link feature is designed to keep you up-to-date with items that may have been changed by others, and that is not possible on your local drive.
> - If you drag and drop multiple files, they will be added, and then multi-selected in the grid. You can then click **Edit** to multi-edit them (see *Multi-Edit*). Drag and drop will *import* items, not *link* them.

4. Click **OK**.

   On the **LIBRARY** screen, you can view the details of the library item by selecting it and checking the *Details* tab under the *Library Items* tab.

Edit Library Items

To edit an existing library item, proceed as follows:

1. On the *Library/Library Items* tab, select the library item.
2. Choose **Edit** from the toolbar.
3. In the **Edit Library** dialog, update data as required. For more information, see *Add/Edit Library Dialog*.
4. Click **OK** to save your changes.

Delete Library Items

To delete an existing library item, proceed as follows:

1. On the *Library/Library Items* tab, select the library item.
2. Choose **Delete** from the toolbar.
3. In the confirmation dialog, click **Check Connections** if you want to review any connections to this library item before deletion.
4. If you want to proceed deleting the library item, click **Delete**, else, choose **Cancel**.

Launch Library Items

Use the **Launch** toolbar button to launch library items on the local machine. By default, NEXUS only launches files with the following extensions: doc, docx, xls, xlsx, jpg, png, jpeg, jfif, bmp, tiff, gif, mpg, mp3, wav, ppt, pptx, txt, pdf, emf, zip, dwg, avi, rtf, mp4, csv.

Hint

Use the Space Bar on your keyboard to launch the currently selected library item.

Note that if the local machine does not have an associated viewer for the document type (for example, AutoCad viewer for DWG type), then the document can not be launched.

Email Library Items

Use the **Email** toolbar button to send an email message with the selected library items attached to it. You can select multiple library items to be sent in the same email message. Note that you must have properly configured your email settings (see *Set Up Email*) for this option to function.

Warning

If the size of the attachment exceeds your organization's attachment size limit, you may get an "Out of memory" error message.

Import Library Items

You can import library items using the standard **Import** toolbar option (see *Import*). You can download the MS Excel Import Template, which shows the required format for importing library items.

You can also import the *Connections* in the same import as the library items, so in addition to the Library Import columns, you can additionally define the Connection information using the following column headings:

- *Library Connection.Connect To*

- *Library Connection.Workpack*
- *Library Connection.Asset Type*
- *Library Connection.Asset*
- *Library Connection.Event Type*
- *Library Connection.Event*
- *Library Connection.Anomaly*
- *Library Connection.Risk Model*
- `Library Connection.Function

Note that the *Connect To* column should only contain one of the following text items:

- Anomaly
- Asset
- Asset Type
- Event
- Event Type
- Function
- Risk Model
- Workpack

16.2.5.16.1.1 Double-click

The first time you double-click on a library item, NEXUS asks you whether you want to launch the library item in an external editor, or edit the library item. If you want your choice to become permanent, tick the **Always do this** checkbox. Note that if you hold down the **Alt** key while double-clicking, you will be asked again.

16.2.5.17 Map

On the **Map** pane, you can see the events visible on the **Event Listing (Workpack)** or **Event Listing (Historical)** panes (see *Event Listing*) on a two-dimensional map, based on their easting (x-coordinate) and northing (y-coordinate). Each event is a dot, coloured with the event type's colour. The colour for each event is set up in NEXUS IC as described in *Configure Event Types*.

16.2.5.17.1 Filtering

The **Map** pane only shows event data included in the filters you applied on the **Event Listing** pane (for example, workpacks, event types, column-specific filters). You can also filter by event type using the **Event Types** toolbar button options. If the events you are interested in are Continuous Event data (such as cross-profiles), ensure that you select that Continuous Event in your event type filter.

16.2.5.17.2 Zooming

You can zoom in or out by clicking in the map area and (with the mouse cursor still inside the map area) spinning the mouse wheel. You can also control zoom with the relevant toolbar buttons.

16.2.5.17.3 Maps Toolbar

You can use the following toolbar menu options on the **Map** pane to manage the appearance of the map:

Toolbar Option	Description
Zoom In	Zooms the map in.
Zoom Out	Zooms the map out.
Reset Zoom	Resets the zoom so that all data points are visible.
Copy	Copies the map, as currently displayed, to the clipboard.
Legend	Shows or hides the legend of the events on the map either on the side or at the bottom. The legend includes the event types that are selected and the layers that have their opacity set to anything above 0%. Layers and event types can be switched off by clicking on the layer or event on the legend. If you hover the mouse over an item on the legend, other series on the map will fade out temporarily. If you export the map, only series currently visible will be exported.
Map Layers	Shows or hides layers on the map and controls their opacity. The menu options include free-to-use map layers from the web, such as ESRI World Imagery, ESRI World Topographic, ESRI Ocean Base Map, ESRI Street Map, and so on. The available map servers can be configured under *Configuration* → *General* → *Map Servers* from the main menu. Each of these layers has an opacity drop-down list to be selected from 0% to 100%. If you select 0% for any of the layers, it will not be included in the map legend.
Event Types	Selects what event types are displayed. This is more persistent than clicking/unclicking series on the map legend.
Inspection Track	Selecting a workpack from under this toolbar option will show a line on the map connecting events in the order they were logged. If the events were logged by a single ROV (or a single human inspector), this track will show the path that the ROV (or inspector) took.
Baseline	Shows or hides the baseline coordinates of the assets behind the events on the map. For example, in case of a pipeline, a black line can be displayed that shows the position of the pipeline. This is shown based on your settings for the asset's coordinates under *Assets* → *Coordinates* (also available in the context menu (right-click) of the selected asset).
Configure	Shows the sources of the various fields used by the **Map** pane to display pipeline baseline data and map data. "As Built - Easting", "As Built - Northing" and "As Built - Order" should all point to the same table, which is the table used to supply the pipeline baseline track. Typically you would point these three fields at a sub-AIG. If you don't configure these, no as-built track will be displayed. If your pipeline has many events on it, not showing an as-built may be OK. Users may be able to get a sense of the pipeline track from the events on it. "Coordinates - Datum" and "Coordinates - UTM Zone" should point to fields that provide these values. Typically they will be in an AIG. Only one datum and one UTM Zone are necessary for an entire asset. Ask your surveyors for the values that you should fill in to these fields.
Export Image	Saves the map to an image file.

16.2.5.18 Pipeline View

On the **Pipeline View** panes, you can see a special chart that shows events along your pipeline in a 3D view. Each event appears in the pipeline view when you click **Save** on the event form.

There are two **Pipeline View** panes in IC-Inspection:

- **Pipeline View (Workpack)**: This pane shows the pipeline view chart for the event selected on the **Event Listing (Workpack)** pane.
- **Pipeline View (Historical)**: This pane shows the pipeline view chart for the event selected on the **Event Listing (Historical)** pane.

The pipeline view can also show seabed profile (if you have any PL - Cross Profile data imported), and animates motion along the pipeline as you select events.

16.2.5.18.1 Prerequisites

To ensure that the **Pipeline View (Workpack)** and the **Pipeline View (Historical)** charts are displayed correctly, configurations must be made in NEXUS IC as described in *Configure Pipeline View Chart*.

16.2.5.18.2 Zooming

You can zoom in or out by clicking in the chart area and (with the mouse cursor still inside the chart area) spinning the mouse wheel.

You can also control zoom using the following toolbar buttons:

Button	Description
	Zooms the image in.
	Zooms the image out.
	Resets to default zoom level.

16.2.5.18.3 Pipeline View Toolbar

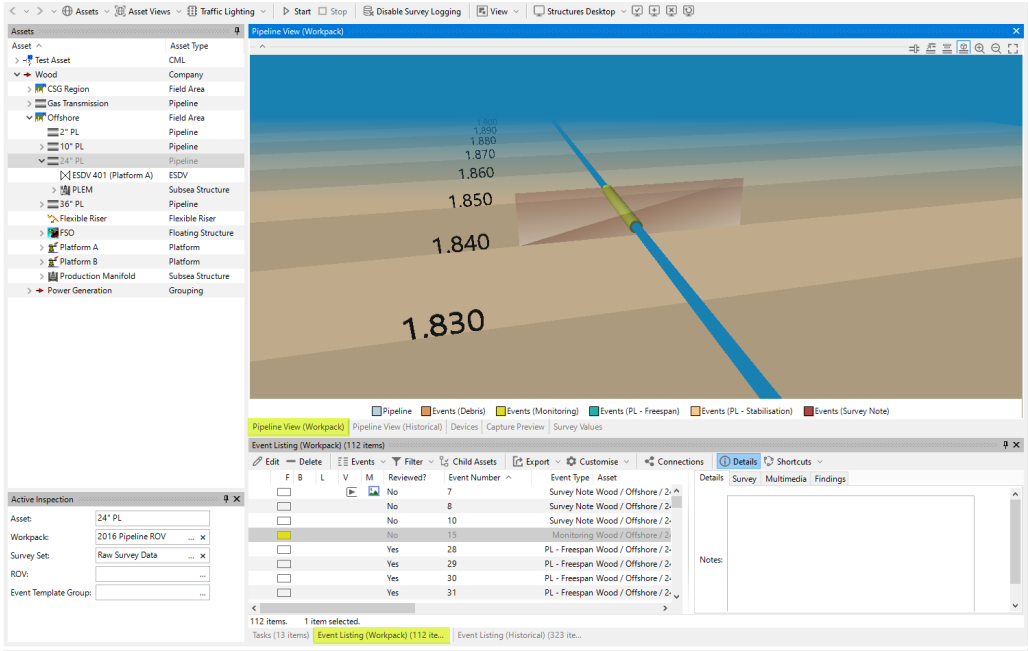
In addition to the toolbar buttons for zooming, the following buttons are available, which are specific to the pipeline view chart:

Button	Description
	Tracks the current KP. This button is only available in IC-Inspection. When selected, the pipeline view will move in time with the KP value coming in from survey. For NEXUS IC, see *Time Source → Synchronise KP* on the *Inspections Toolbar*.
	Exaggerates the scale to show more of the pipeline. When selected, the scale of the pipeline will be distorted to make a greater KP range visible.
	Toggles stacked series mode. When selected, events above the pipeline will be moved to make them more obvious. Different events will be moved up different distances so that all are easily distinguishable.
	Toggles 3D perspective mode. When unselected, you will see the pipeline viewed from the side. When selected, you will see the pipeline viewed from above and slightly off to one side.

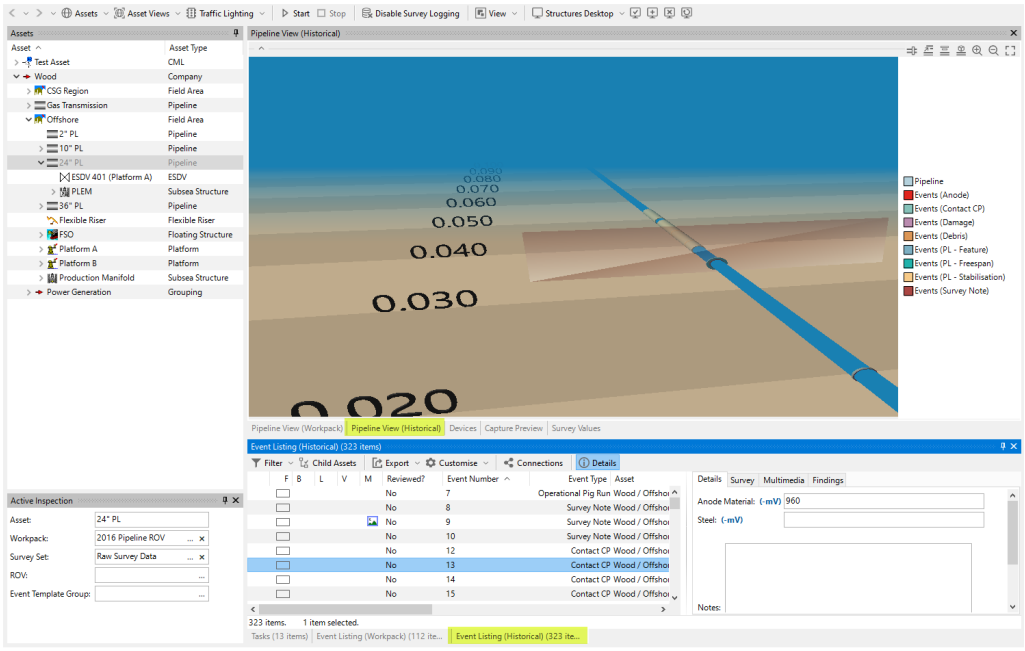
16.2.5.18.4 Displaying Pipeline Views

To ensure that the **Pipeline View (Workpack)** and the **Pipeline View (Historical)** charts are displayed correctly, in addition to the configurations in NEXUS IC (see *Configure Pipeline View Chart*), in IC-Inspection, you must perform the following steps:

- Close and reopen the database in IC-Inspection whenever you have made a change to your **Pipeline View** chart configurations in NEXUS IC.
- After reopening the database for the first time, perform the following:
  - For the **Pipeline View (Workpack)** chart, open the **Event Listing (Workpack)** pane before you check the chart on the **Pipeline View (Workpack)** pane, and ensure that events are listed there. This pane must be active so that the chart is displayed correctly on the **Pipeline View (Workpack)** pane:



  - For the **Pipeline View (Historical)** chart, open the **Event Listing (Historical)** pane before you check the chart on the **Pipeline View (Historical)** pane, and ensure that events are listed there. This pane must be active so that the chart is displayed correctly on the **Pipeline View (Historical)** pane:



16.2.5.19 Survey Values

The **Survey Values** pane displays all survey fields that are coming through the serial string. Survey fields are defined in the Device Manager, within the device they are being received from. You can also see the field type, the current value, the source of the serial input and the database field in which the survey value will be recorded into. For information about updating the default mapping between the source and destination survey fields, see *Map Survey Fields*.

The **State** column shows a colour that reflects the status of survey value transmission. Click **Legend** to display an explanation for each colour at the bottom of the pane. If the colour is red, it means that the value is invalid. This can happen if the **Value** field contains a value that does not match its survey field type. For example, if the type is a *Whole Number* and the value is "1-1-2017", then that's not valid.

16.2.5.20 Tasks

On the **Tasks** pane, you can see the list of tasks that are associated with the selected asset in the asset tree and included in the workpack selected on the **Active Inspection** pane.

From this pane, you can use the toolbar options to perform various actions on tasks, such as review, edit or launch them. For more information, see below.

16.2.5.20.1 Tasks Toolbar

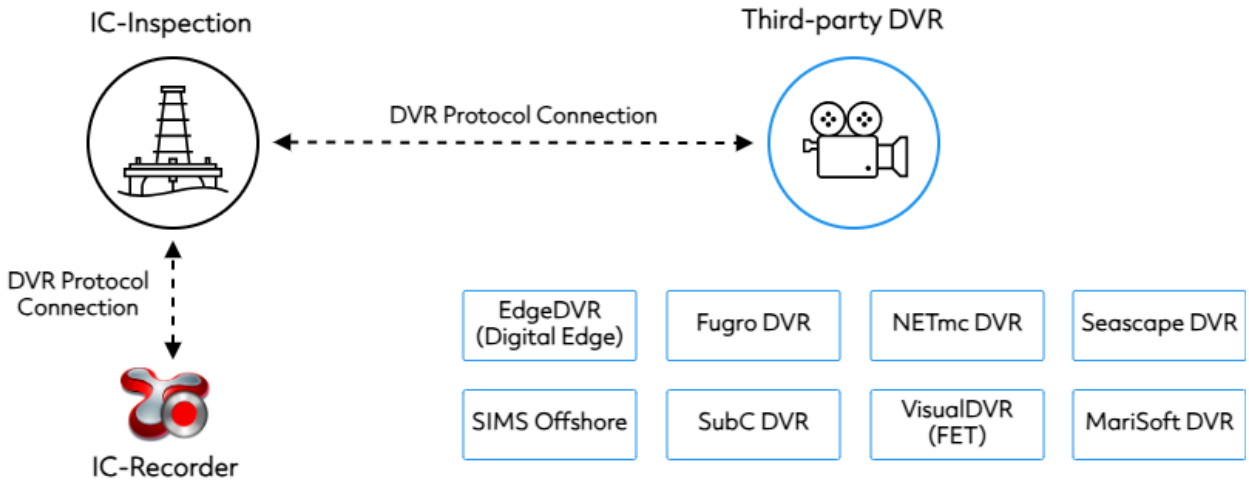
Toolbar Option	Description
Launch	Launches the currently selected task and creates an event form in the **Active Events** pane. For more information, see *Create Event from Task*.
Template	You can use this option if you have set up an event template (see *Set Up Event Templates*) for the event type of the task, and selected the event template group in the **Active Inspection** pane. This allows you to launch the task and create the event using the preconfigured event template.
Edit	Allows you to edit the task in the **Edit Task** dialog. For more information, see *Add/Edit Task Dialog*.
Navigate to Asset	Changes the active asset in the asset tree to the currently selected task's asset. Note that this will change what tasks are visible in the **Tasks** pane.
Filter	Allows you to filter the visible tasks in the **Tasks** pane. If you select *Hide Completed*, all completed tasks will be hidden.
Child Assets	Toggles on and off the display of tasks on assets that are descendants of the currently selected.
Parent Assets	Toggles on and off the display of tasks on assets that are ancestors of the currently selected asset.
Export	See *Export*.
Customise	See *Customise*. On this pane, the additional option **Instructions Preview** is available under **Customise**, which displays an additional column in the pane for **Instructions**.
Connections	See *Connections*.
Instructions	Toggles the visibility of the **Task Instructions** pane within the **Tasks** pane.

16.2.6 Third-party DVRs

IC-Inspection can be used to remote control digital video recorders during online inspection (see *Add a Third-Party DVR Device*), enabling operators to manage video recording as part of the inspection workflow.

16.2.6.1 Supported Third-party DVRs

In addition to controlling our own *IC-Recorder*, IC-Inspection can control the following DVRs through a DVR protocol connection:



16.2.6.2 DVR Protocol Options

To enable IC-Inspection to remote control your DVR, you can choose one of the following options:

16.2.6.2.1 Custom DVR Protocol

We can build a custom protocol to work with your existing application.

- Development is performed on a rates basis according to your specification.
- A DVR system must be provided for testing.
- Future updates are undertaken on your instruction.

A quotation can be provided on review of your specification.

16.2.6.2.2 Generic DVR Protocol

Alternatively, you can implement our standard DVR protocol for NEXUS.

For a one-off fee of 5000 USD, we provide:

- The generic DVR protocol specification document for NEXUS
- A software-based test harness that emulates IC-Inspection for comprehensive interface testing
- Phone and email support during implementation
- Updates for new features or protocol changes
- Optional display of your company logo on this website
- IC-Recorder: freely distributable licences of our digital video recording software (including integrated software-based text overlay) for contingency use on your hardware

16.2.6.3 Third-party DVR Configuration

To enable remote control of a third-party DVR from IC-Inspection, the device must be configured to use the appropriate DVR protocol.

16.2.6.3.1 Configuring VisualDVR

To configure a VisualDVR to accept commands via the protocol, perform the following steps:

1. Left-click on the main video preview.
2. In the dialog that appears, select *Systems Setup & Admin → Advanced → NEXUS IC DVR control*.
3. Tick **Enable NEXUS IC DVR control**.

For other DVR products, consult the manufacturer documentation.

CHAPTER

SEVENTEEN

IC-INSPECTOR

IC-Inspector is a tablet application optimised for on-site or offshore inspection data collection. IC-Inspector communicates with a NEXUS *REST* server to receive tasks and drawings, and to upload inspection data. It can be used for inspection with no internet connectivity, although it requires connectivity to initially receive tasks and finally send inspection data.

17.1 IC-Inspector Platforms

IC-Inspector is compatible with different platforms, including iPad, Windows and Android tablets. For more information, see *IC-Inspector Platforms*.

17.2 Prerequisites

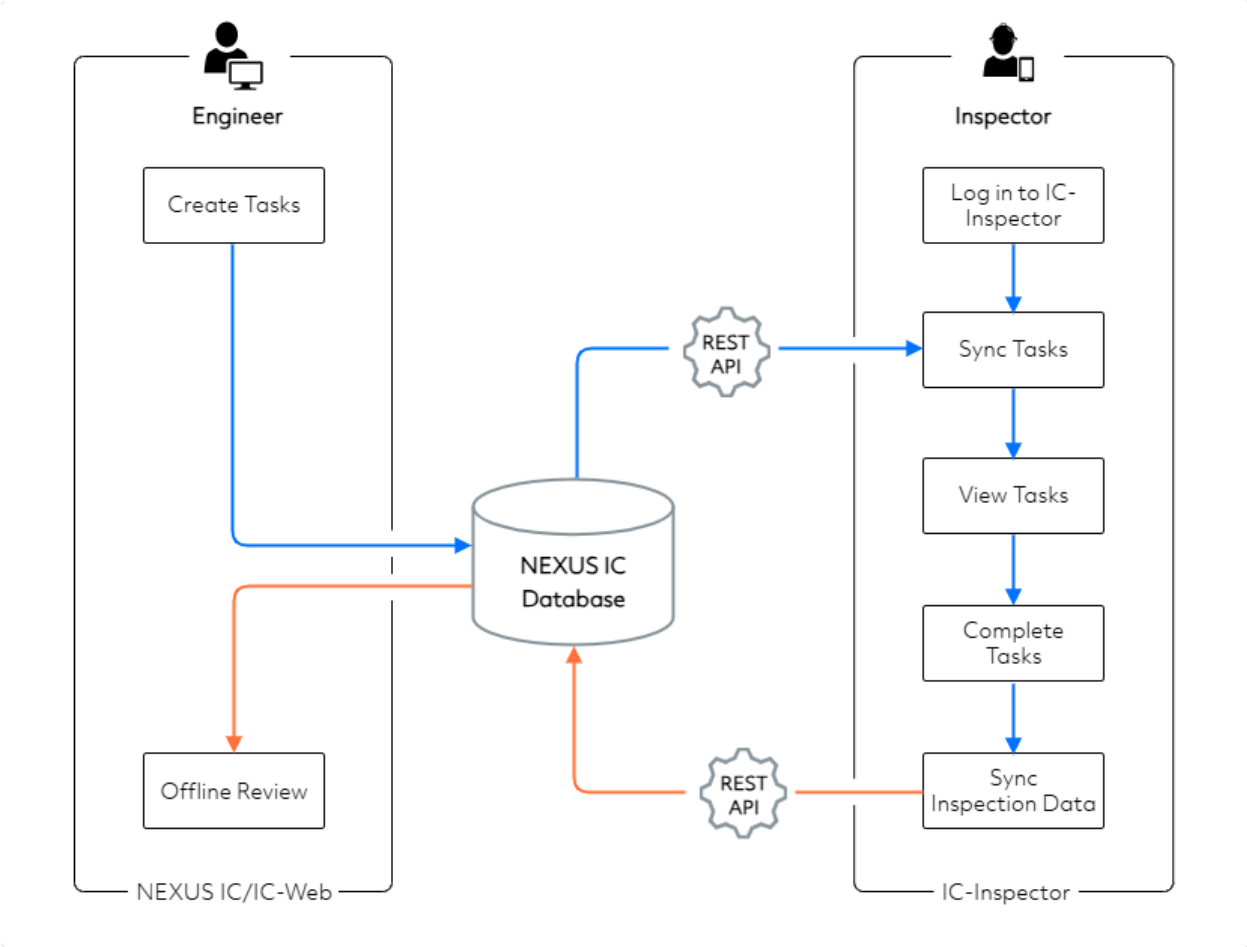
Before using IC-Inspector, ensure the following:

- You have downloaded the IC-Inspector app on your tablet and deployed it as described in *Install IC-Inspector*.
- The necessary configurations have been made in the NEXUS IC database, including assets (see *Asset Data Management*), event types (see *Configure Event Types*), and optionally drawings (see *Drawings*).
- You have set up the IC-Web URL, login name and password for IC-Inspector. The login name should match an inspector who has tasks assigned to them.
- Ensure that you have Wi-Fi or mobile data connection to login and sync your data.

17.3 Using IC-Inspector

The following figure shows the basic process of using IC-Inspector and is followed by an explanation:

1. The integrity engineer/work planner creates and assigns tasks to inspectors using NEXUS IC or IC-Web (see *Create Tasks* and *Assigning Tasks*).
2. The tasks are stored in the NEXUS IC database.
3. The inspector logs in to IC-Inspector (see *Log In to IC-Inspector*) and performs synchronisation to retrieve the assigned tasks through the REST service (IC-Web). The synchronisation process also retrieves any unassigned *ad hoc tasks* in case the inspector has at least one assigned task in the same workpack. For more information, see *Sync to IC-Inspector*.


Engineer
Create Tasks
Offline Review
NEXUS IC/IC-Web
NEXUS IC Database
REST API
REST API
Inspector
Log in to IC-Inspector
Sync Tasks
View Tasks
Complete Tasks
Sync Inspection Data
IC-Inspector

4. The inspector accesses tasks in IC-Inspector (see *View Tasks*) and completes them by filling in event forms. They can take or attach photos as desired. Optionally, they can create ad hoc (or unplanned) events to allow filling in additional event forms over and above the tasks assigned. For more information, see *Complete Tasks*.
5. The inspector performs synchronisation in IC-Inspector again to send the events (completed task data) to the database through the REST service (IC-Web). For more information, see *Sync to NEXUS IC*.
6. Engineers or review teams review events in NEXUS IC or IC-Web (see *Inspection*).

The app comes with demo data suitable for touring and learning the app. You can connect it to your actual database via *Settings*.

17.3.1 IC-Inspector Platforms

IC-Inspector can run on three different platforms:

- iPad (but not on iPhone or iPod Touches)
- Windows tablet
- Android tablet (but not on Android phone)

17.3.1.1 IC-Inspector Feature Matrix

The availability of some features may vary across these platforms. The following figure shows the features supported by different IC-Inspector platforms.

Note

Certain platform-specific functions (such as Camera or Library) may have varying appearances on the different platforms.

17.3.2 Install IC-Inspector

To deploy IC-Inspector, ensure you have the required hardware and download the appropriate version of the app for your device.

Note

If you have version 6.8 of IC-Inspector on your device, you must delete it before installing the latest version. Be sure to synchronise your data before deletion to avoid data loss.

IC-Inspector can be installed on various platforms, including iPads, Android tablets or Windows tablets. Select your platform below for installation instructions:

Install IC-Inspector on iPad

IC-Inspector for iPad is available for free from the App Store.

Feature Category	Feature	iPad	Android	Windows
Summary	View summary of tasks and statuses	●	●	●
Tasks	Complete tasks	●	●	●
	Ad hoc eventing	●	●	●
	Maintain event details	●	●	●
	Set task status	●	●	●
	Search tasks	●	●	●
	Bookmark	●	●	●
	Delete ad hoc events, posted tasks	●	●	●
Multimedia	Add new photos	●	●	●
	Add photos from library	●	●	●
	Add drawing	●	●	●
	Create sketch	●	●	●
	Share multimedia	●	●	– [1]
	Edit photos	●	●	●
	Markup photos	●	●	●
	Delete multimedia	●	●	●
Drawings	View drawings	●	●	●
	Check tasks on drawings	●	●	●
Scan Code	Scan QR and bar codes	●	–	–
Synchronise	Sync tasks with NEXUS IC	●	●	●
Settings	Server settings	●	●	●
	Clear data	●	●	●
	General settings	●	●	●
	Sync - Remove Completed Tasks	●	●	●
	Sync - Upload Completed Tasks	●	●	●
	Sync - View Last Sync Log	●	–	–
	Sync - View Stored Data	●	–	–

Key

- ● Supported
- – Not supported

[1] Only download supported

Requirements

- iPad with iPadOS 16 or later
- IC-Web Read/Write License
- IC-Web 6.9 or higher (6.9 recommended)
- NEXUS DB schema 8.210
- Deployment of IC-Inspector on multiple iPads for multiple inspectors in the field should be performed using a Mobile Device Management (MDM) solution or by using a different Apple ID on each iPad.

> **Warning**
>
> If multiple users are using IC-Inspector on different iPads but with the same Apple ID (which is not recommended), then you must turn off iCloud synchronisation for IC-Inspector before synchronising your data. Failure to do so may result in data loss.

Recommendations

- We recommend using the iPad Pro. IC-Inspector will run on any iPad (which can be useful for testing and training), but will not run on iPhones or iPod Touches.
- If you expect inspectors to mark up photos, we suggest purchasing an Apple Pencil.
- If you expect inspectors to do significant quantities of typing, we also suggest purchasing a keyboard cover.
- Note that in quiet environments, you can use the iPad's built-in speech-to-text dictation capability. On some devices, this capability works independent of internet connection. You can go to *Settings* → *General* → *Keyboard* and check the bottom of the screen for the message "You can use Dictation for English when you are not connected to the Internet."

> **Tip**
>
> When using speech-to-text for numeric fields, use phrases like "numeral one" for single-digit numbers; phrases like "one dot two three" for decimal numbers less than 10; phrases like "twenty three dot one nine" for decimal numbers from 10 to 100; and phrases like "one two three dot four five" for decimal numbers greater than 100.

- If intrinsic safety is required, consider using intrinsically safe enclosures available from third-party vendors. Be aware that some vendors may require you to ship your tablet to them for installation.
- Inspections are often conducted in extreme or hazardous environments. To ensure optimal performance, make sure your tablets are rated for the specific environmental conditions of your site, including temperature, pressure, humidity, and intrinsic safety.

> **Caution**
>
> Applications on iPads have a memory limit, which is specific to your device and iOS version. In case the memory limit in IC-Inspector is exceeded, the app may close without warning. We recommend that you regularly synchronise your data to free up space and avoid exceeding the application memory limit.

Security

On iPads, the app performs a check for jailbroken devices upon launching. If it detects that the device is jailbroken, it shows a notification and does not allow the user to proceed.

Install IC-Inspector on Android Tablet

IC-Inspector for Android tablet is available for free from the Google Play Store.

Requirements

- Android version 15 or later
- 6 GB RAM
- 128 GB Storage
- IC-Web Read/Write License
- IC-Web 6.9 or higher (6.9 recommended)
- NEXUS DB schema 8.210

Recommendations

- For integrated image markup capabilities, install the Google Photos app from the Google Play Store.
- If intrinsic safety is required, consider using intrinsically safe enclosures available from third-party vendors. Be aware that some vendors may require you to ship your tablet to them for installation.
- Inspections are often conducted in extreme or hazardous environments. To ensure optimal performance, make sure your tablets are rated for the specific environmental conditions of your site, including temperature, pressure, humidity, and intrinsic safety.

Install IC-Inspector on Windows Tablet

IC-Inspector for Windows tablet can be installed by requesting an installer package from support@nexusic.com.

Requirements

- Windows 10 tablet
- 6 GB RAM
- 128 GB Storage
- IC-Web Read/Write License

- IC-Web 6.9 or higher (6.9 recommended)
- NEXUS DB schema 8.210

Recommendations

- If intrinsic safety is required, consider using intrinsically safe enclosures available from third-party vendors. Be aware that some vendors may require you to ship your tablet to them for installation.
- Inspections are often conducted in extreme or hazardous environments. To ensure optimal performance, make sure your tablets are rated for the specific environmental conditions of your site, including temperature, pressure, humidity, and intrinsic safety.

> **Tip**
>
> You can check for app updates on the **Settings** screen by clicking **About** under **APP INFO**.

17.3.3 Log In to IC-Inspector

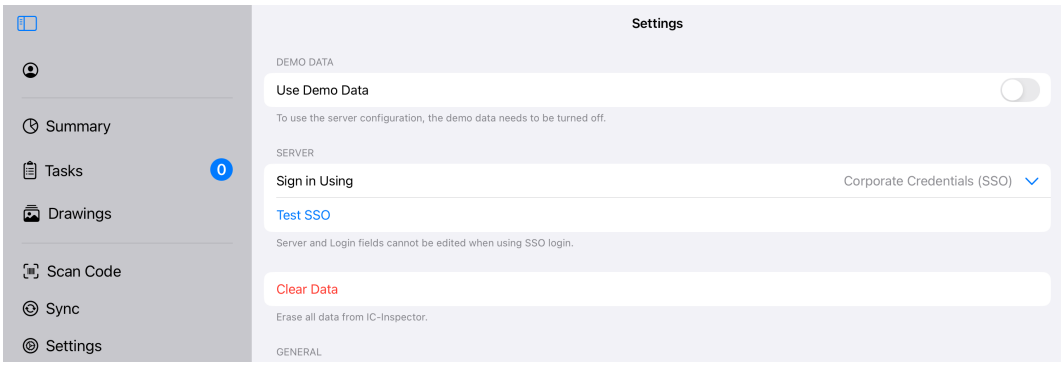
You can log in to IC-Inspector using one of the following methods:

- **Single Sign-On (SSO)**: Use your company credentials for seamless authentication.
- **Database-specific credentials**: Use a dedicated account to access IC-Inspector.

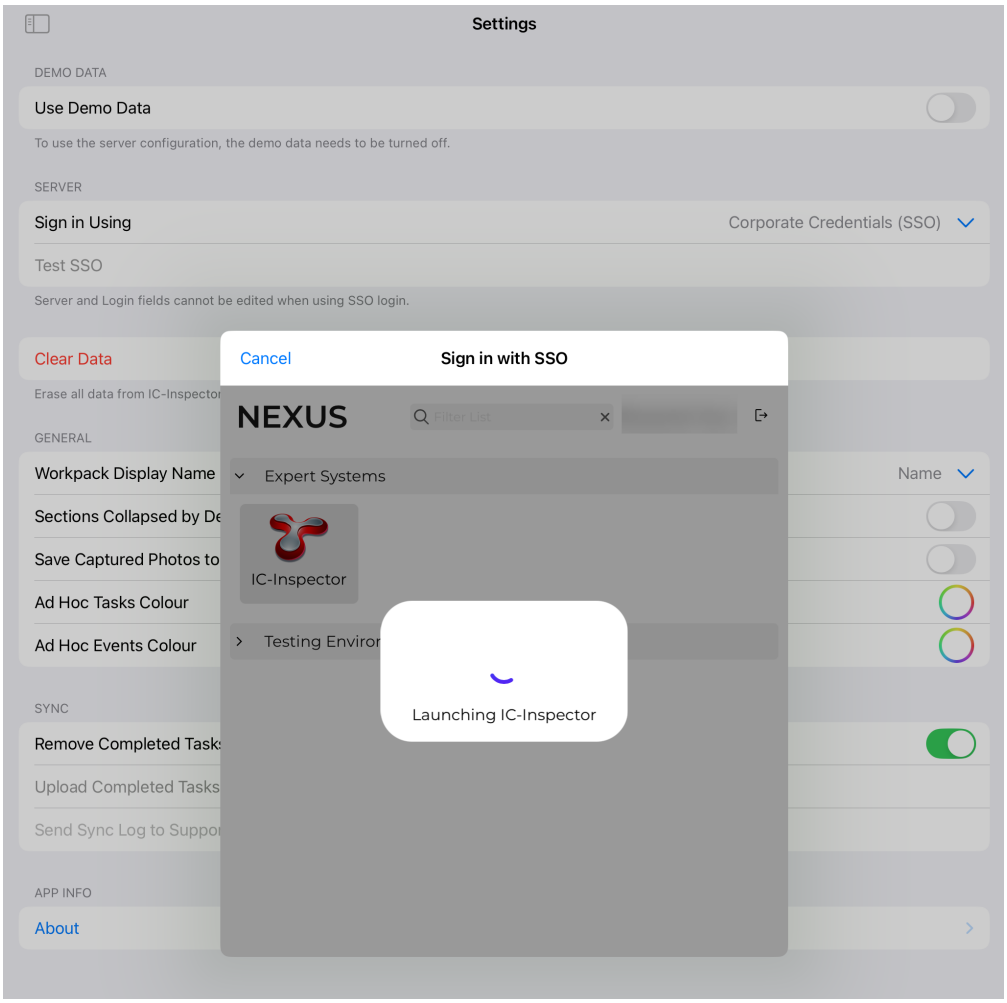
Both login methods are described below.

17.3.3.1 Log In Using SSO

1. Launch the IC-Inspector app on your tablet.
2. Go to **Settings**.
3. Ensure that the **Use Demo Data** option is turned off.
4. Under **SERVER**, confirm that **Corporate Credentials (SSO)** is selected in the **Sign in Using** field. This is selected by default.

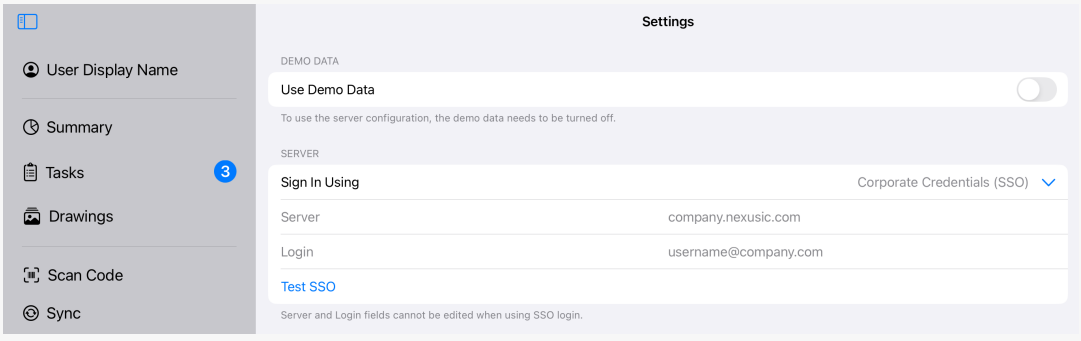


5. Each time you perform a sync (see *Sync to IC-Inspector* and *Sync to NEXUS IC*), IC-Inspector initiates the sign-in process unless you have already signed in and your SSO session and hash are still active. You can also tap **Test SSO** on the **Settings** page to verify SSO connectivity.
6. When prompted, enter your company username and password, and complete any multi-factor authentication steps required by your organisation's standard login process.
7. If you have access to more than one database, you will be prompted to select the appropriate IC-Inspector database by tapping its icon on the sign-in page.



Result

A success message confirms that SSO authentication was successful. Your username appears in the sidebar, and the **Server** and **Login** fields on the **Settings** page are automatically populated and locked.

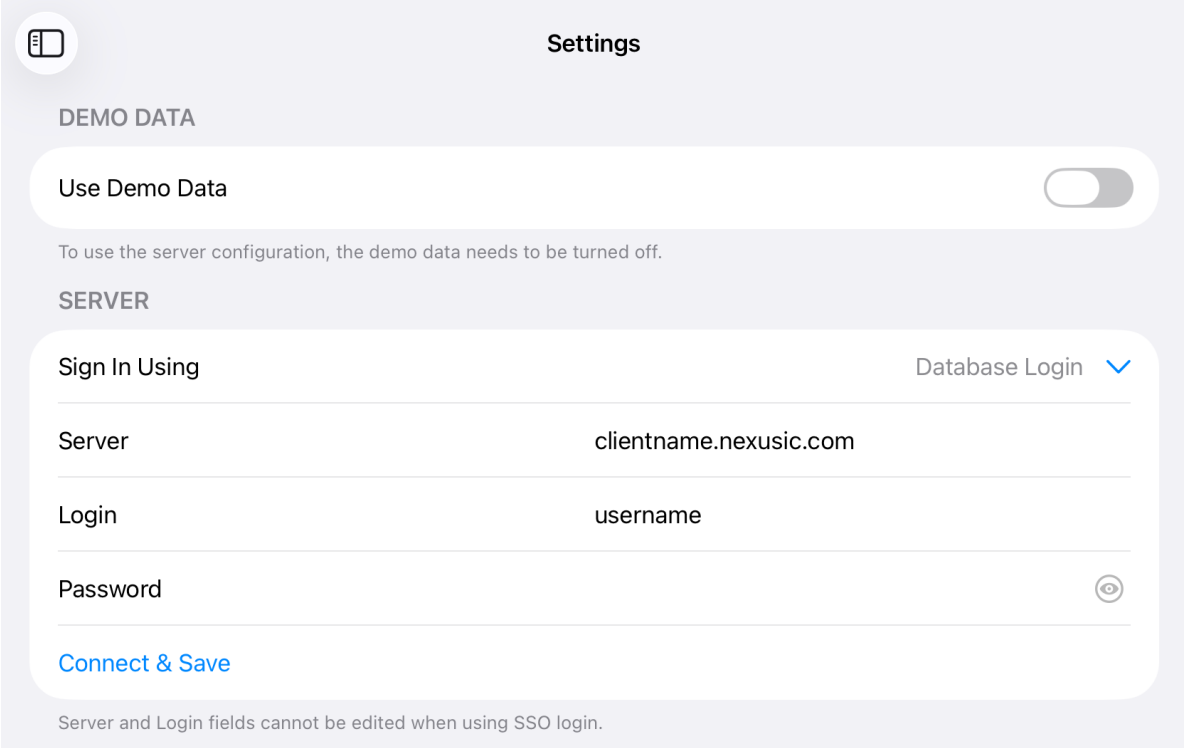


Note

- The SSO session and hash expire after a set period. After that, you'll be prompted to sign in again when performing a new sync.
- If you switch users or change the login method, the previous SSO session will be terminated. Any unsynchronised data from the previous session will be lost.

17.3.3.2 Log In Using Database-Specific Credentials

1. Open the IC-Inspector app on your tablet.
2. Go to **Settings**.
3. Ensure that the **Use Demo Data** option is turned off.
4. Under **SERVER**, select **Database Login** in the **Sign in Using** field.
5. Enter data as follows:
   - **Server**: Enter the server name.
     - For **SaaS** clients, this is the URL of the IC-Web instance, for example, *clientname.nexusic.com*.
     - For **on-prem** clients, contact your IT team for the correct server name.
   - **Login**: Enter your username stored in the database.
   - **Password**: Enter your password.



6. Tap **Connect & Save**.

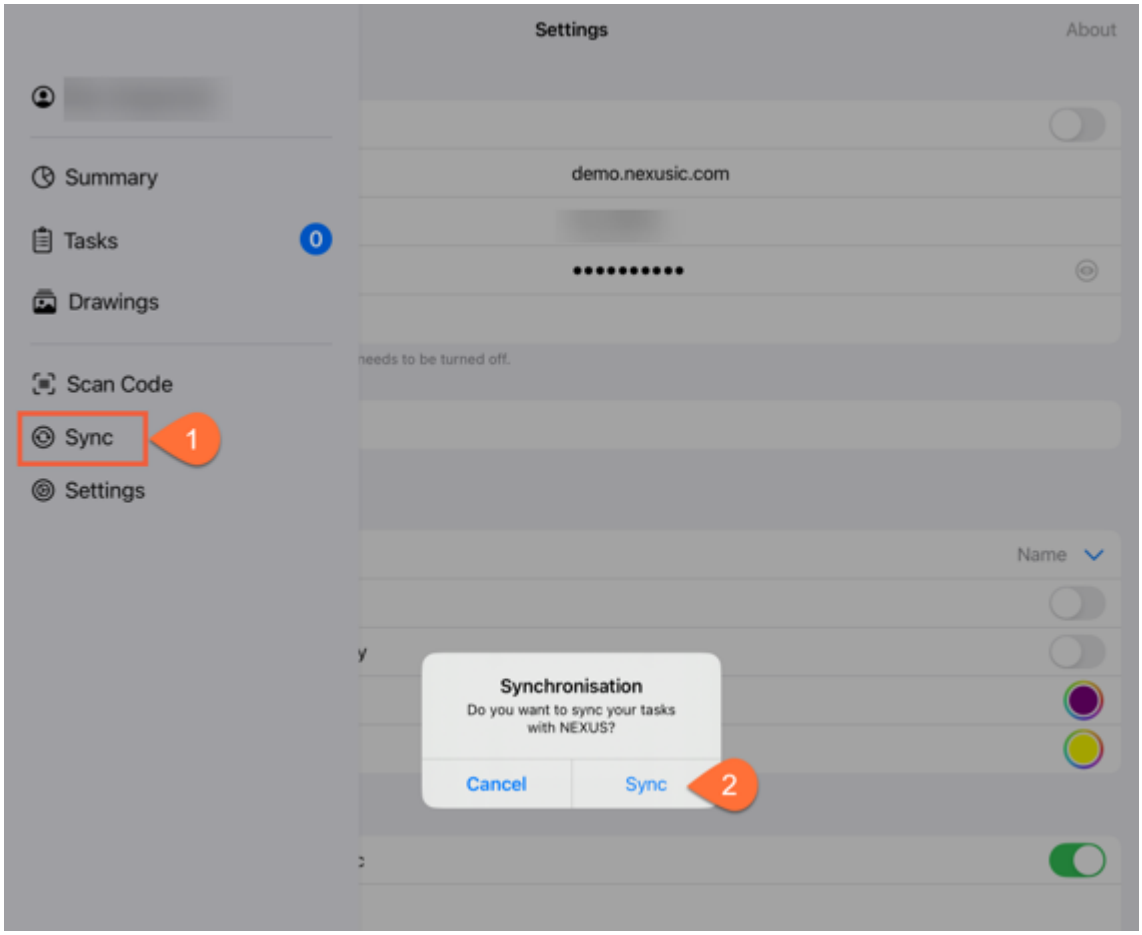
17.3.4 Sync to IC-Inspector

Before inspectors can carry out their inspection activities, they must perform synchronisation to download their assigned tasks from NEXUS IC through the REST service.

> **Note**
>
> You must have a stable internet connection to perform sync.

17.3.4.1 Initiating Sync

1. Click **Sync** in the sidebar of IC-Inspector.
2. In the pop-up dialog, click **Sync** to proceed.



Warning

If multiple users are using IC-Inspector on different iPads but with the same Apple ID (which is not recommended), you must turn off iCloud synchronisation for IC-Inspector before synchronising your data. Failure to do so may result in data loss.

17.3.4.2 Sync Operations

During sync, the following actions are performed:

- Any **new tasks (and their associated drawings) assigned to you** are downloaded to your tablet from the NEXUS IC database.
- Any **new unassigned** *ad hoc tasks* within a workpack are also downloaded, but only if you already have at least one assigned task in that same workpack.
- Any **tasks no longer assigned to you** are removed from your tablet.

> **Note**
>
> If any of these tasks are partially completed, that data will be lost.

- **Tasks that you have completed** are sent back to the NEXUS IC database.
- Any **changes in task statuses** are sent back to the NEXUS IC database.

> **Note**
>
> - Between synchronisations, you may operate outside of network range; you need coverage only during sync.
> - In Demo mode, sync is disabled.

17.3.5 View Tasks

Once tasks have been synchronised to your tablet, you can view them in IC-Inspector through the following interfaces:

- **Summary** screen

  Displays an overview of tasks using donut charts. See *Summary Screen*.

- **Tasks** screen

  Shows a detailed list of all tasks. See *Tasks Screen*.

- **Drawings** screen

  Allows you to view tasks directly from drawings. See *Drawings Screen*.

- **Scan Code**

  Scan QR or barcodes affixed to physical assets to quickly locate linked tasks. See *Scan Code*.

17.3.5.1 Task Types

Records in IC-Inspector fall into three categories:

- **Assigned Tasks**

  These are specific tasks allocated to you by an integrity engineer or work planner. For example, you may be required to perform a general visual inspection (GVI) on a designated section of piping.

- **Ad Hoc Tasks**

  These are not assigned to individual inspectors but are available for use as needed. Engineers or work planners can create ad hoc tasks for specific workpacks. If you have an assigned task within a workpack, any related ad hoc tasks will also appear in your task list.

  You can use ad hoc tasks to record observations that may require follow-up. For instance:

  - If your GVI procedure indicates that corrosion should trigger a UT measurement, locate and complete the relevant ad hoc UT task.
  - If you observe a leak, use the corresponding ad hoc leak task to record the event.

  You can record multiple events for a single ad hoc task. The task remains in your list even after events have been recorded.

- **Ad Hoc Events**

These are created when you record an event using an ad hoc task. Each ad hoc event appears as a separate entry in your task list, while the original ad hoc task remains available for future use.

> **Tip**
>
> To easily distinguish between task types, we recommend assigning specific row colours to ad hoc tasks and ad hoc events under **Settings** (see *Settings*).

17.3.5.1.1 Summary Screen

The **Summary** screen provides a visual overview of your assigned tasks and their completion status using doughnut charts. Its layout is similar to the dashboard in NEXUS IC.

17.3.5.1.1.1 Available Views

From this screen, you can access four distinct views from the bottom menu. Each view groups tasks by a higher-order category:

Task	Displays doughnut chart pairs grouped by assigned tasks and ad hoc tasks.
Workpack	Displays doughnut chart pairs for each workpack containing your assigned tasks.
Asset	Displays doughnut chart pairs for each different asset you have assigned tasks on.
Status	Displays doughnut chart pairs for each task status.

In each view:

- The **left chart** shows the number of tasks by event type.
- The **right chart** shows the percentage of tasks completed.

17.3.5.1.1.2 Using the Summary Screen

From the **Summary** screen, you can perform the following actions:

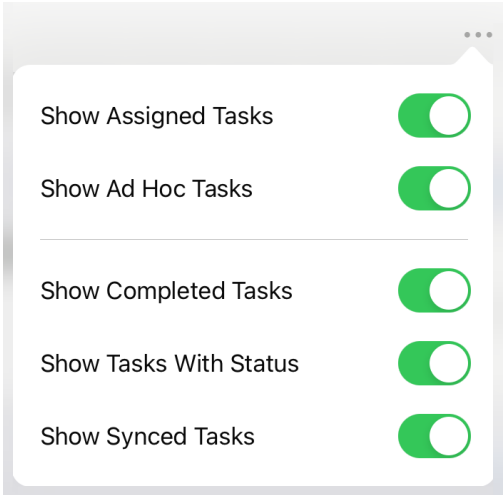
Action	Result
Enter a search term in the search bar at the top of the screen and hit Enter	Allows you to search for tasks. On the **Summary** screen, the search function indexes the Task Name, Asset Name or Location, the Event Type Name, and Workpack Name or abbreviation depending on the **Workpack Display Name** setting.
Tap the icon (top-left)	Toggles between showing or hiding the sidebar on the screen.
Tap the • • • ellipsis icon (top-right)	Opens options to toggle **Show Tasks in Drawings** and **Show Ad Hoc Tasks** on or off. This can be used when you check a collection of tasks. When you toggle **Show Tasks in Drawings** off, you will be shown a list of *Tasks Screen*, and if toggled on, you will see a collection of *Drawings Screen* with tasks in layers on those drawings.
Tap the text at the centre of a doughnut	Opens a page that shows only the relevant collection of tasks. The way tasks are shown on this page is determined by what you have selected under • • • → *Show Tasks in Drawings*.
Tap a segment of a doughnut or its name in the chart legend	Filters tasks by the selected event type and shows: • **Left chart**: Number of tasks for that event type vs total tasks • **Right chart**: Completion status for that event type **Example:** Tapping the segment **Coating Assessment** on the left-hand chart highlights that segment and displays the number of **Coating Assessment** tasks versus the total tasks. The right-hand chart then shows the proportion of **Coating Assessment** tasks completed.
Tap the top centre of the screen	Quickly scrolls back to the top of the list.

17.3.5.1.2 Tasks Screen

On the **Tasks** screen, you can see the complete list of tasks assigned to you, as well as ad hoc tasks and all ad hoc events that you created from ad hoc tasks. Tasks are assigned to you by an integrity engineer or work planner in NEXUS IC (see *Assigning Tasks*). The total number of all tasks is displayed next to **Tasks** in the sidebar.

17.3.5.1.2.1 Filter Tasks

You can choose which tasks to show by tapping the ••• ellipsis at the top right:



Note

- To make the **Show Synced Tasks** option visible, go to the **Settings** screen and disable **Remove Completed Tasks During Sync** under **SYNC**.
- The filters *Show Completed Tasks*, *Show Tasks With Status* and *Show Synced Tasks* will only work if either the *Show Assigned Tasks* filter, the *Show Ad Hoc Tasks* filter, or both are enabled.

17.3.5.1.2.2 Grouping of Tasks

Depending on the view selected in the bottom menu, tasks are grouped as follows:

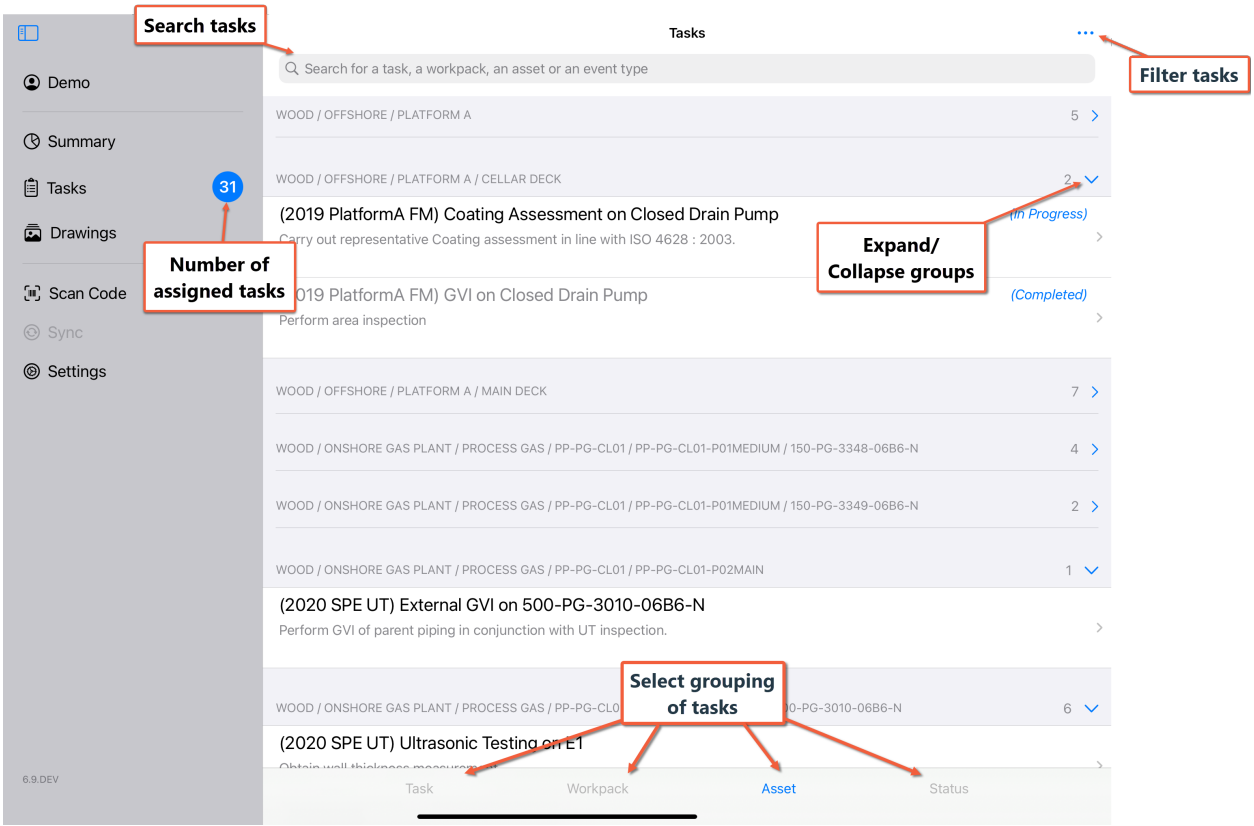
View	Grouping
Task	Tasks are grouped based on their task type, that is, whether they are assigned or ad hoc. Ad hoc events created for ad hoc tasks are also included in the task list.
Workpack	Tasks are grouped by the workpack the task is assigned to. This assignment is defined in the **Workpack** field when a task is created in NEXUS IC (see *Tasks*).
Asset	Tasks are grouped by the name and location of the asset to which the task belongs. This value is defined in the **Asset** field when a task is created in NEXUS IC (see *Tasks*).
Status	Tasks are grouped by their statuses. For more information about the available statuses, see *Task Statuses*.

By default, tasks within these groups will be ordered by the order number given to the task in NEXUS IC. If no order number is defined, then they will be ordered by name.

You can expand or collapse the list of tasks under the grouping header they belong to. You can also see the number of assigned tasks for each grouping next to the grouping header.

17.3.5.1.2.3 Search Tasks

You can search for tasks by entering your search term in the search bar at the top of the screen. On the **Tasks** screen, the search function indexes the Task Name, Asset Name or Location, the Event Type Name, and Workpack Name or abbreviation depending on the 'workpack display name' setting.

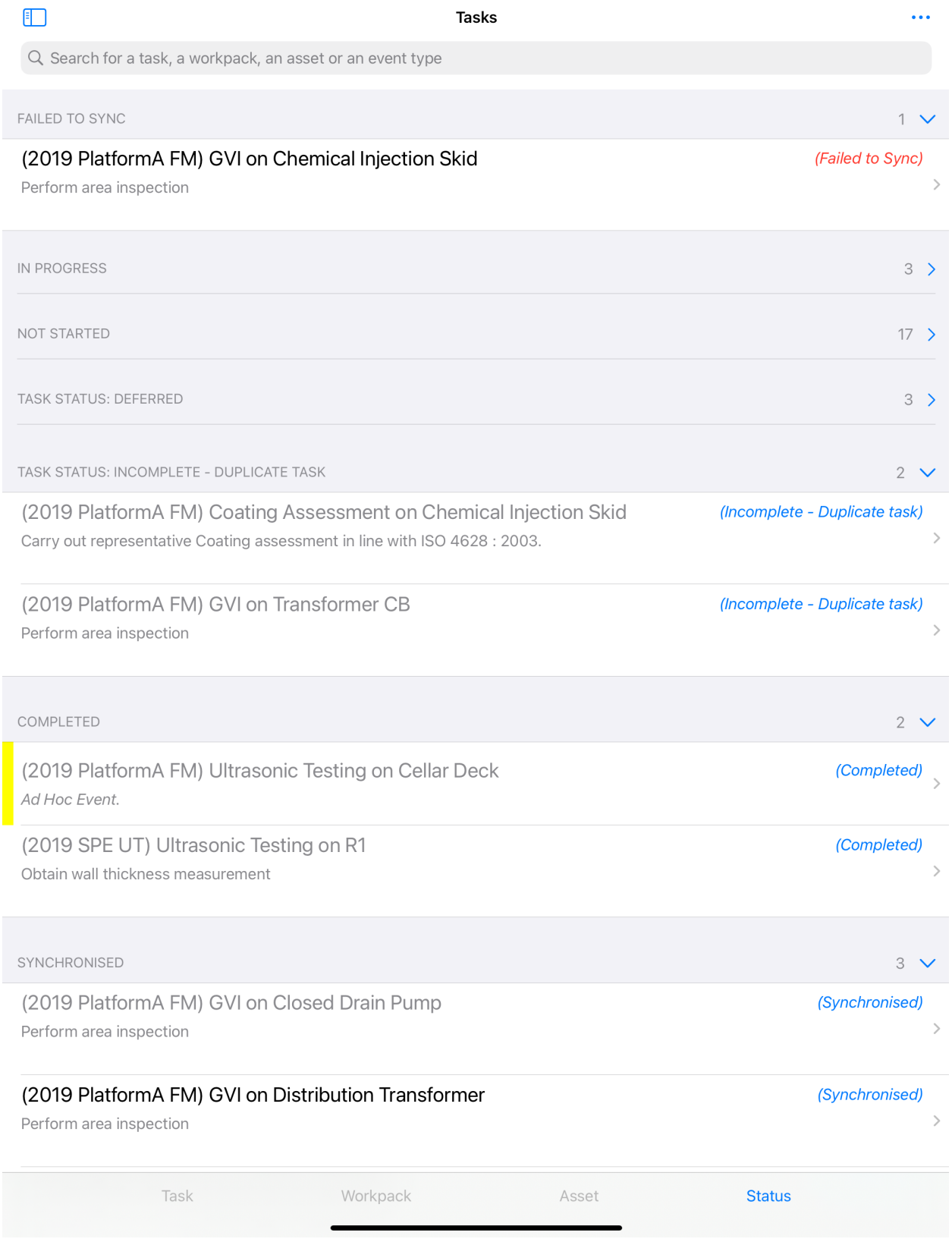


17.3.5.1.2.4 Task Statuses

The task statuses are displayed in *italics*, next to each task in a task list. These statuses have either been manually selected by the user or automatically determined by IC-Inspector, based on the actions performed on the task.

Tasks can be grouped by their status by selecting the **Status** view from the bottom menu on any screen that displays a task list.

For detailed information about how tasks statuses are determined, see *Set Status*.


Tasks
Search for a task, a workpack, an asset or an event type
FAILED TO SYNC 1
(2019 PlatformA FM) GVI on Chemical Injection Skid
(Failed to Sync)
Perform area inspection
IN PROGRESS 3
NOT STARTED 17
TASK STATUS: DEFERRED 3
TASK STATUS: INCOMPLETE - DUPLICATE TASK 2
(2019 PlatformA FM) Coating Assessment on Chemical Injection Skid
(Incomplete - Duplicate task)
Carry out representative Coating assessment in line with ISO 4628 : 2003.
(2019 PlatformA FM) GVI on Transformer CB
(Incomplete - Duplicate task)
Perform area inspection
COMPLETED 2
(2019 PlatformA FM) Ultrasonic Testing on Cellar Deck
(Completed)
Ad Hoc Event.
(2019 SPE UT) Ultrasonic Testing on R1
(Completed)
Obtain wall thickness measurement
SYNCHRONISED 3
(2019 PlatformA FM) GVI on Closed Drain Pump
(Synchronised)
Perform area inspection
(2019 PlatformA FM) GVI on Distribution Transformer
(Synchronised)
Perform area inspection
Task
Workpack
Asset
Status

See also

- *Perform Actions on Tasks*
- *Complete Tasks*
- *Maintain Event Details*
- *Edit and Markup Images*

17.3.5.1.2.5 Perform Actions on Tasks

You can perform various actions on the **Tasks** screen by tapping or swiping an item in the list of tasks.

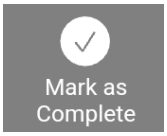
17.3.5.1.2.6 Tapping a Task

When you tap a task, it results in the following:

- In the case of an assigned task, the **Event Details** screen opens, where you can fill out more information (see *Maintain Event Details*).
- In the case of an ad hoc task, besides being able to enter data on the **Event Details** screen, a new ad hoc event item is created under the task list.

17.3.5.1.2.7 Swiping a Task

You can perform the following actions when **swiping** a task's row:

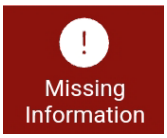


Mark as Complete
Mark a task as complete. For more information, see *Complete Tasks*.

Mark as Incomplete
Change a task that has already been completed back to incomplete status.

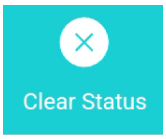
Create Event

Create an event for an ad hoc task. When you create an event for an ad hoc task, a new ad hoc event item is created and is visible under **AD HOC EVENTS** on the **Task** screen when you use grouping by Task. You can enter event details or complete a task from there.



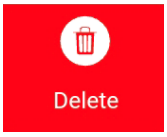
Missing Information

See if a task has missing information in its event details. This means that either there is no value defined for a required field, or there is an incorrect value for a field (for example, the value is outside of the minimum and maximum value range). Go to the event details of the task to enter or correct field values.



Clear Status

Remove the status that was assigned to the task on the **Event Details** screen (see *Set Status*).



Delete Task

Delete ad hoc events from IC-Inspector. You can also delete posted tasks, that is, tasks that have been completed and synchronised but not deleted from IC-Inspector (probably due to the fact that the option of deleting completed tasks upon synchronisation has been disabled in your settings).

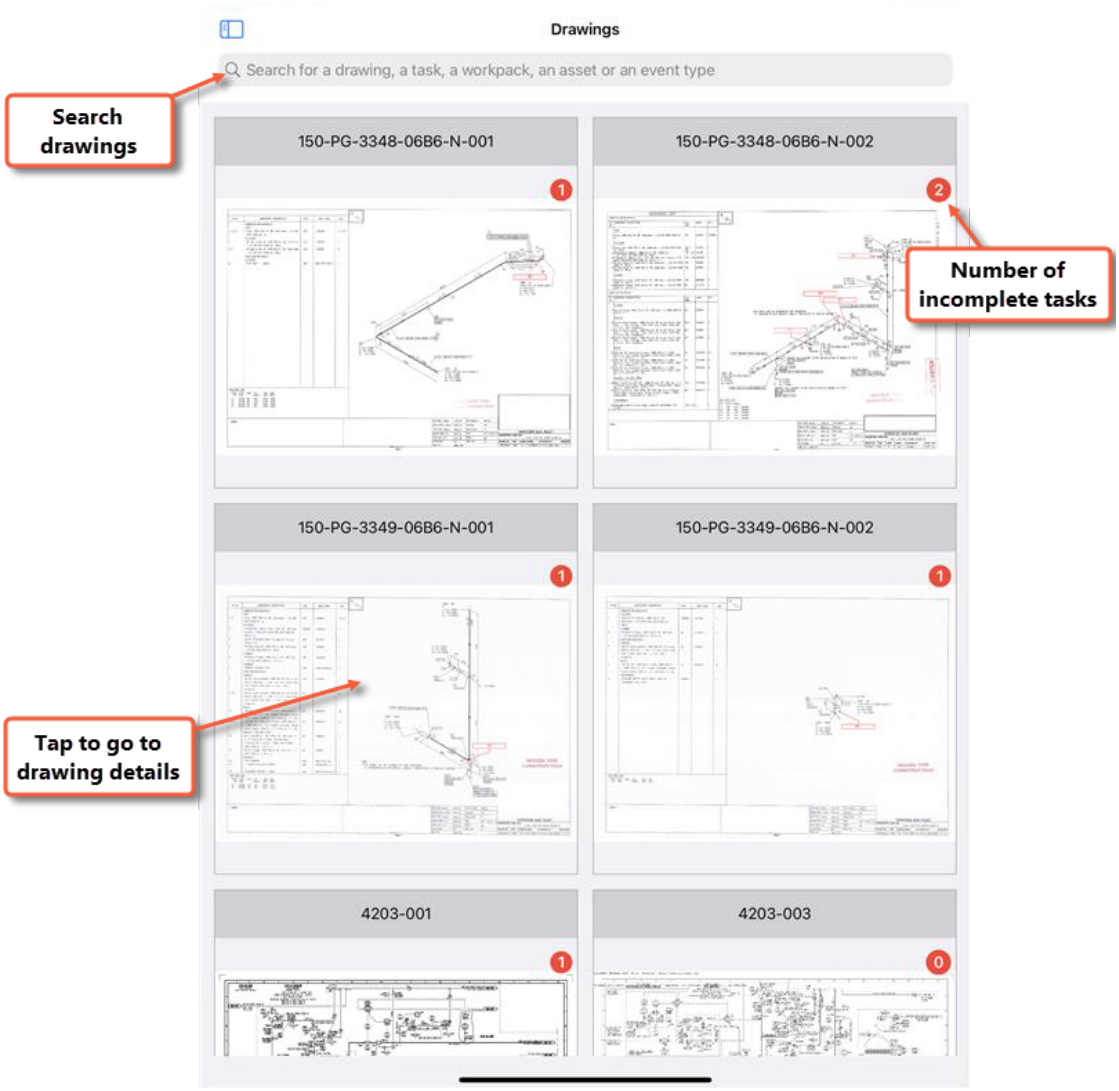
Bookmark Task
Add a task to your bookmarks. You can remove the bookmark by tapping this button again.

17.3.5.1.3 Drawings Screen

The **Drawings** screen shows a collection of drawings linked to assets in NEXUS IC. If you have tasks associated with an asset that has a drawing, you can access those task details directly from the drawing.

17.3.5.1.3.1 Using the Drawings Screen

- **Scroll** to browse available drawings
- **View task counts**: The number of incomplete tasks is shown in the top-right corner of each drawing.
- **Open drawing details**: Tap a drawing to view its layers and associated tasks (see *Drawing Details*)
- **Search drawings**: Use the search bar at the top to find drawings by entering keywords. The search indexes the following fields:
  - Drawing Name
  - Task Name
  - Asset Name or Location
  - Event Type Name
  - Workpack Name or abbreviation (based on the 'workpack display name' setting)



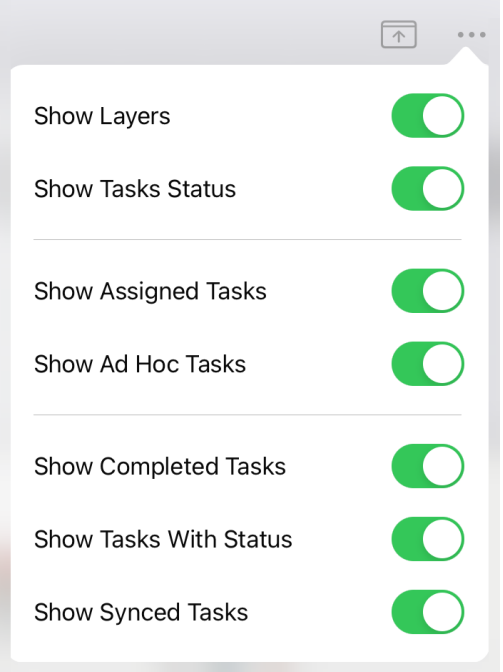
17.3.5.1.3.2 Drawing Details

When you tap a drawing on the **Drawings** screen, the drawing's details are shown where you can see its layers and associated tasks.

Layers are created in NEXUS IC (see *Manage Layers in Drawings*) and may contain links to specific assets. If a layer is linked to an asset, you can view the number of tasks associated with that asset directly from the drawing layer.

17.3.5.1.3.3 Screen Options

At the top right of the **Drawing** screen, tap the ••• ellipsis icon to reveal display and filtering options.



You can also collapse or expand the drawing height using the corresponding icon.

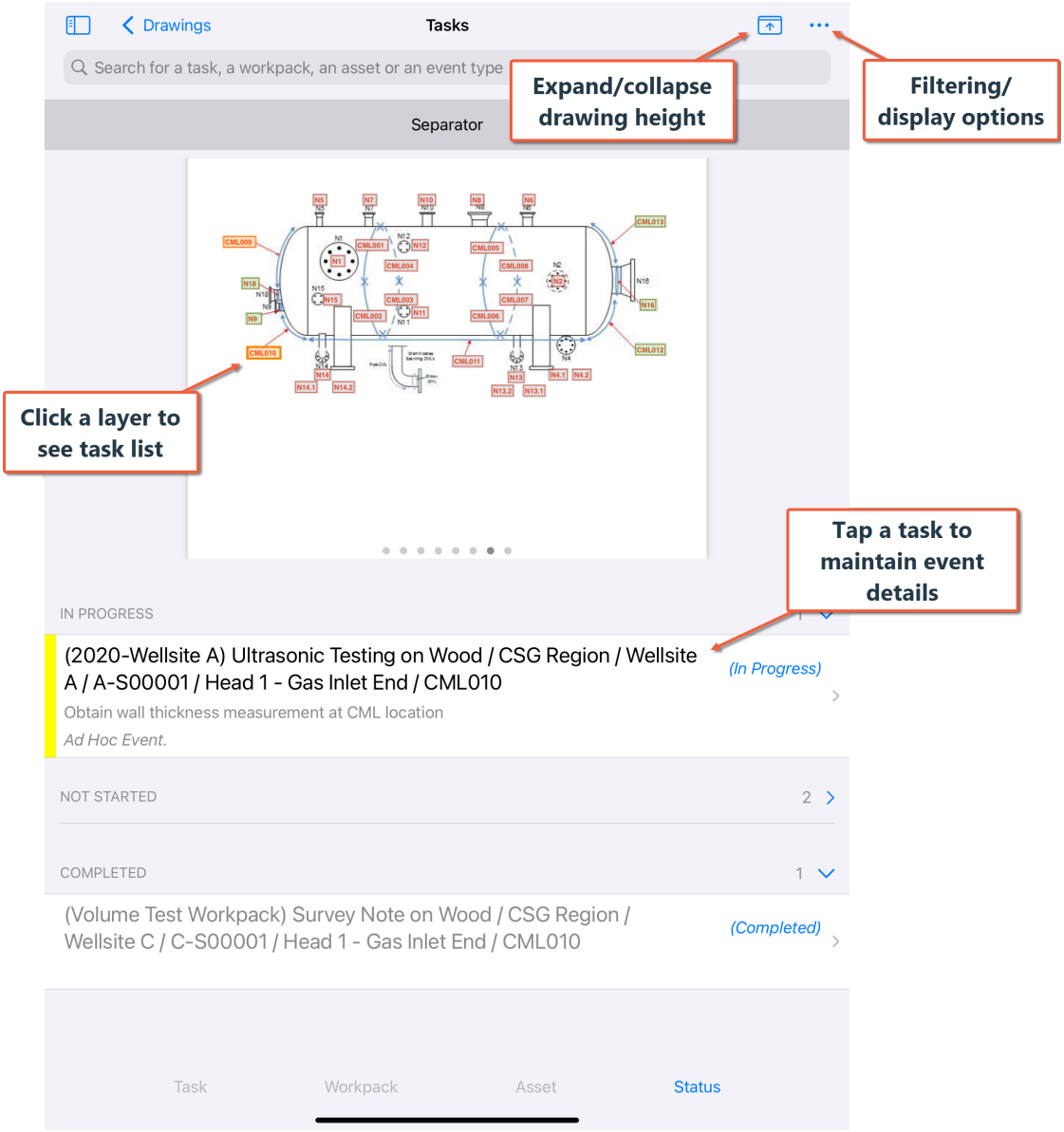
17.3.5.1.3.4 Layer Colours

The colour of each layer indicates the task status:

Grey	Layer has no task
Red	All tasks are incomplete
Orange	Some tasks are incomplete
Green	All tasks are complete

17.3.5.1.3.5 Interacting with Layers and Tasks

- **Tap a layer** to view its tasks in a task list at the bottom of the screen.
- **Tap a task** in the task list to launch it and maintain its event details. For more information, see *Maintain Event Details*.



17.3.5.1.4 Scan Code

If your NEXUS database has a field (such as an asset information field) configured to contain an asset tag, you can affix QR codes or bar codes to your physical assets, then scan them in IC-Inspector.

17.3.5.1.4.1 Prerequisites

To use this functionality, the following configuration must have been made in NEXUS IC:

1. A field must be available in an asset information group (AIG), where the QR code or bar code can be assigned to a specific asset.

2. This specific field must have been assigned to the usage **Asset - Tag** under *Configuration* → *Assets* → *Features*. For more information, see *Configure Features*.

17.3.5.1.4.2 Process

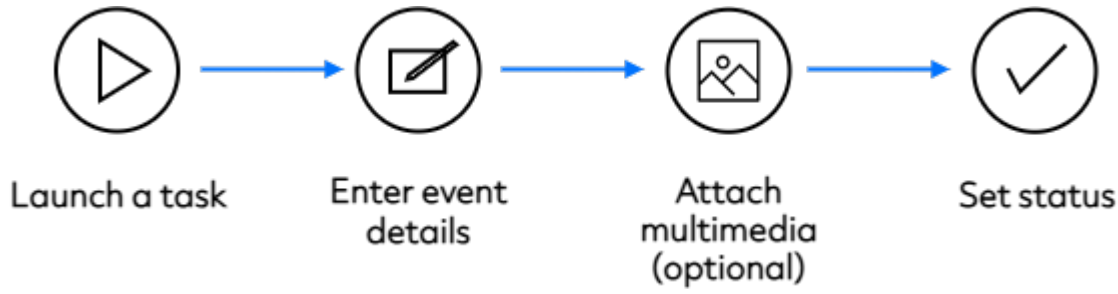
To scan a code, proceed as follows:

1. Tap **Scan code**, then point the iPad's camera at the QR code or bar code.
2. If the code is found in your NEXUS database, and IC-Inspector currently has one or more tasks for that asset, you can see the asset name that matches this code at the bottom of the screen.
3. Tap the asset name to see its list of tasks.
4. Select tasks from the list as required.

> **Note**
>
> You can use the buttons at the top of the screen as follows:
>
> - To display the actual QR or bar code, tap the **i** info button.
> - To scan another code, tap **Continue**.
> - To cancel scanning and go back to the task list, tap **Cancel**.

17.3.6 Complete Tasks

Completing a task in IC-Inspector involves the following key steps:



1. **Launch the task.**

   Open the **Event Details** screen by launching a task.

   See *Launch Tasks*.

2. **Enter inspection data (event details).**

   Fill in the required inspection details. This action creates an event record.

   See *Maintain Event Details*.

3. **Attach multimedia (optional).**

   You may attach photos or other multimedia files to the event record.

   See *Add and Manage Multimedia*.

4. **Set task status.**

   Update the task status as needed. To sync the event record with the NEXUS IC database, the task must be marked as **Complete**.

   See *Set Status*.

17.3.6.1 Launch Tasks

When you launch a task, the **Event Details** screen opens where you can record data against the task (see *Maintain Event Details*).

You can launch a task in several ways in IC-Inspector:

- From the **Tasks** screen: Tap the task in the task list.
- From the **Drawing** details screen: Tap the task in the task list that opens when you click a layer.
- From the **Summary** screen: Tap the task in the task list that opens when you click the centre of a donut.

> **Note**
>
> If you tap an *ad hoc task*, besides being able to enter data on the **Event Details** screen, a new ad hoc event item is created under the task list. Even after completing an ad hoc event, the original ad hoc task remains in your task list for future use.

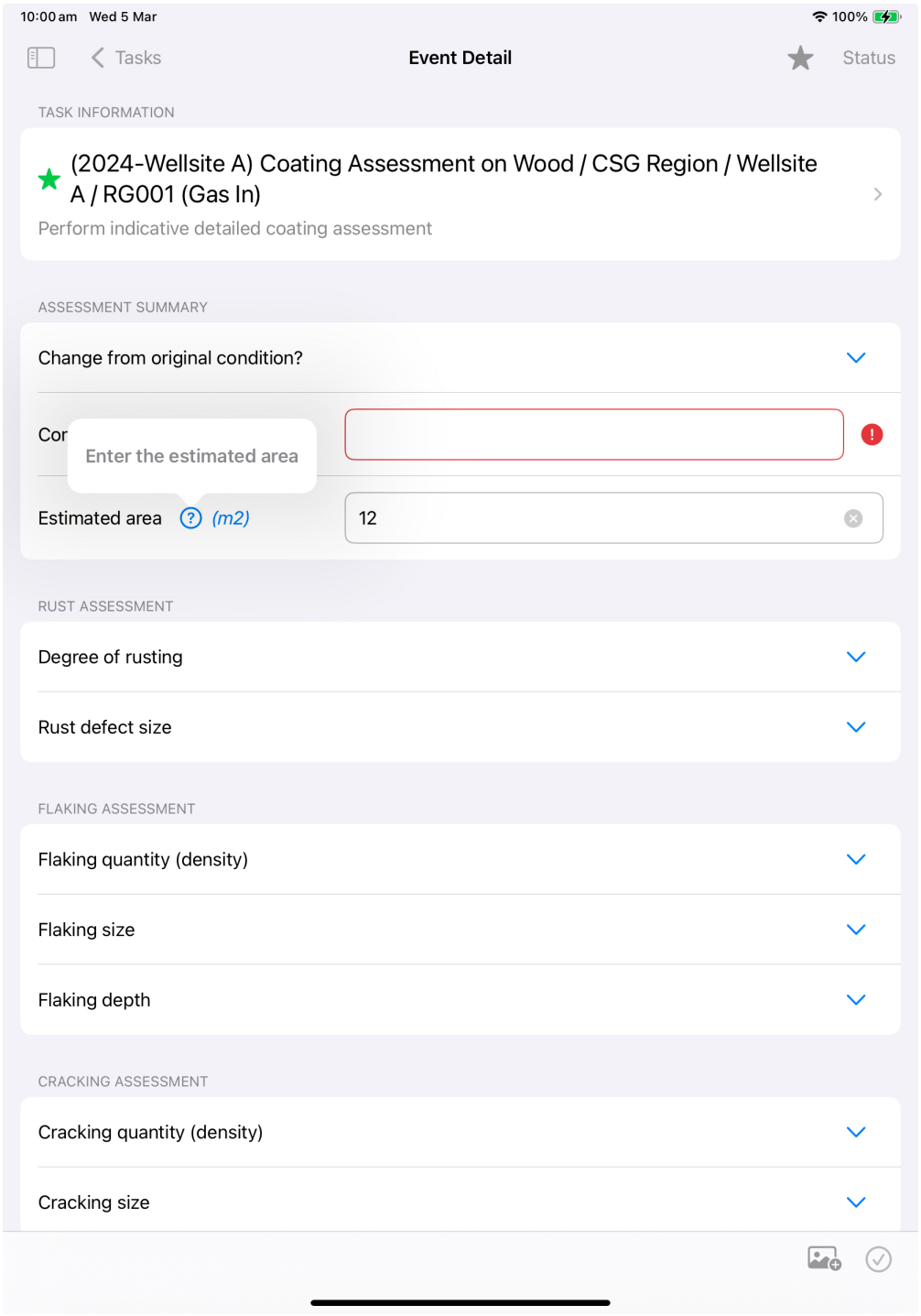
17.3.6.2 Maintain Event Details

Once you have launched a task (see *Launch Tasks*), you can enter data against the task on the **Event Details** screen. Data entered for a task is then saved as an event record.

For each type of task, there's a corresponding event form. These forms can be designed in NEXUS IC. For more information, see *Configure Event Types*.

You can fill details into the form as required. Note the following:

- A red icon indicates that there is no value entered for a field that is required, or an invalid value is defined for the field (for example, the text is too long in an edit box).
- You can clear a non-required field by tapping the clear icon.
- If a field has a field help, you can view it by clicking the icon visible next to the field.



Tip

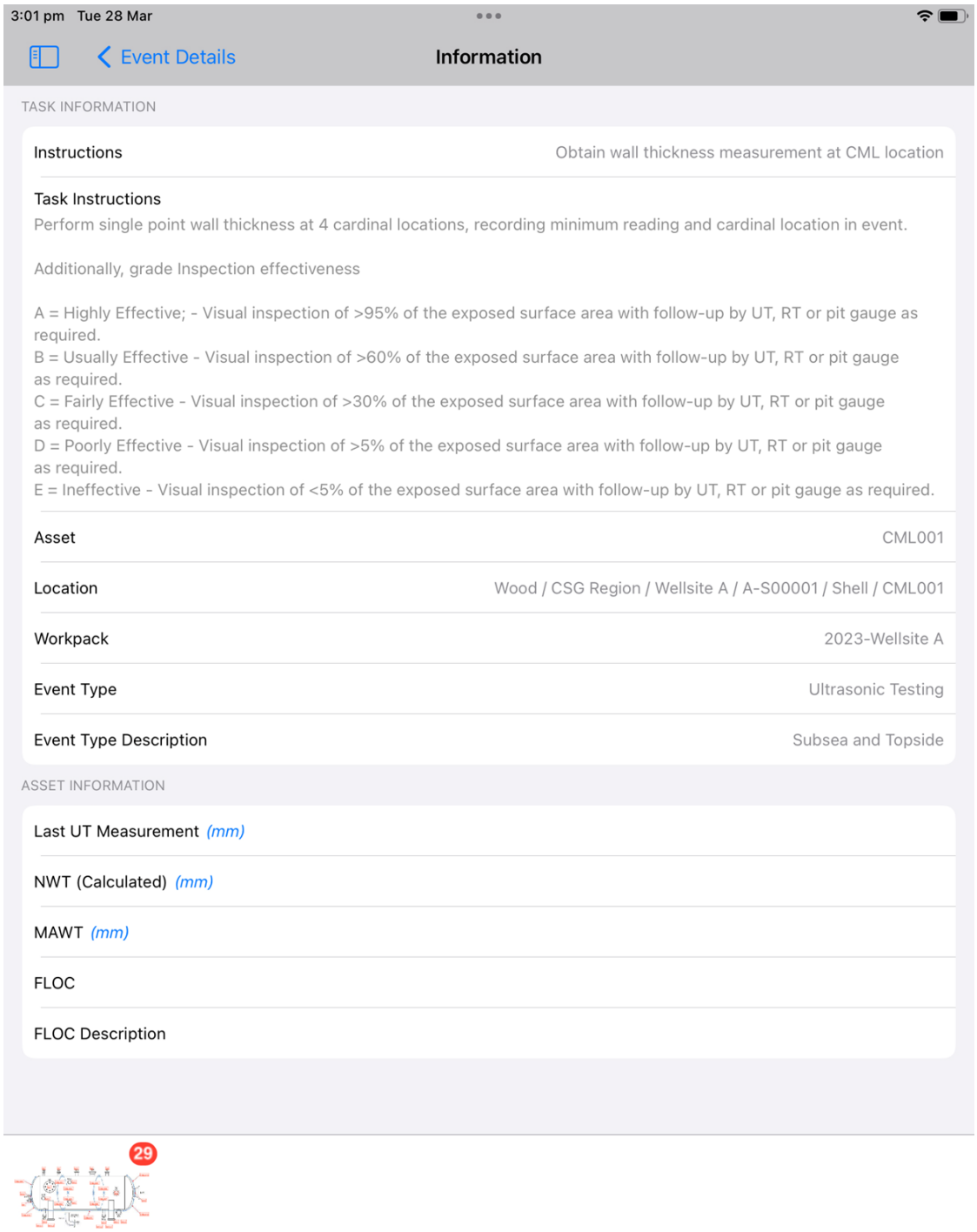
You can change the text size on event forms (and therefore how much of the form fits on your screen at once) in your tablet's Settings, under *Display & Brightness → Text Size*.

17.3.6.2.1 Delete Ad Hoc Events

For ad hoc events, the **Delete** button is visible, which you can use to delete the ad hoc event from IC-Inspector.

17.3.6.2.2 Check Task Information

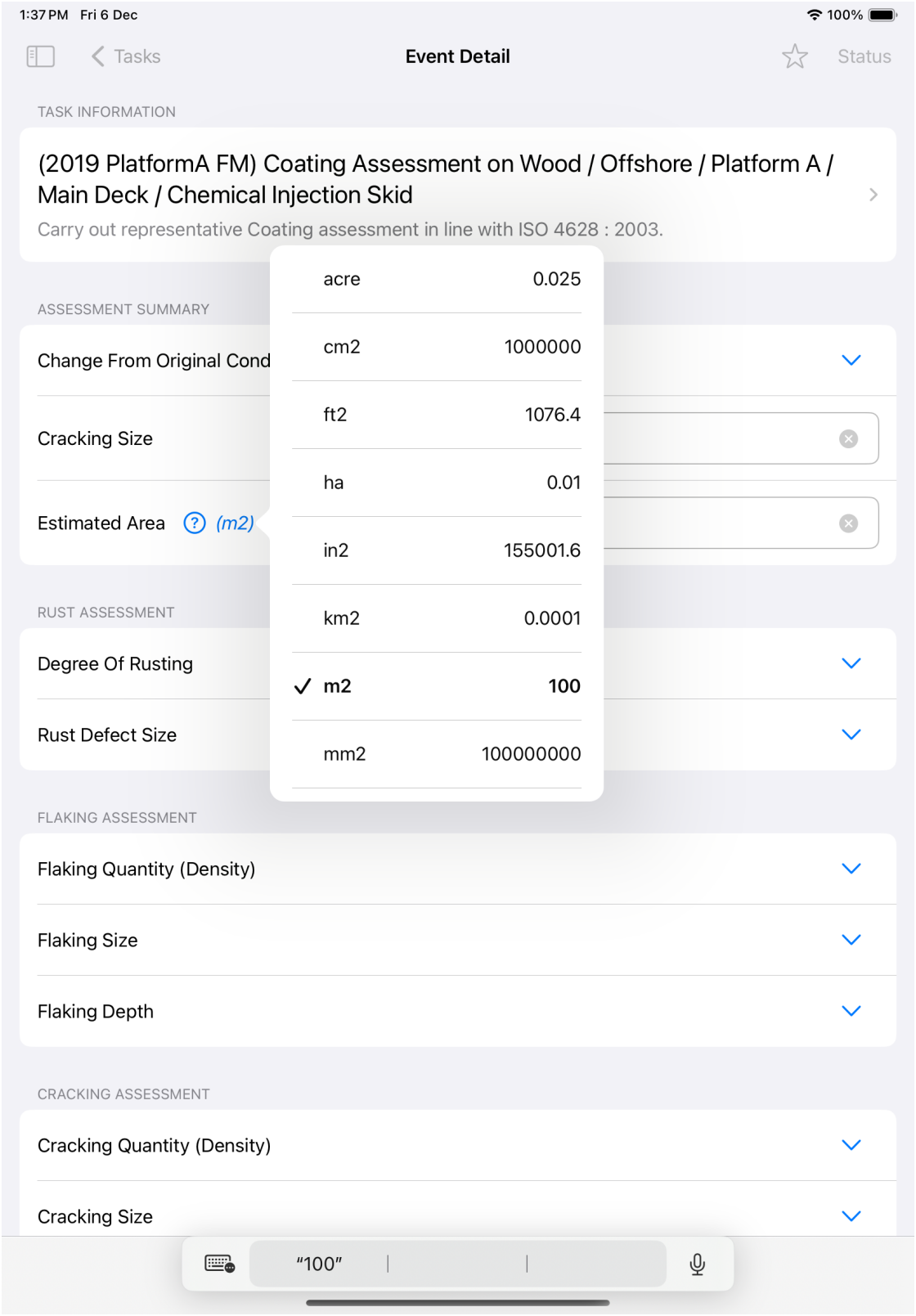
Tap on **TASK INFORMATION** to see details of this task (the asset name, event type, asset location, any task instructions, and any drawings directly linked to this asset). If any Asset Information Group is configured to be shown in IC-Inspector (see *Configure Asset Information Groups*), it will be shown on this screen.



Note that the *Task Instructions* section is shown only if there's actual task instruction data assigned to the task.

17.3.6.2.3 Convert Unit for Numeric Fields

If a unit value has been assigned to a numeric field in NEXUS IC, you can convert it to another unit on the **Event Details** screen. To do this, click on the blue unit value next to the field and choose the required unit from the context menu. The field's value will then update to reflect the selected unit.


1:37 PM Fri 6 Dec
100%
Tasks
Event Detail
Status
TASK INFORMATION
(2019 PlatformA FM) Coating Assessment on Wood / Offshore / Platform A / Main Deck / Chemical Injection Skid
Carry out representative Coating assessment in line with ISO 4628 : 2003.
ASSESSMENT SUMMARY
Change From Original Cond
Cracking Size
Estimated Area (m2)
RUST ASSESSMENT
Degree Of Rusting
Rust Defect Size
FLAKING ASSESSMENT
Flaking Quantity (Density)
Flaking Size
Flaking Depth
CRACKING ASSESSMENT
Cracking Quantity (Density)
Cracking Size
acre 0.025
cm2 1000000
ft2 1076.4
ha 0.01
in2 155001.6
km2 0.0001
m2 100
mm2 100000000
"100"

17.3.6.2.4 Bookmark Events

You can "bookmark" an event by tapping ☆. The icon will change to ★. You can tap again to remove the bookmark.

Bookmarking is used for user-defined purposes, its purpose is defined by the requirements of your organisation. Its usual use is to flag events which require review, for example, checking grammar, checking that you are on the correct asset, sense-checking data recorded. You can also add text in the Notes field indicating the reason you have bookmarked this event. Bookmarked events will be flagged with a green star in NEXUS IC's *Event Listing*.

17.3.6.3 Add and Manage Multimedia

You can add multimedia files (for example, photos, drawings, sketches) to your event records on the **Event Details** screen when maintaining event data (see *Maintain Event Details*).

17.3.6.3.1 Add Multimedia

To add multimedia, tap the button at the bottom of the **Event Details** screen. A menu will appear with the following options:

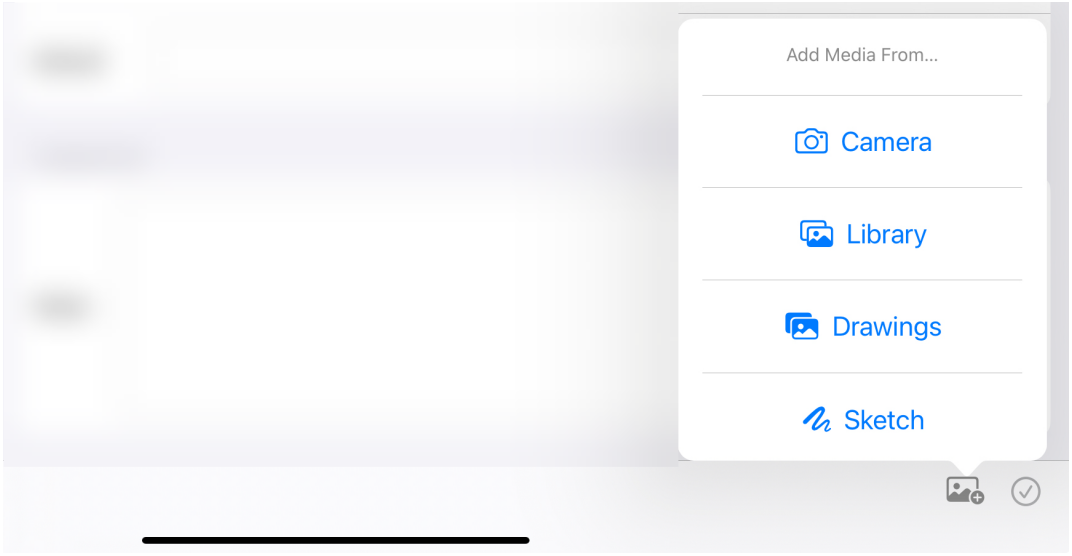
- **Camera**: Take a photo using your device's camera.

  Note: If you enabled it under **Settings**, photos are automatically saved to your tablet's photo library when taking new photos.

- **Library**: Select one or more images from your device's photo library.

- **Drawings**: Choose a drawing with layers linked to this task's asset. If no linked drawings are available, this option will be disabled.

- **Sketch**: Open a markup canvas to create a sketch using your device's native markup tools. The sketch is saved as an image and attached to the Event Details. For more information, see *Markup*.



All added images appear in a banner along the bottom of the **Event Details** screen.

17.3.6.3.2 View and Edit Images

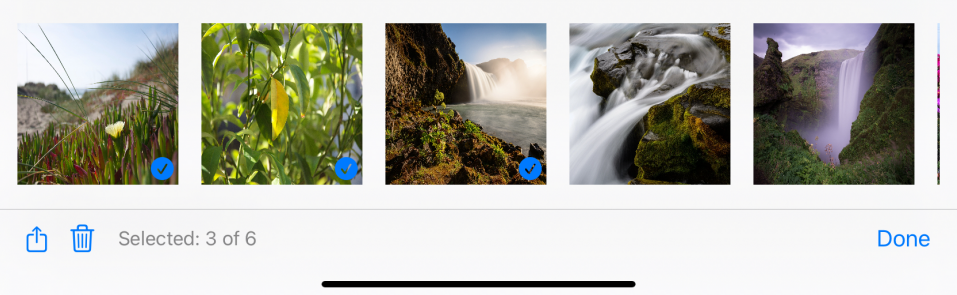
Tap any image in the banner on the **Event Details** screen to view it fullscreen. You can swipe between images and use markup tools to mark up or edit them.

For more information, see *Edit and Markup Images*.

17.3.6.3.3 Delete or Share Multimedia Files

When you tap the selection button at the bottom right of the **Event Details** screen, you can select multiple images and perform either of the following actions:

- Delete images by tapping the trash can icon.
- Share images (for example, to a message or email, to the Photos app, to a printer, to your file directory, etc.) by tapping the share icon.



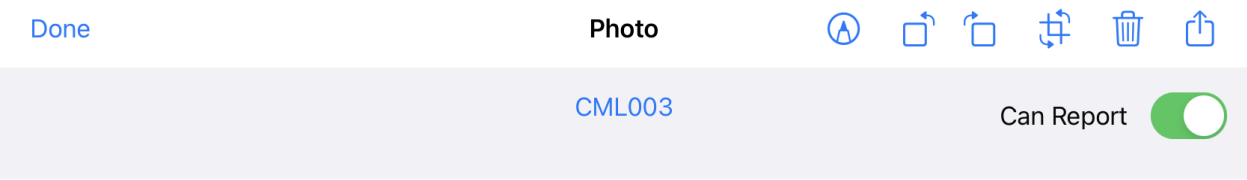
> **Note**
>
> On Windows tablets, you can only delete or download the images. Sharing is not supported.

17.3.6.3.3.1 Edit and Markup Images

When you tap an image on the **Event Details** screen (see *Maintain Event Details*), the image editing screen opens. From here, you can view, edit, and mark up images attached to the event.

17.3.6.3.3.2 Using the Image Editor

- **Swipe** left or right to browse through attached images.
- **Rename** the image by tapping its name. By default, the image name matches the task it was created from.
- **Toggle "Can Report"** to set the **Can Report** status of an image. This optional flag can be used in report templates to include only key images.
- Use the toolbar at the top of the screen to:
  - Mark up the image (see *Markup*)
  - Rotate (see *Rotate*)
  - Crop and rotate (see *Crop and Rotate*)
  - Share (see *Share*)
  - Delete (see *Delete*)



When you're finished editing, tap **Done** to save your changes or **Cancel** to discard them.

17.3.6.3.3.3 Markup

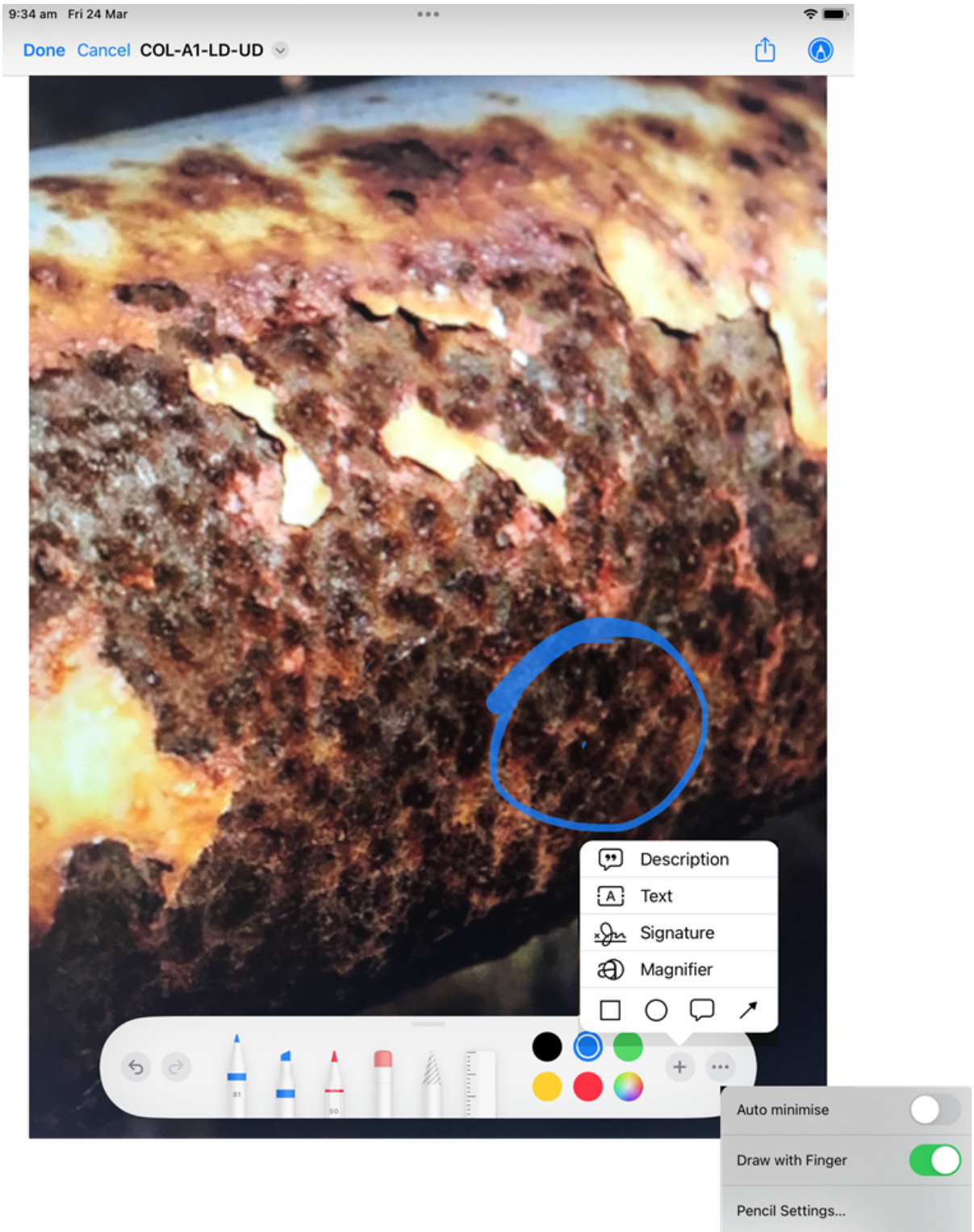
Tap on to open the markup screen. Here, you can draw on the image, add text, shapes, and more.

The available markup tools vary depending on your platform:

- **iPad**: Use Apple's standard markup tools to edit your image.
- **Android**: When you start editing, choose from the installed image editing apps. We strongly recommend using **Google Photos** for seamless integration with IC-Inspector. If you don't have Google Photos, install it from the Google Play Store.
- **Windows**: Use Microsoft Paint's standard markup tools.

For more information on using the markup tools, refer to the platform-specific guidelines.

Below is an example of using markup tools on an iPad:


9:34 am Fri 24 Mar
Done Cancel COL-A1-LD-UD
Description
Text
Signature
Magnifier
Auto minimise
Draw with Finger
Pencil Settings...

17.3.6.3.3.4 Rotate

You can rotate the image right or left by tapping or respectively. This rotates the image in 90° steps.

17.3.6.3.3.5 Crop and Rotate

On **Android** and **Windows** platforms, you can crop and rotate images using the markup tool of the platform (see above).

On **iPads**, you can tap at the top of the screen to access the crop-and-rotate screen.

Use the slider at the bottom of the screen to rotate the image by an arbitrary angle, from 180° anticlockwise to 180° clockwise. Or tap any of the five buttons below the slider to select specific angles.

> **Note**
>
> - Using angles other than -180°, -90°, 0°, 90° or 180° will crop away part of your image.

If required, you can also crop your image.

17.3.6.3.3.6 Share

To share the marked-up image, tap and choose from the available sharing options provided by your platform.

> **Note**
>
> On Windows tablets, you can only save the marked-up image.

17.3.6.3.3.7 Delete

Tap to delete this image and return to the **Event Details** screen (see *Maintain Event Details*). This is different from tapping the **Event Details** button at the top left, which will return you to **Event Details** *without* deleting the photo.

17.3.6.4 Set Status

Task statuses in IC-Inspector are either:

- Automatically applied based on user actions, or
- Manually selected by inspectors on the **Event Details** screen.

17.3.6.4.1 Automatically Applied Statuses

The following statuses are set by IC-Inspector based on specific actions:

Failed to Sync	Applied when the task could not be sent to the database server during synchronisation.
In Progress	Applied under the following conditions: • The user has started editing the task and updated and saved any field value. • If the user views an event and navigates back from the *Event Detail* screen without making any changes: – No fields with default values: *In Progress* status is **not** applied. – Default field values present: Fields are auto-populated and *In Progress* status is applied.
Not Started	Status is applied when the task has been synchronised to the tablet but no action has been recorded on it. • This status appears only as a grouping header in the **Status** view. • Tasks with this status do **not** display a status label in the task list.
Task Status: <Custom Status>	Applied based on custom statuses defined in your NEXUS IC database configuration. In the **Status** view, these appear with the prefix "TASK STATUS:" in grouping headers.
Completed	Applied when the task is marked as complete (see *Complete Tasks*).
Synchronised	Applied when the task has been successfully sent to the database server after synchronisation.

17.3.6.4.2 Change Status Manually

After completing all required fields on the **Event Details** screen, you can update the task's status as follows:

1. Tap the **Status** button at the top of the screen.
2. Choose an option from the drop-down list.

The available status options depend on your organisation's configuration in NEXUS IC (see *Task Status*).

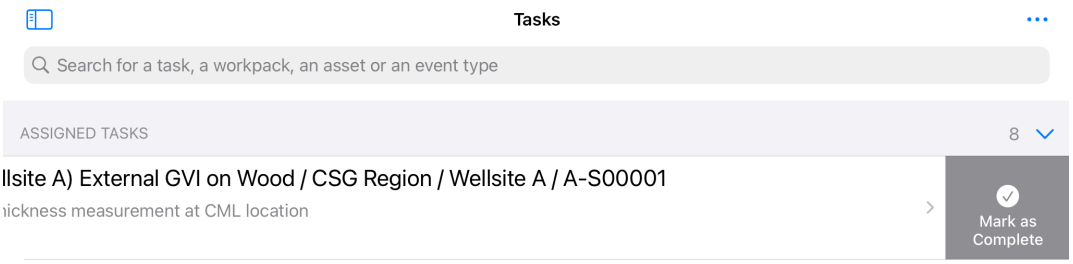
Once updated, the status will be sent to the master database during the next synchronisation. This helps planners track progress and determine whether tasks need reassignment or further action. The task will continue to appear on your task list in IC-Inspector until it has been reassigned or marked as **Completed**.

> **Note**
>
> Ad hoc events can only be completed or deleted, they cannot have any other statuses.

17.3.6.4.3 Set Status to Completed

In IC-Inspector, you can mark a task as **Completed** in one of the following ways:

- By swiping the task's row on the **Tasks** screen (see *Tasks Screen*) and tapping on *Mark as Complete*:



- By changing the status of the task on the **Event Details** screen (see *Maintain Event Details*).

  To set the status to completed, tap **Status** on the top of the screen and select *Mark as Complete*. You can get to the **Event Details** screen by launching the task as described in *Launch Tasks*.

Once marked as completed, the task will be uploaded to the server during the next synchronisation (see *Sync to IC-Inspector*).

17.3.7 Sync to NEXUS IC

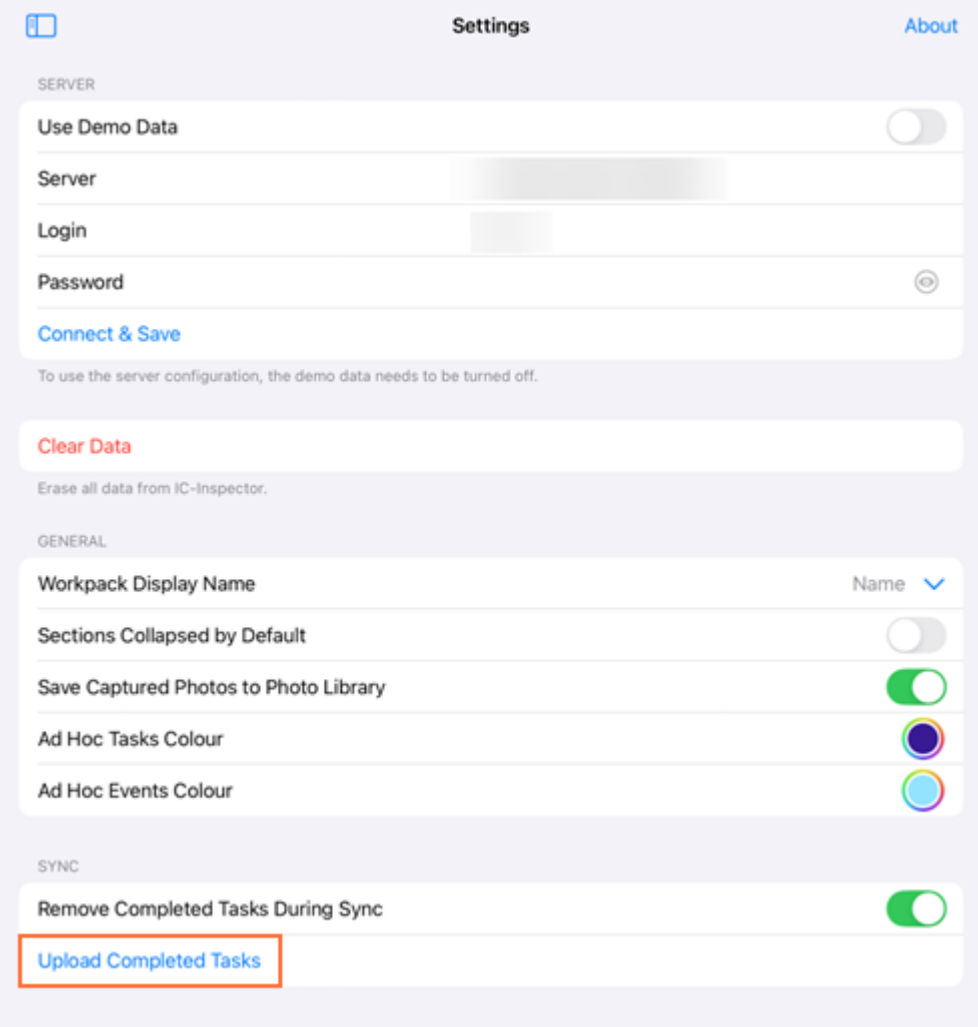
Once you mark your tasks as **Completed**, you can sync them to the NEXUS IC database using one of the following methods:

- **Two-way sync**

  Tap **Sync** in the sidebar. This will upload your completed tasks to the database and download any assigned or ad hoc tasks to your tablet. For more information about two-way sync, see *Sync to IC-Inspector*.

- **One-way sync**

  1. Go to the **Settings** screen.
  2. Tap **Upload Completed Tasks** under **SYNC**.



Note

One-way sync provides a faster sync process by only uploading your completed tasks.

17.3.8 Settings

On the **Settings** screen, you can define various settings for the usage of IC-Inspector.

17.3.8.1 Server Settings

Under **SERVER**, you can control whether you want to use IC-Inspector with demo or real data.

If you would like to try IC-Inspector with demo data, tap the **Use demo data** switch. Note that using demo data will erase any local data currently in the app.

If you are planning to use real data, sign in to IC-Inspector. For more information, see *Log In to IC-Inspector*.

Note

- If you change user credentials, the previous user's data (for example, tasks, events) will be cleared, and the new user's data will be loaded from the server.
- Ensure that the account you use has an IC-Web Read/Write *license* in NEXUS. If it does not have this license, you will not be able to synchronise your work back to the server. You get the message "This account has a readonly license."

17.3.8.2 Clearing Data

If you tap **Clear Data**, it erases all the data stored on your mobile device, including any task and event data, photos or configuration data.

17.3.8.3 General Settings

Under **GENERAL**, you can customise how certain elements are displayed in IC-Inspector:

- **Workpack Display Name**

  Choose how workpack names appear in the app: by **Workpack Name**, **Abbreviation**, or a combination of both.

- **Sections Collapsed by Default**

  Use this toggle to control whether task groupings are collapsed by default. When enabled, task lists under each header will be collapsed initially; otherwise, all tasks will be expanded.

- **Save Captured Photos to Photo Library**

  Enable this option to automatically save photos taken in the app to your tablet's photo library.

- **Ad Hoc Tasks Colour** and **Ad Hoc Events Colour**

  Use these settings to assign colours for distinguishing ad hoc tasks and events in the task list view. By default, no colour is applied.

17.3.8.4 Sync

Under **SYNC**, you can manage and monitor data synchronisation between your device and the NEXUS IC database. It includes the following options:

- **Remove Completed Tasks During Sync**

  Enable this switch to automatically remove tasks from your device that are no longer available (either because you have completed them or they've been removed in NEXUS IC).

- **Upload Completed Tasks**

  Use this option to upload completed task data (events) to the NEXUS IC database. This is a one-way sync: it sends data to the server but does not retrieve new tasks.

- **Send Sync Log to Support**

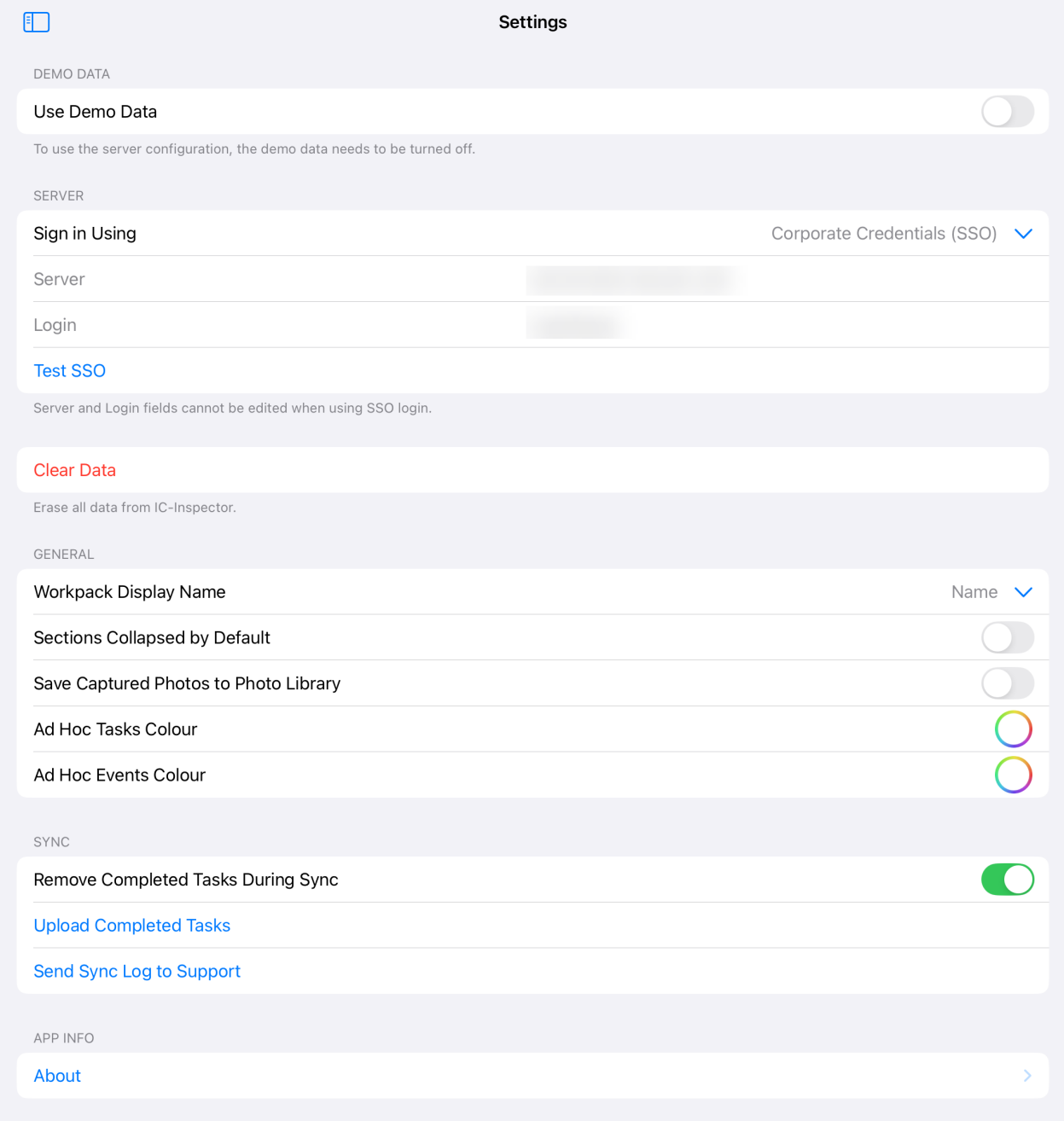
  If you encounter sync issues, use this option to send a sync log to NEXUS Support. It becomes available after a partial or full sync. You can also add comments before sending the log, which is recommended to help Support understand the issue. Once the log is sent, the option is disabled.

17.3.8.5 App Info

Under **APP INFO**, click **About** for the following options:

- View the current app version
- Navigate to IC-Web

- Access the documentation
- Check for available app updates



CHAPTER

EIGHTEEN

IC-RECORDER

IC-Recorder is a Digital Video Recorder software application capable of overlaying text onto video as it is recorded. It can accept video from a variety of sources (USB cameras, SD cameras, HD SDI cameras, etc) depending on the capture hardware available to the PC. A single IC-Recorder instance captures a single channel of video, but several IC-Recorder instances can be run on one PC, enabling multi-channel capture on a single PC.

18.1 Communication with IC-Inspection

IC-Recorder is designed to work seamlessly with *IC-Inspection* to deliver the most efficient offshore campaigns possible and the software is provided **free-of-charge** as a companion product to IC-Inspection. Contact us to request a copy.

IC-Recorder can be used as a standalone application but it works best in conjunction with *IC-Inspection*.

A connection to IC-Inspection is necessary for the following functionality:

- Synchronise stop/start recording across multiple video channels.
- Display survey and asset data on overlays.
- Capture images from IC-Inspection.

18.2 Prerequisites

Before you start using IC-Recorder, you must:

- Make the necessary installations (see *Deployment*)
- Set up a project location where video files will be stored and make other configurations as per your requirements (see *Configuration*)
- If you're using IC-Recorder together with IC-Inspection, set up IC-Recorder as a device in IC-Inspection (see *Add Video Devices*)

18.3 Using IC-Recorder

For information about how you can use IC-Recorder, see *Using IC-Recorder*.

See also

- *Deployment*
- *Configuration*
- *IC-Recorder Screen*
- *Using IC-Recorder*
- *IC-Inspection*

18.3.1 Deployment

IC-Recorder is a single-channel recording application. However, it is designed to allow several copies to run smoothly on one or more PCs for multi-channel recording scenarios.

When deploying IC-Recorder, you have two options:

- Deploy the software on existing DVR hardware.
- Obtain dedicated hardware specifically for video recording.

The type of hardware you require depends on the number of channels to be recorded and the required video resolution and frame rate (SD or HD). Use the information provided below to guide your selection.

For more information about offshore deployment of IC-Recorder together with IC-Inspection and NEXUS IC, see *Offshore Deployment*.

Warning

Disable "Automatically adjust clock for Daylight Saving Time" on DVR computers. IC-Recorder periodically syncs time with IC-Inspection but dead-reckons between updates. Sudden clock adjustments during operations can lead to issues. We strongly recommend that you avoid daylight saving adjustments.

18.3.1.1 PC-based Video Capture Devices

IC-Recorder supports a variety of video capture hardware, both internal and external. If a device supports "DirectShow," it is likely to work seamlessly with IC-Recorder. Below are some recommended options:

- **Startech S-Video Composite to USB Video Capture Cable (SVID2USB23)**
  - An external USB device suitable for laptops and any machine requiring single-channel recording.
  - Captures full analog resolution (720x576 for PAL).
  - Devices with a "2861" or "EM2861" chip or chipset are also compatible.
  - While not broadcast quality, image degradation happens anyway due to electrical noise and signal attenuation by the time the signal reaches the capture device, so the quality of the capture device becomes less critical.
  - We have encountered challenges when connecting multiple of these USB devices to a single machine, but using just one device has consistently worked well
- **Osprey Analog Series (e.g., 260e and 210e)**
  - Internal broadcast-quality cards.

  - Positive experiences with the 260e and its older sibling. The 100e model is likely suitable as well.
  - For multi-channel recording, consider the 4-channel 460e. Note, however, that there's a known PCIe bus issue: Windows infrequently allocates IRQs on the PCIe bus, resulting in frame drops for the 460e. To address this, navigate to *Options* → *Hardware* → *Properties* → *Device*, move the slider on the 'PCIe Bus Usage' section (up or down), and click **Apply**. After next reboot, the problem may recur though.

- **Blackmagic DeckLink Cards**

  Blackmagic offers suitable cards, but they may be more finicky to set up than Osprey devices and are less heavily tested with IC-Recorder.

- **Osprey HD Devices**

  For HD capture, Osprey provides both USB 3.0 devices and internal cards.

Note

If you need to edit recording profiles, install **Windows Media Encoder** and copy its **WmProEdt.exe** (usually located under C:\Program Files (x86)\Windows Media Components\Encoder) to IC-Recorder's Profiles folder (usually located under C:\Users\Public\Documents\IC-Recorder\Profiles).

18.3.1.1.1 Computing power

When using these video devices, the processing power of your PC plays a crucial role as video is converted into WMV format by the PC's own CPU. Thus, the CPU needs to be powerful enough to do the conversion work. Consider the following:

- For a single channel of HD video at 1080p25, your CPU should have a multi-CPU score of approximately 11,000 on Geekbench. If you're dealing with two channels, aim for twice that score (around 22,000). Doubling the frame rate (e.g., 1080p50) doubles the CPU requirements. An SD channel (with about one-fifth the pixels of 1080p25) needs roughly one-fifth the CPU power.
- If you're buying an Intel CPU, consider an LGA 2066 socket paired with an X299 chipset (as of 2018). The number of PCIe lanes required depends on the number of hard disks connected to the motherboard NVMe connectors. If you're using only one NVMe port, a 28-lane CPU should suffice. For multiple NVMe SSDs, more lanes may be advisable. Check your motherboard documentation to understand which PCIe card slots will be activated under different circumstances (often expressed as "×16/×0/×8/×0" or "×8/×0/×8/×8"). Keep in mind that as of 2018, AMD CPUs may offer better performance per dollar compared to Intel.
- Regarding capture cards, an Osprey 460e-equipped modern PC can handle recording up to 4 channels of SD video. For the Osprey 825e, expect it to handle 2 channels of HD video.

18.3.1.1.2 Hardware

When choosing PC hardware for video processing, consider the following factors:

- Ensure that your hardware provides an adequate number of **PCIe lanes**. These lanes are essential for various components, including capture cards, optional graphics cards, and RAID controllers. Keep in mind that SATA, M.2 drives, and other peripherals also consume PCIe lanes. After selecting a CPU, consult the motherboard documentation. If the CPU has a limited number of lanes (e.g., less than 44), not all PCIe slots may be active or may operate at reduced physical width.

- As of 2019, we recommend the X299 chipset as a suitable choice for video processing. High-end graphics cards are unnecessary; focus on how many monitors the graphics card can support simultaneously (referred to as "heads"). Some cards have more output connectors than they can drive concurrently. Consider the i7-7800X CPU for your setup.
- Avoid using RAID directly on the encoding machines. RAID introduces potential failure points and complicates troubleshooting. Instead, transfer video data off the encoding machines and onto a redundant storage system like a NAS.
- If you're using SSDs, ensure that their sustained write speed can handle the maximum video capture rate. Recording multiple HD channels may exceed the sustained write capabilities of certain SSDs. Mitigate this by installing several SSDs and distributing different channels across them. Spinning hard disks are also a viable option for video storage. Consider using a small SSD for the operating system, plus a hard disk for the video data.

18.3.1.2 Non-PC based Video Capture Devices

IC-Recorder also supports the Marshall VS-103E-3GSDI encoder. The Marshall encoder handles digital video conversion using its own hardware, bypassing the PC or laptop's CPU. Although its text overlay capabilities are slightly less robust, they remain perfectly adequate. This device captures either standard-definition composite analog video or HD digital video via SDI or HDMI (though not both simultaneously). When controlled by IC-Recorder, the Marshall Encoder records exclusively to AVI format.

18.3.1.2.1 Computing power

The Marshall device digitises and encodes video, significantly reducing the load on the PC or laptop. The PC's primary role becomes simple video decoding for viewing the video stream. In general terms, a single PC can control and preview up to 4 channels of video from 4 encoders.

18.3.1.2.2 Hardware

Whenever possible, use a Power over Ethernet (PoE)-capable Ethernet switch for your Marshall encoders. This eliminates the need for separate wall-wart power bricks for each unit. As long as the switch receives good-quality power, it minimizes power-related issues.

Remember that the limitations of SSD write speed described earlier also apply in this context.

18.3.1.2.3 Preview

When using a Marshall encoder in IC-Recorder, you can preview video complete with overlay. However, under certain circumstances, this preview may stutter or skip. It's important to note that this preview is separate from the recorded stream. Skipping during preview does **not** imply skipping in the final recorded video. To verify the actual recorded content, play back the recorded video.

If you want an accurate video reference, use VLC Player and connect to the following URL: rtsp://<IP address>/video1_audio1. Alternatively, connect a monitor directly to the Marshall encoder's HDMI Out port. Keep in mind that HDMI Out only provides pass-through video without text overlay.

18.3.1.3 Storage & Redundancy

IC-Recorder stores video in the location that you have configured. Ensure sufficient storage space for the recorded video. Implement robust security measures and backup strategies for video data. Note that there are no inherent archiving or backup routines within IC-Recorder. We recommend using network-based archiving utilities or PowerShell scripts to manage video data effectively.

Always prioritize hardware redundancy to ensure uninterrupted operation in case of hardware failures.

18.3.2 Configuration

Before you start using IC-Recorder, you must make a number of configurations:

- You make generic configurations for video recording and image capture under the *Tools → Options* menu option in IC-Recorder. For more information, see *Configuration Options*.
- You set up text overlays to be displayed on the videos. For more information, see *Set Up Text Overlays*.

18.3.2.1 Configuration Options

To make generic configurations for video recording and image capture, navigate to the *Tools → Options* menu option in IC-Recorder. This launches the **Options** dialog, where you can make settings on various tabs as described below.

18.3.2.1.1 Hardware

On the **Hardware** tab, you make settings related to the hardware used during recording.

In the **Input** field under **Source**, select one of the following options:

- *Video Hardware*
- *Still Camera*
- *Marshall Encoder*

The available fields on the tab depend on your selection in this field. See below for detailed information about each.

18.3.2.1.1.1 Video Hardware

Video Hardware can be any device that implements Microsoft's DirectShow interface. This includes nearly every video capture card, sound card, or USB capture device. A video hardware device begins recording when an inspection is started.

If you choose *Video Hardware* from the **Input** field, you can make settings in the following fields:

Field/Check Name	Description
Select Devices - Video	Select the device that you use for video capture. If you are running several IC-Recorders, you should choose a different video capture device for each. In general, you can't use one video capture device twice. Click the **Properties** button to make settings specific for the device. This opens a dialog provided by the hardware driver. Note that this dialog is not designed by us, and its appearance will vary based on your specific capture device. In some cases, certain device drivers may not offer a **Properties** dialog at all, resulting in no action when clicking.
Select Devices - Audio	Optionally, select the device that you use for audio capture. For the primary video channel, it's advisable to record audio. However, for other channels, you can consider not recording audio to prevent echo during multi-channel playback caused by slight synchronization differences. When in doubt, prioritize recording audio on the main video channel. Click the **Properties** button to make settings specific for the device. This opens a dialog provided by the hardware driver. Note that this dialog is not designed by us, and its appearance will vary based on your specific capture device. In some cases, certain device drivers may not offer a **Properties** dialog at all, resulting in no action when clicking.
Video Preview - Type	This option controls certain behaviours of the underlying Windows Media encoder. Its default setting, labelled as "Software - Most CPU for compression/Some CPU for Preview," is suitable for most scenarios. With this configuration, if your CPU lacks sufficient power, the preview may appear jerky, displaying only a few frames per second. However, the recorded video will still be smooth. If you encounter jerky preview, consider recording a test video with substantial movement and then play it back using Windows Media Player or another tool to assess its smoothness. Even if you experience no preview at all, perform a test recording and playback, as there are cases where the Windows Media encoder fails to deliver a preview but still records flawlessly.

18.3.2.1.1.2 Still Camera

Still Camera mode allows IC-Recorder to treat the camera device as a snapshot-taking device, rather than a video recorder. This means that if you start an inspection in IC-Inspection, the device will not begin recording immediately.

If you choose *Still Camera* from the **Input** field, you can select the relevant device from the **Camera** field. Click the **Properties** button to make settings specific for the device. This opens a dialog provided by the hardware driver. Note that this dialog is not designed by us, and its appearance will vary based on your specific capture device. In some cases, certain device drivers may not offer a **Properties** dialog at all, resulting in no action when clicking.

18.3.2.1.1.3 Marshall Encoder

The Marshall VS-103E Encoder is an external hardware device that takes a single video signal, converts it into a digital stream, and transmits it to IC-Recorder over an Ethernet connection. IC-Recorder then saves this stream to disk as a file. The key advantage of this setup is that it minimises CPU overhead on the computer running IC-Recorder, as most of the processing is handled by the Marshall Encoder. Additionally, the Marshall Encoder can overlay text onto the video feed under the direction of IC-Recorder.

If you choose *Marshall Encoder* from the **Input** field, you can set up Marshall Encoder as follows:

Field/Check Name	Description
IP Address	Specify the IP address of the Marshall Encoder.
Username	Enter the username that you set up in your Marshall Encoder.
Password	Enter the password that you set up in your Marshall Encoder.
Use Authentication	Enable this option to allow authentication.
Channel	Set the value to **1**.

The remaining fields on this tab are informational only.

Once you've made these adjustments, clicking **OK** displays a preview of the video feed from the Marshall Encoder.

18.3.2.1.2 Video Format

The **Format** tab allows you to configure video format settings. Note that this tab is not relevant if you've selected **Still Camera** mode on the **Hardware** tab.

If you've selected **Marshall Encoder** on the **Hardware** tab, there are no format options because the encoding is performed by the Marshall Encoder itself, not by IC-Recorder. When controlled by IC-Recorder, Marshall Encoder video recordings will always be in AVI format.

For system hardware (cards or USB devices directly connected to this PC), there are a variety of video format options to configure.

Under **Video Format**, select one of the following options:

- **AVI**
- **WMV**

Your choice determines the fields available on this tab. Think of this choice as an "envelope" for digital video. Just like a paper letter can be placed in different envelopes, digital video can be encoded with various codecs and then wrapped in different video format "envelopes" (such as AVI or WMV). When a computer plays back a video file, it first handles the envelope (format), and then processes the video streams within. If you're certain that the video will only be played back on Windows computers, WMV is a good choice because all Windows systems have pre-installed WMV support. However, support for other formats depends on the operating system version and the installed codecs. Installing a codec on a specific client computer may require cooperation from corporate IT.

> **Note**
>
> Whichever format you choose, during recording, IC-Recorder creates a file with a ".part" extension (for example, "video.part"). Once recording completes, the ".part" extension is removed, resulting in a final file (for example, video.wmv or video.avi). Configure backup processes to ignore ".part" files.

18.3.2.1.2.1 AVI

If you choose AVI, make settings as follows:

Field/Check Name	Description
Video Input - Resolution	Shows the default resolution of the video. If you click **Change** next to this field, you can configure "Capture Pin Properties". The term "Capture Pin" is specific to Windows Media and refers to a concept related to video capture. The options available for modification here may be restricted by the codec you are using. If possible, ensure that the device resolution and frame rate match the actual input from the device. Note that "Capture Pin Properties" is quite technical, and in most cases, you won't need to adjust or delve into these settings.
AVI Settings - Codec	For video files to be playable on a specific client computer, an appropriate codec must be installed on that machine. Therefore, selecting a widely supported codec is crucial. Next to the **Codec** field, you'll find an **Advanced** button. Clicking this button reveals the configuration dialog provided by the codec. Note that the appearance and functionality of this dialog will vary depending on the specific codec, and some codecs may not offer a configuration dialog at all.
Audio	Under **Audio**, you can find a number of fields that allow you to make settings for capturing audio during video recording.

18.3.2.1.2.2 WMV

If you choose WMV, make settings as follows:

Field/Check Name	Description
Video Input - Resolution	Shows the default resolution of the video. If you click **Change** next to this field, you can configure "Capture Pin Properties". The term "Capture Pin" is specific to Windows Media and refers to a concept related to video capture.
WMV Settings	You must select a profile, which defines encoding settings, including resolution, frame rate, and quality. Ensure that the incoming video resolution and frame rate match those specified in the chosen profile. If they match, a green message confirms the validity; if not, a red message indicates an invalid configuration. Adjust either the incoming resolution or the profile settings to achieve a match. Note that if the resolution does not match, you will not be able to record. IC-Recorder is shipped with a predefined set of profiles. Profiles are stored in the Profiles folder (usually located at C:UsersPublicDocumentsIC-RecorderProfiles). If you've installed Windows Media Encoder and copied **WmProEdt.exe** ((usually found in C:\Program Files (x86)\Windows Media Components\Encoder) to the Profiles folder, you can edit settings within a profile using the **Edit** button. You can also use the **Open Folder** button to access the Profiles folder conveniently, making it easier to copy profiles into the designated location.

Video Standards

See below for information about supported video standards:

- **Standard Definition (SD)** Video:
  - **NTSC** video operates at 60 interlaced fields (equivalent to 30 full frames) or 59.94 fields (approximately 29.97 frames) per second. Its vertical resolution is around 486 lines.
  - **PAL** video runs at 50 interlaced fields (25 full frames) per second, with a vertical resolution of 576 lines.

  - Analogue video lacks a fixed number of horizontal pixels, but common values during conversion to digital include 768, 720, and 704.
  - NTSC and PAL encode colour differently, so if you choose the wrong format, you may get black and white video.

- **High Definition (HD)** Video:
  - HD video has a minimum height of 720 pixels, with 1080 pixels being the most common resolution. The aspect ratio is typically 16:9 (e.g., 1280x720 or 1920x1080).
  - HD video can be either interlaced ("i") or progressive ("p").
  - Common frame rates include 25, 29.97, 30, 50, 59.94, or 60 fields per second. For instance, "1080p25" refers to a 1920x1080 pixel image delivered 25 times per second, while "1080i50" delivers 50 interlaced fields per second (equivalent to one full frame). So when using progressive video, it is fine for the final number to be half the size. Progressive video is generally preferred over interlaced video due to easier encoding and avoidance of artefacts like "combing."

SD video is typically delivered as analogue video, often using composite connections. HD video is commonly transmitted via SDI (Serial Digital Interface), a digital format. That is, SD usually isn't SDI. SDI intentionally uses the same cable types and connectors as analogue video, allowing TV studios to reuse existing infrastructure. However, mixing digital and analogue signals (for example, feeding a digital signal into an analogue capture device) will not result in successful video capture.

18.3.2.1.3 Project Location

On the **Project** tab, you specify the location of the created video files as well as the camera name as follows:

Field/Check Name	Description
Project Location	Determines where IC-Recorder saves video files as they are created. It's recommended to record video to a local drive rather than a network drive to avoid issues related to bandwidth, latency, and dropouts. The path that you set up here will be the generic recording folder. In NEXUS IC, you can also set up relative asset-specific recording subfolders, if necessary. For more information, see *Specify Project Path for Recording*. If you're running multiple IC-Recorders, you can specify the same recording folder for all IC-Recorders, in which case each recorder will have a different camera name to distinguish files. Alternatively, you can assign a different folder for each recorder (for example, "C:\Video\Port\", "C:\Video\Centre\"). Note that if two copies of IC-Recorder attempt to record the same filename at the same time (for example, "C:\Video\2018-01-01 120000 Digital Video.wmv"), one of them will fail.
Camera	Specifies the name that will be used in video files. It's a free-text field with some presets available. Note that if your IC-Recorder is controlled by IC-Inspection (which is the common use case), file names are determined by IC-Inspection. Therefore, configure the camera name in IC-Inspection, not here. For more information, see *Add Video Devices*.

18.3.2.1.4 Recording

The **Recording** tab allows you to configure various settings related to recording:

Field/Check Name	Description
Recording Settings	Allows you to select whether to include the video count in the video filename.
Filename Offset	You can select to automatically calculate the recording start time and include it in the filename.
Hard Disk Space	Allows you to set thresholds for when the system should trigger a warning or stop recording based on available disk space. By default, a warning triggers when there are 500 MB remaining, and recording stops when only 100 MB are left.
Borderless	When enabled, IC-Recorder hides its border, toolbars, etc., when you start recording. This can be useful if you want to maximise the amount of monitor space devoted to video. To revert, right-click the video area and deselect **Borderless Mode** in the pop-up menu or double-click within the video area.
Record Limits	Allows you to reduce the video to manageable "chunks" based on time or file size. For example, if you want files to stay below 2GB (to fit FAT32 file size limits), specify a time limit that ensures files remain within this size. Alternatively, use a File Size Limit.

18.3.2.1.5 Remote Access

On the **Remote** tab, you can specify settings for remote access of your recording device.

Field/Check Name	Description
Remote Access	You can specify a port to listen on (the default port is 4500).
Time Sync	Allows you to enable IC-Recorder to synchronise its time with IC-Inspection when connected.

18.3.2.1.6 Advanced

On the **Advanced** tab, you can make some advanced configurations for IC-Recorder.

Field/Check Name	Description
Show Overlay Text Shadow	When enabled, this feature adds a white border around dark text or a black border around light text in your overlay. This enhances text legibility when the underlying video colour is similar to the text colour. Note that enabling this option consumes slightly more CPU power. If your CPU usage is near 100% during recording, consider disabling this option.
JPEG Quality	This percentage value determines the image quality of JPEGs captured by IC-Recorder. Even if you manually capture a frame in IC-Recorder, it will always be in JPG format, regardless of the file type specified in IC-Inspection's frame capture settings.
Logging	You can set the logging level for debugging purposes. The higher the level, the more verbose the logging becomes. As a general practice, leave the logging level setting at its default unless directed otherwise by technical support. While more verbose logging can provide detailed information helpful for identifying and resolving bugs, overly verbose logging may slow down the system.

18.3.2.2 Set Up Text Overlays

If you use IC-Recorder to record video with text overlays, you have two options for configuring the text overlays:

- **Configuration in IC-Inspection**:

  You can set up text overlays in IC-Inspection by using the **Text Overlays** button on the **Devices** pane.

  If you're using IC-Recorder alongside IC-Inspection, we highly recommend setting up text overlays within IC-Inspection. This ensures consistency when using multiple recorders since you can use the same overlay on each recorder (except for channel name). When you configure the overlay in IC-Inspection, you only need to do it once, and the settings will be applied to all connected recorders. If IC-Recorder is currently disconnected, it will receive the configuration upon reconnection.

- **Configuration in IC-Recorder**:

  You can also set up text overlays in IC-Recorder using the **Edit Overlays** button from the main toolbar.

  We recommend using this option only if you're using IC-Recorder as a standalone device. If you use IC-Recorder alongside IC-Inspection, make the configurations in IC-Inspection to maintain uniformity across recorders.

18.3.2.2.1 Create a New Overlay

1. Start creating a new overlay in either of the following ways:
   - In IC-Inspection, choose **Text Overlays** from the toolbar of the **Devices** pane.
   - In IC-Recorder, choose **Edit Overlays** from the mail toolbar.
2. In the **Edit Overlays** dialog, choose **Add**.
3. In the **Edit Overlay** dialog, specify a name for the new overlay on the top of the **Configuration** screen area. Here you can also select a background colour for designing the text overlay. By default, the colour is black.

   > **Tip**
   >
   > Drag the window larger to make the black overlay region larger. It doesn't need to match the actual size of your video feed, but it's convenient for you if you drag it to approximately the same shape.

4. On the left-hand side of the screen, under the **Available Regions** section, ensure that you have all the fields that you want to include in your text overlay.
   - In **IC-Inspection**, you can add additional asset information fields by choosing the **Asset Information Fields** button on the top of the screen. Besides asset information, you can also see database fields, device information, survey fields, as well as static text or image elements that you can include. If a survey field you want is not shown in the list, ensure that the appropriate survey field is configured and has a value.
   - In **IC-Recorder**, you can see device information fields and static text or image elements that can be retrieved directly from IC-Recorder. Survey fields, database fields and asset information fields are all retrieved from IC-Inspection. You cannot add new asset information fields in IC-Recorder. If you want to add a new field, you have to do it in IC-Inspection.
5. Drag fields from the tree on the left onto the overlay layout region. Move them to the position where you want to see the fields on the recorded video screen.

   Any fields that you have dragged to the overlay layout region will appear in the list under the **Regions** section at the bottom of the screen.
6. Customise the appearance of the fields.

When add your first field, you may want to customise it (colour, font, size, etc.), because additional fields you add will inherit their settings from the previous field.

Once fields are on the overlay, you can configure them as follows:

- **Selection**: You can select fields by clicking them on the overlay or selecting them from the grid under **Regions**.

  You can also multiselect fields as follows:

  – On the overlay, you can "lasso" several fields by click-dragging a box around them or use the **Ctrl** key to select fields one after the other.

  – In the grid, you can use the **Ctrl** key or **Shift** key to select multiple rows.

- **Toolbar Buttons**: You can use the toolbar buttons at the top of the **Regions** screen area to perform actions on selected fields. You can nudge them, align them, change their font size, or delete them.

- **In-grid editing**: You can adjust settings specific to individual fields by **double-clicking** in the cell for the required field and parameter. You can make the following settings:

  – Specify a text for static texts and images

  – Add a prefix or suffix text, for example, a short prefix "E: " for Easting, etc.

  – Define offset values for field placement (percentage from the top and left side of the captured screen).

  – Specify font type, font size and font colour for the texts. Note that a 10-point font on a 576-pixel high SD video will fill about 1/57th of the height of the image, which may be suitable, however, it would be too small on a 1080-pixel high HD feed.

  – Select a background colour for the field. By default, no background colour is applied (transparent). This conceals less of the video, but may be less clear on certain video colours. Consider enabling the **Show Overlay Text Shadow** option under *Tools* → *Options* → *Advanced* (see *Advanced*) for better legibility with transparent-background fields. This option consumes additional CPU power, so if your CPU is near 100% during recording, disable this option.

If you add an "Image" region, a file dialog will appear immediately. If you choose a .PNG file, its transparency will be honoured. If the PNG has partial or full transparency, you'll see the video through the image. You can add multiple image regions if needed.

> **Note**
>
> If you're using a Marshall Encoder rather than a system hardware, some overlay configuration options are ignored because the Marshall Encoder does not support them. Text, prefix, suffix, source, top, left, font size, and font color are supported, but font choice (for example, Courier, Arial) is not. Additionally, the Marshall Encoder supports a maximum of 16 overlaid fields.

7. Choose **OK** to save your changes and exit the dialog or **Apply** to save your changes and keep the dialog open.

   After confirming your settings and closing the chain of dialogs, you'll see real-time updates of survey values on your recorders.

18.3.2.2.2 Edit Overlays

You can edit overlays only within the application where they were originally created. That is, in IC-Inspection, you can edit overlays created in IC-Inspection, in IC-Recorder, you can only edit overlays created in IC-Recorder.

1. Start editing an overlay in either of the following ways:

   - In IC-Inspection, choose **Text Overlays** from the toolbar of the **Devices** pane.

- In IC-Recorder, choose **Edit Overlays** from the mail toolbar.

2. In the **Edit Overlays** dialog, choose **Edit**.
3. Make your changes as required. For more information about the configuration options, see ic-inspection.devices.text_overlay.create above.
4. Choose **OK** to save your changes and exit the dialog or **Apply** to save your changes and keep the dialog open.

18.3.3 IC-Recorder Screen

The IC-Recorder screen is made up of the following main elements:

18.3.3.1 Main Menu

From the main menu of IC-Recorder, you can access the following options:

Menu Option	Description
File → Change Project Location	Allows you to change the folder where the recorded video files are stored. You specify the default location under *Tools → Options → Project*. If you want to change this location for a specific recording before starting the inspection, you can go to *File → Change Project Location* and select the folder from the file explorer window.
File → Open Project Location	Launches the file explorer where you can view the folder where the recorded video files are stored.
File → Open Video	Allows you to select a video file from the file explorer and play it in IC-Recorder.
File → Show/Hide Status Bar	Shows or hides the status bar from the bottom of the IC-Recorder screen.
File → Exit	Closes the IC-Recorder application.
View → Captured Videos	Select to display or deselect to hide the **Captured Videos** pane on the IC-Recorder screen.
View → Captured Images	Select to display or deselect to hide the **Captured Images** pane on the IC-Recorder screen.
View → Borderless	If you select this option, IC-Recorder will hide its border, toolbars, and other elements when you start recording (either by clicking the **Record** button or by initiating an inspection in IC-Inspection). This feature can be useful if you want to maximize the monitor space dedicated to video. To revert to the default view, simply right-click on the video area and deselect 'Borderless Mode' in the context menu, or double-click within the video area.
View → Log File	Allows you to open the trace log file, which shows a technical log of changes made in the current session. This can be useful for debugging purposes.
Tools → Options	Allows you to set up and customise IC-Recorder as per your requirements. For more information see *Configuration*.
Help	You can access the online help documentation, the official NEXUS website, or contact support from this menu option.

18.3.3.2 Panes

There are three main panes available on the screen of IC-Recorder:

- **Captured Video** pane: Shows all the video files that have been recorded in the current session. From this pane, you can play these videos or open the file location where they are stored.
- Main recording pane: Allows you to view and manage the video files that are recorded by IC-Recorder.

- **Captured Images** pane: Shows all the images that have been captured in the current session. From this pane, you can launch these image files in the default image viewer or open the file location where they are stored.

18.3.3.3 Main Toolbar

The toolbar on the main recording pane contains the following options:

Menu Option	Description
Record	Starts recording video directly from IC-Recorder. **Note** Use this option only if you use IC-Recorder as a standalone application. If you use IC-Recorder together with IC-Inspection, we recommend that you start video recording by initiating an inspection from within IC-Inspection. This will trigger video recording in IC-Recorder.
Stop	Stops the recording of video. **Note** Use this option only if you started video recording from IC-Recorder. If you started recording from IC-Inspection, stop the inspection within IC-Inspection, which stops video recording in IC-Recorder as well.
Frame	Captures an instant image of what you can currently see in the recording pane.
Overlay	Allows you to select the text overlay option to be applied for the current video. These available text overlays are set up either in IC-Inspection (see *Set Up Text Overlays*) or in IC-Recorder (see *Set Up Text Overlays*).
Refresh	Allows you to refresh the video stream or image in the current pane.
Edit Overlays	Allows you to configure text overlays. For more information, see *Set Up Text Overlays*.
Time Source	If set to *System Time*, the date and time field visible to the right of this button shows the current time according to this PC's clock. If set to *IC-Inspection Time*, it shows time from IC-Inspection.
ROV	If you use multiple ROVs during inspection, you can select the ROV from this menu to display the relevant video channel.

18.3.3.4 Status Bar

The status bar at the bottom of the IC-Recorder screen shows the following:

- Whether IC-Inspection is connected
- The port that you are connected to
- The status of video recording
- The path to the project location folder where the recorded videos will be stored. You can click this path to open the folder or change the project location.
- The resolution of the video
- The available HD space
- Software Version

You can hide the status bar from the **View** menu option.

18.3.4 Using IC-Recorder

In IC-Recorder, you can perform the following activities:

- Record videos (see *Record Video*)
- Capture images (see *Capture Images*)

18.3.4.1 Record Video

The main function of IC-Recorder is recording video during an inspection campaign.

When you launch IC-Recorder, if the default TCP port (4500) is unavailable, IC-Recorder will sequentially 'probe' higher port numbers (such as 4501, 4502, and so on) to find an available port. This allows you to run multiple instances of IC-Recorder, each using a different port. IC-Recorder loads a settings file based on the discovered port number, enabling using different capture hardware and output recording folders for each IC-Recorder.

The typical scenario involves having several capture devices on a single PC or a multi-channel capture device. In such cases, you can run multiple copies of IC-Recorder on that PC. For instance, in the first IC-Recorder instance, select the first capture device (or the initial channel on your multi-channel device), and repeat this process for additional instances.

18.3.4.1.1 Prerequisites

To be able to record video, you must ensure the following:

- You have set up a project location where video files will be stored and made other configurations as required. For more information, see *Configuration*.
- If you're using IC-Recorder together with IC-Inspection, you must have set up IC-Recorder as a device in IC-Inspection. For more information, see *Add Video Devices*.

18.3.4.1.2 Video Recording

1. Start video recording in one of the following ways:
   - If you're using IC-Recorder as a standalone device, simply click the **Record** toolbar button in the main recording pane of IC-Recorder.
   - If you're using IC-Recorder alongside IC-Inspection, initiate an inspection in IC-Inspection by clicking **Start**. This action will automatically trigger IC-Recorder to start video recording.

   > **Note**
   >
   > If you use IC-Recorder with IC-Inspection, we strongly recommend that you start video recording by starting the inspection in IC-Inspection. This not only initiates video recording but also begins survey data logging.

2. During video recording, you can see the video in the main recording pane of IC-Recording and perform video commentary, capture images or create events in IC-Inspection as required. For more information, see *Online Inspection*.
3. When you've completed online data capture, stop the recording in either of the following ways:
   - If you've started video recording directly in IC-Recorder, click the **Stop** toolbar button in the main recording pane of IC-Recorder.
   - If you've started video recording by initiating an inspection from IC-Inspection, click **Stop** from the main toolbar of the IC-Inspection screen to stop the inspection. This action will automatically stop the recording in IC-Recorder.

4. Once you've stopped video recording, the recorded video file will be stored under the project location that you've configured. You can also see the captured video file in the **Captured Video** pane of IC-Recorder.

   When IC-Inspection communicates with IC-Recorder, it sends the timestamp, which IC-Recorder uses to create a filename for the recording. Throughout the recording process, this filename remains in use. After recording completes, IC-Recorder checks for any time discrepancy between when it generated the video file and actual recording starting. If a difference exists, IC-Recorder adjusts the filename accordingly — usually by just one second, depending on machine load.

   Caution

   During an inspection campaign, if Windows automatically switches to daylight saving time, it can potentially lead to confusingly named video files. For example, at the beginning of daylight saving in spring, your video recordings may appear to have a one-hour gap when, in reality, there was none. This discrepancy occurs because your PC clocks have moved forward by one hour. Similarly, during autumn/fall, video files might seem to be recorded at the same time as videos actually recorded an hour earlier. This happens because clocks have fallen back by an hour.

   For this reason, we recommend disabling automatic daylight saving adjustment on PCs running IC-Inspection or IC-Recorder. This also applies to any third-party systems that supply time via a survey string. Set your timezone at the start of any inspection campaign and remain consistent throughout.

18.3.4.2 Capture Images

You can capture a snapshot from a video at any time during video recording.

You can capture images during video recording in the following ways:

- In IC-recorder, you can click the **Frame** toolbar button in the main recording pane. The captured image file will be stored under the same project location that you've configured for video files. You can also see the captured images in the **Captured Images** pane of IC-Recorder.
- In IC-Inspection, you can capture an image when you're creating an event in the **Active Events** pane of IC-Inspection. For more information, see *Attach Multimedia to Event*.

CHAPTER

NINETEEN

IC-WEB

19.1 Technical Specifics

Due to the technical differences between IC-Web and NEXUS IC, some features work differently and are specific to IC-Web.

These differences are listed below:

- After 1 hour of inactivity, your IC-Web session will automatically log you out. Additionally, if there is 10 minutes (by default) of inactivity across the entire web server, you will also be logged out. If this occurs, the next time you attempt to click on a new item or access non-cached information using IC-Web, you will receive a message indicating that you have been logged out and will be redirected to the login page.
- A variety of tabs, panels, and pop-ups will briefly display a 'Loading' indicator when selected.
- A variety of forms (for example, Asset Information Groups) in NEXUS IC allow in-place editing. In IC-Web, you will instead see an **Edit** button, which will pop up a modal form for you to do the editing in. This ensures that when you complete editing, IC-Web can immediately commit your changes to the REST service.
- In some areas, when creating or editing a new item, IC-Web will implement the changes but the changes will not immediately become visible. A banner proposing a refresh will appear and allow the user to refresh the page via hyperlink.
- When another user changes data, NEXUS IC will automatically prompt you to refresh the information on your screen with the latest version. IC-Web, however, does not automatically detect that the current on-screen data is outdated. To ensure you have the most up-to-date information, re-select an item in IC-Web (that is, select another item and then return to the previous item).
- Reports and imports in IC-Web (a SaaS-only feature) create jobs that are processed on the server. Any import or report you generate during your session will be available from the notification bar that appears at the bottom of the screen. However, once this bar is dismissed, you will no longer be able to access the results through IC-Web. Note that reports set to be emailed will still be sent upon successful completion of the job, regardless of whether the notification bar is dismissed.

19.2 User Interface Features

Even though the user interface (UI) of IC-Web is similar to that of NEXUS IC, there are some differences to consider. Refer to the documentation below for information about these differences and some UI features specific to IC-Web.

19.2.1 Basic Differences

- IC-Web pop-up "windows" are not actual windows, and cannot be moved outside the bounds of the web browser.
- On the **ASSETS** screen, the options for adding, editing, and removing assets are slightly limited. There is no option to add a linked asset (with children) or to edit asset type properties.

- IC-Web displays version information at the top right instead of the bottom right. Other NEXUS IC status bar fields are not applicable to IC-Web and are not shown.
- Some data entry controls, such as date/time pickers, will look and work slightly differently in IC-Web.
- Shortcuts cannot be manually run from IC-Web, so the **Shortcuts** toolbar button is not available in IC-Web.
- The **History** button on forms is not available.
- The **Connections** toolbar button is not available.
- The *Forward* and *Backward* toolbar buttons on the **Asset Information** tab of the **ASSETS** and **INSPECTION** screen are not available.
- Unlike in NEXUS IC, the location of panes on the screen cannot be changed (except for the **Event Details** pane on the **INSPECTION** screen), but they can be resized.
- On the **Children** tab, the full location of assets is displayed, as opposed to the relative location shown in NEXUS IC.
- When you generate a report or import in IC-Web, a notification bar appears at the bottom of the screen showing the job details. Note, however, that if you reload the page, this bar will disappear. You can check all the basic job details though from the *IC-Web* → *Jobs* menu option.

19.2.2 Main Menu

The available options under the main menu of IC-Web are different as compared to NEXUS-IC. For IC-Web, you can perform the following actions from the **IC-Web** menu:

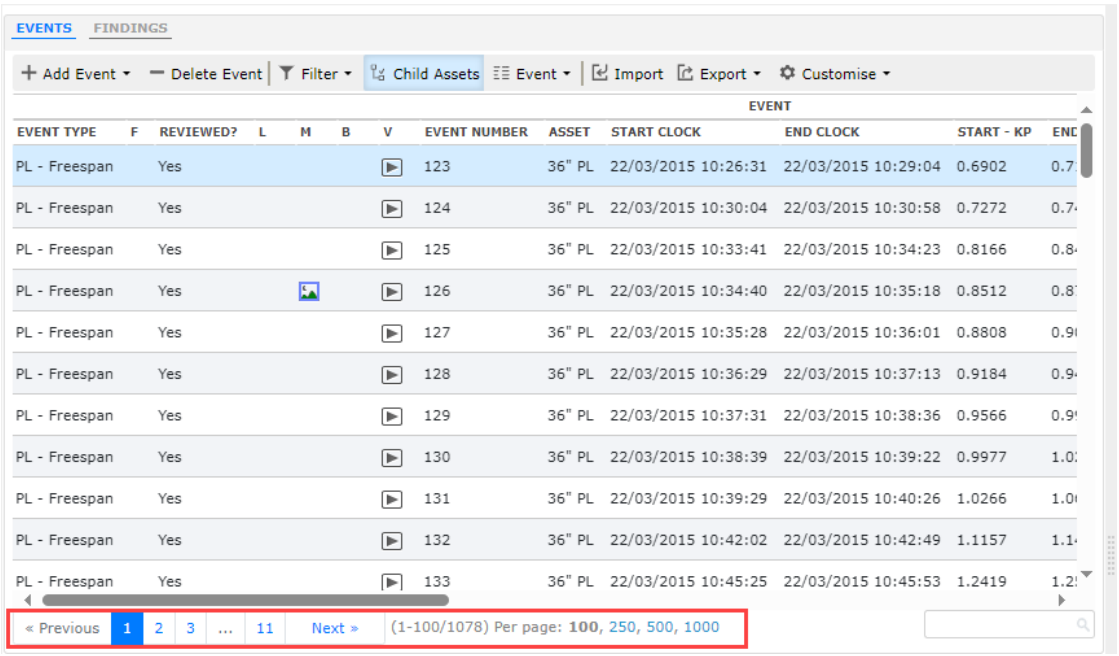
- Under the **Your Profile…** option, you can view or change your own user account details or specify your favourite reports similarly to the *Database* → *Your Profile…* option in NEXUS IC (see *Your Profile*). Note that the **Settings** tab is not available in IC-Web.
- You can view your job details or dismiss them from the **Jobs** menu option.
- Under **Date and Time Format Options**, you can change the date and time settings.
- Under **Reset All Local Settings**, you can reset all your local user settings including the currently selected view, selected rows, expanded trees, open tabs, and reset them to default.
- You can log out of the IC-Web session using the **Logout** option.

Additionally, you can access the online help documentation or information about IC-Web from the **Help** menu.

19.2.3 Grid Pagination

IC-Web paginates grids across multiple pages when there are a large number of rows.

By default, IC-Web grids display 100 rows per page. If the grid contains more rows, they will be spread across multiple pages. The pagination UI element includes **Previous** and **Next** buttons, as well as options to navigate to the first and last pages.



> **Note**
>
> The pagination functionality refers to the new type of grid format. Since grid styles are being changed over from the previous format, IC-Web grid pagination will not apply to all grids in IC-Web.

19.2.4 Multiple Column Sorting

IC-Web grids can be sorted by multiple columns at once. Sorting the grid is performed by clicking a column header and toggling between ascending (arrow up) and descending (arrow down). Grids can be sorted by multiple columns by selecting an initial column, followed by holding down the CTRL key and selecting a second column. This will sort the grid by the first column, then sort by the second column.

The grid sorting should persist locally and can be cleared via the *customise* > *reset to default* option.

19.2.5 INSPECTION Screen Layout

You can view the **INSPECTION** screen in IC-Web using the following two layouts:

- *Default* view: Contains the **Events Details** pane in the middle.
- *Alternate* view: Contains the **Events Details** pane on the right.

You can choose the layout from the drop-down menu of the *Layout* toolbar button on the **INSPECTION** screen.

19.3 Importing and Exporting in IC-Web

The import and export functionality in IC-Web is similar to that of NEXUS IC (see *Import* and *Export*).

However, some features may work differently in IC-Web:

19.3.1 Importing

- Importing using IC-Web is only available for Wood-hosted clients and the logged-in user will require an IC-Web Read/Write license to perform imports.
- IC-Web does not support Excel file formatted import sheets. You will need to convert your import file to *csv* / *tsv* / *txt*. If your import includes external files (for example, event multimedia files or library items), then you must *zip* your import sheet and files first. When you choose the *zip* file, the IC-Web Import Wizard will extract the contents, and confirm the contents with you before proceeding.
- When attempting to upload a zip file larger than 500MB, you will receive a warning that it may fail.

19.3.2 Exporting

- In IC-Web, exporting only provides a summary export. If you have multiple pages in the grid, it will only export items from the currently selected page.
- IC-Web editing grids support exporting to CSV with grouping enabled. Editing grids are any grid that appears after clicking add or edit on a row. In these grids, export to email is not available.

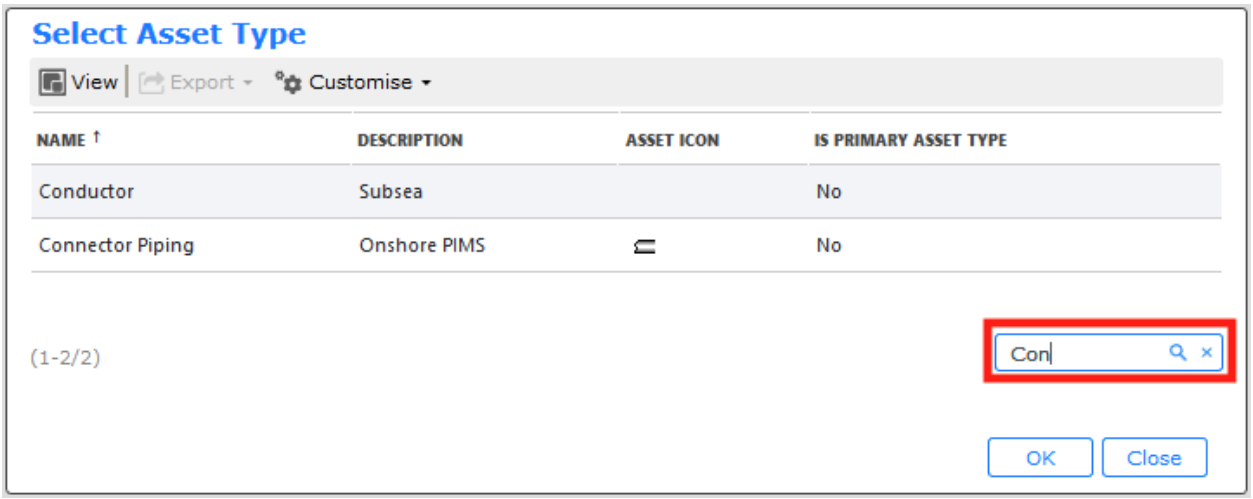
19.4 Searching in IC-Web

In IC-Web, the *Search* box is located above the asset tree (as opposed to the top right in NEXUS IC). This search function searches only asset names (see *Searching in Different Solutions*).

19.4.1 Grid Search

Some IC-Web grids are now searchable.

Grids can be searched when a search bar is present to the bottom right of the grid. To run a each query, enter three or more characters into the search bar, then click or press Enter. To cancel the search, click next to search or press ESC.



19.5 Navigating and Sharing via URL

In IC-Web, URLs can be used to navigate directly to specific areas of the application or to share links to selected items with other users.

19.5.1 Navigating via URL

IC-Web supports navigation to specific sections and page elements using URL parameters. These parameters direct the browser to a particular database entry via a GET request.

The parameter `searchKey` identifies the database table, while `searchValue` specifies the numeric ID of the selected item within that table.

The available inputs are shown below.

<table> value	<value> meaning
Asset	VN_ID
Library	Library_ID
Planning	VN_ID
Workpack	Workpack_ID
Review	Header_ID
Anomaly	Anomaly_ID

These parameters can be appended to the IC-Web URL as follows:

```
https://demo.nexusic.com/?searchKey=<table>&searchValue=<value>
```

Example

Using the *Expert Systems* database, the following URL navigates to the *Gas Transmission* asset:

```
https://demo.nexusic.com/?searchKey=Asset&searchValue=2638
```

> **Note**
>
> For Asset, Planning, and Review items, if the component exists in multiple views, one of the available views is selected automatically.

19.5.1.1 Navigating to a Specific Dashboard

You can also navigate directly to a specific asset dashboard by including the `tab` and `dashboardId` parameters.

For example, if a Report Template has the ID `325`, the following URL opens that dashboard for the *Gas Transmission* asset in the *Expert Systems* database:

```
https://demo.nexusic.com/?searchKey=Asset&searchValue=2638&tab=Dashboard&dashboardId=325
```

19.5.2 Sharing via URL

IC-Web assets, library items, workpacks, events, anomalies, dashboards, and items on the **PLANNING** screen can be shared using a URL.

To generate a shareable link:

1. Select the row you want to share on the relevant page.

2. From the toolbar, choose *Navigation Link → Copy to Clipboard*.

You can then share this link as needed. When opened, the recipient is directed to the selected page and item in IC-Web.

19.6 Drawings in IC-Web

In IC-Web, some features related to drawings work differently as compared to NEXUS IC.

19.6.1 3D CAD Drawings

In IC-Web, 3D drawings are supported via a conversion process. To convert the drawing, follow the steps below:

1. Prepare the 3D CAD drawing in AutoCAD and ensure that you have set up any required tags for navigation as described in *3D Drawing Preparation in Autocad*.
2. Send the drawing to NEXUS support.
3. NEXUS support converts your CAD file to DAE, a 3D format that works well in web browsers and which is understood by IC-Web.
4. You (or NEXUS support) can then load that file into your NEXUS library as a drawing on the same asset in the same Library Category group as your original CAD drawing.
5. NEXUS IC lists both files in the drawing panel but only the CAD files render in 3D; DAE is an unsupported drawing format for NEXUS IC. IC-Web, however, displays the DAE file as a 3D scene.

In IC-Web, you can use your mouse for 3D drawings as follows:

Action	Mouse
Rotate	Hold left mouse button and drag
Pan	Hold right mouse button and drag
Zoom	Use mouse wheel or hold middle mouse button and move up/down

IC-Web is a web-based version of NEXUS IC, running in Chrome, Edge, Safari or Firefox. It aims to replicate the functionality of NEXUS IC in a web browser, using JavaScript and REST, with the exception of *Configuration*, which is available only from NEXUS IC.

IC-Web addresses the following main two use cases:

- Read-only access for a large number of users
- Read/Write access for a smaller number of users with an IC-Web read/write *license*

19.7 Prerequisites

Before using IC-Web, ensure the following:

- Your organisation has an IC-Web license. Contact support@nexusic.com for details.
- You have deployed IC-Web as described in *IC-Web Deployment* or you are hosting the IC-Web server in Wood infrastructure. See *Software as a Service (SaaS)* for Wood hosting details.
- You have logged in to IC-Web as described in *SaaS Login*.

19.8 Features

Mostly, IC-Web has the same features as NEXUS IC. However, there are a variety of differences related to the different implementation challenges in JavaScript/REST versus Windows/SQL. Recent changes in NEXUS IC may not yet be reflected in IC-Web, and vice versa. For detailed information about the main features of IC-Web, see the documentation of NEXUS IC (*NEXUS IC Overview*).

> **Note**
>
> Some features in IC-Web are only available in Software as a Service (SaaS) deployments. For more information, see *NEXUS Feature Matrix*.

> **Warning**
>
> When using IC-Web v6.9 for the first time after upgrading from IC-Web v6.8 or lower, your local user settings will be automatically deleted for compatibility reasons.

The following sections describe the features that are specific to IC-Web and different from NEXUS-IC:

- *Technical Specifics*
- *User Interface Features*
- *Importing and Exporting in IC-Web*
- *Searching in IC-Web*
- *Navigating and Sharing via URL*
- *Drawings in IC-Web*

CHAPTER

TWENTY

DATA CONNECTORS

NEXUS offers a robust REST API library designed to facilitate seamless connection to external data sources. Using external connectors provided by Wood, organisations can efficiently integrate their systems, ensuring smooth data exchange and enhanced operational workflows.

20.1 External System Connectivity

NEXUS IC provides a diverse range of external data connectors, each tailored to connect with specific types of external systems. These connectors enable integration with the following types of external data sources:

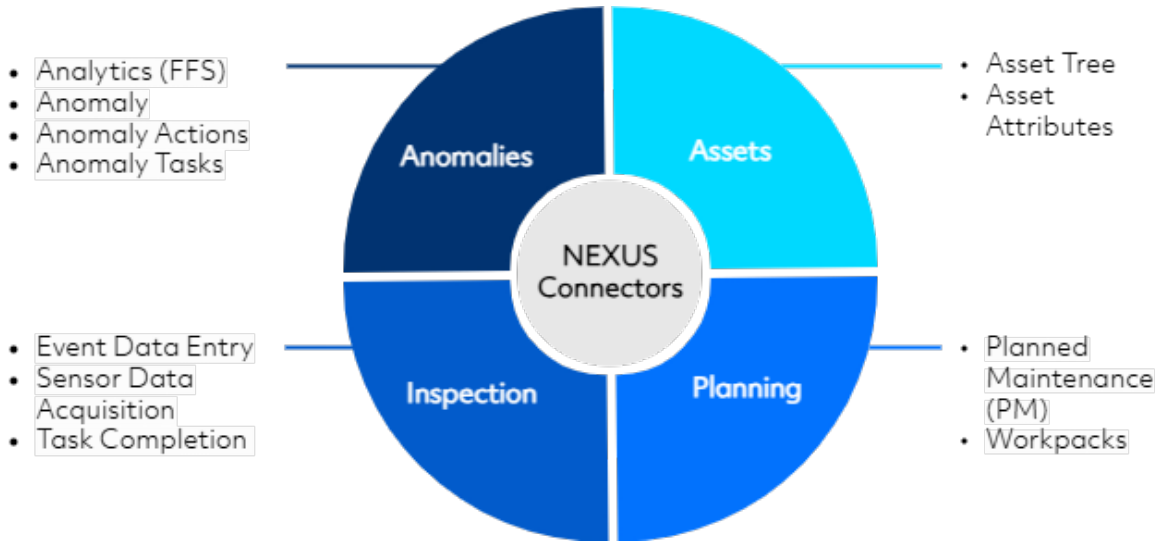
- **Computerised Maintenance Management Systems (CMMS)**, such as SAP, Maximo, Oracle
- **Digital Twins**, for example, Open Wells, Wellview, EDM
- **Digital Data Collection** (tablets, import data)
- **Data Lakes**, for example, sensors, sampling, historians
- **Electronic Document Management Systems (EDMS)**
- **Visualisation Tools**, such as GIS
- **Dashboards** (Power BI, Spotfire, Tableau)
- **Calculation Engines** (FEA Engines, FFS Analysis, ECE)

20.2 Data Connector Types

NEXUS supports a flexible integration model, allowing data connectors to be aligned with specific stages of the asset integrity management lifecycle. Each stage can be associated with connectors designed to handle particular data types, enabling targeted and efficient data exchange with external systems.

The diagram below illustrates the main workflow stages and examples of data connector types that can be integrated at each point:

These connectors are intended to support the flow of structured data between NEXUS and external platforms, enhancing the precision and efficiency of asset integrity processes.



For further details on connector design and implementation, refer to the relevant documentation sections.

20.3 Accessing Data Connectors

NEXUS data connectors are available as **subscription-based services**. Developed and maintained by Wood, each connector is part of an off-the-shelf framework that can be tailored to fit client-specific systems and workflows.

Wood handles the **setup, configuration, and ongoing support**, ensuring smooth integration with minimal effort from the client. Connectors can be deployed in the cloud or on-premises, depending on operational needs.

For more information or to request a connector, contact your Wood representative.

20.4 Integration Models and Data Sources

NEXUS data connectors can be deployed using different integration models to suit client infrastructure, security and regulatory requirements. These models define how connectors are hosted, how data is transferred and which types of external data sources can be supported across **Software as a Service (SaaS)**, **on-premises** and **hybrid** deployments.

For more information, see *Integration Models and Data Sources*.

20.5 Connector Data Process Flow

As data moves through a NEXUS connector, it passes through a defined sequence of processing stages. These stages govern how data is acquired, validated, structured and submitted into NEXUS, ensuring consistency and integrity across all integration models.

For more information, see *Connector Data Process Flow*.

20.5.1 Integration Models and Data Sources

NEXUS supports three integration models which define how connectors operate and how data is transferred between external systems and NEXUS.

- **SaaS** (Software as a Service)

These connectors are hosted within the Wood PLC cloud. They communicate over the REST protocol using HTTPS, either receiving data from client systems in real time or pulling data from client data sources on a scheduled basis. For more information, see *SaaS Integration Model*.

- **On-premises**

  These connectors are typically deployed within the client's own infrastructure. They usually run as Windows services which pull data from client systems at agreed intervals and push the data into the client's NEXUS instance. For more information, see *On-premises Integration Model*.

- **Hybrid**

  This model consists of two components. SaaS connectors are deployed to receive data, while an on-premises installed component is configured as an agent rather than a full connector. This agent pulls data from the client's on-premises sources and securely forwards it to the SaaS connectors where the client's NEXUS instance resides. For more information, see *Hybrid Integration Model*.

20.5.1.1 Data Sources and Connector Compatibility

The table summarises supported data source types and their compatibility with each integration model:

Data source type	SaaS	On-premises	Hybrid
REST API (client sending data)	**Yes**	No	No
REST API (pulling data from external source)	**Yes**	**Yes**	**Yes**
ODBC SQL source	**Yes**	**Yes**	**Yes**
ODBC Oracle source	**Yes**	**Yes**	**Yes**
NTFS JSON file	No	**Yes**	**Yes**
NEXUS IC-WEB	**Yes**	**Yes**	**Yes**
SharePoint folder	**Yes**	No	No
Azure Blob Storage	**Yes**	No	No

20.5.1.1.1 SaaS Integration Model

The Software as a Service (SaaS) integration model uses NEXUS SaaS connectors to expose a web-based REST interface over Hypertext Transfer Protocol Secure (HTTPS), secured with Transport Layer Security (TLS). This interface enables client systems to integrate with NEXUS either on demand or through scheduled execution.

The SaaS connectors support both client-driven data submission and cloud-initiated data retrieval from client systems.

20.5.1.1.1.1 Connector Behaviour

Typically, a dedicated portion of the Microsoft Azure cloud infrastructure is provisioned to host the NEXUS SaaS connectors alongside the NEXUS platform.

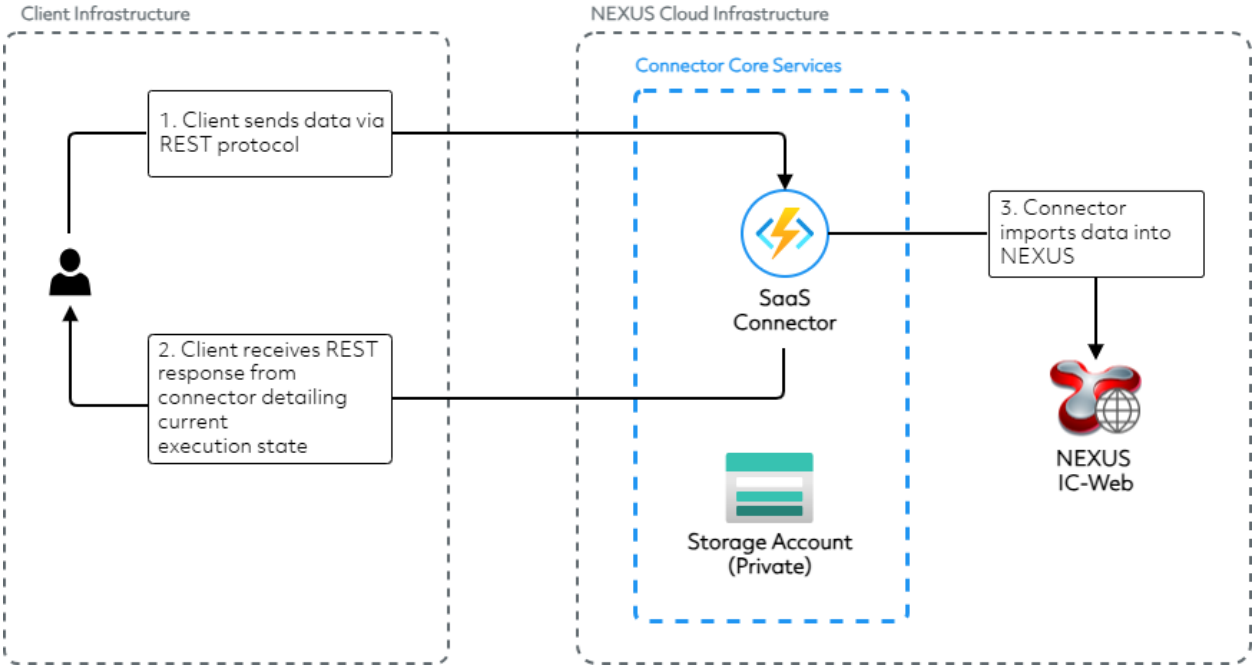
Once deployed, clients are provided with REST application programming interface (API) documentation describing the available endpoints and their purpose. These endpoints enable data to be ingested into NEXUS through the SaaS connectors using one of two approaches:

- **Client-driven execution**, where client systems call the REST API endpoints and submit data payloads.
- **Scheduled execution**, where the SaaS connector runs at defined intervals and retrieves data from client systems by pulling from their data sources and executing the workload in the cloud.

20.5.1.1.1.2 Deployment Topologies

20.5.1.1.1.3 1. Client-driven REST cloud deployment

This topology is used when the client initiates execution of the SaaS connector through REST API calls. The following diagram shows an example of a typical setup:

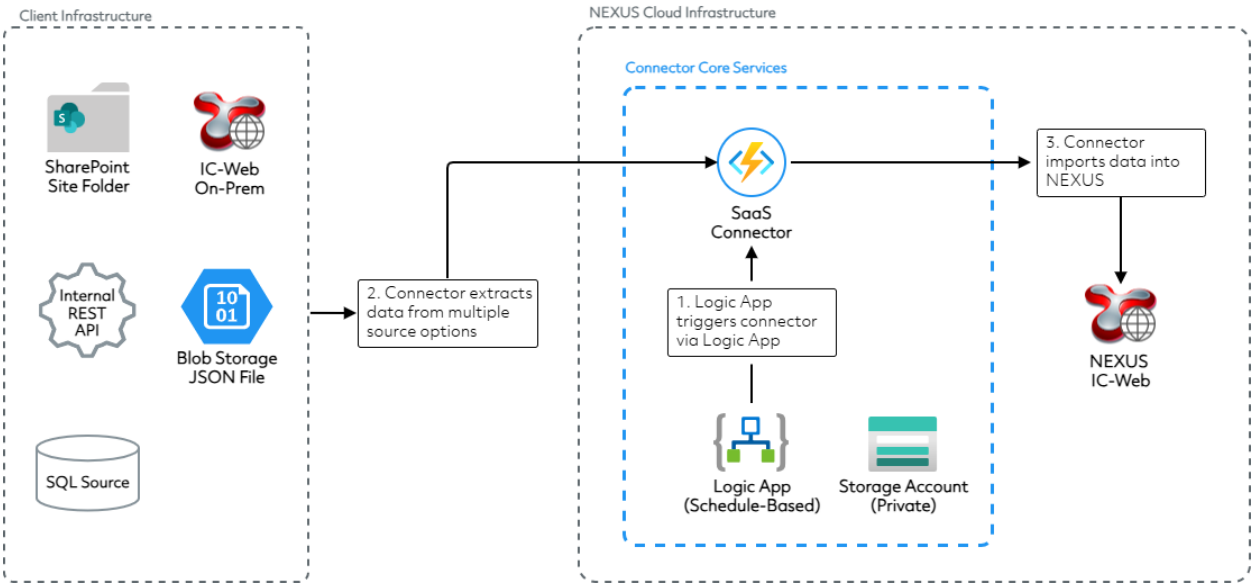


20.5.1.1.1.4 Execution flow

1. The client sends an authorised REST request containing a JSON payload to the connector. The request includes an identifier that tells the connector which execution flow to use.
2. The connector returns a result payload describing the execution state of the flow. This enables the client system to poll the execution state and outcome of the flow.
3. The connector executes the specified data flow using the supplied payload and submits valid data to the NEXUS IC-Web interface.

20.5.1.1.1.5 2. Logic App-driven cloud deployment

This topology is used when execution is initiated by a cloud-based scheduler, such as an Azure Logic App. The following diagram shows an example of a typical setup:



20.5.1.1.1.6 Execution flow

1. The Logic App triggers based on a schedule expression, such as a Cron expression, and invokes the SaaS connector over REST, passing only the connector identifier or flow identifier.
2. The connector starts the configured flow and determines, from the flow configuration, the method to obtain the required source data.
3. The connector processes the retrieved source data and submits valid data to the NEXUS IC-Web interface.

20.5.1.1.1.7 Security Considerations

- All REST API traffic between connectors and data sources is:
  a. Encrypted over HTTPS using TLS, with a minimum cipher suite of TLS_RSA_WITH_AES_128_CBC_SHA.
  b. Requires a credential artefact known as a function key, which supports immediate value rotations at a clients' request.
- All inbound and outbound traffic involving on-premises connectors in a hybrid-cloud configuration follows the same security controls described above.

20.5.1.1.2 On-premises Integration Model

The on-premises integration model is designed for clients who do not want data or traffic to leave their network, who must comply with legislation or regulatory requirements in their country of operation or industry.

In this model, connectors run within the client's infrastructure and transfer data into the client's NEXUS instance using the NEXUS IC-Web interface.

20.5.1.1.2.1 Connector Behaviour

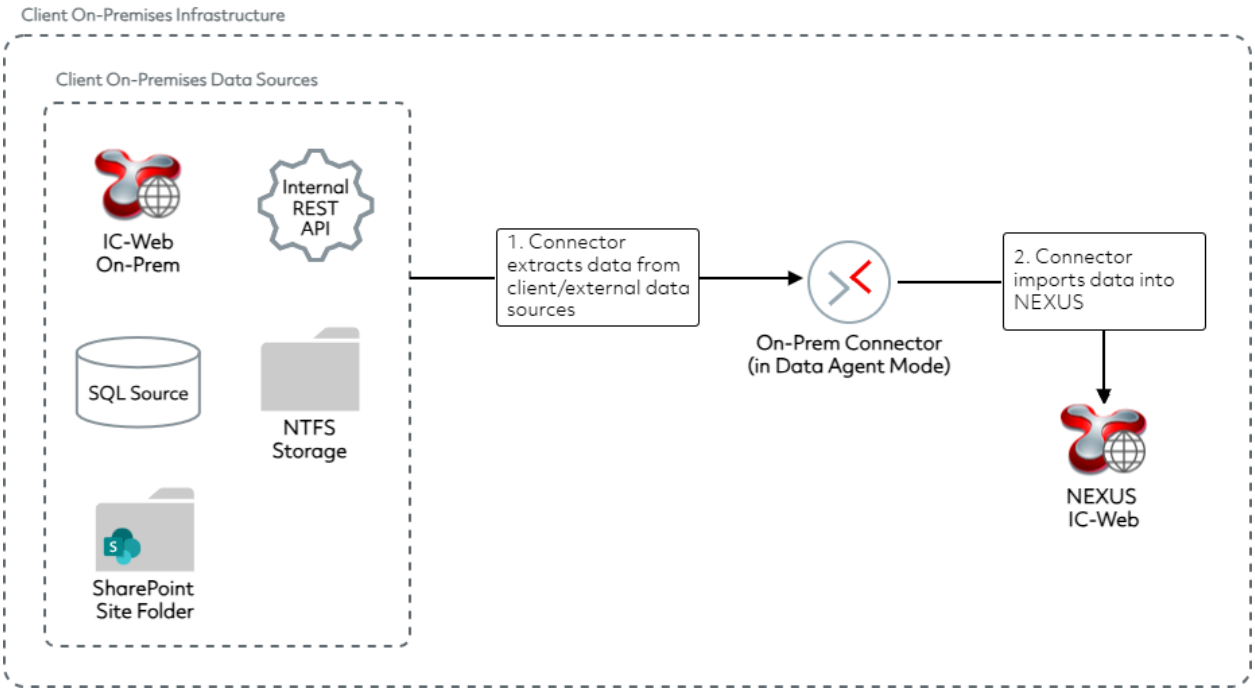
Typically, a Windows-based service application is installed on the client's infrastructure and runs at intervals agreed with the client. More than one connector can be installed for a client, allowing multiple workflows to obtain data and process it into the NEXUS IC-Web interface from within the client's infrastructure.

20.5.1.1.2.2 Deployment Topology

20.5.1.1.2.3 Client-hosted infrastructure

This topology is used when the client requires all connectors to be locally installed within their own network. The connectors run as Windows services on a schedule, moving data from various source systems that the client has access to and processing that data into the client's NEXUS instance via the IC-Web interface.

The following diagram shows an example of a typical setup:



20.5.1.1.2.4 Execution flow

1. The connector establishes a connection to the on-premises data source and retrieves the required data into the execution flow configured for that connector. Sources driven by dynamic configuration files include:
    - External REST APIs, connection made over REST with support for OAuth.
    - Local NEXUS IC-Web, connection made over REST using IC-Web protocols.
    - NTFS JSON files, connection made to local file systems where JSON files are dropped for processing.
    - SharePoint site folders, connection made to process JSON files.
    - SQL sources, connection made over Open Database Connectivity (ODBC), supporting Microsoft SQL Server and Oracle data sources.

2. The connector then connects to the client's in-client-infrastructure NEXUS instance via the IC-Web interface and submits the data to NEXUS.

20.5.1.1.2.5 Security Considerations

- All REST API traffic between connectors and data sources is:
  a. Encrypted over HTTPS using TLS, with a minimum cipher suite of TLS_RSA_WITH_AES_128_CBC_SHA.
  b. Requires a credential artefact known as a function key, which supports immediate value rotations at a clients' request.
- All inbound and outbound traffic involving on-premises connectors in a hybrid-cloud configuration follows the same security controls described above.

20.5.1.1.3 Hybrid Integration Model

The hybrid integration model is intended for clients who want to retain some infrastructure under their direct control without relying on a cloud provider. In this model, on-premises and cloud resources are used together to transmit data from on-premises data sources to a Software as a Service (SaaS) NEXUS instance hosted in the cloud.

20.5.1.1.3.1 Connector Behaviour

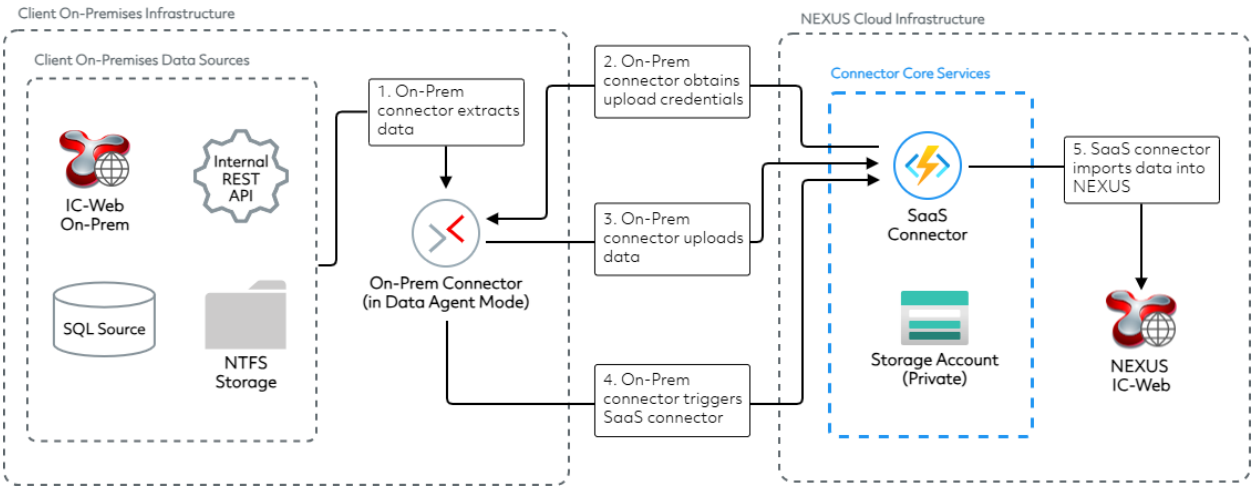
Typically, an on-premises connector is installed within the client environment and configured to operate as an agent. This agent extracts data from various on-premises sources and securely transmits the data to a cloud-based connector, which then processes the data into the SaaS NEXUS instance.

20.5.1.1.3.2 Deployment Topology

20.5.1.1.3.3 Hybrid on-premises to cloud configuration

This topology is used when the client requires some connectors to run within their on-premises environment while using cloud-hosted connectors to import data into a SaaS NEXUS instance.

The following diagram shows an example of a typical hybrid setup:



20.5.1.1.3.4 Execution flow

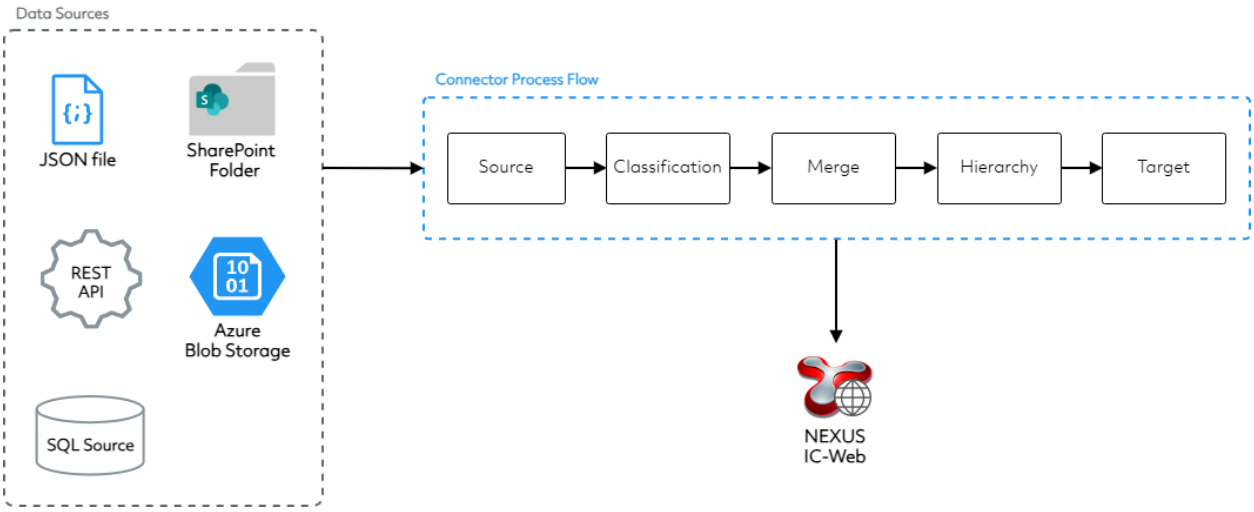
1. The on-premises connector triggers based on a Cron expression, with hourly, daily or monthly intervals, and obtains the set of the source data that was agreed with the client.
2. The on-premises connector, operating in agent mode, contacts the SaaS connector to obtain a set of credentials that are valid for a defined period.
3. The connector uploads the bulk data to an Azure storage location provisioned for processing by the SaaS connector.
4. The on-premises connector sends a request to the SaaS connector to initiate processing of the uploaded data.
5. The SaaS connector executes its processing flow and imports the data into NEXUS via the NEXUS IC-Web interface.

20.5.2 Connector Data Process Flow

The connector data process flow describes the key stages executed within a NEXUS connector when data is submitted by a client over REST or when the connector is triggered on a scheduled basis.

20.5.2.1 Process Flow Overview

The process flow consists of a series of steps which prepare, validate, structure and submit data into NEXUS:



20.5.2.2 Explanation of Steps

20.5.2.2.1 Source

The Source step is where the connector either receives data directly or is triggered to retrieve data from various configurable data sources. The connector collects this data into what is referred to as an in-memory data lake. Once data acquisition has completed successfully, the data is passed to the next step in the process.

20.5.2.2.2 Classification

The Classification step performs data identification. The connector inspects each data item as a structured object, analysing data types and values and applying validation rule sets. This process determines the corresponding NEXUS item type for each piece of data.

20.5.2.2.3 Merge

The Merge step is an optional normalisation stage. In cases where clients are unable to provide de-duplicated data, this step allows multiple instances of the same entity to be merged. This ensures that parent entities, or entities that should only be processed once, are handled correctly.

20.5.2.2.4 Hierarchy

The Hierarchy step resolves relationships within the data as they should exist in NEXUS. Each data item is associated with a NEXUS entity, and this step defines the relational structure and processing order used when submitting data through the IC-WEB interface. Based on the classification results, the connector also determines the correct NEXUS item type and position within the hierarchy.

20.5.2.2.5 Target

The Target step processes the hierarchical data from the previous step and submits each classified data item to the appropriate location within NEXUS.

20.5.3 Asset Data Connectors

Asset data connectors are designed to facilitate the exchange of asset-specific information - such as asset hierarchies and attributes - between NEXUS and external systems.

The following connectors are currently available:

Connector	Purpose	Direction
Asset Tree Connector	Aligns source asset locations and parent relationships with NEXUS Component IDs to maintain a consistent asset hierarchy across systems.	Single External Source -> NEXUS
Asset Attribute Connector	Maps data from Asset Information Groups (AIGs) and sub-AIGs into NEXUS.	Single External Source -> NEXUS

See also

- *Asset Tree Connector*
- *Asset Attribute Connector*

20.5.3.1 Asset Tree Connector

20.5.3.1.1 Overview

The asset tree connector is a configurable integration component used to import, organise and synchronise hierarchical asset structures such as companies, sites, systems, components and asset information groups into NEXUS IC from third-party systems.

The connector acts as an intermediary between client systems and NEXUS IC. It receives structured payloads and translates them into the appropriate NEXUS IC API (IC-Web) operations. This provides a consistent and well-defined interface for asset tree updates and simplifies integration.

For information about asset tree hierarchies within NEXUS IC, see *Asset Tree*.

20.5.3.1.2 Functionality

20.5.3.1.2.1 Asset Synchronisation

The connector provides a direct integration between an external data source and NEXUS IC, enabling automated synchronisation of assets and associated information.

When a change occurs in the source system, such as creating or modifying an asset, the connector can receive a JSON payload and update NEXUS IC accordingly. This ensures both systems remain aligned and reduces manual data maintenance.

For example, creating a new asset in the source system and sending its payload to the asset tree connector results in that asset being added to the correct position within the NEXUS hierarchy.

20.5.3.1.2.2 Interface

The asset tree connector is implemented as a configuration of the standard NEXUS Connector Framework.

In cloud deployments, it is accessed through a Swagger interface, where users can:

- Select the tree connector configuration
- Submit asset data payloads
- Review example schemas agreed with the client
- Follow the self-documenting API instructions

These examples define the expected structure of incoming data and help client teams interact correctly with the connector.

20.5.3.1.2.3 Capabilities

The connector supports a set of capabilities designed to automate and streamline the construction and maintenance of asset hierarchies within NEXUS IC.

External Reference ID Tracking

Assets can be linked to records in the source system using an external reference ID. When a payload is received for an existing asset in NEXUS IC, the connector updates the asset, including relocating it in the hierarchy if its parent has changed.

Full Hierarchy Construction

The asset tree connector can build an entire asset hierarchy from the ground up. Instead of manually creating the NEXUS asset tree, clients can submit a complete dataset via REST and the connector generates the structure automatically.

Automatic Generation of Missing Hierarchy Levels

The connector can be configured to create assets or grouping nodes that are missing from the source data but required in NEXUS IC. For example, if all assets need to be grouped under a top-level node such as a company, the connector can generate that parent node and ensure all incoming data is nested beneath it.

20.5.3.1.3 Example: SAP Integration

The asset tree connector is designed to integrate with a range of CMMS systems. While SAP is a common example, the connector supports similar approaches for other systems that provide structured asset data. The following example demonstrates how the connector aligns asset hierarchies between SAP and NEXUS IC, but the same principles can be applied to other third-party platforms.

When integrating with SAP, the asset tree connector ensures alignment between asset locations in SAP, called Functional Locations (FLOCs), and the asset locations in the NEXUS environment. In NEXUS, assets are organised within a hierarchical tree structure, where each asset's location is represented by the **Full Location** field, which is derived from its parent assets.

The connector maps NEXUS Full Locations to SAP FLOCs. NEXUS provides a custom Asset Information Group (AIG) form that includes fields for storing asset attributes retrieved from SAP. The connector populates these fields, which are then used to calculate the Full Location in NEXUS. This approach allows asset trees to be constructed in NEXUS from a vertical list of components, provided that the necessary parent attributes are available to define the hierarchy.

The mapping process typically involves the following steps:

1. **Data Synchronisation**

   Populate designated fields in NEXUS with asset-level information from SAP FLOCs.

2. **Tier Mapping**

   Use the populated fields to determine the hierarchical tier levels required to construct the Full Location in NEXUS.

3. **Asset Creation**

   For any SAP FLOCs that do not yet have a corresponding NEXUS asset (specifically for asset types such as "vessel", "tank", or "corrosion circuit"), create the asset in NEXUS. Its location is derived from the tier structure defined in the previous step.

20.5.3.2 Asset Attribute Connector

20.5.3.2.1 Overview

The Asset Attribute Connector simplifies the process of mapping data from Asset Information Groups (AIGs) and sub-AIGs into NEXUS. It simplifies the external payload required to push attribute data into NEXUS, making integration more efficient.

20.5.3.2.2 Functionality

Once a unique identifier is established for the external source, the connector can receive a JSON payload containing asset attributes and map them to specific fields within NEXUS.

The **core connector service** enhances this process by handling:

- Unit conversions
- Lookup list mappings
- Sub-AIG change management

This approach simplifies and enhances connection over the direct NEXUS REST route.

20.5.4 Planning Data Connectors

Planning data connectors enable the exchange of planning-related information - such as Planned Maintenance (PM) data and workpacks - between NEXUS and Computerised Maintenance Management Systems (CMMS). These connectors support efficient coordination of inspection and maintenance activities across platforms.

The following connectors are currently available:

Connector	Purpose	Direction
Planned Maintenance (PM) Connector	Enables creation of PMs in the CMMS directly from the NEXUS inspection planner. Also supports updates to existing PMs, including revised intervals and start dates.	Dual
Workpack Connector	Facilitates the creation of workpacks in NEXUS, triggered by the CMMS, and compatible with Wood's mobility solution.	Single CMMS -> NEXUS

See also

- *PM Connector*
- *Workpack Connector*

20.5.4.1 PM Connector

20.5.4.1.1 Overview

The PM connector ensures that Planned Maintenance (PM) data in NEXUS reflects PM data within a Computerised Maintenance Management Systems (CMMS) environment and that the data in both systems is kept accurate and up-to-date without having to enter data into both systems.

By automating the synchronisation process and ensuring data consistency, the connector enhances the efficiency and reliability of PM management within the organisation.

Note

The functionality described below reflects the standard behaviour of the connector. However, workflows and features can be highly customised to meet specific client requirements.

20.5.4.1.2 Functionality

NEXUS provides an Asset Information Group (AIG) form, which stores PM data, including the following key fields:

- PM Number
- Function fields (used to calculate RBI interval and next inspection date)

- CMMS Start Date
- CMMS Interval

Additional fields can be mapped to NEXUS as needed as part of the configuration process.

The connector operates by identifying PM records where:

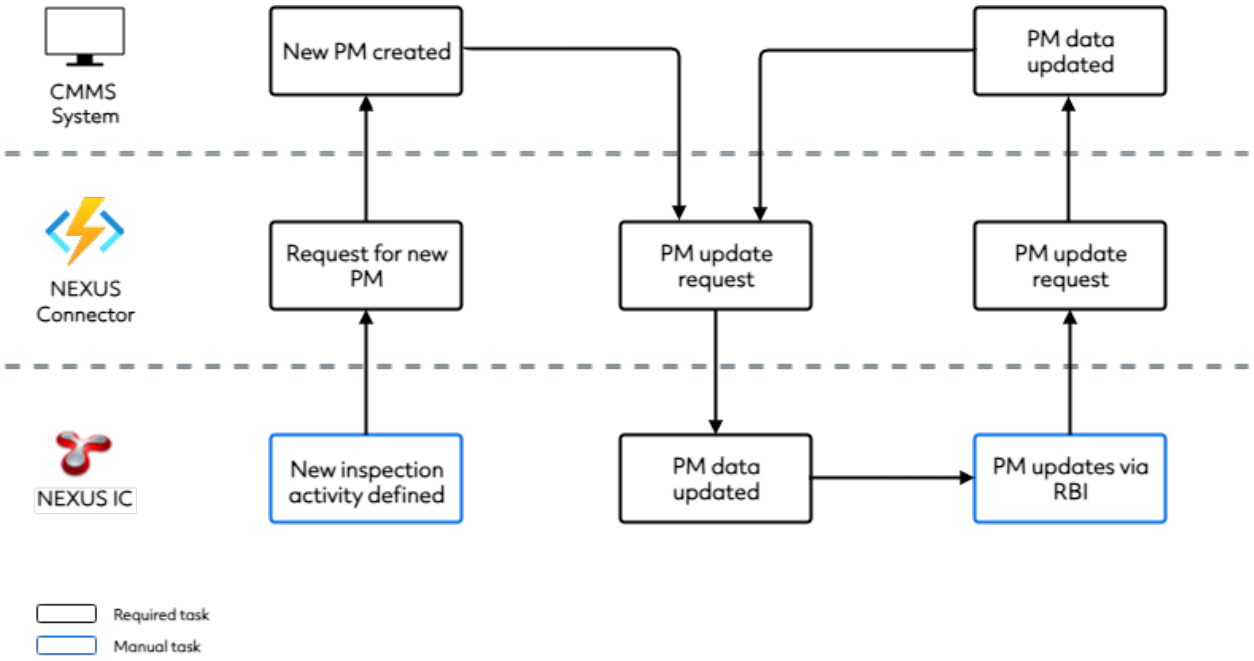
- The **PM Number** is blank, or
- The **Next PM Date** and **Interval** fields in NEXUS do not match the **CMMS Start Date** and **CMMS Interval** fields.

For each PM that meets these criteria, the connector sends a request to the CMMS system, including the unique Sub-AIG Row ID. Once the PM is created or updated in the CMMS, a payload is returned to NEXUS containing:

- The unique PM ID
- The CMMS Start Date
- The CMMS Interval

This data is then used to update the corresponding PM record in NEXUS.

The following diagram summarises the standard example workflow:



1. NEXUS periodically checks for PMs that either lack a PM Number or have mismatched start dates or intervals compared to the CMMS.
2. The connector sends the Sub-AIG Row ID to the CMMS system, where a new PM will be created.

3. Upon receiving a response from the CMMS, NEXUS updates the PM Number, CMMS Start Date, and CMMS Interval fields accordingly.
4. If an existing PM has changes to its interval or start date in NEXUS, the connector detects the discrepancy and pushes the update to the CMMS.
5. If PM details are modified in the CMMS, these changes are automatically pushed back to NEXUS.

20.5.4.2 Workpack Connector

20.5.4.2.1 Overview

The Workpack Connector ensures that when work orders are released from a Computerised Maintenance Management System (CMMS), a corresponding workpack is automatically created in NEXUS, along with the required tasks. If a work order is later updated in the CMMS (for example, revision status changes), the associated workpack in NEXUS is also updated accordingly.

This integration removes the need for manual data entry in NEXUS and ensures that work orders in the CMMS remain aligned with their corresponding workpacks in NEXUS.

> **Note**
>
> The functionality described below reflects the standard behaviour of the connector. However, workflows and features can be highly customised to meet specific client requirements.

20.5.4.2.2 Prerequisites

Before the connector can operate, the following conditions must be met:

- At least one planning template (see *Planning Templates*) exists in NEXUS, which can be used to generate tasks in a workpack based on the **asset types** of the relevant assets.
- The CMMS asset location has a unique corresponding asset location in NEXUS.
- The CMMS asset has a Start Date specified.

20.5.4.2.3 Functionality

When a work order is generated in a CMMS system, work order data is sent to NEXUS, including the planning template reference, asset locations and work order number. Additional fields - such as target dates, scheduled dates, and final dates - can also be mapped as required during configuration. This data may be stored in an Asset Information Group (AIG) form in NEXUS.

The Workpack Connector then:

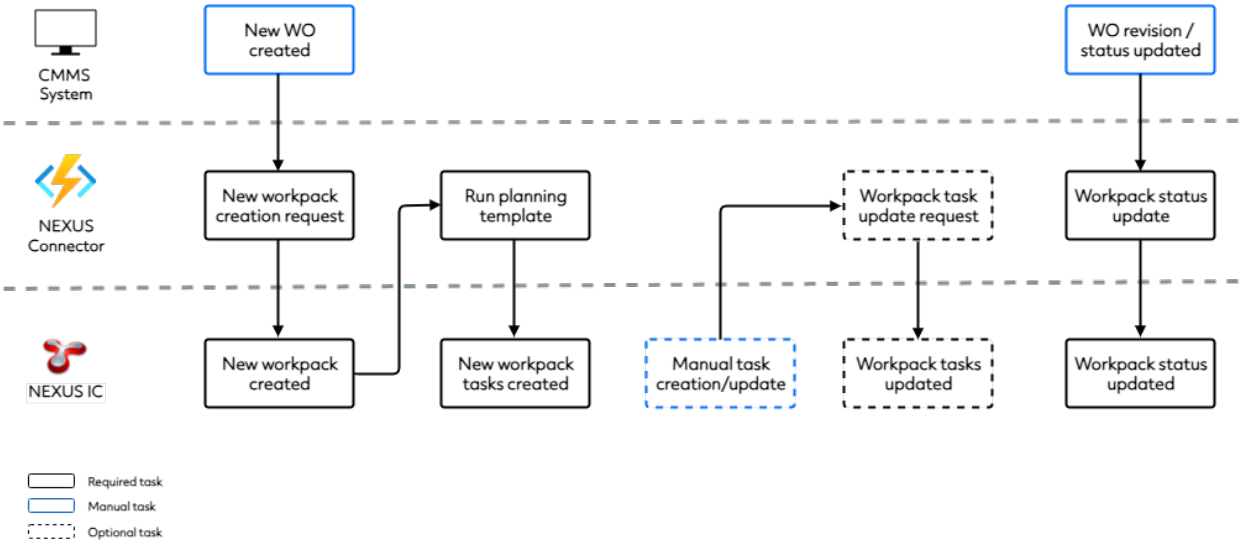
1. Generates the workpacks based on the incoming workpack creation request.
2. Triggers the associated planning template, which:
    - Identifies child assets under the parent asset associated with the work order.
    - Generates tasks based on the asset types and other AIG configuration.

Users may also manually create and modify workpack tasks in NEXUS. If this occurs, the connector can re-process the original workpack creation request and add, update or remove any tasks accordingly.

> **Note**
>
> Task assignment for workpacks is primarily controlled by NEXUS through planning templates and rule sets defined in AIGs, not by the connector itself.

If the work order is later updated in the CMMS, the connector ensures that the corresponding workpack in NEXUS is updated to reflect those changes.

The following diagram summarises the standard workflow:



> **Note**
>
> An additional NEXUS-to-CMMS connection can be configured to notify the CMMS when inspection-related tasks have been completed in NEXUS. This can be configured as required as an additional connection point.

20.5.5 Inspection Data Connectors

The NEXUS REST API library enables direct entry of inspection and sensor data into NEXUS. While this method offers powerful flexibility, it requires a solid understanding of both the REST library and the underlying NEXUS database structure.

To simplify this process, the **core connector services** provide enhanced capabilities, including:

- Unit type and lookup list management
- Multimedia and library item attachments with a single payload

In cases where inspection or sensor data is collected from external sources, it can be automatically imported into NEXUS. This ensures that all relevant data is available for follow-on analysis as required.

20.5.6 Anomaly Data Connectors

Anomaly data connectors enable the exchange of anomaly-related information - such as anomalies, associated actions, and tasks derived from those actions - between NEXUS and external systems.

The following connectors are currently available:

Connector	Purpose	Direction
Anomaly Action Connector	Creates notification requests in the Computerised Maintenance Management System (CMMS) based on anomaly actions recorded in NEXUS. Also supports updating anomaly actions in NEXUS with information received from CMMS notifications.	Dual
Corrective Maintenance (CM) Connector	Facilitates the creation of corrective workpacks in NEXUS based on work orders created in the CMMS. The corrective workpack includes tasks linked to the original anomaly.	Dual

See also

- *Anomaly Action Connector*
- *Corrective Maintenance (CM) Connector*

20.5.6.1 Anomaly Action Connector

20.5.6.1.1 Overview

The Anomaly Action Connector enables the automatic creation of notification requests in a Computerised Maintenance Management Systems (CMMS) system when an anomaly action is raised in NEXUS with the action type set to a specified value. It also supports updates to anomaly actions in NEXUS when corresponding notifications are modified in the CMMS, ensuring both systems remain synchronised.

Note

The functionality described below reflects the standard behaviour of the connector. However, workflows and features can be highly customised to meet specific client requirements.

20.5.6.1.2 Functionality

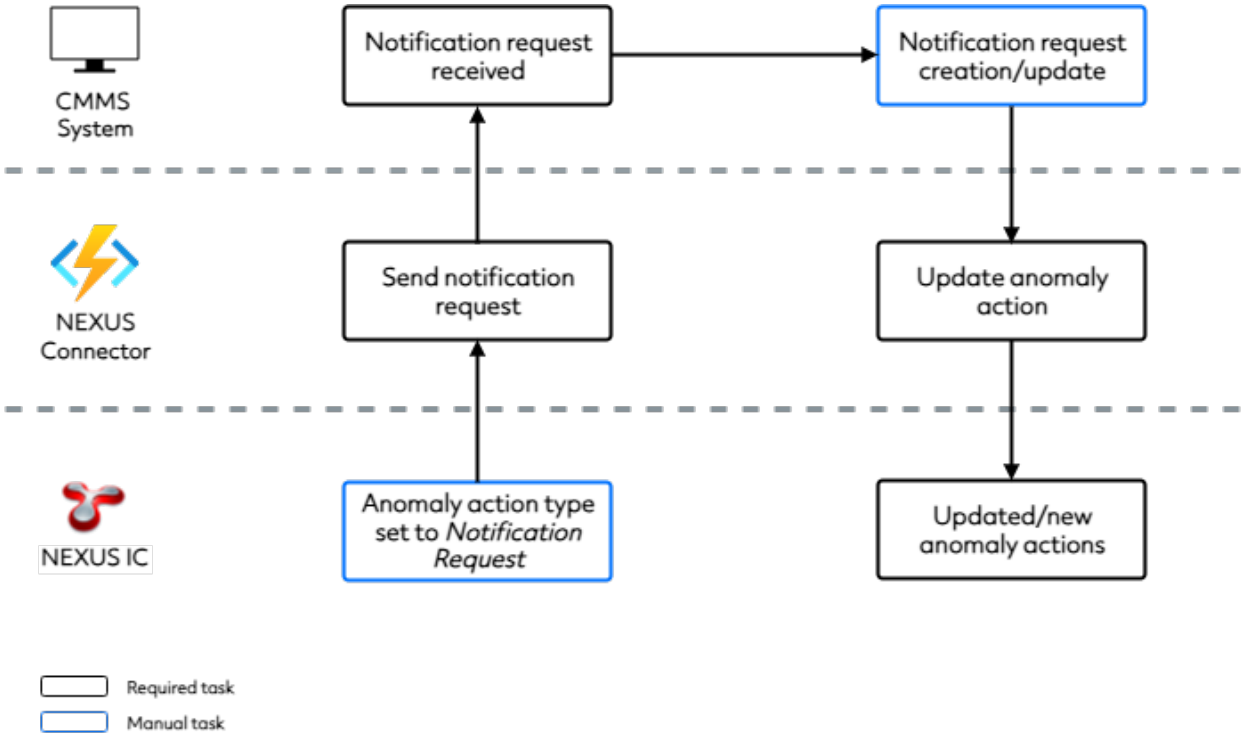
The connector operates on a scheduled basis and retrieves anomaly actions from NEXUS where:

- **Action Type** is set to a specified value (for example, “Notification Request”)
- **Completed At** and **Reference Number** fields are empty

For each matching anomaly action, a notification request is created in the CMMS.

Any updates made to the notification request in the CMMS are sent back to NEXUS, updating the corresponding anomaly action. This ensures NEXUS mirrors the current state of the notification in the CMMS.

The following diagram summarises the standard workflow:



1. On a scheduled interval, the connector identifies anomaly actions in NEXUS where:
    - *Action Type* = "Notification Request"`
    - *Completed At* is empty
    - *Reference Number* is empty
2. For each identified anomaly action, the connector sends a notification request to the CMMS.
3. Users manage and update the notification in the CMMS to track progress and resolution.
4. Updates from the CMMS are sent back to NEXUS, ensuring the anomaly action reflects the current state of the notification. No manual action is required in NEXUS during this process.

20.5.6.2 Corrective Maintenance (CM) Connector

The Corrective Maintenance Connector operates similarly to the Workpack Connector. When a corrective work order is created in the Computerised Maintenance Management System (CMMS), and a valid planning template reference is provided, a corresponding workpack is automatically generated in NEXUS. This workpack includes tasks linked to the original anomaly record.

Once the corrective workpack is created, it is managed using the same process and logic as standard workpacks, as outlined in *Workpack Connector*.

CHAPTER

TWENTYONE

REST SERVICE SPECIFICATIONS V2.0

21.1 Version

Returns the current REST service version and Database schema.

21.1.1 HTTP Request

```
GET /icweb.dll/version
```

21.1.1.1 URI Parameters

None

21.1.1.2 Responses

Name	Type	Description
200 OK	*Version*	OK

21.1.2 Version

Contains the REST service version and database schema.

Name	Type	Description	Optional
`version`	String	Version and build of REST service.	No
`schema`	String	Database schema version	No

21.1.3 Example

21.1.3.1 Request

```
GET /icweb.dll/version
```

21.1.3.2 Response

```
{
        "version": "6.6.35223.0",
        "schema": "8.198"
}
```

21.2 Login

Validates the supplied credentials, and if valid returns a *hash* to be used on subsequent REST api requests.

21.2.1 HTTP Request

```
POST /icweb.dll/security/login
Authorization {type} {value}
```

21.2.1.1 URI Parameters

Nam	In	Required	Type	Description
type	Head	Yes	String	Style of authorization. This can be one of either BASIC, APIKEY, TOKEN.
valu	Head	Yes	String	This is the base 64 encoded authorization key, it is a string containing `username:password` for BASIC, `apiKey` for APIKEY, or the `emailToken` for TOKEN.

21.2.1.2 Responses

Name	Type	Description
200 OK	*SecurityHash*	OK
401		An attempt was made to validate an invalid token/apiKey/username and password.

21.2.2 SecurityHash

Contains the temporary hash that can be used with subsequent REST api calls.

Name	Type	Description	Optional
hash	String	Temporary security hash, that can then be used in subsequent REST api requests, expires 60 minutes after last use.	No
id	Integer	Key associated with the user that this hash is associated with.	No
username	String	Username associated with the user that this hash is associated with.	No
license	String	Type of license the user has assigned to them. Possible values are 'write' or 'readonly'.	No
allowPasswordC	Boolea	True if this user's accounts password can be changed by the end user.	No
name	Boolea	Full name of the user from the Personnel table. If it is blank it won't be returned.	Yes

21.2.3 Example

Request authentication via a users username and password.

21.2.3.1 Request

```
POST /icweb.dll/security/login
Authorization BASIC YWRtaW46cGFzc3dvcmQ=
```

Note 'YWRtaW46cGFzc3dvcmQ=' is the BASE64 encoded equivalent to the string 'admin:password'

21.2.3.2 Response

```
{
        "hash":
↪"E05DEB57605BA82CD1A0C130B38C7BC1415BA094B28D73B03577B7CAB438834E6B680B437C85A65CA796AB6E7DC8545555CC
↪",
        "id": 4,
        "username": "admin",
        "license": "write",
        "allowPasswordChange": false
}
```

21.2.4 Example

Request authentication via an API Key.

21.2.4.1 Request

```
POST /icweb.dll/security/login
Authorization APIKEY RTA1REVCNTc2MDVCQTgyQ0QxQTBDMTMwQjM4QzdCQzE0MTVCQTA5NEIyOEQ3M0IwMw==
```

Note: the APIKey is shown BASE64 encoded.

21.2.4.2 Response

```
{
        "hash":
↪"E05DEB57605BA82CD1A0C130B38C7BC1415BA094B28D73B03577B7CAB438834E6B680B437C85A65CA796AB6E7DC8545555CC
↪",
        "id": 4,
        "username": "admin",
        "license": "write",
        "allowPasswordChange": true
}
```

21.2.5 Example

Request authentication via an email token.

21.2.5.1 Request

```
POST /icweb.dll/security/login
Authorization TOKEN RTA1REVCNTc2MDVCQTgyQ0QxQTBDMTMwQjM4QzdCQzE0MTVCQTA5NEIyOEQ3M0IwMw==
```

Note: the APIKey is shown BASE64 encoded.

21.2.5.2 Response

```
{
        "hash":
```

(continues on next page)

(continued from previous page)


```
↪"E05DEB57605BA82CD1A0C130B38C7BC1415BA094B28D73B03577B7CAB438834E6B680B437C85A65CA796AB6E7DC8545555CC
↪",
        "id": 4,
        "username": "admin",
        "license": "write",
        "allowPasswordChange": false
}
```


21.3 Logout

Invalidates the `hash` passed so that it can no longer be used for any subsequent requests.

21.3.1 HTTP Request

```
GET /icweb.dll/security/logout?hash={hash}
```

21.3.1.1 URI Parameters

Name	In	Required	Type	Description
`hash`	Url	Yes	String	`hash` to be logged out/invalidated.

21.3.1.2 Responses

Name	Type	Description
200 OK		OK
404		An attempt was made to invalidate an invalid hash.

21.3.2 Example

Invalidate a valid `hash` token.

21.3.2.1 Request

```
GET /icweb.dll/security/logout?
↪hash=E05DEB57605BA82CD1A0C130B38C7BC1415BA094B28D73B03577B7CAB438834E6B680B437C85A65CA796AB6E7DC85455
```

21.3.2.2 Response

200 OK

21.4 Business Objects

Retrieves information about a business object.

21.4.1 HTTP Request

```
GET /icweb.dll/bo/{tableName}
```

Additionally you can lookup a business object by it's key, this is useful when you only have the key from a `foreignTableId` field from within *BusinessObjectField*

```
GET /icweb.dll/boByKey/{keyValue}
```

21.4.2 URI Parameters

Name	In	Required	Type	Description
tableNa	Path	Yes	String	tableName of the business object to be returned
keyValu	Path	Yes	Integer	key value of the business object to be returned, this can be obtained from *BusinessObjectField* `foreignTableId`

21.4.3 Responses

Name	Type	Description
200 OK	*BusinessObject*	OK
404 Not Found		Business object with specified tableName was not found.

21.4.4 BusinessObject

The business object result type, describes a business object, henceforth referred to as meta table.

Name	Type	Description	Optional	Default
key	Integer	Key value for this meta table, unique	No	
tableName	String	Table Name for this meta table, used to generate REST requests	No	
name	String	Display / Friendly name for this meta table	No	
description	String	Description of this meta table, omitted if null	Yes	
category	String	Category of this meta table, omitted if null	Yes	
tableTypeId	Integer	Id value of the type of meta table, omitted if null	Yes	
tableType	String	Name of the table type, omitted if null	Yes	
defaultNameFie	String	Field Name of the field that should be used as the display name for rows in this object	No	
uniqueFieldNam	String	Field Name of the field that contains the unique row identifier	No	
permissions	String	Permissions the user has on the BO. None / Read / Write	No	
categories	*BusinessObjectFieldCategory*	Array of Business Object Field Categories, defines all the visible categories	Yes	
fields	*BusinessObjectField* []	Array of Business Object Fields, defines all fields in Business Object.	Yes	

21.4.5 BusinessObjectField

The business object field result type, describes a field in a business object, henceforth referred to as meta field.

Name	Type	Description
name	String	Default display name of the field
fieldName	String	Field Name used in REST requests
fieldTypeId	Integer	Type of data the field stores in the database. See *Field Types*
displayFieldTypeId	Integer	The display type of the field type, this may differ to fieldTypeId, for example fieldT
editorTypeId	Integer	Type of control that should be used to allow the user to edit raw data for this field.
displayEditorTypeId	Integer	Type of control that should be used to allow the user to edit the display value of thi
fieldSize	Integer	Maximum size of a string field
comments	String	Long comments describing use of the field
defaultValue	String	Contains the default value that should be given to this field when creating a new ro
required	Boolean	Defines if the can be set to 'null'.
lowerValue	Float	Defines the absolute minimum value for an Integer/Float field
upperValue	Float	Defines the absolute maximum value for an Integer/Float field
format	String	Defines the display format for a field
preventEditing	Boolean	Prevent the user from editing the value in this field, only valid for native field types
category	String	Category of the field, used to group like categories into 'groups'
blankText	String	Value displayed in edit field, when the field value is null
formColumns	Integer	Number of columns the field should consume on the form
formVisible	Boolean	Is the field visible on the form
formOrder	Integer	Order of the field when displaying as a form
formCaption	String	Caption used as the form caption
formShowCaption	Boolean	Should the caption be shown for the field on the form. Visible by default.
gridVisible	Boolean	Is the field visible on the grid, True, visible by default, False, not visible, null, not
gridOrder	Integer	Order of the field when displaying as a grid
gridCaption	String	Caption used as the grid caption
mobileVisible	Boolean	Should the field be visible for mobile style UIs
mobileOrder	Integer	Order of the field when displaying on a mobile UI.
mobileCaption	String	Caption used as the field caption for mobile UI's. If not defined, use Name.
booleanTypeId	Integer	The display type for Boolean fields
isBooleanTypeImage	Boolean	Is the above display type for boolean fields an image.
foreignTableId	Integer	The key for the foreign meta table this field refers to.
subTableId	Integer	The key for the sub event/aig table this field refers to. Only valid when field type is
unitId	Integer	The key for the unit assigned to this field, only relevant for Float fields.
lookupListId	Integer	The key for the lookup list assigned to this field
isLookupListImage	Boolean	Is the display type for the lookup list.
multiValue	Boolean	If this field is a PassThru field, it may be a one-to-many relationship, in which case
nestedField	*BusinessObjectField*	If this field is linked to another business object field, such as PassThru or Global L
businessObjectName	string	If this is a nested field, then the Business Object Name will be included here to allo
supportsApprovers	Boolean	Does this meta table support approvers being configured, also see approversCon
approversConfigured	Boolean	Does this meta table have approvers configured, when true, change requests can be

21.4.6 BusinessObjectFieldCategory

The business object fields category type, describes a category for a field, used when displaying the fields in a form, and optionally in a grid.

Name	Type	Description	Optional	Default
name	String	Display name of the category.	No	
alignTo	Boolean	Determines if the fields are positioned above the control, or to the left.	Yes	No
comment	String	Comments/Description that is displayed at the top of the category group, before any fields.	Yes	undefined
columns	Integer	Number of columns of fields to display in categories.	Yes	2
hasImag	Boolean	Determines if the category has an image that should be displayed at the top of the category group.	Yes	No
imageUr	String	Specifies the relative Url to retrieve the image data for the category image, only valid if hasImage is Yes.	Yes	undefined

21.4.7 Example

21.4.7.1 Request

```
GET /icweb.dll/bo/Workpack
```

21.4.7.2 Response


```
{
        "key": 136,
        "tableName": "Workpack",
        "name": "Workpack",
        "defaultNameFieldName": "Name",
        "uniqueFieldName": "Workpack_ID",
        "category": "Work Scoping",
        "tableTypeId": 11,
        "tableType": "System Table",
        "permissions": "write",
        "categories": [{
                "name": "Budget"
        }, {
                "name": "Status"
        }, {
                "name": "Timing"
        }],
        "fields": [{
                "name": "",
                "fieldName": "Guid",
                "fieldTypeId": 17,
                "editorTypeId": 3,
                "formVisible": false,
                "gridVisible": false
        }, {
                "name": "Workpack_ID",
                "fieldName": "Workpack_ID",
                "fieldTypeId": 3,
                "editorTypeId": 4,
                "fieldSize": 4,
```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```
                "formColumns": 1,
                "formVisible": false,
                "gridVisible": false
        }, {
                "name": "Workpack Group",
                "fieldName": "WPG_ID",
                "fieldTypeId": 3,
                "displayFieldTypeId": 1,
                "editorTypeId": 13,
                "fieldSize": 4,
                "formColumns": 2,
                "formOrder": 1,
                "foreignTableId": 138
        }, {
                "name": "Cost Code",
                "fieldName": "CC_ID",
                "fieldTypeId": 3,
                "displayFieldTypeId": 1,
                "editorTypeId": 13,
                "fieldSize": 4,
                "category": "Budget",
                "formColumns": 1,
                "formOrder": 20,
                "gridVisible": false,
                "foreignTableId": 31
        }, {
                "name": "Revision",
                "fieldName": "Revision_ID",
                "fieldTypeId": 3,
                "displayFieldTypeId": 1,
                "editorTypeId": 13,
                "fieldSize": 4,
                "category": "Status",
                "formColumns": 2,
                "formOrder": 5,
                "foreignTableId": 97
        }, {
                "name": "Name",
                "fieldName": "Name",
                "fieldTypeId": 1,
                "editorTypeId": 3,
                "fieldSize": 50,
                "required": true,
                "formColumns": 2
        }, {
                "name": "Abbreviation",
                "fieldName": "Abbreviation",
                "fieldTypeId": 1,
                "editorTypeId": 3,
                "fieldSize": 10,
                "formColumns": 2,
                "formOrder": 2,
```


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```
            "gridVisible": false
        }, {
            "name": "Actual Start",
            "fieldName": "Actual_Start",
            "fieldTypeId": 9,
            "editorTypeId": 8,
            "fieldSize": 16,
            "category": "Timing",
            "formColumns": 2,
            "formOrder": 7
        }, {
            "name": "Description",
            "fieldName": "Description",
            "fieldTypeId": 1,
            "editorTypeId": 3,
            "fieldSize": 100,
            "formColumns": 2,
            "formOrder": 3,
            "gridVisible": false
        }, {
            "name": "Read Only",
            "fieldName": "ReadOnly",
            "fieldTypeId": 5,
            "editorTypeId": 5,
            "fieldSize": 1,
            "required": true,
            "category": "Status",
            "formColumns": 2,
            "formOrder": 6,
            "booleanTypeId": 9
        }, {
            "name": "Personnel",
            "fieldName": "SU_ID",
            "fieldTypeId": 3,
            "displayFieldTypeId": 1,
            "editorTypeId": 13,
            "formColumns": 1,
            "formVisible": false,
            "gridVisible": false,
            "foreignTableId": 86
        }, {
            "name": "Task Time",
            "fieldName": "Task_Time",
            "fieldTypeId": 40,
            "displayFieldTypeId": 6,
            "editorTypeId": 11,
            "displayEditorTypeId": 4,
            "category": "Timing",
            "formColumns": 1,
            "formOrder": 8,
            "gridVisible": false
        }, {
```

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```
                "name": "Work Hours (per day)",
                "fieldName": "Hours_Per_Day",
                "fieldTypeId": 6,
                "editorTypeId": 4,
                "category": "Timing",
                "blankText": "Number of effective work hours per day.",
                "formColumns": 1,
                "formOrder": 9,
                "gridVisible": false
        }, {
                "name": "Duration (Estimated)",
                "fieldName": "Estimated_Duration",
                "fieldTypeId": 40,
                "displayFieldTypeId": 6,
                "editorTypeId": 11,
                "displayEditorTypeId": 4,
                "category": "Timing",
                "formColumns": 1,
                "formOrder": 10,
                "gridVisible": false
        }, {
                "name": "Duration (Contingency)",
                "fieldName": "Duration_Contingency",
                "fieldTypeId": 6,
                "editorTypeId": 4,
                "category": "Timing",
                "blankText": "Enter a value to add a contingency to the estimated␣
↪duration",
                "formColumns": 1,
                "formOrder": 11,
                "gridVisible": false,
                "unitId": 36
        }, {
                "name": "Duration (Override)",
                "fieldName": "Override_Duration",
                "fieldTypeId": 6,
                "editorTypeId": 4,
                "category": "Timing",
                "blankText": "Enter a value to override the estimated duration",
                "formColumns": 1,
                "formOrder": 12,
                "gridVisible": false,
                "unitId": 36
        }, {
                "name": "Actual End",
                "fieldName": "Actual_End",
                "fieldTypeId": 40,
                "displayFieldTypeId": 9,
                "editorTypeId": 11,
                "displayEditorTypeId": 8,
                "category": "Timing",
                "formColumns": 2,
```

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```
            "formOrder": 13
        }, {
            "name": "Day Rate",
            "fieldName": "Day_Rate",
            "fieldTypeId": 6,
            "editorTypeId": 4,
            "category": "Budget",
            "blankText": "Used to calculate cost based on day rate",
            "formColumns": 1,
            "formOrder": 14,
            "gridVisible": false
        }, {
            "name": "Cost based on Day Rate",
            "fieldName": "Cost_Day_Rate",
            "fieldTypeId": 40,
            "displayFieldTypeId": 6,
            "editorTypeId": 11,
            "displayEditorTypeId": 4,
            "category": "Budget",
            "formColumns": 1,
            "formOrder": 15,
            "gridVisible": false
        }, {
            "name": "Costs (Fixed)",
            "fieldName": "Fixed_Cost",
            "fieldTypeId": 6,
            "editorTypeId": 4,
            "category": "Budget",
            "formColumns": 1,
            "formOrder": 16,
            "gridVisible": false
        }, {
            "name": "Cost (Total)",
            "fieldName": "Total_Cost",
            "fieldTypeId": 40,
            "displayFieldTypeId": 6,
            "editorTypeId": 11,
            "displayEditorTypeId": 4,
            "category": "Budget",
            "formColumns": 1,
            "formOrder": 17,
            "gridVisible": false
        }, {
            "name": "Cost (Override)",
            "fieldName": "Override_Cost",
            "fieldTypeId": 6,
            "editorTypeId": 4,
            "category": "Budget",
            "blankText": "Enter a value to override the calculated total cost",
            "formColumns": 1,
            "formOrder": 18,
            "gridVisible": false
```

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```
        }, {
                "name": "Final Estimate",
                "fieldName": "Cost",
                "fieldTypeId": 40,
                "displayFieldTypeId": 6,
                "editorTypeId": 11,
                "displayEditorTypeId": 4,
                "category": "Budget",
                "formColumns": 1,
                "formOrder": 19,
                "gridVisible": false
        }, {
                "name": "Asset",
                "fieldName": "Component_ID",
                "fieldTypeId": 3,
                "displayFieldTypeId": 1,
                "editorTypeId": 13,
                "formColumns": 2,
                "formOrder": 4,
                "gridVisible": false,
                "foreignTableId": 30
        }, {
                "name": "Tasks",
                "fieldName": "Task_Count",
                "fieldTypeId": 3,
                "editorTypeId": 4,
                "formColumns": 1,
                "formVisible": false
        }, {
                "name": "Task Breakdown",
                "fieldName": "Task_Breakdown",
                "fieldTypeId": 1,
                "editorTypeId": 3,
                "formColumns": 1,
                "formVisible": false,
                "gridVisible": false
        }]
}
```


21.5 Get Row

Retrieve a single row from a business object. The result can be used to display or update the row.

21.5.1 HTTP Request

```
GET /icweb.dll/bo/{tableName}/{keyValue}?calculateValues={true|false}
```

21.5.1.1 URI Parameters

Name	In	Require	Type	Description
tableNa	Path	Yes	Strin	Table Name of the business object
keyValu	Path	Yes	Integer	Id of the row to be returned, if you specify 0 as the key value (this can't exist) then getRow returns you a blank row with the default values for all fields populated, ready to be used to insert a new row.
calcula	Path	No	Bool	This can be used to disable returning calculated fields. By default this is true, if you supply false, then no calculated fields will be returned.

21.5.1.2 Responses

Name	Type	Description
200 OK	*TableData*	OK
404 Not Found		No row found for specified `keyValue`

21.5.2 TableData

Contains the row data for the requested row for the specified business object.

Name	Type	Description	Optional	Default
key	Integer	Key value for this business object, unique.	No	
stamp	String	Stamp for this row set, can be used to re-request the data or request the next page of data. If omitted row set can't be paged or re-requested.	Yes	
startI	Integer	Starting row for this set of paged data.	Yes	0
pageS	Integer	Number of rows in each page of data.	Yes	100
totalI	Integer	Number of rows total across all pages, this value may change on subsequent page retrievals if modifications are made by other users.	Yes	null
rows	*TableR* []	Array of fields/values. Fields are defined by the *BusinessObject*.	Yes	Any field not specified is assumed to be null.

21.5.3 TableRow

The business object data row, describes a row of data in a TableData result set. The fields that are defined in TableRow are based on the *BusinessObject*.

Note

The fields are dynamic and can change. Each and every NEXUS database may have slightly different fields in the System Tables. The custom tables (Asset Information, Events etc) may differ significantly between databases, and can change between calls to the REST service if the users are actively making changes. It is expected that any client

consuming data from the NEXUS REST service is able to cope with this. Either by ignoring additional fields in the TableRow or by assuming a field value is null if the field does not exist.

Additionally, there is a special field returned, `@permissions` for each row. The two values available for this field are: `write` and `read`. `write` is the default value.

`write` means the user has permission to read and write to the row. `read` means the user only has permission to read the row, but not write.

Name	Type	Description	Optional	Default
{field	*Any*	Contains the value for the specified field, see *BusinessObject-Field*. If this is a non-stored field, then this will contain the display value.	Yes	If a field is omitted, it is because the fields value is null.
{field	*Error*	If the field is in an error state, then an error object is returned.	Yes	

21.5.4 Error

The error object, contains a single value for the error message

Name	Type	Description	Optional
`error`	string	Error string to be shown to the user	No

21.5.5 Example

21.5.5.1 Request

```
GET /icweb.dll/bo/Workpack/4
```

21.5.5.2 Response


```
{
        "rows": [{
                "Guid": "{35809A21-9174-4B56-AD5F-F3930DE24A2D}",
                "Workpack_ID": 1,
                "Name": "2015 ROV Inspection",
                "Actual_Start": "2015-05-15T00:00:00.000Z",
                "Description": "Annual 2015 full field rov inspection",
                "ReadOnly": false,
                "Task_Time": 0,
                "Hours_Per_Day": 12,
                "Estimated_Duration": 0,
                "Actual_End": "2015-05-15T00:00:00.000Z",
                "Total_Cost": 0,
                "Cost": 0,
                "Component_ID": 1,
                "Task_Count": 0
        }],
        "key": 136
}
```

21.6 Get Row Field

Retrieve a single field value from a row from a business object. The result is not JSON encoded, and is the literal value.

21.6.1 HTTP Request

```
GET /icweb.dll/bo/{tableName}/{keyValue}/{fieldname}?format={format}
```

21.6.1.1 URI Parameters

Name	In	Required	Type	Description
tableN	Path	Yes	String	Table Name of the business object.
keyVal	Path	Yes	Integer	Id of the row to be returned.
fieldN	Path	Yes	String	Field Name within the business object.
format	Path	No	string	Format of results. Possible values are `value`, `png`, and `thumbnail`, but depends on the field type. `FT_CALC` supports png, some Repository items support png and thumbnail.
page	Path	No	Integer	Where this is a multi-page document, such as PDF, return the specific page rendered as `png`.

21.6.1.2 Responses

Name	Type	Description
200 OK	*Literal Value*	OK
404 Not Found		No row found for specified `keyValue`
404 Not Found		Field `fieldName` not found in `tableName`

21.6.2 Literal Value

The response contains the literal value of the field. The content type in the response header describes the type of content returned.

21.6.3 Example

Retrieve the name of a workpack.

21.6.3.1 Request

```
GET /icweb.dll/bo/Workpack/4/Name
```

21.6.3.2 Response

```
Content-Type: text/plain
2015 ROV Inspection
```

21.6.4 Example

Retrieve the icon for an Asset

21.6.4.1 Request

```
GET /icweb.dll/bo/Comp_Icon/4/Icon
```

21.6.4.2 Response

```
Content-Type: image/png
{binaryData}
```

21.7 Get Rows

Retrieve a 0 or more rows from a business object. This can either return all rows, or rows that match a specified filter.

21.7.1 HTTP Request

```
GET /icweb.dll/bo/{tableName}/
```

21.7.1.1 URI Parameters

Name	In	Required	Type	Description	Default
tableNam	Path	Yes	String	Table Name of the business object	
startRow	Query	No	Integer	Starting row to be returned, when using paged datasets this sets the first row returned.	0
pageSize	Query	No	Integer	The number of rows in each page. Determines the maximum number of rows to return in the requests, starting at `startRow`.	100
pageWitl	Query	No	Integer	Returns the page of data, that contains the specified key value in `pageWithKey`.	
stamp	Query	No	String	Specifies the existing result set to return more rows from. This must come from a prior request.	

21.7.1.2 Request Headers

Name	Required	Type	Description
X-NEXUS-Filt	No	*BusinessObject-Filters*	Filter that should be used to select rows. If this is not specified, then all rows are returned.
X-NEXUS-Sort	No	*BusinessObject-Sort* []	List of fields and direction to sort the resulting dataset.

21.7.1.3 Responses

Name	Type	Description
200 OK	*TableData*	OK

21.7.2 BusinessObjectFilters

Specifies the filter that should be used to return rows.

Name	Type	Description	Optional	Default
`operator`	string	Specifies the type of operator used to join filters together. There are two possible values: • and • or	Yes	and
`where`	*BusinessObjectFilter*	List of filters to be used	Yes	
`nested`	*BusinessObjectFilters*	Nested list of filters to be used	Yes	
`distinct`	boolean	Specifies that only distinct rows should be returned.	Yes	False

21.7.3 BusinessObjectFilter

Specifies a single filter.

Name	Type	Description	Optional	Default
`field`	string	Name of the field to apply a filter on.	No	
`method`	string	Filter method: • `eq` Equals • `lt` Less Than • `gt` Greater Than • `le` Less than or Equal • `ge` Greater than or Equal • `like` Like (Use % characters as wildcard matching) • `in` In (Use `items`) • `pa` Parents Of • `ch` Children Of	Yes	eq
`value`	string	String representation of the filter value. (Ignored when the `method` is `in`)	Yes	null
`items`	Integer[]	List of values to be used when `method` is `in`.	Yes	null
`not`	boolean	Inverts the `method`, ie `eq` becomes `not eq`, `in` becomes `not in`	Yes	False

21.7.4 BusinessObjectSort

Specifies a sort, defines a field and direction to sort by.

Name	Type	Description	Optional	Default
`field`	string	Name of the field to sort on	No	
`ascendin`	boolean	Specifies the order to sort, when true sort is in ascending order, when false descending order.	Yes	True

21.7.5 Example (Lookup_Item)

Return Lookup Items for Lookup List with LL_ID of 4. Page Size is set to 5, so the first response only returns 5 rows.

21.7.5.1 Request

```
GET /icweb.dll/bo/Lookup_Item/?pageSize=5
```

21.7.5.2 Request Header

```
X-NEXUS-Filter: {"where":[{"field": "LL_ID", "value": "4"}]}
```

21.7.5.3 Response


```
{
        "pageSize": 5,
        "startRow": 0,
        "totalRows": 12,
        "rows": [{
                "Guid": "{A348BB1B-4DD4-494A-8A26-51746F2BE1A8}",
                "LL_ID": 4,
                "LI_ID": 506,
                "Value": "0",
                "Comments": "Item 0",
                "Item_Order": 0
        }, {
                "Guid": "{049D6A48-DFFF-4C37-8C91-5EF4C4C26BDA}",
                "LL_ID": 4,
                "LI_ID": 507,
                "Value": "1",
                "Comments": "Item 1",
                "Item_Order": 1
        }, {
                "Guid": "{01AB1DDC-5909-434A-A441-CFB592FC2960}",
                "LL_ID": 4,
                "LI_ID": 508,
                "Value": "2",
                "Comments": "Item 2",
                "Item_Order": 2
        }, {
                "Guid": "{8975DF1F-C06B-4B43-ADA1-5E549F846B3E}",
                "LL_ID": 4,
                "LI_ID": 509,
                "Value": "3",
                "Comments": "Item 3",
                "Item_Order": 3
        }, {
                "Guid": "{D601759D-C2D5-4DBD-856A-EC2063138443}",
                "LL_ID": 4,
                "LI_ID": 510,
                "Value": "4",
                "Comments": "Item 4",
                "Item_Order": 4
        }],
        "key": 67
}
```

21.7.6 Example (Lookup_Item)

Return Lookup Items for Lookup List with LL_ID of 4 and (Item_Order < 5 OR Item_Order > 10). Page Size is set to 5, so the first response only returns 5 rows.

21.7.6.1 Request

```
GET /icweb.dll/bo/Lookup_Item/?pageSize=10
```

21.7.6.2 Request Headers

```
X-NEXUS-Filter: {"where": [{"field": "LL_ID","value": "4"}],"nested": [{"operator": "or",
↪"where": [{"field": "Item_Order","method": "lt","value": "5"}, {"field": "Item_Order",
↪"method": "gt","value": "10"}]}]}
X-NEXUS-Sort: [{"field": "LL_ID", "ascending": false}]
```

21.7.6.3 Response


```
{
        "pageSize": 10,
        "startRow": 0,
        "totalRows": 12,
        "rows": [{
                "Guid": "{DE2042D6-D988-43B2-9097-3BE8130DE9A7}",
                "LL_ID": 4,
                "LI_ID": 506,
                "Value": "0",
                "Comments": "Item 0",
                "Item_Order": 0
        }, {
                "Guid": "{13C2D078-B8E7-4A77-BF2C-15EF131618DB}",
                "LL_ID": 4,
                "LI_ID": 507,
                "Value": "1",
                "Comments": "Item 1",
                "Item_Order": 1
        }, {
                "Guid": "{4BD34909-E95A-413C-BD43-6936BF1D5728}",
                "LL_ID": 4,
                "LI_ID": 508,
                "Value": "2",
                "Comments": "Item 2",
                "Item_Order": 2
        }, {
                "Guid": "{918A854C-718C-4AA1-AC98-4C781F4985B9}",
                "LL_ID": 4,
                "LI_ID": 509,
                "Value": "3",
                "Comments": "Item 3",
                "Item_Order": 3
        }, {
                "Guid": "{B3234C2F-3C0C-46CD-B125-715DDC686786}",
                "LL_ID": 4,
```


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```
                "LI_ID": 510,
                "Value": "4",
                "Comments": "Item 4",
                "Item_Order": 4
        }, {
                "Guid": "{EEE0268D-B3F3-45F7-B8CE-A88989C9A1BB}",
                "LL_ID": 4,
                "LI_ID": 517,
                "Value": "11",
                "Comments": "Item 11",
                "Item_Order": 11
        }, {
                "Guid": "{080A5FC0-DF25-44DE-896F-25EB95B28E74}",
                "LL_ID": 4,
                "LI_ID": 518,
                "Value": "12",
                "Comments": "Item 12",
                "Item_Order": 12
        }, {
                "Guid": "{ABFDFC1C-8C31-4DC7-A0AE-0A3174A0C30F}",
                "LL_ID": 4,
                "LI_ID": 519,
                "Value": "13",
                "Comments": "Item 13",
                "Item_Order": 13
        }, {
                "Guid": "{4758598E-5008-4008-A4A6-0EB4697D98C9}",
                "LL_ID": 4,
                "LI_ID": 520,
                "Value": "14",
                "Comments": "Item 14",
                "Item_Order": 14
        }, {
                "Guid": "{7010FCB9-E0DC-409B-8C4F-2A6B81769852}",
                "LL_ID": 4,
                "LI_ID": 521,
                "Value": "15",
                "Comments": "Item 15",
                "Item_Order": 15
        }],
        "key": 67
}
```


21.7.7 Example (complex expression)

For following filter:

((Field_A = Column_A AND Column_B = Value_B) OR (Column_C = Value_C AND Column_D = Value_D))

the syntax is:


```
{
  "operator": "or",
```


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```
  "nested": [
        {
          "operator": "and",
          "where": [
                {
                  "field": "Column_A",
                  "value": "Value_A"
                },
                {
                  "field": "Column_B",
                  "value": "Value_B"
                }
          ]
        },
        {
          "operator": "and",
          "where": [
                {
                  "field": "Column_C",
                  "value": "Value_C"
                },
                {
                  "field": "Column_D",
                  "value": "Value_D"
                }
          ]
        }
  ]
}
```

The above expression has been unpacked onto multiple lines and indented for easy reading; you will of course need to deliver the expression in a single X-NEXUS-Filter.

21.8 Create / Update Row

Create a new row or update an existing row in a business object.

> **Note**
>
> Some tables are read-only and cannot be modified. For more information, see *Read-Only Tables*.

21.8.1 Read-Only Tables

In REST API, certain tables are designated as read-only and you are prohibited from writing to these tables. Below is a list of the read-only tables:

Category	Table Name
Charts Tables	Axis_Kind Axis_Type Line_Weight Point_Style Series_Type
Component Tables	Info_Def
Drawing Tables	Layer_Type
Event Data Tables	MM_Type
Function Tables	Function_Definition Function_Part Function_Part_Input Part_Option
Library Tables	Lib_Conn_Type
Metadata Tables	Boolean_Exception Default_Column Editor_Type External_Provider_Type Field_Def Field_Layout Field_Type Map_Direction MT_Action Table_Def Text_Align
Planning Tables	LTIP_Frequency LTIP_Task_Task LTIP_Workpack
Reports Tables	Schedule_Repeat
Synchronisation Tables	Operation Sync_Change
Workflow Tables	Trigger_Type Workflow_Filter Workflow_Item Workflow_Item_Input Workflow_Item_Type

21.8.2 HTTP Request

Create:

```
PUT /icweb.dll/bo/{tableName}/{keyValue}?calculateValues={true|false}&request=
↪{true|false}
```

Update:

```
POST /icweb.dll/bo/{tableName}/{keyValue}?calculateValues={true|false}&request=
↪{true|false}
```

21.8.2.1 URI Parameters

Name	In	Required	Type	Description
tableName	Path	Yes	String	Table Name of the business object
keyValue	Path	Yes	Integer	For PUT (create) use 0, for POST (update) use the existing primary key value.
calculate\	Path	No	Boole	This can be used to disable returning calculated fields. By default this is true, if you supply false, then no calculated fields will be returned.
request	Path	No	Boole	This is used to submit a change request for creating/deleting a row. By default this is false.

21.8.2.2 Request Body

This contains fields and values for the new/updated row. For simplicity, you should only include fields that have a value other than null. You should also exclude any non-stored field, as these will be ignored.

Name	Type	Description	Optional	Default
{fieldNam	*Any*	Should contain the new value for the specified field, see *BusinessObjectField*.	Yes	You can omit a field if the value is null.

Note

If a field has a default value, then if you want to set the value of that field to null, you must include the field in the request body with a `null` value. If you omit the field then the new row will have the default value inserted.

21.8.2.3 Responses

Name	Type	Description
200 OK	*TableData*	OK
403		An attempt was made to set a value for a read-only field.
422		An attempt was made request changes to a row that was not allowed.

21.8.3 Example

Create a new Workpack. Response will contain the new row that was created in the database.

21.8.3.1 Request

```
PUT /icweb.dll/bo/Workpack/0
```

21.8.3.2 Request Body

```
{
        "Name": "2015 ROV Inspection",
        "Actual_Start": "2015-05-15T00:00:00.000Z",
```

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```
        "Description": "Annual 2015 full field rov inspection",
        "ReadOnly": false,
        "Component_ID": 1
}
```

21.8.3.3 Response

```
{
        "rows": [{
                "Guid": "{35809A21-9174-4B56-AD5F-F3930DE24A2D}",
                "Workpack_ID": 1,
                "Name": "2015 ROV Inspection",
                "Actual_Start": "2015-05-15T00:00:00.000Z",
                "Description": "Annual 2015 full field rov inspection",
                "ReadOnly": false,
                "Task_Time": 0,
                "Hours_Per_Day": 12,
                "Estimated_Duration": 0,
                "Actual_End": "2015-05-15T00:00:00.000Z",
                "Total_Cost": 0,
                "Cost": 0,
                "Component_ID": 1,
                "Task_Count": 0
        }],
        "key": 136
}
```

21.8.4 Example

Request creation of a new workpack. Note the response will be a copy of the Approval record, rather than the newly created Workpack.

21.8.4.1 Request

```
PUT /icweb.dll/bo/Workpack/0?request=true
```

21.8.4.2 Request Body

```
{
        "Name": "2015 ROV Inspection",
        "Actual_Start": "2015-05-15T00:00:00.000Z",
        "Description": "Annual 2015 full field rov inspection",
        "ReadOnly": false,
        "Component_ID": 1
}
```

21.8.4.3 Response

```
{
        "rows": [{
```

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```
                        "Guid": "{962496F3-8B3C-4B34-BA06-7E0F4AFED05C}",
                        "Approval_ID": 1,
                        "Requested": "2024-11-12T01:14:23.880Z",
                        "TD_ID": 136,
                        "SU_ID": 4,
                        "Row": "{8099539E-0865-4FC3-9D94-2E06F4DE30DB}",
                        "Operation_ID": 1
                }
        ],
        "key": 266
}
```


21.9 Validate Row

Validate updates to a new or existing row in a business object.

21.9.1 HTTP Request

```
POST /icweb.dll/bo/{tableName}/validate/{keyValue}
```

21.9.1.1 URI Parameters

Name	In	Required	Type	Description
tableName	Path	Yes	String	Table Name of the business object
keyValue	Path	Yes	Integer	For new rows (create) use 0, for existing rows (update) use the existing primary key value.

21.9.1.2 Request Body

This contains fields and values for the new/updated row. For simplicity, you should only include fields that have a value other than null. You should also exclude any non-stored field, as these will be ignored.

Name	Type	Description	Optional	Default
{fieldNam	*Any*	Should contain the new value for the specified field, see *BusinessObjectField*.	Yes	You can omit a field if the value is null.

21.9.1.3 Responses

Name	Type	Description
200 OK	*Validation Data*	OK

21.9.2 Validation Data

Contains the data for a row validation requests. Including invalid fields, the overall validation status of each field, and any updated values after the field actions have been executed.

Name	Type	Description	Optiona	Default
validat	String	Contains the validation status. vtOk, vtWarning, vtError. vtOk and vtWarning are able to be submitted as a row request, vtError will be rejected by the rest service if submitted as an update.	No	null
invalic	*Invalid Field* []	Contains a list of any invalid fields, and the reason the field is invalid.	No	null
updateS	*Update Status* []		No	null
updateV	*Update Value* []	Contains an array of field/values for any fields that need their values updated by field action shortcuts. Fields omitted from this response are not changed by the validation request.	No	null

21.9.3 Invalid Field

Contains the data for an invalid field.

Name	Type	Description	Optional	Default
field	String	Field name	No	null
state	String	State for the field, vtWarning or vtError.	No	null
message	String	Message containing why the field is invalid and how to resolve the issue, can be shown to the user.	No	null

21.9.4 Update Status

Contains the data for any changes to the state of a field, ie visible, read-only.

Name	Type	Description	Optional	Default
fieldName	String	Name of the field.	No	null
readOnly	Bool	Is the field read-only, ie prevent the user from editing the field value.	Yes	False
visible	Bool	Is the field visible, ie it should be shown or hidden from the user editing the form.	Yes	True

21.9.5 Update Value

Contains the data for any changes to the value of a field.

Name	Type	Description	Optional	Default
`{fieldName}`	*Any*	Should contain the new value for the specified field, see *BusinessObjectField*.	No	null

21.10 Delete Row

Delete a single row from a business object.

> **Note**
>
> Some tables are read-only and cannot be modified. For more information, see *Read-Only Tables*.

21.10.1 HTTP Request

```
DELETE /icweb.dll/bo/{tableName}/{keyValue}
```

21.10.1.1 URI Parameters

Name	In	Required	Type	Description
`tableName`	Path	Yes	String	Table Name of the business object
`keyValue`	Path	Yes	Integer	Id of the row to be deleted

21.10.1.2 Responses

Name	Type	Description
204 No Content	Row Deleted	The server successfully processed the request, but is not returning any content.
404 Not Found		No row found for specified `keyValue`
500 Error	*Error*	An error occurred details in Error object.

21.10.2 Example

21.10.2.1 Request

```
DELETE /icweb.dll/bo/Workpack/4
```

21.10.2.2 Response

204 No Content

21.11 Request Cookie Token

Requests the REST service generates a single use token to be emailed to the user to then request a permanent access token.

21.11.1 HTTP Request

```
GET /icweb.dll/security/requestCookieToken?{parameters}
```

21.11.1.1 URI Parameters

Name	In	Required	Type	Description
email	Query	Yes	String	Email address of existing user.

21.11.1.2 Responses

Name	Type	Description
200 OK		OK
404		An attempt was made for an unknown email address.

21.11.2 Example

21.11.2.1 Request

```
GET /icweb.dll/security/requestCookieToken?email=joe.bloggs@nexusic.com
```

21.11.2.2 Response

200 OK

21.12 Validate Cookie Token

Validates a generated single use token, and if valid, responds with a permanent token lasting 90 days for subsequent authorisation.

21.12.1 HTTP Request

```
GET /icweb.dll/security/validateCookieToken?{parameters}
```

21.12.1.1 URI Parameters

Name	In	Required	Type	Description
token	Query	Yes	String	Single-use token

21.12.1.2 Responses

Name	Type	Description
200 OK	*SecurityToken*	OK
401		An attempt was made to validate an invalid token.

21.12.2 SecurityToken

Contains the permanent security token

Name	Type	Description	Optional
token	String	Permanent security token, that can then be used in subsequent REST api requests, expires in 90 days.	No

21.12.3 Example

21.12.3.1 Request

```
GET /icweb.dll/security/validateCookieToken?
↪token=C45CB5E015A818013276727666615578D6B4C37D69BBB43D74C9A3E4907676CD1C53EADC408A6B41B2B58DD3A6B500A7
```

21.12.3.2 Response

```
{
        "token":
↪"E05DEB57605BA82CD1A0C130B38C7BC1415BA094B28D73B03577B7CAB438834E6B680B437C85A65CA796AB6E7DC8545555CC
↪"
}
```

21.13 Post Blob

Post a blob to the REST service, that can then be used in subsequent operations, such as adding library items, multimedia, and importing.

If you attempt to add a blob, that already exists in the database, the request will return the existing blob id.

21.13.1 HTTP Request

```
POST /icweb.dll/postBlob
```

21.13.1.1 URI Parameters

None

21.13.1.2 Request Body

This contains the binary data for the blob.

21.13.1.3 Responses

Name	Type	Description
200 OK	*Blob*	OK
403	Not authorised	An attempt was made to upload a blob when you do not have permissions.
404.13	File exceeds maximum IIS size.	An attempt was made to upload a file larger than the IIS setting. See: https://msdn.microsoft.com/en-us/library/ms689462%28VS.90%29.aspx

21.13.2 Blob

The Blob object, contains information about the uploaded Blob.

Nam	Type	Description	Optional
Expi	Date Time	Date and Time the blob will expire and be removed from the server if it has not be persisted using another REST api.	No
Guid	string	Unique Identifier for this blob	No
md5	string	MD5 checksum for this blob to ensure that the server received the blob correctly, you should check this against your local md5 and if it does not match, re-post the blob using another request.	No

21.13.3 Example

21.13.3.1 Request

```
POST /icweb.dll/postBlob
```

21.13.3.2 Request Body

binary data

21.13.3.3 Response

```
{
        "expiry": "2018-11-01T00:05:13.000Z",
        "guid": "{69EA081E-84ED-4504-B15D-14BC7A020E49}",
        "md5": "cf894da06f793ed73d841c72dd0bfde3"
}
```

21.13.3.4 Request

The *guid* can then be used to insert a row in Repository, passing the guid for the File_Data field.

```
PUT /icweb.dll/bo/Repository/0
```

21.13.3.5 Request Body

```
{
        "UNC": "file.pdf"
        "File_Data": "{69EA081E-84ED-4504-B15D-14BC7A020E49}"
}
```

21.13.3.6 Response

```
{
        "rows":[{
                "Guid":"{71DEE3A8-5BD9-4651-8807-3213A67AFF4E}",
                "Repository_ID":1152,
                "Cached":false,
                "File_Checksum":"9a990adf862d59c4a21e5d12e8ef8f5c",
```

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```
                "UNC":"20191122_113302.jpg",
                "File_Size":4504068,
                "RD_ID":213
        }],
        "key":96
}
```


21.14 Get Function Object

Get information about a NEXUS function from the REST service, that can then be used to call the function via REST to execute.

21.14.1 HTTP Request

```
GET /icweb.dll/function/{functionName}
```

21.14.1.1 URI Parameters

Name	In	Required	Type	Description
`functionName | functionKey`	Path	Yes	String | Integer	Specify the function name or function key to be returned.

21.14.1.2 Responses

Name	Type	Description
200 OK	*FunctionObject*	OK
403	Not authorised	An attempt was made to access a function when you do not have permissions.

21.14.2 FunctionObject

The Function object, contains information about the function.

Name	Type	Description	Optional
`name`	string	Name of the function.	No
`key`	Integer	Key value for this function, unique.	No
`resultTypeId`	Integer	Result type of the result from executing this function. See *Field Types*.	No
`parameters`	*FunctionParameter* []	List of parameters for this function.	No

21.14.3 FunctionParameter

The Function Parameter object, contains information about each parameter in a function.

Name	Type	Description	Optional	Default
name	string	Name of the parameter	No	
parameterTypeId	Integer	Result type of the result from executing this function. See *Field Types*	No	
allowsNull	Boolean	If this parameter allows a null input value	Yes	Yes

21.14.4 Example

21.14.4.1 Request

```
GET /icweb.dll/function/Compare A = B
```

21.14.4.2 Response

```
{
        "name": "Compare A = B",
        "key": 57,
        "resultTypeId": 5,
        "parameters": [{
                "name": "A",
                "parameterTypeId": 0
        }, {
                "name": "B",
                "parameterTypeId": 0
        }]
}
```

21.15 Execute Function

Execute a NEXUS function.

21.15.1 HTTP Request

```
POST /icweb.dll/function/{functionName}/?format={format}
```

21.15.1.1 URI Parameters

Name	In	Required	Type	Description
functionName | functionKey	Path	Yes	String | Integer	Specify the function name or function key to be executed .
format	Path	No	String	Possible values are value or png. value is the default if omitted, and ensures the result of the function is returned. If png is specified then the result will be a png containing the function preview with results.

21.15.1.2 Request Body

This contains parameters and their values to use to execute the function. For simplicity, you should only include fields that have a value other than null.

Name	Type	Description	Optional	Default
`{parameterN`	*Any*	Should contain the new value for the specified field, see *FunctionParameter*.	Yes	You can omit a parameter if the value is null.

21.15.1.3 Responses

Name	Type	Description
200 OK	*FunctionResult*	OK
200 OK	image/png	An image containing the function layout with results
403	Not authorised	An attempt was made to access a function when you do not have permissions.

21.15.2 FunctionResult

The Function result, contains the result of the function execution, or if an error occurred the message.

Name	Type	Description	Optional
`state`	string	State of the function call, `ok` or `error`.	No
`value`	*Any*	If state is `ok` then this will hold the result of the function execution.	Yes
`message`	String	If state is `error` then this will contain the error message returned from the function.	Yes

21.15.3 Example

21.15.3.1 Request

```
POST /icweb.dll/function/Compare A = B/

{
        "A": 5,
        "B": 3.4
}
```

21.15.3.2 Response

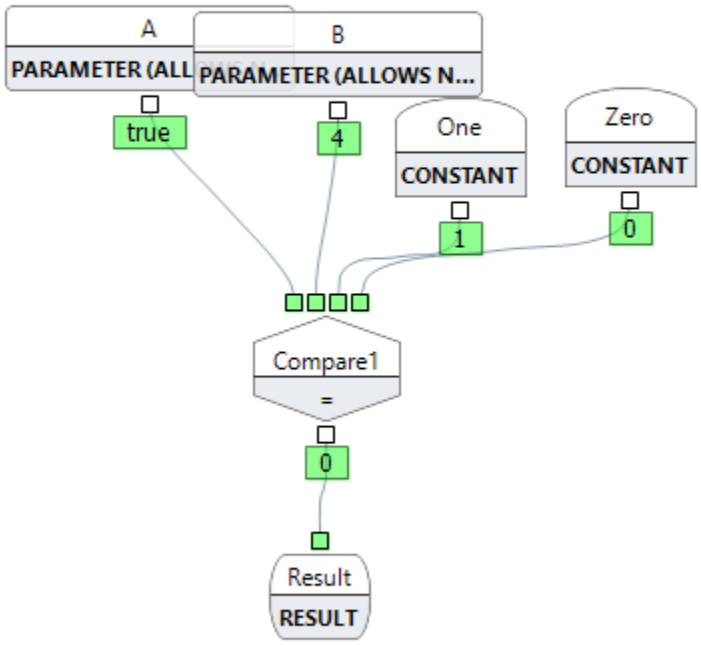
```
{
        "state": "ok",
        "value": false
}
```

21.15.3.3 Request

```
POST /icweb.dll/function/Compare A = B/?format=png
```

```
{
        "A": true
        "B": 4
}
```

21.15.3.4 Response



21.16 Dashboards

Generate the data required to display a dashboard, response data contains all information required for displaying the dashboard. The response may be quite large, depending on the dashboard that is requested. Charts especially may contain a large number of points.

21.16.1 HTTP Request

```
GET /icweb.dll/dashboard/{key}

POST /icweb.dll/dashboard/{key}
```

21.16.1.1 URI Parameters

Name	In	Required	Type	Description	Default
`key`	Path	Yes	Integer	Key associated with dashboard.	
`parameters`	Body	Yes	*Parameter* []	List of parameters that the report requires.	No

21.16.1.2 Responses

Name	Type	Description
200 OK	*Dashboard*	OK
404 Not Found	String	Dashboard identified by *key* was not found.

21.16.2 Dashboard

Contains the data associated with a dashboard, there is a `name` as well as a list of elements, each element identifies an element in the dashboard, these elements are extensible, and can be customised by the user within NEXUS IC itself.

Name	Type	Description	Optional
`name`	string	Name of the dashboard	No
`elements`	*Dashboard Element* []	List of elements in the dashboard.	No

21.16.2.1 Dashboard Element

Specifies an element in the dashboard, each element contains some base configuration, but each element also contains a `data` element, and the contains of this JSON object is based entirely on the `type` of dashboard element. Those elements that you don't understand can be skipped and not displayed.

Name	Type	Description	Optional
`caption`	string	Caption used for the dashboard element.	No
`type`	string	Specifies the type of element this represents. • `table` *Table Element* • `chart` *Chart Element* • `paragraph` *Paragraph Element* • `section` *Section Element* • `image` *Image Element*	No
`data`	object	Contains the data associated with the element, this is dependant on the element type defined in `type`	No

21.16.3 Table Element

Contains the data for a table, a table can be either a normal table, a vertical table or a pivot table. A table may not have any `columns`, `categories` or `rows`, but will have at least `columns or ``rows` defined. It is assumed that the `columns` and `rows` are in matched order, so the first item in each `TableRow` is the value for the first `column`.

Name	Type	Description	Optional	Default
`sourceBusine`	String	If there are source rows for *Table Row* entries, then this will contain the name of the business object that the key values are from.	Yes	null
`columns`	*Table Column* []	Contains a list of columns for the table.	Yes	
`categories`	*Table Category* []	Contains a list of optional categories for the table columns, generally this are output above the columns, grouping them together.	Yes	
`rows`	*Table Row* []	Contains the rows of data for the table.	Yes	

21.16.3.1 Table Column

Name	Type	Description	Optional	Default
`caption`	String	Caption for the column.	No	
`alignment`	String	Specifies the way the caption should be align, `center`, `right`, `left`.	Yes	`left`

21.16.3.2 Table Category

Name	Type	Description	Optional	Default
`caption`	String	Caption for the column.	No	
`spanColumns`	Integer	Number of columns this category spans.	Yes	1
`alignment`	String	Specifies the way the caption should be align, `center`, `right`, `left`.	Yes	`left`
`style`	*Style*	Defines the style of this cell.	Yes	

21.16.3.3 Table Row

Name	Type	Description	Optional	Default
`cells`	*Table Cell* []	Contains the data for each of the cells of the *Table Row*.	No	
`sourceKey`	Integer	Contains the primary key for the source row applicable to this *Table Row*.	Yes	null

21.16.3.4 Table Cell

Name	Type	Description	Optional	Default
`value`	String	Contains the value for the column, if a datetime, contains an ISO 8601 formatted date/time. If the time is 00:00:00 it should be omitted from display.	No	
`alignment`	String	Specifies the way the cell value should be align, `center`, `right`, `left`	Yes	`left`
`style`	*Style*	Defines the style of this cell.	Yes	
`sourceBusin`	String	If there are source rows for this *Table Cell* then this will contain the name of the business object that the key values are from.	Yes	null
`sourceKey`	Integer []	Contains 0 or more primary key values for the source rows applicable to this *Table Cell*.	Yes	null

21.16.4 Image Element

Contains an embedded image, with a caption, should be displayed to the end-user with no interactivity.

Name	Type	Description	Optional	Default
`type`	String	Mime Type of format of image.	No	
`image`	String	Base64 encoded imaged	No	

21.16.5 Chart Element

Specifies the data that is produced when the dashboard element is a chart, a chart can be rendered as either a table of data or a chart itself, decision should be made by the client. A chart element may contain more than 1 Chart, if more than one is output then the Charts will take on the same structure, they will just contain a differing set of data.

Name	Type	Description	Optional	Default
`charts`	*Chart* []	1 or more charts defined in this Chart Element.	No	

21.16.6 Chart

Contains a the data for a single chart, for the Chart Element. Each chart can have 1 x and y axis, and then 1 or more series. Eachs series will have a specific type, such as bar, line etc and contain the data for that series.

Name	Type	Description	Optional	Default
`x-axis`	*Chart Axis*	Defines the x-axis for this chart.	No	
`y-axis`	*Chart Axis*	Defines the y-axis for this chart.	No	
`series`	*Chart Series* []	Defines the series data for this chart.	No	
`seriesSou`	*Chart Series Source* []	Defines the source data used for each of the chart series.	No	
`zoomBar`	Boolean	Determines if a zoombar is visible.	Yes	No
`showCount`	string	One of 3 values, none (don't display count), series (display the count per series) or chart (show total for all series).	Yes	*none*

21.16.7 Chart Axis

Chart Axis defines the specific axis for a chart, such as title and format of data.

Name	Type	Description	Optional	Default
`title`	String	Title for the axis.	Yes	null
`showTitle`	Bool	Should the title be shown for this axis.	Yes	True
`autoScale`	Bool	Specifies whether this axis should auto-scale to fit the data.	Yes	True
`scale`	Float	When `autoScale` is False, then this contains the scale at which the axis should display the data.	Yes	null
`format`	String	Specifies the type of data in the axis, float, int, datetime, string.	No	
`granulatio`	Integer	Where this is a risk chart, this specifies the number of sections on the axis that have defined ticks.	No	
`labels`	String[	Specifies the labels of each section on the axis, used in conjunction with `granulation`.	No	

21.16.8 Chart Series

Contains the data for each chart series. A chart series is visually defined by the *type* that determines how the series points should be displayed to the user.

Name	Type	Description	Optiona	Default
`type`	String	Type of Series, point, line, bezier, bar, gantt, verticalLine, horizontalLine, pie, disjointedLine, histogram, shadedSection, polygon, minMax, average, standardDeviation, trendFirstLast, trendLastTwo, trendAll, leastSquares, heatMap	No	null
`id`	String	Contains a global unique identifier to allow matching to the `seriesSources` containing the source rows used to generate the series data.	No	null
`name`	String	Name of the series, to be shown in any legend.	Yes	null
`colour`	String	Web Colour	Yes	null (use series colour)
`points`	*Chart Point* []	Contains the series points to be displayed in the chart series.	No	
`opacit`	Float	0 to 1 determining the opacity of the point, 0 is completely transparent, 1 is not transparent at all.	Yes	1
`pointS`	String	Style of points for series that have points, circle, square, diamond, cross	Yes	null
`border`	Bool	For points, should a border be painted.	Yes	True
`pointS`	Number	Size of points, in pixels.	Yes	1
`lineWe`	Number	Weight of lines, in pixels for series that draw lines.	Yes	1
`displa`	Bool	For line series, do we show points for each point on the line.	Yes	False
`shaded`	Bool	Should the space between the line and where X = 0, be shaded.	Yes	False
`showMe`	Bool	For heatMap and contour series, should a mesh be shown.	Yes	False
`ganttS`	String	For Gantt charts, should it be painted as *line* or *bar*.	Yes	bar
`shadel`	String	For shaded section series, should the shading occur between the bound lines, or outside the bounding lines.	Yes	False
`gradie`	Float	For trend line chart series, this specifies the gradient of each line, if 0, then the trend line is horizontal.	Yes	0

21.16.9 Chart Point

Contains the data for each series point. Depending on the series type, it may contain different fields

Name	Type	Description	Optional	Default
opacity	Float	0 to 1 determining the opacity of the point, 0 is completely transparent, 1 is not transparent at all.	Yes	1
label	String	Point Label	Yes	null
id	Number	Unique key for this point in this series.	Yes	0
colour	String	Web Colour	Yes	null (use series colour)
x	Float	X-Value	Yes	null
y	Float	Y-Value	Yes	null
z	Float	Z-Value	Yes	null
x2	Float	Secondary X-Value	Yes	null
y2	Float	Secondary Y-Value	Yes	null
z2	Float	Secondary Z-Value	Yes	null
coordina	*Coordinate* []	Polygon series require an array of X,Y points to plot the polygon.	Yes	null

21.16.10 Chart Series Source

Contains the data for the raw data used to generate the chart series.

Name	Type	Description	Optional	Default
series	String	Series identifier to match to the chart series	No	
source	*Chart Point Source* []	Contains a list of sources for each point. This may not contain an item for each point in the chart series if the source isn't able to be determined.	Yes	null

21.16.11 Chart Point Source

Contains the data for a single point in a chart series. To match a chart point to a point source, the seriesId and pointId need to both match to first find the *Chart Series Source* and then the corresponding *Chart Point Source*

Name	Type	Description	Optional	Default
pointId	Number	Id of the point this source corresponds to.	No	
sourceBusinessObje	String	Name of the business object the *sourceKey* are contained in.	No	
sourceKey	Number []	List of 0 or more keys that were used to generate the chart series point.	Yes	null

21.16.12 Coordinate

Simple array of X,Y coordinates for polygon series.

Name	Type	Description	Optional	Default
x	Float	X-Value	Yes	null
y	Float	Y-Value	Yes	null

21.16.13 Paragraph Element

A paragraph element contains text, generally it does not have a title for the dashboard element, the text may be formatted. It may contain 1 or more paragraphs within it.

Name	Type	Description	Optional	Default
text	*Paragraph Text* []	Contains the values for the paragraph.	No	

21.16.14 Paragraph Text

Specifies text within a paragraph, including any styling.

Name	Type	Description	Optional	Default
value	String	Contains a text string for a paragraph.	Yes	
color	String	Contains a web colour in #AARRGGBB form.	Yes	
alignment	String	Alignment, left, center, right.	Yes	left
text-bold	Bool	Determines if the text is bold.	Yes	False
text-underline	Bool	Determines if the text is underlined.	Yes	False
text-italic	Bool	Determines if the text is italic.	Yes	False
text-size	Bool	Determines the point size of the text	Yes	

21.16.15 Section Element

Specifies a new section starts in the elements, allowing the section to define the number of columns the elements are displayed in

Name	Type	Description	Optional	Default
columns	Integer	Number of columns the elements should be split into. Columns are consumed, top to bottom, left to right.	Yes	1

21.16.16 Style

Specifies style of an element.text within a paragraph, including any styling.

Name	Type	Description	Optional	Default
color	String	Contains a web colour in #AARRGGBB form.	Yes	
alignment	String	Alignment, left, center, right.	Yes	left
text-bold	Bool	Determines if the text is bold.	Yes	False
text-underlin	Bool	Determines if the text is underlined.	Yes	False
text-italic	Bool	Determines if the text is italic.	Yes	False
text-size	Bool	Determines the point size of the text	Yes	
background-co	String	Contains a web colour in #AARRGGBB form.	Yes	
font-name	String	Contains the name of the font to be used.	Yes	
space-before	String	Number of pixels before element.	Yes	
space-after	String	Number of pixels after element.	Yes	
padding-left	String	Number of pixels inside the element on the left before content.	Yes	
padding-right	String	Number of pixels inside the element on the right after content.	Yes	
vertical-alig	String	Vertical alignment of element (top, middle, bottom).	Yes	top
text-orientat	String	Orientation of text (leftToRight, topToBottom, bottomToTop).	Yes	left-ToRight
border-xxx-co	String	Colour of the border in web format (xxx is left, top, right, bottom, inner-vert, inner-horz).	Yes	
border-xxx-wi	String	Width of the border in pixels (xxx is left, top, right, bottom, inner-vert, inner-horz)	Yes	

21.16.17 Example

Generate and return the dashboard for the dashboard identified by the key of `3` with 2 parameters `Pipeline Width` and `Gas Type` with the values `54.2` and `Oxygen` respectively.

21.16.17.1 Request

```
POST /icweb.dll/dashboard/3
```

21.16.17.2 Request Body

```
{
        "parameters": [
                {
                        "parameterName": "Pipeline Width",
                        "value": 54.2
                }, {
                        "parameterName": "Gas Type",
                        "value": "Oxygen"
                }
        ]
}
```

21.16.17.3 Response

```
{
        "name": "Test Dashboard",
        "elements": [{
                        "type": "section",
```

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```
                        "data": {
                                "columns": 2
                        }
                }, {
                        "type": "table",
                        "caption": "Workpack Listing",
                        "data": {
                                "columns": [{
                                                "caption": "Name"
                                        }, {
                                                "caption": "Description"
                                        }, {
                                                "caption": "Read Only"
                                        }, {
                                                "caption": "Actual Start",
                                                "alignment": "right"
                                        }, {
                                                "caption": "Hours (per day)",
                                                "alignment": "center"
                                        }, {
                                                "caption": "Workpack Group"
                                        }
                                ],
                                "rows": [{
                                                "cells": [{
                                                                "value": "Workpack A"
                                                        }, {
                                                                "value": "This is the␣
↪description for WA"
                                                        }, {
                                                                "value": "No"
                                                        }, {
                                                                "value": "2019-08-
↪26T00:00:00.000Z",
                                                                "alignment": "right"
                                                        }, {
                                                                "value": "8",
                                                                "alignment": "center"
                                                        }, {
                                                                "value": "Group A"
                                                        }
                                                ]
                                        }, {
                                                "cells": [{
                                                                "value": "Workpack B"
                                                        }, {
                                                                "value": "This is the␣
↪description for WB"
                                                        }, {
                                                                "value": "No"
                                                        }, {
                                                                "value": "2019-08-
```

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```
↪26T00:00:00.000Z",
                                                        "alignment": "right"
                                                }, {
                                                        "value": "6",
                                                        "alignment": "center"
                                                }, {
                                                        "value": "Group B"
                                                }
                                        ]
                                }
                        ]
                }
        }, {
                "type": "paragraph",
                "data": {
                        "text": [{
                                        "value": "The above table displays all␣
↪workpacks.\r",
                                        "color": "#0055FF3A",
                                        "alignment": "center",
                                        "text-bold": true
                                }, {
                                        "value": "There should be 2 workpacks in␣
↪this test."
                                }
                        ]
                }
        }, {
                "type": "image",
                "caption": "Drawing Details",
                "data": {
                        "type": "image\/png",
                        "image": "iVBORw0KGgoAAAANSUh..."
                }
        }, {
                "type": "chart",
                "caption": "Test Chart",
                "data": {
                        "charts": [{
                                        "x-axis": {
                                                "title": "Anomaly Code",
                                                "format": "label"
                                        },
                                        "y-axis": {
                                                "title": "Count",
                                                "format": "integer"
                                        },
                                        "series": [{
                                                        "id": "{860BF005-A81D-
↪45A9-B57E-7F0497347442}",
                                                        "type": "pie",
                                                        "name": "Anomaly Code",
```

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```
                                                    "points": [{
                                                                "label":
↪"C3",
                                                                "id": 3,
                                                                "x": 3,
                                                                "y": 1
                                                    }, {
                                                                "label":
↪"C2",
                                                                "id": 2,
                                                                "x": 2,
                                                                "y": 2
                                                    }, {
                                                                "label":
↪"C1",
                                                                "id": 1,
                                                                "x": 1,
                                                                "y": 3
                                                    }
                                                ]
                                        }
                                    ],
                                    "seriesSources": [{
                                                "seriesId": "{860BF005-
↪A81D-45A9-B57E-7F0497347442}",
                                                "sources": [{
                                                                "pointId
↪": 3,
↪"sourceBusinessObject": "Anomaly",
↪"sourceKey": [6]
                                                    }, {
                                                                "pointId
↪": 2,
↪"sourceBusinessObject": "Anomaly",
↪"sourceKey": [4, 5]
                                                    }, {
                                                                "pointId
↪": 1,
↪"sourceBusinessObject": "Anomaly",
↪"sourceKey": [1, 2, 3]
                                                    }
                                                ]
                                        }
                                    ]
                                }
                            ]
```

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```
                        }
                }
        ]
}
```

21.17 Report Details

Request information about a report, including the parameters the report requires to be executed.

Only available to hosted SaaS clients

21.17.1 HTTP Request

```
GET /icweb.dll/report/{key}
```

21.17.1.1 URI Parameters

Name	In	Required	Type	Description	Default
key	Path	Yes	Integer	Key associated with report.	

21.17.1.2 Responses

Name	Type	Description
200 OK	*Report*	OK
404 Not Found	String	Dashboard identified by *key* was not found.

21.17.2 Report

Contains the information associated with a report.

Name	Type	Description	Optional
name	string	Name of the report	No
parameters	*Parameter* []	List of parameters that the report requires.	No
excludable	*Excludable*	Defines the elements in the report that can be excluded from being generated	Yes

21.17.2.1 Parameter

Specifies a parameter for a report, a report may have 0 or more parameters, these parameters contain information on allowing the user to select or enter an appropriate value.

Name	Type	Description	Optional	Default
parameterN	string	Name of the parameter.	No	
displayNar	string	Display caption used when displaying the parameter to the user for them to enter/select a value.	No	
order	integer	Display order of the parameter.	No	
columns	integer	The number of display columns that this column consumes, report parameters should be displayed in a 2 column form.	No	1
blankText	string	Text that can be used, in a greyed-out embedded in the control for the parameter.	Yes	
fieldType	Integer	Field Type of the parameter, determines what data can be entered by the user.	No	
editorType	Integer	Editor that should be used for the parameter.	No	
foreignTal	Integer	If this is a foreign key, then this specifies the table that should be used to provide a selection dialog.	Yes	
multiSelec	Boolea	Does this parameter allow multiple values to be selected.	No	No
lookupLis1	Integer	Specifies the key of the lookup list to use, if `fieldType` is a lookup list.	No	No
required	Boolea	Is a value required to be provided for this report parameter.	No	True
previousVa	Any	Contains the previously selected value from the last time this report was executed.	Yes	Null

21.17.2.2 Excludable

Specifies a report element that may be excluded and defines children that may also be excluded.

Name	Type	Description	Optional	Default
name	string	Name of the report element.	No	
descripti	string	Description of the report element.	No	
canExcluc	bool	True if the element can be excluded from the report	No	
key	integer	Key associated with the element, when excluding elements from a report job, this key should be specified.	No	
elements	*Excludable* []	List of child elements that may be excluded.	Yes	

21.17.3 Example

Retrieve the name and parameters for the report identified by the key of 3

21.17.3.1 Request

```
GET /icweb.dll/report/3
```

21.17.3.2 Response

```
{
        "name": "Test Report",
        "parameters": [{
```

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```
                        "parameterName": "Component_ID",
                        "displayName": "Asset",
                        "order": 0,
                        "columns": 1,
                        "fieldType": 3,
                        "editorType": 13,
                        "foreignTable": "Component",
                        "multiSelect": true,
                        "previousValue": 2
                }, {
                        "parameterName": "Workpack_ID",
                        "displayName": "Workpack",
                        "order": 0,
                        "columns": 1,
                        "fieldType": 3,
                        "editorType": 13,
                        "foreignTable": "Workpack",
                }
        ],
        "excludable": {
                "name": "Test Report",
                "canExclude": false,
                "key": 9,
                "elements": [{
                                "name": "Repeat Assets",
                                "canExclude": false,
                                "key": 10,
                                "elements": [{
                                                "name": "Tasks",
                                                "canExclude": true,
                                                "key": 11,
                                                "elements": []
                                        }
                                ]
                        }
                ]
        }
}
```

21.18 Report

Submit a job to generate a report template.

Only available to hosted SaaS clients

21.18.1 HTTP Request

```
POST /icweb.dll/report/
```

21.18.1.1 URI Parameters

Name	In	Require	Type	Description	Default
reportTe	Body	Yes	Integer	Key associated with report.	
outputTy	Body	No	String	Format that the report should be generated in, JSON, html, xlsx, rtf, pdf are accepted types.	JSON
excluded []	Body	No	Integer	Contains a list of groups (obtained from *Excludable*) to exclude from report generation.	
recipien	Body	No	String	List of comma separated email address to send the report to, if omitted then the report isn't emailed and is available for download.	
embedHtn	Body	No	Bool	If `outputType` is 'html' and `recipients` contains a valid email address, then this determines whether the html report is sent as the body of the email (true) or as an attachment (false).	False
subject	Body	No	String	Subject used in the email generated if the report is sent to `recipients`.	
paramete	Body	No	JSON	A JSON object of all the parameter values used in the report.	

21.18.1.2 Responses

Name	Type	Description
200 OK	*Server Job*	Report job created, response contains information on the job.
400	Validation Error	Configuration provided for report is invalid, further information on what part was invalid is provided.
404	Not found	The specified `reportTemplate` was not found.

21.18.2 Example

Ask the server to generate the report identified by the key of 3, using the values of the passed parameters

21.18.2.1 Request

```
POST /icweb.dll/report
```

```
{
        "reportTemplate": 3,
        "outputType": "html"
        "parameters": [{
                        "parameterName": "Component_ID",
                        "value": [4, 3]
                }, {
                        "parameterName": "Workpack_ID",
                        "value": 35
                }
        ]
}
```

21.18.2.2 Response

```
{
        "id": "{7945AE0D-BB7D-4D7C-AF68-175C74CF02D5}",
        "percentComplete": 0
}
```

21.19 Import

21.19.1 Contents

Asks the server to enumerate the files in a compressed zip file that was uploaded for importing.

Only available to hosted SaaS clients

21.19.1.1 HTTP Request

To retrieve files in an archive:

```
POST /icweb.dll/import/contents/{file}
```

21.19.1.1.1 Request Body

Contains information on how to parse the import file to detect the columns.

Name	Required	Type	Description	Default
`file`	Yes	String	Specifies the import file previously uploaded.	

21.19.1.1.2 Responses

Name	Type	Description
200 OK	*Files*	Contains a list of files found in the uploaded file.
400	Validation Error	Configuration provided for import is invalid, further information on what part was invalid is provided.
404	Not found	The blob id was not found.

21.19.1.2 Files

The Files object, contains a list of files in the uploaded archive.

Name	Type	Description	Optional
`files`	string []	List of files found in the uploaded archive.	No

21.19.2 Detect Columns

Asks the server to detect the columns in the import sheet, the server will attempt to match each column with an associated business object field. A base business object needs to be specified.

Only available to hosted SaaS clients

21.19.2.1 HTTP Request

To retrieve detected columns from import file:

```
POST /icweb.dll/import/columns
```

21.19.2.1.1 Request Body

Contains information on how to parse the import file to detect the columns.

Name	Require	Type	Description	Default
file	Yes	String	Specifies the import file previously uploaded.	
files	Yes	String[]	Specifies a number of import files that have previously been uploaded. This can be used instead of file where there are multiple zip files (exceeding 500mb) to allow larger uploads.	
fileName	No	String	If the import file was a zip file, this specifies a file within the zipfile that is used as the import file. (Where multiple zipfiles are specified in files this file can be in any of them)	
business	Yes	String	The base business object for the server to use to perform column detection with. The server will attempt to match columns in this table first.	
headerRo	Yes	Integer	The number of rows that relate to column headers in the import file.	1
delimite	Yes	String	Column delimiter	‘,’
qualifie	Yes	String	String qualifier to denote start/end of strings, possible values, ‘quote’, ‘doubleQuote’, ‘none’	quote
consecut	No	Boolean	Treat consecutive delimiter as a single delimiter.	False
columnMa	No	*ColumnMap*[]	Contains a list of desired column mappings as a starting point for the detection of further columns, and/or receiving a list of required fields for these mappings.	[]
ignoreCo	No	integer[]	List of column indexes from source file that should be ignored.	Yes
ignoreBl	No	Boolean	Lets the importer know whether to ignore blank cells from the import sheet and not modifying existing data, or (the default) when a blank is found, to set the existing data to null.	False

21.19.2.1.2 Responses

Name	Type	Description
200 OK	*Import Columns*	Contains a list of columns detected in the import sheet, mappings that are detected based on those columns as well as required fields.
400	Validation Error	Configuration provided for import is invalid, further information on what part was invalid is provided.
404	Not found	Either the blob id was not found or the businessObject specified was not found.

21.19.2.2 Import Columns

The Import Columns object, contains information about the auto-detected columns from the import sheet, as well as a list of column maps to business object fields that have been detected.

Name	Type	Description	Optional
sourceCol	*Source Column* []	List of columns detected	No
columnMap	*Column Map* []	List of column maps detected	No
requiredF	*Required Field* []	List of fields that are required to be provided, either via a static value, or a mapping for the import, based on other fields that have been mapped.	Yes
ignoreCol	integer[]	List of column indexes from soure file that should be ignored.	Yes
preview	*Source Row* []	Contains at most 50 rows from the source row, converted to a json object.	No
commonFie	*Common Category* []	This contains a list of common fields that can be used as a destination for column mappings.	No

21.19.2.3 Source Column

The source column object, contains information about the columns detected in the import sheet.

Name	Type	Description	Optional
columnIn	Integer	Column index, 0 is the first, left-most column.	No
columnNa	string	Name of the column that was detected from the header rows, where there are no header rows in the import sheet, this will be blank.	Yes

21.19.2.4 Column Map

Contains information to map a column in the import sheet, with a business object field.

Name	Type	Description	Optional
busine	string	Name of the business object	No
fieldN	string	Field name of the field to map this column to.	No
path	string	Path to join from the base businessObject to the destination businessObject. Effectively when businessObject is not in the base table, NEXUS may not be able to correctly determine a path to the destination field. `path` helps NEXUS decide on the best path to join between the businessObjects.	Yes
columr	Integer	Column index, 0 is the first, left-most column.	Yes
static	any	This will provide a static value for the business object to be imported with, use this instead of a `columnIndex` to provide the same value to be imported for each row created in the business object.	Yes
optior	Bool	Determines if this field mapping should create a row, a new row won't be inserted if it only contains values for 'optional' field mappings, default value is `False`.	Yes

21.19.2.5 Required Field

Contains information about fields that are required to be provided, either by a column mapping or static value for the import to succeed.

Name	Type	Description	Optional
`businessObject`	string	Name of the business object	No
`fieldName`	string	Field name of the field to map this column to.	No
`isMapped`	Boolean	Specifies if a mapping exists for this field, default `False`	Yes

21.19.2.6 Source Row

Contains a preview of up to 50 rows from the source row, as parsed using the submitted settings.

Each column will have a property in the JSON object, the name of the JSON pair will be columnX, where X is a zero based index, and the value will be of type `string` and contain the raw characters from the source file.

21.19.2.7 Common Category

Contains a list of categories, and a list of business objects and fields for each category.

Name	Type	Description	Optional
`category`	string	Name of the category of business objects.	No
`businessObjects`	*Common BusinessObject* []	Details on each business object in this category.	No

21.19.2.8 Common BusinessObject

Contains a reference to a business object, and a list of fields in that business object that can be chosen as a destination field map for importing.

Name	Type	Description	Optional
`name`	string	Display Name of the business objects.	No
`businessObject`	string	Name of the business objects.	No
`fields`	*Common Field* []	Details on field that can be imported to in this business object.	No

21.19.2.9 Common Field

Contains a reference to a field in a business object.

Name	Type	Description	Optional
`fieldName`	string	Field Name	No
`name`	string	Display Name of the field, not returned if it is the same as fieldName.	Yes
`path`	string	Path helper for the import, to return if this column is provided.	Yes

21.19.3 Import

Import data into 1 or more tables from a previously posted blob, the blob must be a text file containing data in a tabulated format, such as TSV or CSV.

Only available to hosted SaaS clients

21.19.3.1 HTTP Request

To start a new import job:

```
POST /icweb.dll/import
```

To retrieve detail on an existing import job, see *Job Status*

21.19.3.1.1 URI Parameters

Name	In	Required	Type	Description
fileId	Path	Yes	String	Specifies the import file previously uploaded.
fileName	Path	No	String	If the import file was a zip file, this specifies a file within the zipfile that is used as the import file.

21.19.3.1.2 Request Body

This contains parameters for how to import the the data from the blob.

Name	Type	Description	Optional	Default
file	String	Contains an identifier previously returned by a *Post Blob* call.	No	
fileN	String	Where the blob is a compressed zipfile containing multiple files, this is the name of the actual text file containing the import data.	Yes	null
busin	String	Name of the primary business object that the import is to be performed on. This forms the basis of the rows in the text file, other objects can be mapped using column mappings.	No	
dateF	String	Date format used when converting dates in the import sheet, acceptable values: 'dd/MM/yyyy', 'MM/dd/yyyy', 'yyyy/MM/dd', 'dd-MM-yyyy', 'MM-dd-yyyy', 'yyyy-MM-dd'.	Yes	yyyy/mm/dd
timeF	String	Time format used when converting times in the import sheet, acceptable values: 'hh:nn:ss AM', 'HH:nn:ss', 'HH:nn:ss.zzz', 'hh:nn AM', 'HH:nn'.	Yes	HH:nn:ss
timeZ	String	Timezone offset of date/times when being imported, a shift will be performed to convert it to UTC for Date & Time fields, Date or Time fields won't have any conversion performed.	Yes	0
heade	Integer	The number of rows that relate to column headers in the import file.	Yes	1
delim	String	Column delimiter	Yes	,
quali	String	String qualifier to denote start/end of strings, possible values, 'quote', 'doubleQuote', 'none'	Yes	quote
conse	No	Boolean	Treat consecutive delimiter as a single delimiter.	False
start	Integer	Start row of data to import, row numbers start at 0, after the header rows. So if there are 2 header rows, and the 3rd line in the file is the first data row, that is considered row 0.	Yes	0
endRo	Integer	End row of data to import, omit this field to import until the end of rows. The importer determines the end of rows by either the end of file, or a blank line.	Yes	
colum	*ColumnMap*[]	List of columns for the import sheet, mapping to business object fields. This is optional, and recommended that you rely on the auto-detect columns, and only pass column maps you want to override in the detection.	Yes	
ignor	integer[]	List of column indexes from soure file that should be ignored.	Yes	
ignor	No	Boolean	Lets the importer know whether to ignore blank cells from the import sheet and not modifying existing data, or (the default) when a blank is found, to set the existing data to null.	False
test	Bool	Run a test of the import as a job.	Yes	False

21.19.3.1.3 Responses

Name	Type	Description
200 OK	*Server Job*	Import job created, response contains information on the job.
400	Validation Error	Configuration provided for import is invalid, further information on what part was invalid is provided.
404	Not found	Either the blob id was not found or the businessObject specified was not found.

21.19.3.2 Example

Example to submit an import job for the Task business object.

21.19.3.2.1 Request

```
POST /icweb.dll/import
```

21.19.3.2.2 Request Body

```
{
        "file": "{69EA081E-84ED-4504-B15D-14BC7A020E49}",
        "businessObject": "Task",
        "qualifier": "quote",
        "dateFormat": "dd/mm/yyyy",
        "timeFormat": "HH:mm:ss"
}
```

21.19.3.2.3 Response

```
{
        "id": "{7945AE0D-BB7D-4D7C-AF68-175C74CF02D5}",
        "percentComplete": 0
}
```

An example to detect the columns in a CSV file, using Header as the base business object.

```
POST /icweb.dll/importColumns`
```

21.19.3.2.4 Request Body

```
{
        "file": "{A29C4D22-214C-4DD6-9ED1-8F7FE084E1AA}",
        "fileName": "Rest - Multi Header - Events - Multimedia.csv",
        "businessObject": "Header",
        "headerRows": 1
}
```

21.19.3.2.5 Response


```
{
        "columnMaps": [{
                        "businessObject": "View_Node",
                        "fieldName": "Full_Location",
                        "columnIndex": 0
                }, {
                        "businessObject": "View_Node",
                        "fieldName": "Full_Location",
                        "columnIndex": 1
                }, {
                        "businessObject": "Comp_Type",
                        "fieldName": "Name",
                        "path": "Component",
                        "columnIndex": 2
                }, {
                        "businessObject": "Workpack",
                        "fieldName": "Name",
                        "columnIndex": 3
                }, {
                        "businessObject": "Table_Def",
                        "fieldName": "Name",
                        "path": "TD_ID",
                        "columnIndex": 4
                }, {
                        "businessObject": "EVT_Span",
                        "fieldName": "Length",
                        "columnIndex": 5
                }, {
                        "businessObject": "SDT_STD_KP",
                        "fieldName": "KP",
                        "path": "Start_Clock_SD_ID",
                        "columnIndex": 6
                }, {
                        "businessObject": "SDT_STD_KP",
                        "fieldName": "KP",
                        "path": "End_Clock_SD_ID",
                        "columnIndex": 7
                }, {
                        "businessObject": "Multimedia",
                        "fieldName": "Name",
                        "columnIndex": 8
                }, {
                        "businessObject": "Repository",
                        "fieldName": "UNC",
                        "path": "Multimedia",
                        "columnIndex": 9
                }
        ],
        "sourceColumns": [{
                        "columnName": "Asset Location.Full Location",
                        "columnIndex": 0
```


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```
                }, {
                        "columnName": "Asset Location.Full Location",
                        "columnIndex": 1
                }, {
                        "columnName": "Asset.Asset Type",
                        "columnIndex": 2
                }, {
                        "columnName": "Workpack.Name",
                        "columnIndex": 3
                }, {
                        "columnName": "Event.Event Type",
                        "columnIndex": 4
                }, {
                        "columnName": "Span.Length",
                        "columnIndex": 5
                }, {
                        "columnName": "Start - Survey - Pipeline.KP",
                        "columnIndex": 6
                }, {
                        "columnName": "End - Survey - Pipeline.KP",
                        "columnIndex": 7
                }, {
                        "columnName": "Multimedia.Name",
                        "columnIndex": 8
                }, {
                        "columnName": "Multimedia.Image",
                        "columnIndex": 9
                }
        ],
        "requiredFields": [{
                        "businessObject": "View_Node",
                        "fieldName": "CV_ID"
                }, {
                        "businessObject": "EVT_Span",
                        "fieldName": "Header_ID",
                        "isMapped": true
                }, {
                        "businessObject": "Multimedia",
                        "fieldName": "Name",
                        "isMapped": true
                }
        ],
        "commonFields": [{
                        "category": "Event",
                        "businessObjects": [{
                                        "businessObject": "EVT_Span",
                                        "name": "Span",
                                        "fields": [{
                                                        "fieldName": "Length"
                                                }
                                        ]
                                }
```

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```
                ]
        }, {
                "category": "Continuous Event",
                "businessObjects": [{
                        "businessObject": "EVT_Pipeline_Profile",
                        "name": "PL - Profile",
                        "fields": [{
                                "fieldName": "Top_Of_Pipe",
                                "name": "Top of Pipe"
                        }, {
                                "fieldName": "Bottom_Of_Pipe",
                                "name": "Bottom of Pipe"
                        }, {
                                "fieldName": "Left_Seabed",
                                "name": "Left Seabed"
                        }, {
                                "fieldName": "Right_Seabed",
                                "name": "Right Seabed"
                        }
                        ]
                }
                ]
        }, {
                "category": "Sub Event",
                "businessObjects": [{
                        "businessObject": "SET_Cross_Profile",
                        "name": "PL - Cross Profile",
                        "fields": [{
                                "fieldName": "Header_ID"
                        }, {
                                "fieldName": "X"
                        }, {
                                "fieldName": "Y"
                        }
                        ]
                }
                ]
        }, {
                "category": "System Table",
                "businessObjects": [{
                        "businessObject": "Commentary",
                        "name": "Commentary",
                        "fields": [{
                                "fieldName": "Header_ID",
                                "name": "Event"
                        }, {
                                "fieldName": "Notes"
                        }
                        ]
                }, {
                        "businessObject": "Signoff",
                        "name": "Event Review",
```

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```
                                    "fields": [{
                                                    "fieldName": "Signed",
                                                    "name": "Date \/ Time"
                                            }, {
                                                    "fieldName": "Description"
                                            }, {
                                                    "fieldName": "SU_ID",
                                                    "name": "Personnel"
                                            }
                                    ]
                            }, {
                                    "businessObject": "Finding",
                                    "name": "Finding",
                                    "fields": [{
                                                    "fieldName": "Finding_ID"
                                            }, {
                                                    "fieldName": "Header_ID",
                                                    "name": "Event"
                                            }, {
                                                    "fieldName": "Anomaly_ID",
                                                    "name": "Anomaly"
                                            }, {
                                                    "fieldName": "Bound_ID",
                                                    "name": "Trigger"
                                            }, {
                                                    "fieldName": "Code_ID",
                                                    "name": "Code"
                                            }, {
                                                    "fieldName": "Is_Bound",
                                                    "name": "Is Auto Generated"
                                            }, {
                                                    "fieldName": "Remedial_Action",
                                                    "name": "Remedial Action"
                                            }, {
                                                    "fieldName": "Anomaly_Required",
                                                    "name": "Anomaly Required"
                                            }, {
                                                    "fieldName": "Severity_ID",
                                                    "name": "Severity"
                                            }, {
                                                    "fieldName": "Reason"
                                            }, {
                                                    "fieldName": "Is_Finding_Reviewed
↪",
                                                    "name": "Is Finding Reviewed"
                                            }, {
                                                    "fieldName": "Finding_Number",
                                                    "name": "Finding Number"
                                            }, {
                                                    "fieldName": "Has_Comments",
                                                    "name": "Has Review Comments"
                                            }
```

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```
                ]
            }, {
                "businessObject": "View_Node",
                "name": "Asset Location",
                "fields": [{
                        "fieldName": "CV_ID",
                        "name": "Asset View"
                    }, {
                        "fieldName": "Component_ID",
                        "name": "Asset"
                    }, {
                        "fieldName": "Is_Dynamic",
                        "name": "Is Dynamic"
                    }, {
                        "fieldName": "Dynamic_Filter",
                        "name": "Dynamic Filter"
                    }, {
                        "fieldName": "Link_ID",
                        "name": "Parent"
                    }
                ]
            }, {
                "businessObject": "BookMark",
                "name": "Bookmark",
                "fields": [{
                        "fieldName": "Header_ID",
                        "name": "Event"
                    }, {
                        "fieldName": "Description"
                    }
                ]
            }, {
                "businessObject": "Multimedia",
                "name": "Multimedia",
                "fields": [{
                        "fieldName": "Name"
                    }, {
                        "fieldName": "Can_Report",
                        "name": "Can Report"
                    }, {
                        "fieldName": "Repository_ID",
                        "name": "Image"
                    }, {
                        "fieldName": "X"
                    }, {
                        "fieldName": "Y"
                    }, {
                        "fieldName": "pppX",
                        "name": "Pixels per Point (X)"
                    }, {
                        "fieldName": "pppY",
                        "name": "Pixels per Point (Y)"
```

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```
                                        }
                                ]
                        }
                ]
        }, {
                "category": "Survey Data",
                "businessObjects": [{
                                "businessObject": "SDT_STD_KP",
                                "name": "Survey - Pipeline",
                                "fields": [{
                                        "fieldName": "KP"
                                }
                                ]
                        }, {
                                "businessObject": "SDT_STD_NORM",
                                "name": "Survey - Standard",
                                "fields": [{
                                        "fieldName": "Easting"
                                }, {
                                        "fieldName": "Northing"
                                }, {
                                        "fieldName": "Depth"
                                }, {
                                        "fieldName": "Elevation"
                                }
                                ]
                        }, {
                                "businessObject": "SDT_STD_KP",
                                "name": "Survey - Pipeline",
                                "fields": [{
                                        "fieldName": "KP"
                                }
                                ]
                        }, {
                                "businessObject": "SDT_STD_NORM",
                                "name": "Survey - Standard",
                                "fields": [{
                                        "fieldName": "Easting"
                                }, {
                                        "fieldName": "Northing"
                                }, {
                                        "fieldName": "Depth"
                                }, {
                                        "fieldName": "Elevation"
                                }
                                ]
                        }
                ]
        }
    ],
    "preview": [{
                "Column0": "Pipelines",
```


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```
                "Column1": "10\" Production Pipeline",
                "Column2": "Flexible Pipe",
                "Column3": "2012 ILI Inspection",
                "Column4": "Span",
                "Column5": "0.012",
                "Column6": "3.56",
                "Column7": "3.61",
                "Column8": "Logo",
                "Column9": "Logo.png"
        }, {
                "Column0": "Pipelines",
                "Column1": "10\" Production Pipeline",
                "Column2": "Flexible Pipe",
                "Column3": "2012 ILI Inspection",
                "Column4": "Span",
                "Column5": "0.0253",
                "Column6": "3.77",
                "Column7": "3.78",
                "Column8": "",
                "Column9": ""
        }, {
                "Column0": "Pipelines",
                "Column1": "10\" Production Pipeline",
                "Column2": "Flexible Pipe",
                "Column3": "2012 ILI Inspection",
                "Column4": "Span",
                "Column5": "0.0043",
                "Column6": "4.8",
                "Column7": "4.93",
                "Column8": "WGIM",
                "Column9": "wgim.bmp"
        }, {
                "Column0": "Pipelines",
                "Column1": "10\" Production Pipeline",
                "Column2": "Flexible Pipe",
                "Column3": "2012 ILI Inspection",
                "Column4": "Span",
                "Column5": "0.122",
                "Column6": "7.12",
                "Column7": "7.35",
                "Column8": "",
                "Column9": ""
        }, {
                "Column0": "Pipelines",
                "Column1": "10\" Production Pipeline",
                "Column2": "Flexible Pipe",
                "Column3": "2012 ILI Inspection",
                "Column4": "Span",
                "Column5": "",
                "Column6": "7.42",
                "Column7": "7.85",
                "Column8": "",
```


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```
                    "Column9": ""
                }, {
                    "Column0": "",
                    "Column1": "",
                    "Column2": "",
                    "Column3": "",
                    "Column4": "",
                    "Column5": "",
                    "Column6": "",
                    "Column7": "",
                    "Column8": "",
                    "Column9": ""
                }
        ]
}
```

21.20 Job Status

Request information about a job, including current progress. If no id is supplied a list of all jobs for the user are returned.

Only available to hosted SaaS clients

21.20.1 HTTP Request

```
GET /icweb.dll/jobStatus/{Id}
```

21.20.1.1 URI Parameters

Name	In	Required	Type	Description
id	Path	No	String	Specifies the job to retrieve the *Server Job* object for, containing the current progress.

21.20.1.2 Responses

Name	Type	Description
200 OK	*Server Job*	When an individual job is requested.
200 OK	*Server Jobs*	When all jobs are requested.
404 Not Found	String	Job identified by *id* was not found.

21.20.2 Server Jobs

The Server Jobs object, contains information about the jobs the user has initiated.

Name	Type	Description	Optional
jobs	*Server Job* []	An array of jobs that are associated with the current user.	No

21.20.3 Server Job

The Server Job object, contains information about the job that was specified.

Name	Type	Description	Optional	Default
id	string	Unique Identifier for this job, can be used to request updated information on status.	No	
percentComp	integer	0 - 100 percent complete of the job.	Yes	0
summary	string	Contains a summary of the job, thus far.	Yes	Unavailable
status	integer	Current status of the job, 1 = Waiting to Start, 2 = Starting, 3 = Running, 4 = Completed, 5 = Failed, 6 = Paused	No	
startClock	String	Date and time the job started.	Yes	False
endClock	String	Date and time the job finished.	Yes	False
dismissed	bool	Has this job been dismissed by the user.	Yes	False
canDismiss	bool	Can this job be dismissed?	Yes	False

Note under some circumstances, the percentComplete value returned may exceed 100. This is caused by NEXUS underestimating the total row count at the commencement of the generation job.

21.20.4 Example

Retrieve the job status, with the id of '{FAAF7FBC-0475-45ED-A148-02238E75C395}'.

21.20.4.1 Request

```
GET /icweb.dll/jobStatus/{FAAF7FBC-0475-45ED-A148-02238E75C395}
```

21.20.4.2 Response

```
{
        "id": "{FAAF7FBC-0475-45ED-A148-02238E75C395}",
        "percentComplete": 35,
        "summary": "",
        "status": 3
}
```

21.20.5 Example

Retrieve all jobs the user has initiated.

21.20.5.1 Request

```
GET /icweb.dll/jobStatus
```

21.20.5.2 Response


```
{
        "jobs": [{
                        "id": "{DD89258A-F8FD-4629-9B7E-569EDA31387E}",
                        "percentComplete": 100,
                        "status": 4
                }, {
                        "id": "{D561361F-FD3A-492A-AE35-B6B77B28B2E0}",
                        "percentComplete": 100,
                        "status": 4
                }
        ]
}
```


21.21 Job Dismiss

Dismiss a job so that it is no longer showon in the UI of NEXUS IC or IC-Web.

Only available to hosted SaaS clients

21.21.1 HTTP Request

```
GET /icweb.dll/jobDismiss/{Id}
```

21.21.1.1 URI Parameters

Name	In	Required	Type	Description
id	Path	Yes	String	Specifies the job dismiss.

21.21.1.2 Responses

Name	Type	Description
200 OK		Job was successfully dismissed.
403 Forbidden		Job is not able to be dismissed.
404 Not Found	String	Job identified by *id* was not found.

21.22 Job Content

Request the content from a completed job, some jobs may not provide any content.

Only available to hosted SaaS clients

21.22.1 HTTP Request

```
GET /icweb.dll/jobContent/{id}
```

21.22.1.1 URI Parameters

Name	In	Required	Type	Description
id	Path	Yes	String	Specifies the job to retrieve the content for. The content will be returned, pay important attention to the response type.

21.22.1.2 Responses

Name	Type	Description
200 OK	Binary / Text - see mime type of response.	OK
404 Not Found	String	Job identified by *id* was not found.

21.22.2 Example

Retrieve the job content, with the id of '{FAAF7FBC-0475-45ED-A148-02238E75C395}'.

21.22.2.1 Request

```
GET /icweb.dll/jobContent?id={FAAF7FBC-0475-45ED-A148-02238E75C395}
```

21.22.2.2 Response

```
content-type: application/json
content-disposition: attachment;filename="report.json"
```

```
{
        "elements": [{
                        "type": "table",
                        "caption": "Table of Data",
                        "data": {
                                "sourceBusinessObject": "Task",
                                "columns": [{
                                                "caption": "Asset"
                                        }, {
                                                "caption": "Event Type"
                                        }, {
                                                "caption": "Workpack"
                                        }
                                ],
                                "rows": [{
                                                "sourceKey": 1,
                                                "cells": [{
                                                                "value": "Test Asset"
                                                        }, {
                                                                "value": "GVI"
                                                        }, {
                                                                "value": "Workpack A"
                                                        }
                                                ]
```

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```
                                        }, {
                                                "sourceKey": 2,
                                                "cells": [{
                                                        "value": "Test Asset"
                                                }, {
                                                        "value": "GVI"
                                                }, {
                                                        "value": "Workpack B"
                                                }
                                                ]
                                        }
                                ]
                        }
                }, {
                        "type": "paragraph",
                        "data": {
                                "text": [{
                                                "value": "Report generated in 00:00:01"
                                        }
                                ]
                        }
                }
        ]
}
```


21.23 License

Returns the license information for the current user.

21.23.1 HTTP Request

```
GET /icweb.dll/license
```

21.23.1.1 URI Parameters

None

21.23.1.2 Responses

Name	Type	Description
200 OK	*License*	OK

21.23.2 License

Contains the license information for the current user.

Name	Type	Description	Optional
`license`	String	`readonly` for a readonly only license, `write` for a write license	No
`risk`	Bool	True if the user has a license to display the risk module.	No
`sensors`	Bool	True if the user has a license to display the sensors module.	No
`saas`	Bool	True if the user has a license to perform SaaS only functions.	No
`name`	String	Display name of the current user.	No
`username`	String	Username of the current user.	No

21.23.3 Example

21.23.3.1 Request

```
GET /icweb.dll/license
```

21.23.3.2 Response

```
{
        "license": "write",
        "risk": true,
        "sensors": true,
        "saas": true,
        "username": "bob.smith@here.com",
        "name": "Bob Smith"
}
```

21.24 Settings

Request settings for a user.

21.24.1 HTTP Request

```
GET /icweb.dll/setting/{category}/{subCategory}/{identifier}/{source}
```

21.24.1.1 URI Parameters

Name	In	Re-quire	Type	Description
`categ`	Path	No	Strin	Specifies the category to retrieve the *Setting* objects for. Common values: Form, Grid, Options, Tree, Window.
`subCa`	Path	No	Strin	Specifies the sub category to retrieve the *Setting* objects for. Value here is related to category, Form, Grid, Tree and Window usually use the subcategory relating to the name of the business object. For example 'Asset Location'.
`ident`	Path	No	Strin	Specifies the identifier to retrieve the *Setting* objects for, `identifier` refers to the specific item, such as focusedRow, layout, selectedItes, expandedNodes for grid/tree `category` items.
`sourc`	Path	No	Strin	Specifies the source to retrieve the *Setting* objects for, source is used to differentiate the setting on use. For example for Grid/Tree, a blank source refers to the defaults for that Grid/Tree, 'Selector' is used in source when the Grid/Tree is within a selection dialog.

21.24.1.2 Responses

Name	Type	Description
200 OK	*Setting* []	One or more settings matching search criteriea.

21.24.2 Setting

The Setting object, contains information about the setting.

Name	Type	Optiona	Description
`catego`	Strin	No	Specifies the category of this setting, common values: Form, Grid, Options, Tree, Window.
`subCa`	Strin	No	Specifies the sub category of this setting, value is related to category: Form, Grid, Tree and Window usually use the subcategory relating to the name of the business object. For example 'Asset Location'.
`ident`	Strin	No	Specifies the identifier of this setting, `identifier` refers to the specific item, such as focusedRow, layout, selectedItes, expandedNodes for grid/tree `category` items.
`source`	Strin	Yes	Specifies the source to retrieve the *Setting* objects for, source is used to differentiate the setting on use. For example for Grid/Tree, a blank source refers to the defaults for that Grid/Tree, 'Selector' is used in source when the Grid/Tree is within a selection dialog.
`value`	Strin	Yes	Specifies the value for the setting. For complex settings this may contain JSON within a string, that may have to be parsed.
`defau`	Strin	Yes	Specifies the default value for the setting. This is used if `value` is null.

21.24.3 Example

Retrieve the all settings for the Grid associated with 'Anomaly'

21.24.3.1 Request

```
GET /icweb.dll/setting/Grid/Anomaly
```

21.24.3.2 Response


```
[{
                "category": "Grid",
                "subCategory": "Anomaly",
                "identifier": "expandedNodes",
                "value": "-1073741841,-1073741851"
        }, {
                "category": "Grid",
                "subCategory": "Anomaly",
                "identifier": "filters",
                "value": "{}"
        }, {
                "category": "Grid",
                "subCategory": "Anomaly",
                "identifier": "focusedRow",
                "value": "-1073741832"
        }, {
                "category": "Grid",
```


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```
                "subCategory": "Anomaly",
                "identifier": "groupedColumns",
                "value": "Closed_Out,Code_ID"
        }, {
                "category": "Grid",
                "subCategory": "Anomaly",
                "identifier": "layout",
                "value": "{\"columns\":[{\"fieldName\":\"AC_ID\",\"order\":19,\"visible\
↪":false},{\"fieldName\":\"AS_ID\",\"order\":15,\"visible\":true},{\"fieldName\":\
↪"Action_Overdue\",\"order\":21,\"visible\":false},{\"fieldName\":\"Action_Status\",\
↪"order\":22,\"visible\":false},{\"fieldName\":\"Anomaly_ID\",\"order\":0,\"visible\
↪":false},{\"fieldName\":\"Anomaly_No\",\"order\":13,\"visible\":true},{\"fieldName\":\
↪"Asset_Location\",\"order\":3,\"visible\":false},{\"fieldName\":\"Asset_Type\",\"order\
↪":7,\"visible\":true},{\"fieldName\":\"Assigned_To_ID\",\"order\":2,\"visible\":false},
↪{\"fieldName\":\"CV_ID\",\"order\":1,\"visible\":false},{\"fieldName\":\"Closed_Out\",\
↪"order\":9,\"visible\":true},{\"fieldName\":\"Code_ID\",\"order\":12,\"visible\":true},
↪{\"fieldName\":\"Comments\",\"order\":20,\"visible\":false},{\"fieldName\":\"Component_
↪ID\",\"order\":6,\"visible\":true},{\"fieldName\":\"Created_By_ID\",\"order\":18,\
↪"visible\":true},{\"fieldName\":\"Date_Created\",\"order\":17,\"visible\":true},{\
↪"fieldName\":\"Date_Found\",\"order\":23,\"visible\":false},{\"fieldName\":\
↪"Description\",\"order\":11,\"visible\":true},{\"fieldName\":\"Most_Recent_Workpack\",\
↪"order\":24,\"visible\":false},{\"fieldName\":\"Name\",\"order\":4,\"visible\":true,\
↪"sortIndex\":0,\"sortDirection\":\"Ascending\"},{\"fieldName\":\"Original_Workpack\",\
↪"order\":25,\"visible\":false},{\"fieldName\":\"Primary_Asset\",\"order\":26,\"visible\
↪":false},{\"fieldName\":\"Ref_No\",\"order\":16,\"visible\":true},{\"fieldName\":\
↪"Risk_ID\",\"order\":5,\"visible\":true},{\"fieldName\":\"Risk_Score\",\"order\":10,\
↪"visible\":true},{\"fieldName\":\"Severity_ID\",\"order\":14,\"visible\":true},{\
↪"fieldName\":\"Status_ID\",\"order\":8,\"visible\":true}]}"
        }, {
                "category": "Grid",
                "subCategory": "Anomaly",
                "identifier": "selectedItems",
                "value": "6"
        }
]
```


21.25 Update Settings

Update settings for a user.

21.25.1 HTTP Request

```
POST /icweb.dll/setting/
```

21.25.1.1 URI Parameters

Name	In	Required	Type	Description
`settings`	Body	Yes	*Setting* []	Specifies the list of settings to update/save for the current user.

21.25.1.2 Responses

Name	Type	Description
200 OK		

21.25.2 Example

Create/update a setting for Grid -> Anomaly. Request ^^^^^^^

```
POST /icweb.dll/setting/
```

21.25.2.1 Body

```
[
    {
                "category": "Grid",
                "subCategory": "Anomaly",
                "identifier": "selectedItems",
                "value": "6"
        }
]
```

21.26 Setting Value Json Format

The following provides a base specification for the JSON that may be included for different settings.

21.26.1 Grid / ? / Layout

Name	Required	Type	Description
`columns`	Yes	*Grid Column* []	Specifies the list of settings for a grid/tree.

21.26.1.1 Grid Column

Name	Required	Type	Description
`fieldNar`	Yes	String	Name of the field from the *BusinessObject* that this column refers to.
`order`	Yes	Integer	Display index of the column. 0 denotes the left-most column in the grid/tree.
`visible`	Yes	Boole	Is the column visible in the grid/tree.
`sortInde`	No	Integer	If specified, this column is being to specify the sorting in the grid, multiple columns can be specified, the index is 0 based, and denotes the first column to sort upon, followed by 1 etc.
`sortDire`	No	String	Specifies the sort direction for the column, either `Ascending` ie A thru Z (0 thru 9), or `Descending` ie Z thru A (9 thru 0).

21.27 Change Requests

Request a list of change requests that the current user has the ability to approve or reject. It may contain already approved/rejected items.

Only available to hosted SaaS clients

21.27.1 HTTP Request

```
GET /icweb.dll/approval/
```

21.27.1.1 Responses

Name	Type	Description
200 OK	changeRequest []	When the change requests are requested.

21.27.2 Change Request

This contains a change request and information associated with what data has been requested to be changed.

Name	Type	Description	Optional	Default
`id`	integer	Unique Identifier for this change rquest, used to approve/reject the request.	No	
`requested`	string	Date/Time the change request was submitted.	Not	
`object`	string	Name of the object/table that the change request relates to.	Yes	
`requestedBy`	string	Name of the person that submitted the change request.	No	
`isApproved`	bool	Determines if the change request has been approved. If this is false but approvedRejectedBy is not null, then the change has been rejected.	No	
`approvedRej`	String	Name of the person that approved or rejected the change request, null if the change has not been rejected or approved.	Yes	
`comments`	String	Comments provided by the person requesting the change.	No	
`operation`	string	One of three operations, Add, Update, Delete.	No	
`currentValu`	*TableR*	Contains the data associated with the current state of the row. This will not be available for 'Add' operations.	Yes	
`newValues`	*TableR*	Contains the data associated with the desired state of the row. This will not be available for 'Delete' operations.	Yes	

21.27.3 Example

Retrieve all the approvals for the current user.

21.27.3.1 Request

```
GET /icweb.dll/approval/
```

21.27.3.2 Response

```
[
        {
```

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```
                "id": 1,
                "requested": 45960.1359869213,
                "object": "Workpack",
                "requestedBy": "Administrator",
                "isApproved": false,
                "approvedRejectedBy": "",
                "comments": "Please create this new workpack for me.",
                "operation": "Add",
                "newValues": {
                        "Workpack_ID": -2,
                        "Name": "Test Workpack",
                        "Actual_Start": "2025-10-30T00:00:00.000Z",
                        "Description": "This is a new workpack",
                        "ReadOnly": false,
                        "Task_Time": "0.0",
                        "Hours_Per_Day": 12,
                        "Estimated_Duration": "0.0",
                        "Actual_End": "2025-10-30T00:00:00.000Z",
                        "Total_Cost": "0.0",
                        "Cost": "0.0"
                }
        }
]
```


21.28 Approve/Reject Change

Approve or Reject a change request, and if relevant make the applicable changes to the row.

Only available to hosted SaaS clients

21.28.1 HTTP Request

```
POST /icweb.dll/approval/{Id}/{approve|reject}
```


```
{
        "comments": "Please update change request with correct information"
}
```


21.28.1.1 URI Parameters

Name	In	Required	Type	Description
id	Path	Yes	String	Specifies the change request
action	Path	Yes	String	Specifiy whether to approve or reject the change request. In the case of reject a comment may be supplied in the json body of the POST
commen	Body	Yes	String	Specifies a comment when a change request is rejected.

21.28.1.2 Responses

Name	Type	Description
200 OK		Change request was successfully approved/rejected.
404 Unsupported	String	Unsupported action for change request, neither approve or reject was specified.
404 Invalid	String	Change request has already been actioned, You can't approve or reject a change request that has already been approved or rejected.
404 Not Found	String	Unknown change request, the id provided was not found or you don't have permissions to action it.

21.29 REST Examples

The following are some examples of different interactions with the REST service using Powershell commands.

> **Note**
>
> It is suggested that interactions with the REST API are thoroughly tested prior to use in a Production environment. Modifying data directly via the REST APIs can have a destructive effect on a NEXUS database if not tested properly.

21.29.1 Authenticating

The following provides an example of how to authenticate against the REST API using powershell. This is required before any other interaction with the REST API.

```
$baseUri = "https://{icWebUrl}/data/icweb.dll/"
$loginUri = $baseUri + "security/login"

# API Key from the user account in NEXUS. We need to base64 encode it for the␣
↪authentication request.
$apiKey = {apiKey}

$apiKeyBytes = [System.Text.Encoding]::UTF8.GetBytes($apiKey)
$apiKeyEncoded = [System.Convert]::ToBase64String($apiKeyBytes)

# Build "Authorization" header for login request.
$headers = New-Object "System.Collections.Generic.Dictionary[[String],[String]]"
$headers.Add("Authorization", "apikey " + $apiKeyEncoded)

# Login to the REST API, result is JSON containing the authentication hash.
$hash = Invoke-RestMethod -method GET -uri $loginUri -Headers $headers
```

21.29.2 Request a list of Rows

Following on from the above authentication, we now have a valid *hash* to be able to query other items from the REST API. The below requests all rows from the Workpack business object.

```
# Base BO REST API
$boUri = $baseUri + "bo/"

# Build the URI to request all the rows from the Workpack business object.
```

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```
$uri = $boUri + "Workpack/" + "?hash=" + $hash.hash
$workpackJson = Invoke-RestMethod -method GET -uri $uri

# Output the list of Workpacks
$workpackJson.rows | Format-Table -Property Workpack_ID, Name
```

> **Note**
>
> If there are more than 100 rows in the workpack table you will need to make subsequent requests to retrieve the rest of the rows.

21.29.3 Request a list of rows with a filter

If you wanted to only return a list of workpacks where the Revision is set to "Planning" we would do that using a filter.

```
# Create filter object
$filter = @{
        where =
        @(
                @{
                        field = "Revision_ID.Name"
                        value = "Planning"
                }
        )
}

# Convert filter object to Json.
$filterJson = $filter | ConvertTo-Json

# Add the filter as a X-NEXUS-Filter http header.
$headers = New-Object "System.Collections.Generic.Dictionary[[String],[String]]"
$headers.Add("X-NEXUS-Filter", $filterJson)

# Build the REST uri for the Workpack business object and Invoke the REST method.
$uri = $boUri + "Workpack/?hash=" + $hash.hash
$workpacks = Invoke-RestMethod -method GET -uri $uri -Headers $headers

# Output the list of workpacks
$workpacks.rows | Format-Table
```

21.29.4 Generate a Report Template

The following generates a report template and emails it to a specified person.

```
# Base report REST URI
$reportUri = $baseUri + "web/generateReport"

# Set the recipient for the report email/
$recipient = "joe.bloggs@nexusic.com"

# Set the report format to RTF - You can use HTML and XLSX as well.
```

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```
$format = "RTF"

# Set the report template key to 16, this specifies the report template to generate.
$reportTemplate = "16"

# Generate Report Template with ID of 16, using RTF format and email it to a specific␣
↪person.
$uri = $reportUri + "?key=" + $reportTemplate + "&format=" + $format + "&recipient=" +
↪$recipient + "&hash=" + $hash.hash
Invoke-RestMethod -method POST -uri $uri
```

21.29.5 Insert a New Row

The following creates a new Workpack, setting the initial values of that Workpack.

```
# Build an object that contains the specified values for Name, Actual_Start, Description␣
↪and ReadOnly
$workpackRow = @{
        Name = "2015 ROV Inspection"
Actual_Start = "2015-05-15T00:00:00.000Z"
Description = "Annual 2015 full field rov inspection"
ReadOnly = $false
}
$body = $workpackRow | ConvertTo-Json

# Build the URI to request all the rows from the Workpack business object.
$uri = $boUri + "Workpack/0?hash=" + $hash.hash
$newRow = Invoke-RestMethod -method PUT -body $body -uri $uri

# Output the the new Workpack row
$newRow.rows | Format-Table -Property Workpack_ID, Name
```

21.29.6 Updating an existing Row

Following on from the insert, we can use the row in *$newRow.Rows* to then update the name of the workpack and abbreviation.

```
# Update Workpack Abbreviation and Name
$workpackRow = @{
        Abbreviation = "2015_ROV"
        Name = "2015 - Annual ROV Inspection"
}
$body = $workpackRow | ConvertTo-Json

# Build the URI - must include the Workpack_ID from the new row so the REST api knows␣
↪what row we are updating.
$uri = $boURI + "Workpack/" + $newRow.rows[0].Workpack_ID + "?hash=" + $hash.hash
$updatedRow = Invoke-RestMethod -method POST -body $body -uri $uri

$updatedRow.rows
```

21.29.7 Getting information on a Function

```
$functionName = "Compare A = B"
$functionUri = $baseUri + "function/"

# Build the URI - must include the Workpack_ID from the new row so the REST api knows␣
↪what row we are updating.
$uri = $functionURI + "/" + $functionName + "?hash=" + $hash.hash
$function = Invoke-RestMethod -method GET -uri $uri

$function
```

The REST service provides an API consisting of a set of HTTP endpoints(methods) with the ability to create, retrieve, edit, or delete access to information stored in a NEXUS IC database. The REST service ensures all request are made through the NEXUS Storage engine which allows security and cohesion to be maintained and respected within the NEXUS database data.

> **Note**
>
> As of NEXUS version 6.9, REST Service Specifications v1.0 is no longer supported.

21.30 Components of a REST API request/response

1. The **request URI**, which consists of: `{uri scheme} :// {uri host} /icweb.dll/ {resource-path} ? {query-string}`
   - `URI scheme`: Indicates the protocol used to transmit the request. This is either http or https. We highly recommend using https in your deployments.
   - `URI host`: Specifies the domain name or IP address of the server where the REST service endpoint is hosted, such as sample.nexusic.com
   - `Resource path`: Specifies the resource or resource collection, as detailed below in the API
   - `Query string (optional)`: Provides additional parameters as required.
2. HTTP request message header fields:
   - A required HTTP method (or verb), which tells NEXUS what type of operation you are requesting. The NEXUS REST service support GET, PUT, POST, and DELETE.
   - Optional additional header fields, as required by the specified URI and HTTP method. For example, an Authentication token that can be used for client authorization.
3. An Optional HTTP request message body, to support the URI and HTTP operation. For POST or PUT operations, the request body is required to have a MIME-type of `application/json`.
4. A HTTP status code, this may be from the 2xx, 4xx or 5xx codes. Each service will indicate what possible returns are available.
5. Optional HTTP response message body, MIME-encoded response objects are returned in the HTTP response body, such as a response from a GET method that is returning data. All results are return in the format JSON.

21.30.1 Authentication

There are 3 authentication options available using *Login*:

1. Username/password request
2. API Key, that is associated with *any* user account with NEXUS, this provides permanent access until the API Key is changed in NEXUS
3. Email based login, that provides the capability for the REST api to email a request token to the user, this is then used to have the REST api issue a token lasting 90 days.

All three of these authorization methods, issue a temporary HASH that expires 60 minutes after the last request.

Once the HASH is received from a valid authorization request to the server, this must be specified in subsequent requests via a `query string` parameter.

```
GET /icweb.dll/bo/?hash={value}
```

21.30.2 Examples

Extensive examples of using the REST API with powershell scripting are available in the below topic.

REST Examples

21.30.3 API Reference

Login	*Logout*	*Business Objects*	*Get Row*
Get Row Field	*Get Rows*	*Create / Update Row*	*Delete Row*
Request Cookie Token	*Validate Cookie Token*	*Post Blob*	*Get Function Object*
Execute Function	*Version*	*Import*	*Report Details*
Job Status	*License*	*Settings*	*Change Requests*

21.30.4 Field Types

Name	Value	Native/JSON Type	Display Field Type
FT_STRING	1	string	string
FT_NUMBER	3	integer (whole number)	integer
FT_NUMERIC	6	float	float
FT_BOOLEAN	5	bool	bool
FT_CURRENCY	7	float	float
FT_DATE	9	string (iso 8601 date/time)	string
FT_TIME	10	string (iso 8601 date/time)	string
FT_DATETIME	11	string (iso 8601 date/time)	string
FT_POSITION	39	string (iso 8601 date/time)	string
FT_LOOKUP	37	integer	string
FT_IMAGE	15	binary	binary
FT_MEMO	16	string	string
FT_PASSTHRU	18	non-stored	based on field type of the destination field. (this is recursive)
FT_GUID	17	string	string
FT_TABLE	38	non-stored	not-visible
FT_CALC	40	non-stored	based on result type of assigned function.
FT_GLOBALTABLE	42	non-stored	based on field type of global field.

CHAPTER

TWENTYTWO

EXPERT SYSTEMS OVERVIEW

Expert system configurations for NEXUS IC are managed by subject matter experts within Wood and are maintained to the latest standards/codes and/or best industry practice.

Click below to find out more about expert systems, how they are used and the benefits they offer.

What is an Expert System?

Expert systems configurations are essentially predefined database configurations, which any NEXUS IC client can subscribe to. When you elect to subscribe to an expert system configuration, the asset types, asset information groups, risk models, event definitions and associated outputs of the expert system (reports, charts, traffic lights and dashboards) are added to your database.

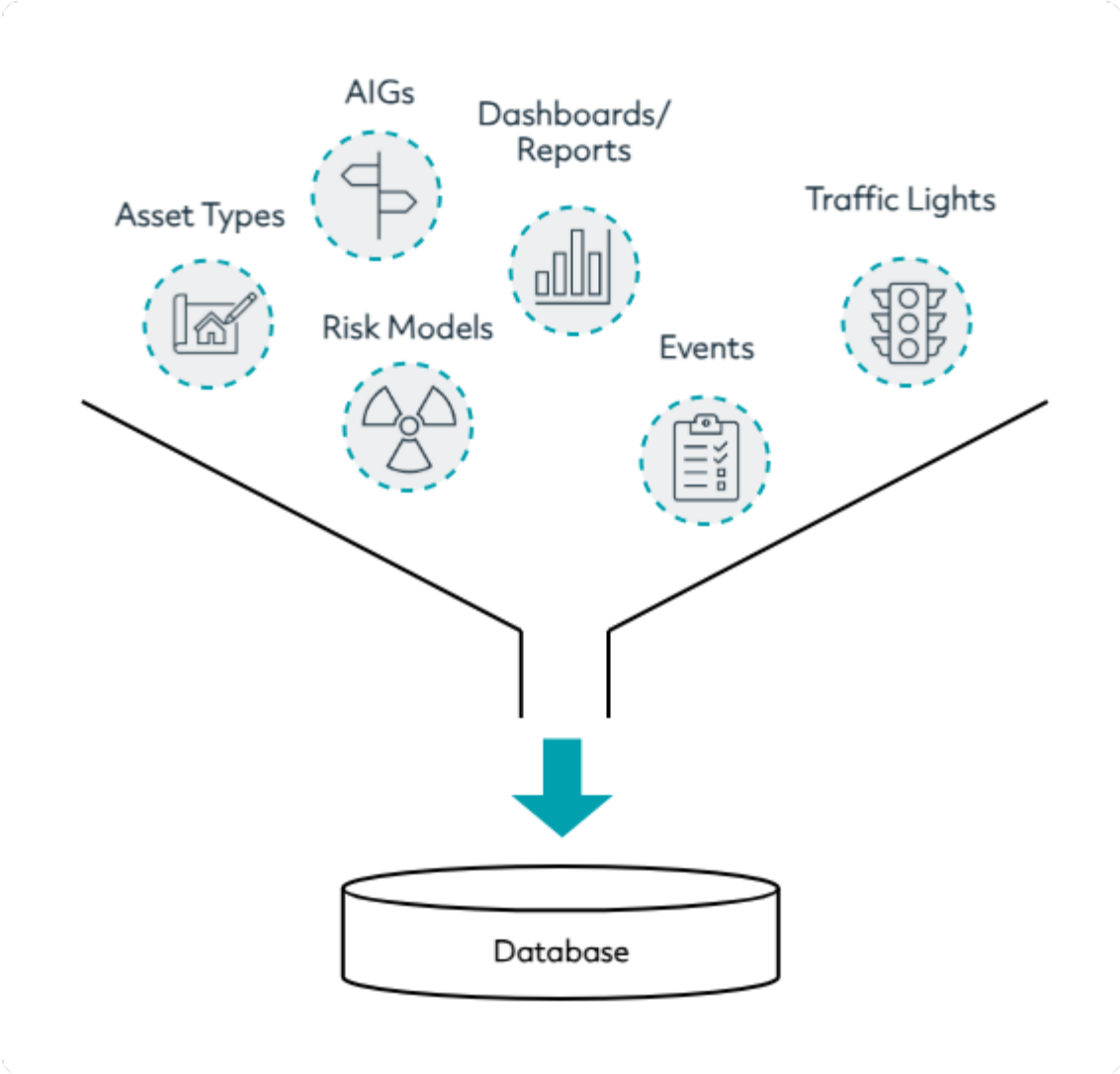
Getting Started

When you create your database with the help of expert systems, you do not have to start from scratch. Expert systems provide the most common configurations that you can use as a basis for your client-specific configurations, which can significantly **reduce the time and effort** that you must invest in setting up your database. If you use expert systems, the process of creating your database will be as simple as shown in the figure below:

Keep Your Database Up-to-Date

Expert systems are **live**, that is, Wood regularly maintains and updates them in line with the evolution of relevant codes, standards and industry best practices.

Changes are managed by Wood and distributed to all NEXUS users that subscribe to the expert system. Updates are synchronised with minimal operations downtime and do not require a software upgrade. Updates do not overwrite the client-specific configurations that you have added to the expert system configurations.


AIGs
Dashboards/
Reports
Asset Types
Traffic Lights
Risk Models
Events
Database

SELECT

Select one or more expert systems that match your asset portfolio.

SUBSCRIBE

Contact Wood to subscribe to each expert system as required.
Subscribing to several expert systems can build a single seamless database.

CUSTOMISE

Add to the database:

- any custom asset information, asset types, calculations or inspection types
- your risk matrix and your inspection plan approach
- connections to other corporate systems

IN-HOUSE UPDATE

The functionality is updated and tested in the relevant expert systems with no client database impact.

PUBLISH & NOTIFY

Updates are published and clients are notified that updates are available.

CLIENT DB UPDATE

Client database can be updated with the new features according to client's own schedule.

Extend Your Portfolio

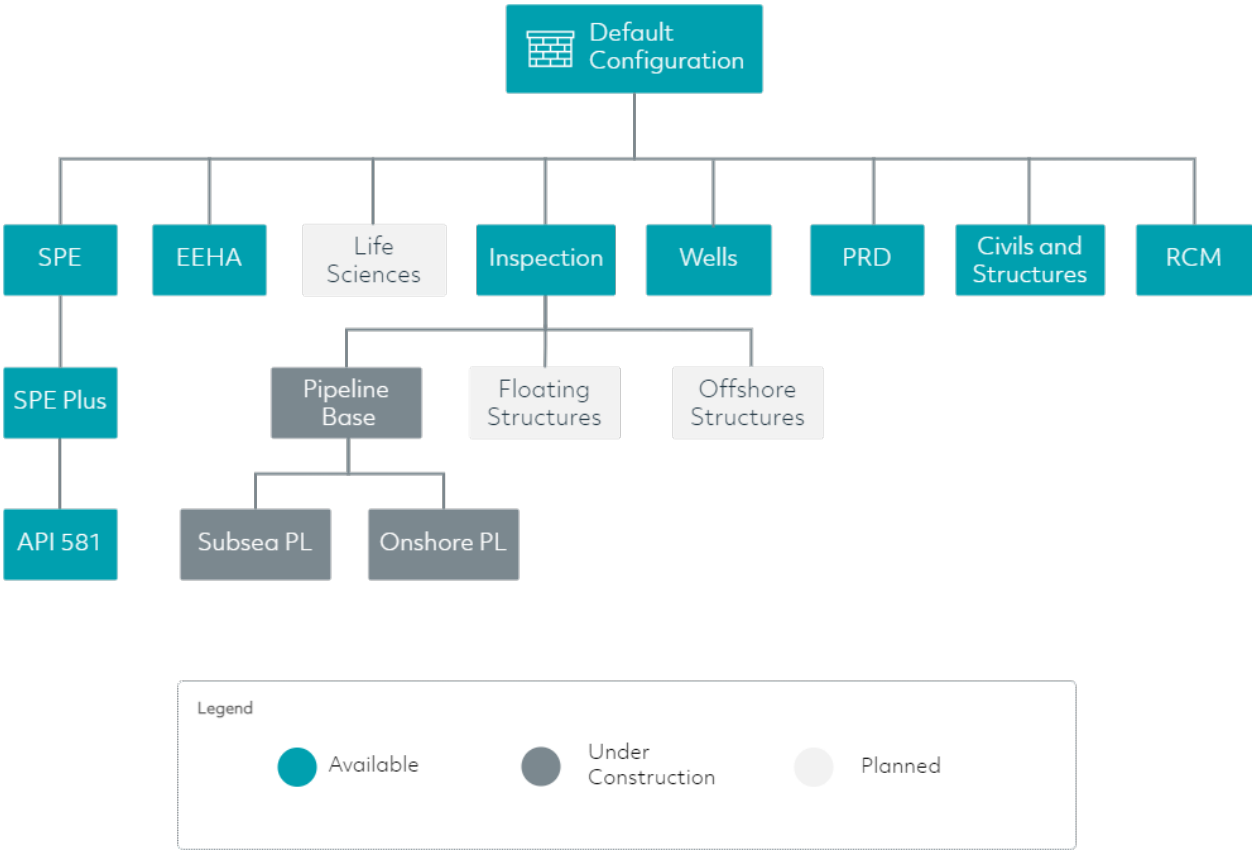
You can add further expert system configurations to your portfolio any time. There is no limit to the number of expert system configurations you can subscribe to. Subscribing to each expert system builds a seamless single database.

22.1 Expert Systems Hierarchy

The diagram below represents the hierarchy of expert system inheritance. Each expert system inherits the configurations above it, starting with the Base Expert System at the root. Click a node for more information about a specific expert system.

Besides expert systems, the following calculators are under planning:

- ECE (expert_systems.ece)
- FMECA (expert_systems.fmeca)
- IOW (expert_systems.IOW)
- Metal Loss Analysis (expert_systems.metalloss)
- FFS (expert_systems.ffs)



For frequently asked questions, see *FAQs*.

22.1.1 Default Configuration

22.1.1.1 Overview

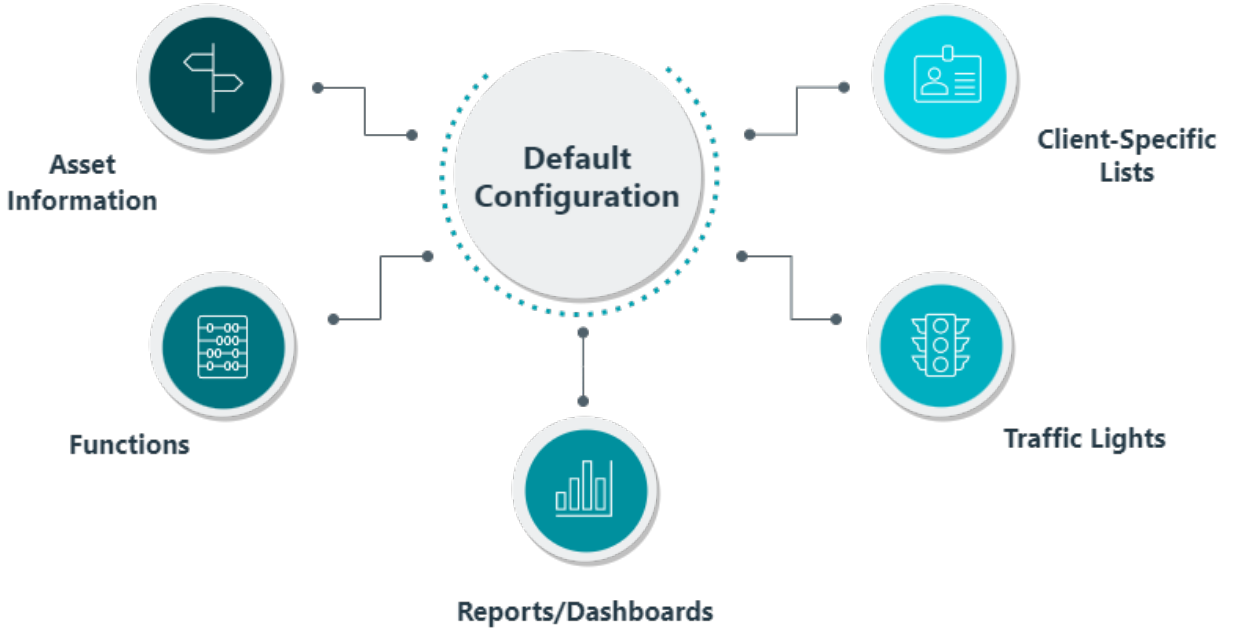
The Default Configuration (also known as the "Base" Expert System), is a foundation level configuration for all other expert system configurations to subscribe to.

This expert system contains generic and commonly used elements, such as chart and report templates, which reference the generic system tables (for example, anomalies, findings, events) as well as several database administration reports providing information on user login activity, database configuration data and commonly used functions.

All other expert systems inherit from this Default Configuration.

22.1.1.2 Content

The following figure shows the elements that are delivered with the Default Configuration. For more information, click on the nodes of the figure below or see *Default Configuration Content*.



22.1.1.3 Deployment Prerequisites

The following configuration is not automatically deployed as part of the "out-of-the box" expert system and needs to be configured manually:

- Client corporate logos (used in header/footers in reports)
- Report styles (corporate fonts and colours used in reports)
- Client risk matrix (corporate risk matrix)
- Security groups (Wood can recommend typical security groups if required)

22.1.1.4 Revision History

22.1.1.4.1 Default Configuration Content

The Default Configuration comes with the following elements:

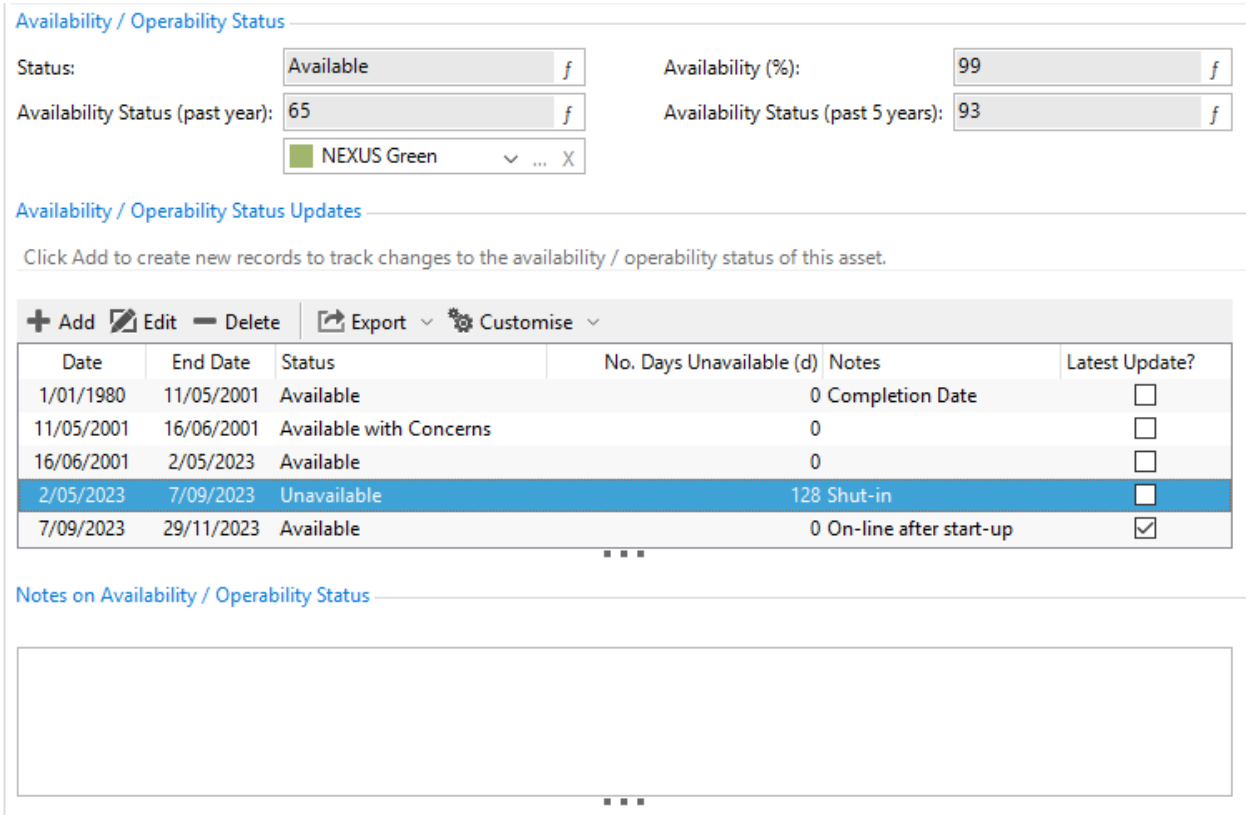
22.1.1.4.1.1 Asset Information Groups (AIGs)

AIG Name	Category	Description
Availability / Operability Status	General Data	Captures and stores availability statistics from facility to component to track and report on availability across the asset pool. Find more information below the table.
MAXIMO	External References	Standard Maximo Asset Identification attributes
Risk Assessment Sign off / Actions	Approvals	Sign-off or approvals for risk assessments with an action register and re-assessment scheduling information. Facilitates the approval and sign-off process for digitally stored risk assessments. Captures actions associated with the risk assessments the risk result on approval to profile risk over the life of the facility. Find more information below the table.

Click below for further details:

Availability / Operability Status

Tracks availability and operability of any asset in the hierarchy. Information stored in this AIG is used to visualise historical and current status of the assets. Uptime statistics are calculated for the asset life, the past year and past 5 years on a rolling basis.



Risk Assessment Sign off / Actions

This AIG comprises two main parts:

- **Risk Review History**

  The agreed assessment approval process is configured in the *Base ExSys Configuration* global table. The Risk Assessment Sign-off functionality works on either a two-step or three-step approval process:

  – The two-step approval process requires a **Prepared** and **Approved** record.

  – The three-step process requires a **Prepared**, **Accepted** and **Approved** record.

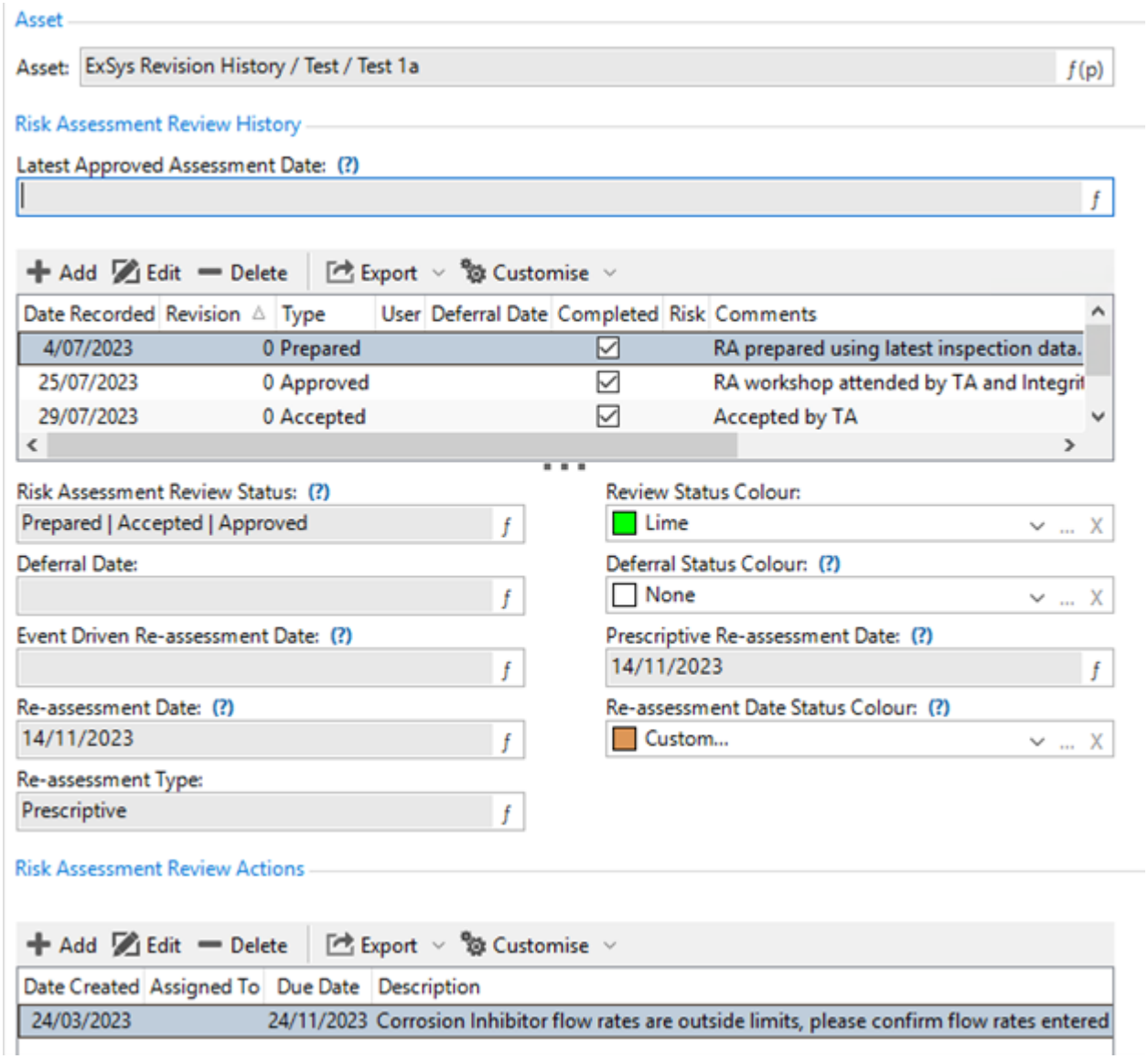
  A risk assessment revision cycle is fully approved when:

  – The relevant Review History records have been created (according to the agreed approval process)

  – The **Completed** field of each of the revision history records is set to *Yes*.

  – The Revision number of each of the records in this revision cycle match. Where the highest revision number represents the latest revision cycle.

  Deferrals are treated in the same way as prepared risk assessments. The agreed deferral process can be different from the approval process. For example, you can have a two-step approval process for risk assessments, but


Asset
Asset: ExSys Revision History / Test / Test 1a
f(p)
Risk Assessment Review History
Latest Approved Assessment Date: (?)
Add
Edit
Delete
Export
Customise
Date Recorded
Revision
Type
User
Deferral Date
Completed
Risk
Comments
4/07/2023
0 Prepared
RA prepared using latest inspection data.
25/07/2023
0 Approved
RA workshop attended by TA and Integrit
29/07/2023
0 Accepted
Accepted by TA
Risk Assessment Review Status: (?)
Prepared | Accepted | Approved
Review Status Colour:
Lime
Deferral Date:
Deferral Status Colour: (?)
None
Event Driven Re-assessment Date: (?)
Prescriptive Re-assessment Date: (?)
14/11/2023
Re-assessment Date: (?)
14/11/2023
Re-assessment Date Status Colour: (?)
Custom...
Re-assessment Type:
Prescriptive
Risk Assessment Review Actions
Add
Edit
Delete
Export
Customise
Date Created
Assigned To
Due Date
Description
24/03/2023
24/11/2023
Corrosion Inhibitor flow rates are outside limits, please confirm flow rates entered

a three-step process for deferrals. This **Risk Assessment Sign Off / Actions** AIG functionality requires client-specific setup. Risk-Based Inspection (RBI) re-assessment dates are calculated based on either the latest approved deferral date, a prescriptive interval or the time since the latest inspection. The risk review re-assessments are forecast and can be visualised in pre-configured charts, reports and dashboards.

- **Risk Assessment Review Actions**

  Any action associated with a risk assessment are captured here and can be forecast and visualised in pre-configured charts, reports and dashboards.

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22.1.1.4.1.2 Functions

There are some generic, commonly used functions available in the Default Configuration database.

Not all functions contained in the Default Configuration are described here. The following, commonly used generic functions can be used in any databases that inherit from this Default Configuration:

Relevance	Function Name	Description
Colour	Due / Overdue Traffic Light to Colour	Takes a <No. days> and <due date> as input parameters. Returns Green, Amber, Red based on Not due, Due within and Overdue.
Colour	Yes/No to Colour	Takes a <Yes/No> type input and returns either NEXUS Green (Yes), NEXUS Orange (No) or Grey (null) from the NEXUS colour palette.
Colour	Anomaly Action Overdue Status to Colour	Takes the <Anomaly.Action Overdue Status> text 'No Actions', 'Overdue' or 'Upcoming' and returns a colour for charting.
Colour	Anomaly Action Status to Colour	Takes the <Anomaly.Action Status> text 'Complete', 'Incomplete' or 'No Action Assigned' and returns a colour.
Database Configuration	Normalise Axis Value	Takes the Risk Assessment <value> as a whole number, and the maximum number matrix <granules> on this axis and returns a value between 0 and 1.
Date and Duration	Days from Today	Takes <Input Date> and calculates the number of days from today's date. A negative result is number of days elapsed from the <Input Date> to today, a positive result is number of days from today to the <Input Date> (in the future).
Date and Duration	Today's Date (as Date)	Returns today's date in Date format.
Date and Duration	Today's Date (as Date/Time)	Returns today's date in Date/Time format.
Formatting	Date (MM-DD) as String	Takes a <Date> type input and returns MM-DD with alphanumeric type.
Formatting	Date (YYYY) as String	Takes a <Date> type input and returns YYYY with alphanumeric type.
Formatting	Date (YYYY) as String	Takes a <Date> type input and returns YYYY-MM with alphanumeric type.
Formatting	Date (YYYY-MM) as String	Takes a <Date> type input and returns YYYY-MM with alphanumeric Type
Formatting	Pad Leading Zeroes	Takes the <Integer> number to pad and the <Total Length (1..10)> of the whole number. For example, input Integer 355 padded to 6 will output "000355".
Miscellaneous	Current user name	Returns the name of the user that is logged into this session. No inputs required.
Miscellaneous	Is Current User?	Takes the <SU_ID> or <Personnel.Name> and determines if the input SU_ID or Personnel.Name matches the currently logged in user. Returns "Yes" or "No".
Miscellaneous	Is this asset Risk Assessed?	If the input Asset <Component_ID> has a Risk Assessment assigned to it, then it returns "Yes", else it returns "No".
Miscellaneous	Is AIG Assigned to this Asset Type?	Returns "Yes" if the <AIG Name> is assigned to the <Asset Type Name>, else it returns "No".
Miscellaneous	Date of most recent Event (by Event Type)	Takes the Asset <Component_ID> and <Event Type> name and returns the most recent event date (including child assets).
Miscellaneous	Return Value from Named Value Pair	Returns the Value from the Base ExSys Configuration Global Table. It passes in the <parameter> Name.
Miscellaneous	Due / Overdue Traffic Light to Text	Takes a <No. days> and <due date> as inputs. Returns "Overdue", "Due within <No. Days> days", "Not due for more than <No. Days> days" or "No Due Date or Due Window defined".
Miscellaneous	No. Layers	Returns the number of Drawings layers that are associated with this asset <Component_ID>.
Miscellaneous	No. Linked Drawings	Returns the number of Drawings that are linked to this asset <Component_ID>.

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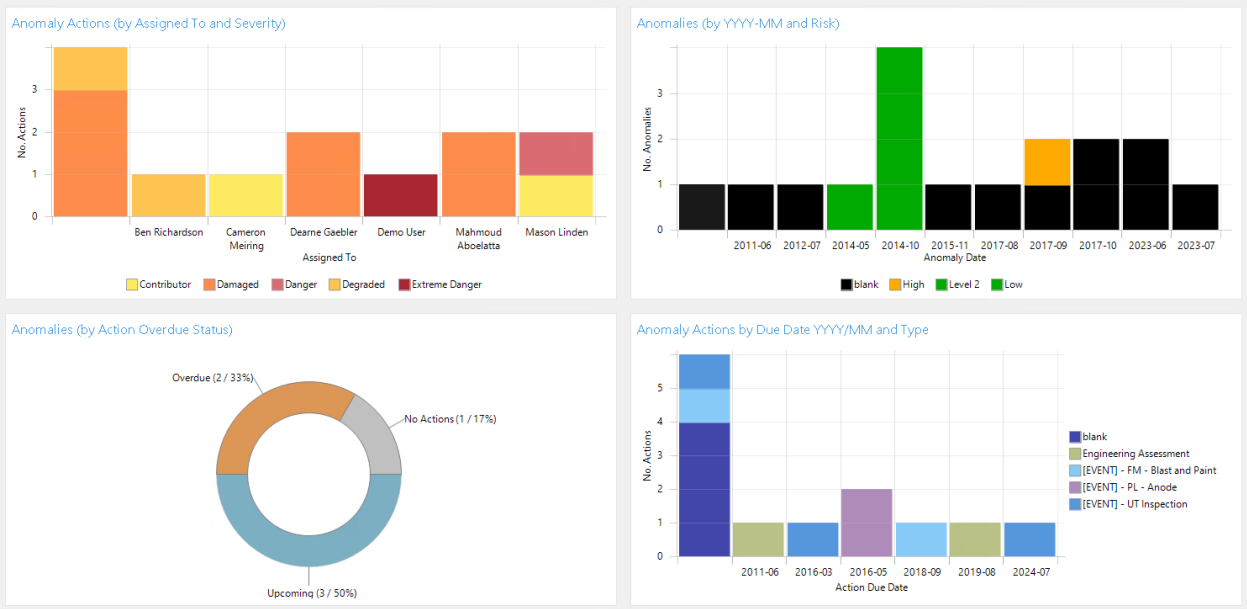
22.1.1.4.1.3 Reports and Dashboards

Report Name	Description
Base ExSys Report Elements	A report containing sample tables and charts from the core database schema that can be used to help accelerate construction of other reports. Use the **Retrieve Element** button to transfer the selected items to your new report. Example charts and tables of the report elements are shown below.
Database Configuration	Lists key configuration elements of the database including the dynamic table definitions, Security Groups and User Lists, Lookup Lists, Expert System revisions, Triggers and Configuration Issues.

Report elements are put into the following categories (click the items to see examples for each category):

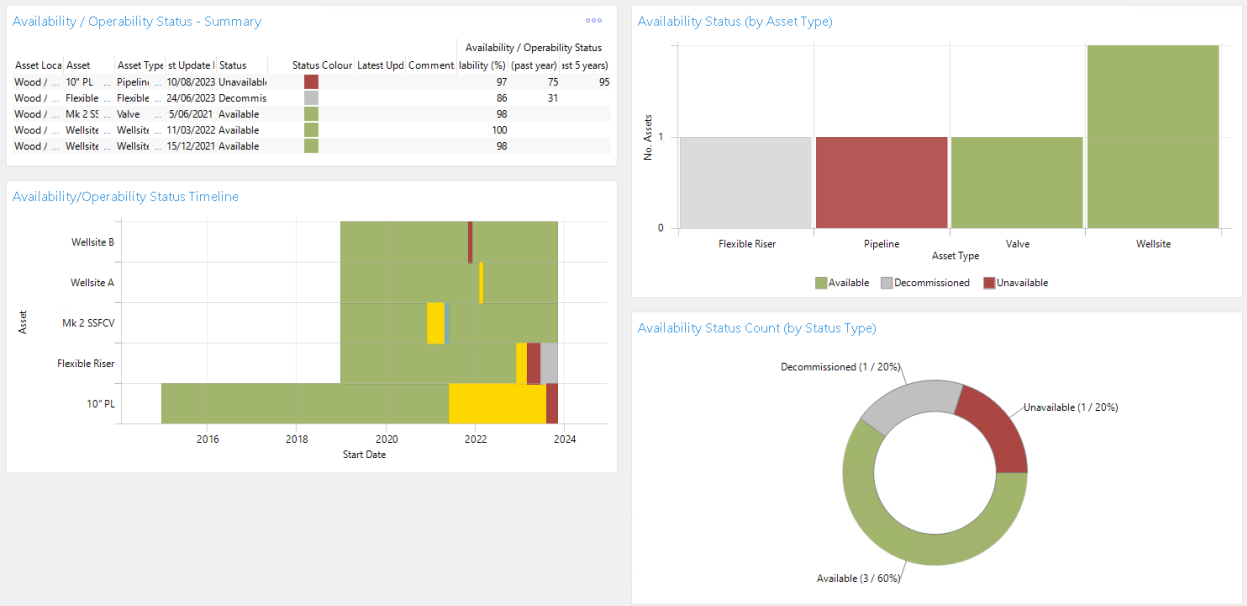
Anomaly / Anomaly Actions



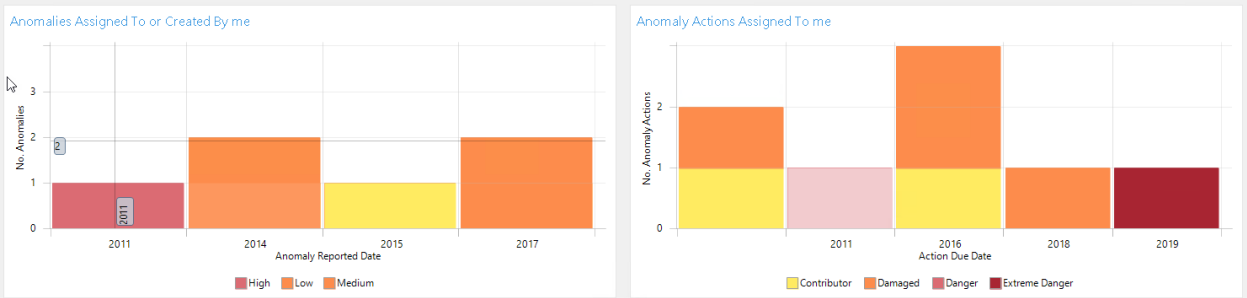
Availability / Operability Status

Events / Findings

"My" Actions


Availability / Operability Status - Summary
Availability / Operability Status
Asset Loca Asset Asset Type st Update I Status Status Colour Latest Upd Comment lability (%) (past year) ast 5 years)
Wood / ... 10" PL ... Pipelin ... 10/08/2023 Unavailabl 97 75 95
Wood / ... Flexible ... Flexible ... 24/06/2023 Decommis 86 31
Wood / ... Mk 2 SS ... Valve ... 5/06/2021 Available 98
Wood / ... Wellsite ... Wellsite ... 11/03/2022 Available 100
Wood / ... Wellsite ... Wellsite ... 15/12/2021 Available 98
Availability/Operability Status Timeline
Wellsite B
Wellsite A
Mk 2 SSFCV
Flexible Riser
10" PL
Asset
2016
2018
2020
2022
2024
Start Date
Availability Status (by Asset Type)
No. Assets
1
0
Flexible Riser
Pipeline
Valve
Wellsite
Asset Type
Available
Decommissioned
Unavailable
Availability Status Count (by Status Type)
Decommissioned (1 / 20%)
Unavailable (1 / 20%)
Available (3 / 60%)

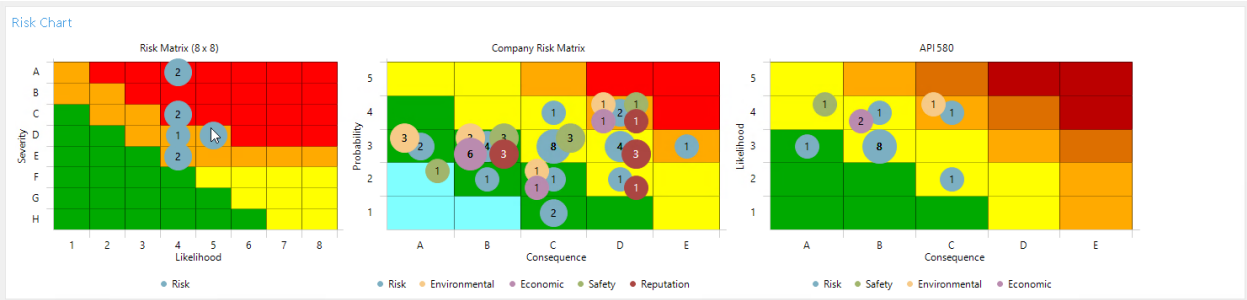
Finding Reviewed Status
No. Findings
500
400
300
200
100
0
0
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
2023
Finding Reported Date
No
Yes
Unreviewed Findings (by Severity)
Danger (4 / 4%)
Degraded (24 / 23%)
Extreme Danger (2 / 2%)
(13 / 13%)
Contributor (60 / 58%)
Events by Type
PL - Profile (1646 / 19%)
PL - ROW Survey (4 / 0%)
PL - Stabilisation (98 / 1%)
PL - ILI Defect (2348 / 27%)
Repair (1 / 0%)
(18 / 0%)
Anode (310 / 4%)
CUI Visual Inspection (1 / 0%)
PL - Feature (71 / 1%)
Monitoring - Temperature (446 / 5%)
CVI (12 / 0%)
ESDV Test (125 / 1%)
Monitoring - Pressure (565 / 6%)
ILI Run (1 / 0%)
Event Reviewed Status (By YYYY)
No. Events
4000
3500
3000
2500
2000
1500
1000
500
0
0 20 05
20 06
20 07
20 08
20 09
20 10
20 11
20 12
20 13
20 14
20 15
20 16
20 17
20 18
20 19
20 20
20 23
Year
No
Yes
Event Reviewed Status (By YYYY-MM)
No. Events
1800
1600
1400
1200
1000
800
600
400
200
0
0-01
2007-05
2008-06
2009-04
2010-02
2010-12
2011-10
2012-08
2013-06
2014-04
2015-02
2015-12
2016-10
2017-08
2018-06
2019-04
2020-02
2020-12
Event Date
No
Yes



Anomalies Assigned to or Created By Me

Asset Location	Asset	Asset Type	Name	Code	Severity	Priority	Anomaly Set	Status	omaly Number	Closed Out	Date Created	Created By	Assigned To	Reference Num	Description	Risk Score
Wood / Ons ...	150-PG-3348-0(	Piping Line	WT @ 150-PG-3	WT	Contributor	Medium		Anomaly raised		Open	18/11/2015	Dearne Gaebler			Low Wall Thick	3
Wood / Offs ...	24" PL	Pipeline	AW @ 24" PL	AW	Contributor	Low		Monitor		Open	13/10/2014	Dearne Gaebler			Depletion 25-5(	2
Wood / Offs ...	24" PL	Pipeline	AW @ 24" PL	AW	Degraded	Low		Monitor		Open	13/10/2014	Dearne Gaebler			Depletion 50-75	2
Wood / Offs ...	24" PL	Pipeline	AW @ 24" PL	AW	Damaged	Medium		Monitor		Open	13/10/2014	Dearne Gaebler			Depletion 75-1(	8
Wood / Offs ...	10" PL	Pipeline	AW @ 10" PL		Damaged	Low		Monitor		Open	13/10/2014	Dearne Gaebler			Depletion 75-1(	7
Wood / Ons ...	150-PG-3348-0(	Piping Line	CD @ 150-PG-3	CC	Damaged	Low		Maintenance Pı		Open	18/08/2017	Dearne Gaebler			Coating Damag	7
Wood / Offs ...	Flare Boom	Topside Structu	CD @ Platform	CD	Degraded	Low		Monitor		Open	6/09/2017	Dearne Gaebler			Excessive coatir	2
Wood / Offs ...	Upper Deck	Topside Structu	CD @ Platform	CD	Damaged	Low		Maintenance Pı		Open	6/09/2017	Dearne Gaebler			Coating Degrac	7
Wood / Offs ...	ESDV 401 (Platf	ESDV	ESDV @ ESDV 4(	ESDV	Danger	High		Anomaly raised		Open	27/06/2011	Dearne Gaebler			ESDV test did n(	14

Risk



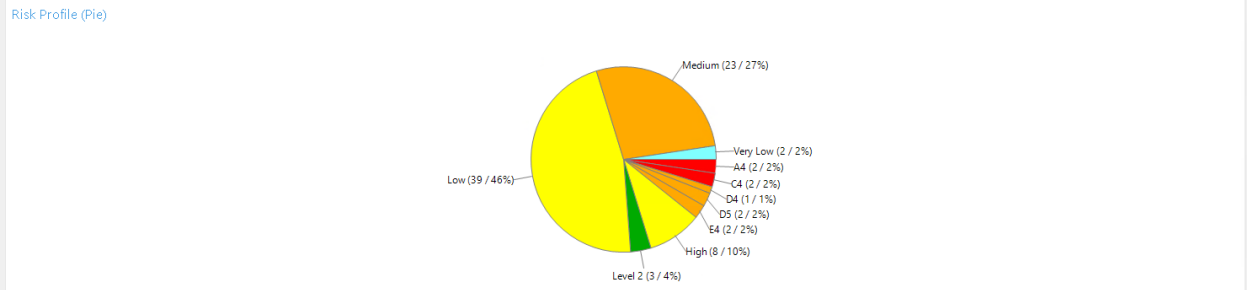
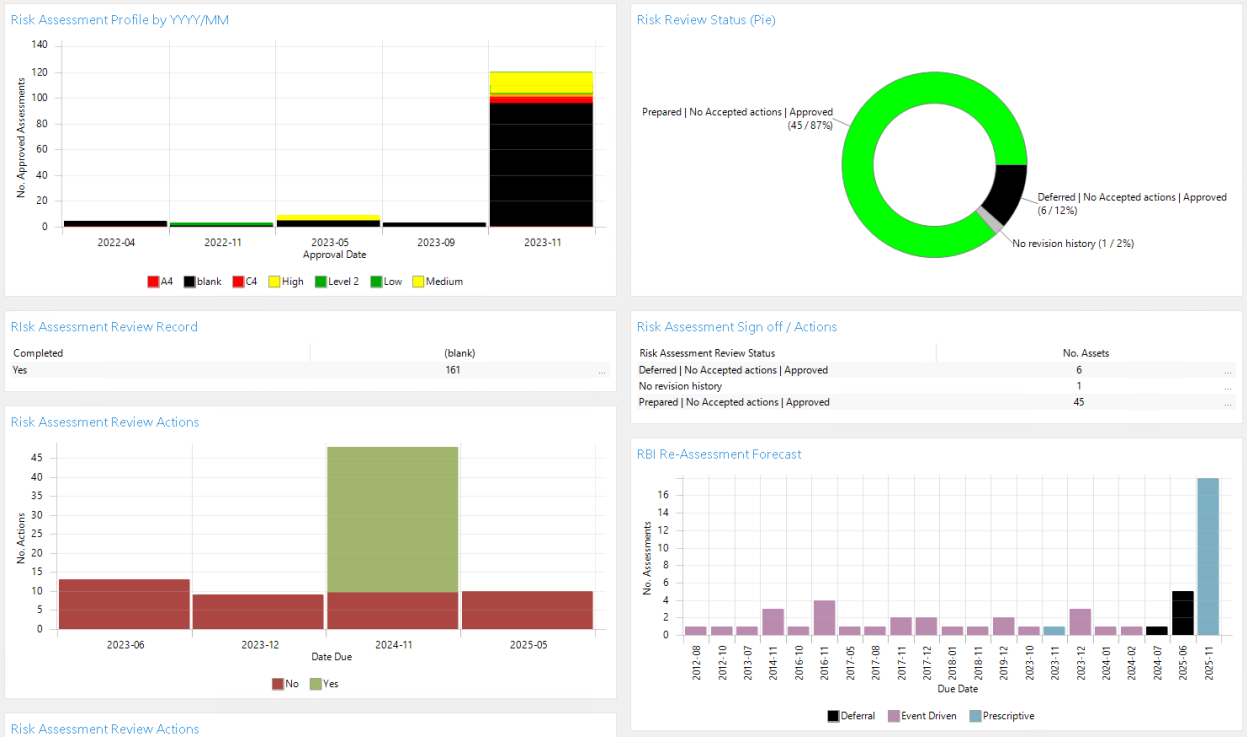


Table of Data

			Risk Assessment					Result		
Asset Location	Asset	Asset Type	Risk Model	Scenario	Risk	X Value	Y Value	Colour	Matrix Value
Wood / Onshore Gas ...	PP-PG-CL01-P01Medium	Piping Circuit	... API 581		Level 2	0.5	0.3		2
Wood / Onshore Gas ...	PP-PG-CL01-P01Medium	Piping Circuit	... API 580 Qualitative		High	0.3	0.7		14
Wood / Onshore Gas ...	PP-PG-CL01-P02Main	Piping Circuit	... API 581		Level 2	0.5	0.1		2
Wood / Onshore Gas ...	PP-PG-CL01-P02Main	Piping Circuit	... API 580 Qualitative		Medium	0.5	0.7		18

Risk Sign-Off / Actions and Re-assessment Forecasting



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22.1.1.4.1.4 Traffic Lights

Whilst traffic lights can be configured to suit specific client requirements, there are a selection of traffic lights that are included in each database deployment.

Traffic Light Name	Description
Anomalies	Displays traffic lights based on Anomaly Count of this asset and all child assets.
Event History	Shows where inspection data exists on this asset and child assets.
Incomplete Tasks	Highlights where incomplete tasks are the active workpack on the asset tree.
Risk	Displays the worst-case risk from this asset and all its child assets.
Rolled up Risk	Shows the rolled up (maximum) risk for an asset and all of its children.
RBI Assessment Review Status	Displays the status of the latest revision cycle (Prepared, Accepted or Accepted).
RBI Deferral Date Status	Where an RBI assessment has been deferred, it shows the Deferral Due Date Status (Red = Overdue, Amber = Due within 90 Days, Green Due > 90 Days).
RBI Re-assessment Due Date Status	Shows the Re-assessment Date Status (Red = Overdue, Amber = Due within 90 Days, Green Due > 90 Days).

Example

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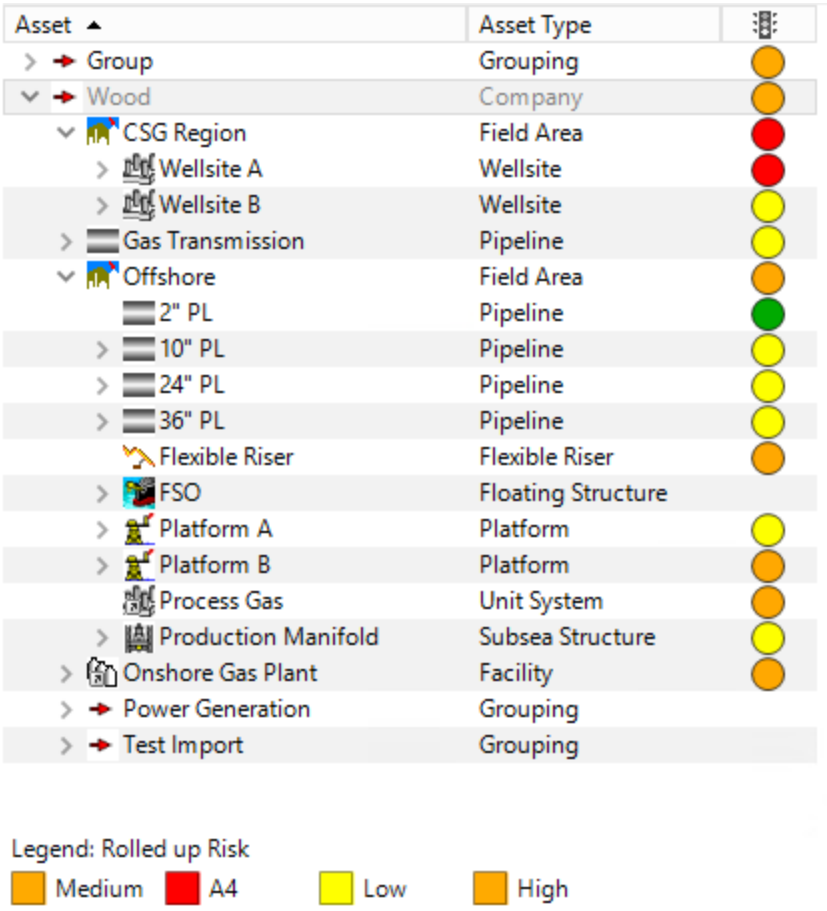
Asset
Asset Type
Group
Grouping
Wood
Company
CSG Region
Field Area
Wellsite A
Wellsite
Wellsite B
Wellsite
Gas Transmission
Pipeline
Offshore
Field Area
2" PL
Pipeline
10" PL
Pipeline
24" PL
Pipeline
36" PL
Pipeline
Flexible Riser
Flexible Riser
FSO
Floating Structure
Platform A
Platform
Platform B
Platform
Process Gas
Unit System
Production Manifold
Subsea Structure
Onshore Gas Plant
Facility
Power Generation
Grouping
Test Import
Grouping
Legend: Rolled up Risk
Medium
A4
Low
High

22.1.1.4.1.5 Client-Specific Lists

Wood delivers "out-of-the-box" configuration for the global tables and lookup lists listed below. These tables and lookup lists are delivered without data. To ensure that the system works effectively, customers must populate them with their own company-specific data upon deployment. Wood can provide sensible default data if required.

Type	Name	Description
Lookup List	Risk Assessment Engineer	To be populated with a list of engineers who might be responsible for preparing, accepting or approving risk assessments, or engineers who can create or be assigned risk assessment actions. When the engineer name matches a user name in the database, then these records are visualised in **My Dashboard** for that logged in user.
Lookup List	Availability / Operability Status	A list of operability statuses. It is used in conjunction with the global lookup table to calculate and visualise asset or component availability. For example, Available; Available with concerns; Unavailable; Maintenance PM; Decommissioned.
Global Table	Base ExSys Configuration	
Global Table	Availability / Operability Status Traffic Lights	For each of the availability/operability statuses defined in the lookup list (above), indicates if the status is Available and the colour assigned to the status. For example, Available, Yes, Green; Available with concerns, Yes, Yellow; Unavailable, No, Red; Maintenance PM, No, Blue; Decommissioned, No, Grey.
Global Table	Approval Status Traffic Light	Depending on the For example, No revision history, Grey; Prepared | Accepted Approved, Green; Deferred | Accepted | Approved, Green;

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22.1.2 Civils and Structures Expert System

22.1.2.1 Overview

The Civils and Structures Expert System is configured to assist in the management of clients' onshore structural assets. This expert system has been configured to allow storage of each structural components general, location, design, baseline, inspection, and risk data. A structural components inspection plan is automatically calculated following a probability of failure and consequence of failure risk assessment.

22.1.2.2 Codes / Standards

N/A

22.1.2.3 Asset Types

Asset Type	Description
Associated Infrastructure	Roads and Associated Infrastructure
Bridges	Civil Infrastructure
Bunds and Dykes	Spill Containment Structure
Buried Sewers	Drainage Network
Catch Basin	Drainage Network

continues on next page

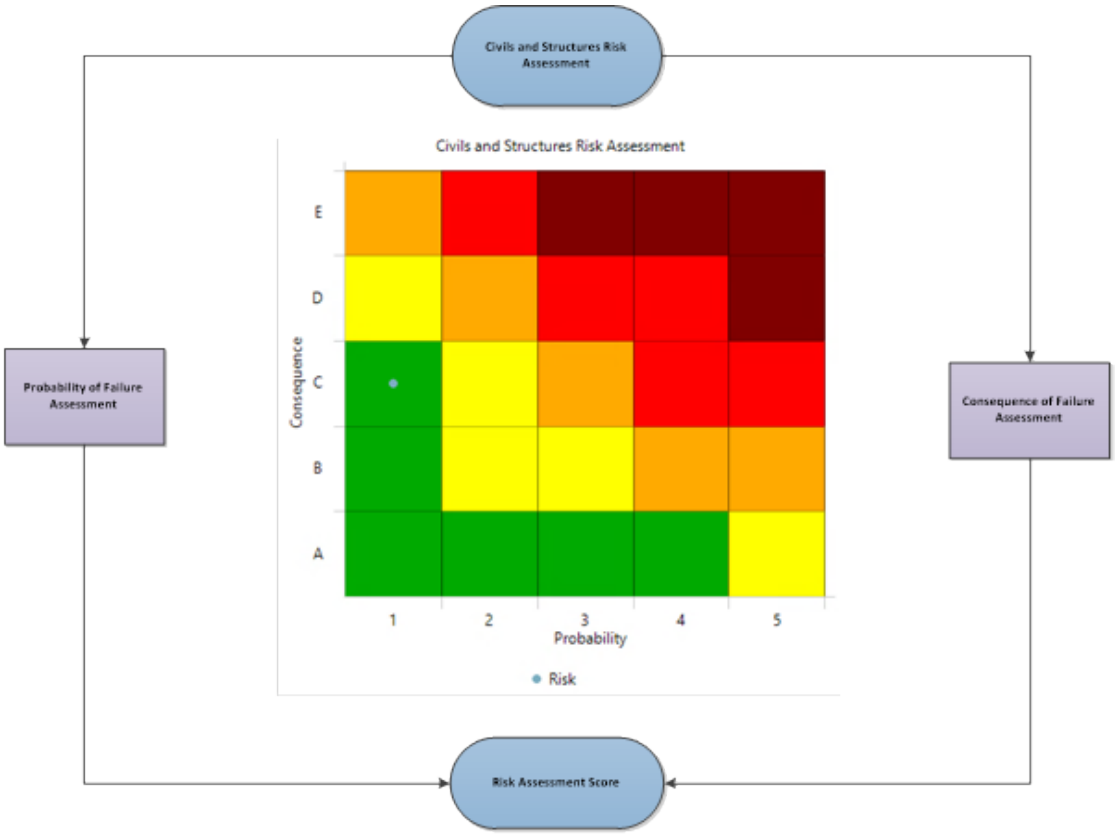
Table 1 – continued from previous page

Asset Type	Description
Client	
Concrete Pavings	Civil Infrastructure
Concrete Pavings	Major Concrete Structure and Foundation
Concrete Sleepers	Major Concrete Structure and Foundation
Cooling Water Structures	Civil Infrastructure
Culverts and Tunnels	Civil Infrastructure
Deflection Wall	Civil Infrastructure
Drainage System	Drainage Network
Electrical and Instrument Support	Major Steel Structure and Foundation
Equipment Foundations	Major Concrete Structure and Foundation
Facility	
Firewalls and Blastwalls	Fire and Blast Protection
Flare Structure	Major Steel Structure and Foundation
Gates and Fences	Major Steel Structure and Foundation
Ground Flare Structure	Major Steel Structure and Foundation
Guy Wire	Major Steel Structure and Foundation
Lifting and Handling Support	Major Steel Structure and Foundation
Manhole	Drainage Network
Non-Process Building	Buildings
Passive Fire Protection	Fire and Blast Protection
Permanent Safety Barriers	Roads and Associated Infrastructure
Piperack Structures	Major Steel Structure and Foundation
Process Building	Buildings
Process Drain Sumps	Drainage Network
Retaining Walls	Civil Infrastructure
Roads and Car Parks	Roads and Associated Infrastructure
Sanitary Sewer System	Drainage Network
Secondary Steel Structure	Major Steel Structure and Foundation
Service Pits and Trenches	Major Concrete Structure and Foundation
Shelter or Shed	Buildings
Standalone/Off-Skid Pipe Supports	Major Steel Structure and Foundation
Structural Component	CSIM
Structural Steel Member	
Structural System	CSIM
System	
Tall Structures	Major Steel Structure and Foundation
Tank Foundations	Major Concrete Structure and Foundation
Tertiary Steelwork	Major Steel Structure and Foundation

22.1.2.4 Asset Information

Asset Information Group	Description
CSIM Baseline SAT	S.A.T details, scope, interfaces, design data, risk data, inspection methods and requirements including any additional data relevant to the baseline.
CSIM General Information	Area and block information, description of asset, associated equipment, and related documentation.
CSIM Location Information	Location name, eastings and northings.
CSIM Design Data	Wall thickness, load, foundation, drainage, and guy wire design criteria.
CSIM Probability of Failure	Civils and structures probability of failure assessment.
CSIM Consequence of failure	Civils and structures consequence of failure assessment.
CSIM Inspection Requirements	Inspection scope, interfaces, limits, specific instructions, preparation, tools and inspection considerations.
CSIM Inspection Plan	Risk assessment results, inspection plan (including last inspection date, calculated and override frequencies and next inspection dates) and approved inspection plan.

22.1.2.5 Risk Models



22.1.2.6 Inspection / Maintenance Events

Event Type	Description
Bolt Integrity Inspection	Bolt condition
Bund Integrity Test	Bund type, volumes, water level readings, duration of test
Buried Sewer and Drainage Visual Survey	Overall condition of the drainage system
Close Visual Inspection - Concrete	Close Visual Inspection (CVI) of concrete condition
Close Visual Inspection - Masonry	Close Visual Inspection (CVI) of Masonry condition
Close Visual Inspection - Steel	Close Visual Inspection (CVI) of Steel condition
Close Visual Inspection - Tertiary Steelwork	Close Visual Inspection (CVI) of Tertiary Steelwork condition
Concrete Crack Inspection	Inspection technique, dimensions of crack and pH readings
General Area Walk-Around Inspection	Area code and name, general visual inspection of the area
General Movement Survey	Type of inspection, dimensions of the deviation
General Visual Inspection - Concrete	General Visual Inspection (GVI) of concrete condition
General Visual Inspection - Masonry	General Visual Inspection (GVI) of Masonry condition
General Visual Inspection - Steel	General Visual Inspection (GVI) of steel condition
General Visual Inspection - Tertiary Steelwork	General Visual Inspection (GVI) of Tertiary Steelwork
Ground Movement Survey	Type of inspection, reason for movement and general
Groundwater Survey	Type of inspection and water level readings
Guy Wire Close Visual Inspection	Design and measured dimensions, general condition, and structural deviation details
Guy Wire Tension Check	Design tension and tension readings
Level Survey	Monitoring location details and measured height
Local Deformation Survey	Type of inspection and overall condition
Post Event Walk-Around Inspection	Type of event recorded and overall condition
Wall Thickness Readings	Feature details, readings at clock positions and wall thickness design data
Weld Integrity Check	NDT technique carried out, position of reading and dimensions of flaw

22.1.2.7 Dashboards / Reports

Report	Description
CSIM Dashboard	For the selected structural component, this report displays a table of child assets and their risk results, risk matrix, inspections due chart and table of inspection types and the next inspection due dates
CSIM IMR Report	[Select a 'Structural Component' grouping] Generates an Excel listing of IMR Last Inspection dates, Frequencies and Next Dates
CSIM Structural Assessment Table Report	[Generate in MS Word] This report generates a Structural Assessment Table (S.A.T) template containing an asset description of the component to be inspected, scope of inspection, interfaces, as well as PoF and CoF values
CSIM Workpack Instruction Report	[Select a Workpack] Asset data, task listing, limits, open anomalies, historical inspections, documents and drawings.

22.1.3 EEHA Expert System

22.1.3.1 Overview

The EEHA (Electrical Equipment in Hazardous Area) Expert System is configured to assist in the management of electrical equipment in hazardous areas. The large volume of Ex equipment that typically exist on many sites can often lead to difficulties in performing inspections and managing the data associated with them. The EEHA expert system can assist by providing a mobile electronic inspection solution that will instantly feed to the database. From here, the data may be used to demonstrate KPIs, perform RBI assessments and plan/create of work pack. Allowing the user to reduce the inspection load and manage the data effectively to meet the required regulations.

22.1.3.2 Codes / Standards

- Australian/New Zealand Standard Explosive Atmosphere Part 17: Electrical installations inspection and maintenance (IEC 60079-17:2013 (ED.5.0) MOD) - AS/NZS 60079.17: 2017.
- Guidelines for managing inspection of Ex electrical equipment ignition risk in support of IEC 60079-17.

22.1.3.3 Asset Types

Asset Type	Description
Lot	Groups Ex electrical equipment together by zone, type of protection, environmental condition, and equipment age. The RBI assessment is performed at this level with an inspection interval applying to the Ex-equipment below.
Ex Electrical Equipment	Defines the physical assets present on site. The inspections are recorded at this level.

22.1.3.4 Asset Information

Asset Information Group	Description	Assigned to Type(s)
Defining Features of Lot	Summarises the type of equipment within a lot.	Lot
Frequency of Inspection	Demonstrates the calculations performed to determine the frequency of inspection.	Lot
Lot Equipment Information	The asset data relevant to Ex electrical equipment.	Ex Electrical Equipment
Sample Size	The determination of the number of children assets to be inspected at a given frequency.	Lot
Sampling Plan	A summary of the current key parameters of the lot.	Lot

22.1.3.5 Inspection / Maintenance Events

Event Type	Description	Assigned to Asset Type(s)
EEHA Close Inspection Form		Ex Electrical Equipment
EEHA Detailed Inspection Form		Ex Electrical Equipment
EEHA Inspection Form		Ex Electrical Equipment
EEHA Visual Inspection Form		Ex Electrical Equipment
Lot Inspection	Calculates the results of most recent inspection	Lot
Review of Sampling Plan		Lot

22.1.3.6 Dashboards / Reports

Report Name	Comments
EEHA - Charts	
EEHA - Inspection Checklist Form	
Ex 'i' Detailed Inspection	

22.1.4 Pipeline Expert Systems

NEXUS offers the following expert systems for pipelines:

- Pipeline Base expert system (see *Pipeline Expert System*)
- Onshore Pipeline expert system (see *Onshore Pipeline Expert System*)
- Subsea Pipeline expert system (see *Subsea Pipeline Expert System*)

22.1.4.1 Pipeline Expert System

This expert system is currently under construction.

22.1.4.2 Onshore Pipeline Expert System

This expert system is currently under construction.

22.1.4.3 Subsea Pipeline Expert System

This expert system is currently under construction.

22.1.5 PRD Expert System

22.1.5.1 Overview

The PRD (Pressure Relief Device) Expert System is configured to assist in the management of clients' pressure relief devices. This expert system has been configured to allow storage of each PRDs general, design and process data, as well as display each PRD's inspection history. A PRD inspection plan is automatically calculated following a PRD criticality assessment.

22.1.5.2 Codes / Standards

N/A

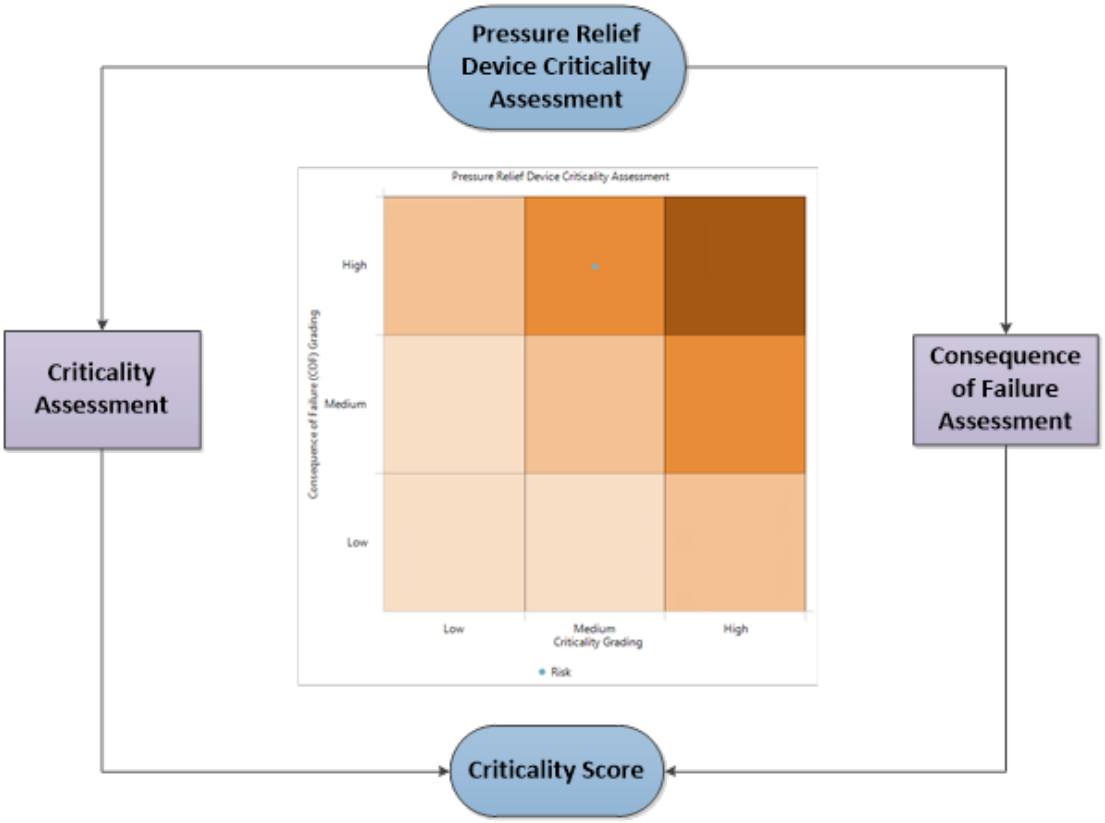
22.1.5.3 Asset Types

Asset Type	Description
PRD	Pressure Relief Device
PVRD	Pressure Vacuum Relief Device

22.1.5.4 Asset Information

Asset Information	Description	Assigned to Type(s)
PRD General Information	General PRD information including tag no., location, associated pipework etc.	PRD, PVRD
PRD Design Data	Valve and body trim data. Sizing basis data.	PRD, PVRD
PRD Process Data	Fluid type and state, pressure, temperature, liquid, and vapor data.	PRD, PVRD
PRD Inspection History	Last inspection data, count of defaults etc.	PRD, PVRD
PRD Criticality Assessment	Criticality, consequence, and confidence grading including justifications.	PRD, PVRD
PRD Inspection Plan	Criticality assessment result, calculated and approved inspection plan (intervals, last inspection date and next recommended date plus overrides).	PRD, PVRD

22.1.5.5 Risk Models



22.1.5.6 Inspection / Maintenance Events

Event Type	Description	Assigned to Type(s)
PRD Inspection	PRD Inspection form - As-received condition and initial test results, strip down internal condition, final test data after overhauling/repairs.	PRD, PVRD
PRD Change Out	Used when the PRD has been changed out. Includes the reason for change out plus serial number removed and installed.	PRD, PVRD

22.1.5.7 Traffic Lights

> **Note**
>
> Traffic Lights are currently not distributed with the Expert System.

22.1.5.8 Dashboards / Reports

Event Type	Description
PRD overview	For each PRD asset, this report displays general PRD information, inspection history, criticality assessment, risk chart and the inspection plan.

22.1.6 RCM Expert System

22.1.6.1 Overview

The RCM expert system is an "off-the-shelf" configuration in NEXUS IC that facilitates efficient deployment and management of a company's Reliability-Centered Maintenance (RCM) strategies.

The RCM expert system provides the following:

- An RCM library that categorises assets based on subclasses and provides Failure Mode Effect and Criticality Analysis (FMECA) functions.
- You can link this RCM library to your asset register and get recommended failure modes and maintenance tasks.
- You can easily customise and extend the library based on your specific requirements.
- You can generate an output ready to be uploaded to CMMS systems.

22.1.6.2 Benefits

The RCM expert system offers the following benefits:

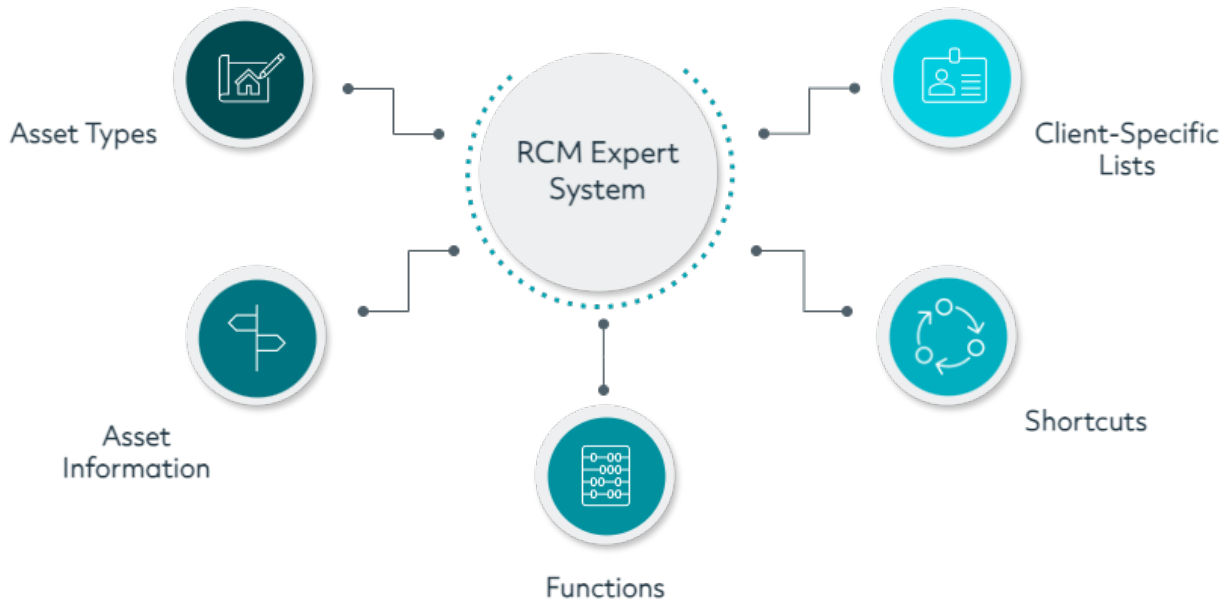
- Streamlines RCM data entry and management, reducing manual effort
- Enhances data quality and reliability by minimizing errors
- Facilitates the setup of efficient, standardised maintenance strategies
- Ensures consistency with RCM industry standards

22.1.6.3 Content

The following figure shows the elements that are delivered with the RCM expert system. For more information, click on the nodes of the figure below or see *RCM Expert System Content*.

22.1.6.4 Codes/Standards

- SAE JA1012 ("A Guide to the Reliability-Centered Maintenance (RCM) Standard")
- SAE JA1011 ("Evaluation Criteria for RCM Processes")
- ISO 14224:2016 - Petroleum, petrochemical and natural gas industries — Collection and exchange of reliability and maintenance data for equipment
- CFIHOS - Capital Facilities Information Handover Specification
- ISO 8000-100 - Data quality - Part 100: Master data: Exchange of characteristic data: Overview



22.1.6.5 Deployment Prerequisites

The following configuration is not automatically deployed as part of the "out-of-the box" expert system and needs to be configured manually:

- Client corporate logos (used in header/footers in reports)
- Report styles (corporate fonts and colours used in reports)
- Client risk matrix (corporate risk matrix)
- Security groups (Wood can recommend typical security groups if required)

22.1.6.6 Revision History

This is the first major release of the expert system.

22.1.6.6.1 RCM Expert System Content

The RCM expert system comes with the following elements:

22.1.6.6.1.1 Asset Types

Asset Type	Description
Equipment Class	Represents an RCM Equipment Class
Subclass	A Subclass of an Asset Class
Subclass Category	A category of a Subclass. Used to assign a maintenance strategy.
Subunit	A Subunit of a Subclass Category
Function	A Function of a piece of Equipment
Functional Failure	A Functional Failure of a Function
Failure Mode	A Failure Mode of a Functional Failure
Maintenance	A Maintenance task to mitigate a Failure Mode

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22.1.6.6.1.2 Asset Information Groups (AIGs)

AIG Name	Category	Description
Equipment Class	RCM Library	Defines key attributes of an Asset Class for exporting to Global Library.
Subclass	RCM Library	Combination of Equipment Class and Equipment Type information.
Subclass Category	RCM Library	
Subunit	RCM Library	Information about this Subunit of the parent Equipment
Function	RCM Library	
Functional Failure	RCM Library	
Failure Mode	RCM Library	
Maintenance Task	RCM Library	Information about what Maintenance Task should be performed and when
RCM Library Asset	RCM	Links the selected asset to the appropriate part of the RCM Library.
Failure Modes	RCM	Key information about Failure Modes assigned to the selected asset.
Maintenance Tasks	RCM	Information about Maintenance Tasks assigned to the selected asset.

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22.1.6.6.1.3 Functions

The table below outlines several frequently used functions delivered with the RCM expert system. Please note that this list does not cover all available functions.

Function	Description
Proposed Task Type from FM_ID	Returns the Proposed Task Type field for a Library Failure Mode with the matching FM_ID. If it is not found, returns null.

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22.1.6.6.1.4 Shortcuts

Shortcut	Description
Add Next RCM Library Node	Adds the next level of the RCM Library hierarchy, based on the currently selected level.

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22.1.6.6.1.5 Client-Specific Lists

Wood delivers "out-of-the-box" configuration for the global tables and lookup lists listed below. These tables and lookup lists are delivered without data. To ensure that the system works effectively, customers must populate them with their own company-specific data upon deployment. Wood can provide sensible default data if required.

Type	Name	Description
Global Table	Allowable RCM Library Asset Types	Used to override the default RCM Library allowable asset types.
Global Table	Failure Mode Library	A library of failure modes that can be applied to assets.
Global Table	Library Revision Status	Stores valid Status values for RCM Library data that can have multiple Revisions.
Global Table	Maintenance Library	A library of maintenance tasks for each library Subclass Category.
Global Table	Subclass Category Codes	Stores valid Subclass Category Codes in the RCM library.
Global Table	Subclass Mapping to Asset Type	Maps Subclasses or Subclass Categories to Asset Types.
Lookup List	Craft	
Lookup List	Failure Characteristic	
Lookup List	Failure Occurrence	
Lookup List	RCM Discipline	
Lookup List	Revision Status	
Lookup List	Task Type	

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22.1.7 Static Pressure Equipment (SPE) Expert Systems

NEXUS offers the following expert systems for Static Pressure Equipment (SPE):

- The **SPE** expert system contains all necessary functionality to manage pressure equipment risk assessment, inspection enactment and dashboarding. For more information, see *SPE Expert System*.
- The **SPE Plus** expert system contains the SPE configuration and adds on a semi-quantitative Risk Based Inspection Methodology that integrates with the SPE AIGs and enhances the assessment of equipment probability of failure. For more information, see *SPE Plus Expert System*.
- The **API 581** expert system incorporates the SPE and SPE Plus expert systems and provides a fully compliant API 581 assessment tool for analysis of equipment risk and inspection planning. The API 581 expert system also contains the SPE++ asset types. For more information, see *API 581 Expert System*.

The following table shows the differences among the various methodologies supported by the expert systems for Static Pressure Equipment:

Methodology	Level of Assessment	PoF Approach			CoF Approach	
		Qualitative (SPE Expert System)	Semi-Quantitative (SPE Plus Expert System)	Quantitative (API 581 Expert System)	Qualitative (SPE, SPE Plus Expert System)	Quantitative (API 581 Expert System)
SPE (level 0)	Qualitative	✓			✓	
SPE+ (level 0+)	Semi-Quantitative		✓		✓	
SPE++ (level 0++)	Semi-Quantitative		✓			✓
API 581 (level 1)	Quantitative			✓		✓

22.1.7.1 SPE Expert System

22.1.7.1.1 Overview

The Static Pressure Equipment (SPE) Expert System contains all necessary functionality to manage pressure equipment risk assessment, inspection enactment and dashboarding. It is seamlessly integrated with NEXUS standard functionality such as anomaly management and libraries.

The SPE expert system is tailored to piping, vessels, tanks and heat exchangers. It can be configured to suit any client risk matrix and can perform qualitative, semi-quantitative or fully quantitative *Risk-Based Inspection (RBI)* (API 581) interchangeably.

The SPE expert system includes:

- In-built material specifications
- tmin calculation
- All API 571 DMs assessed
- All API 581 corrosion models
- CML trending and remaining life calculation
- Alignment to any risk matrix
- Automatic inspection planner
- CML distribution tool
- Report generator

22.1.7.1.2 Benefits

The SPE expert system offers the following benefits:

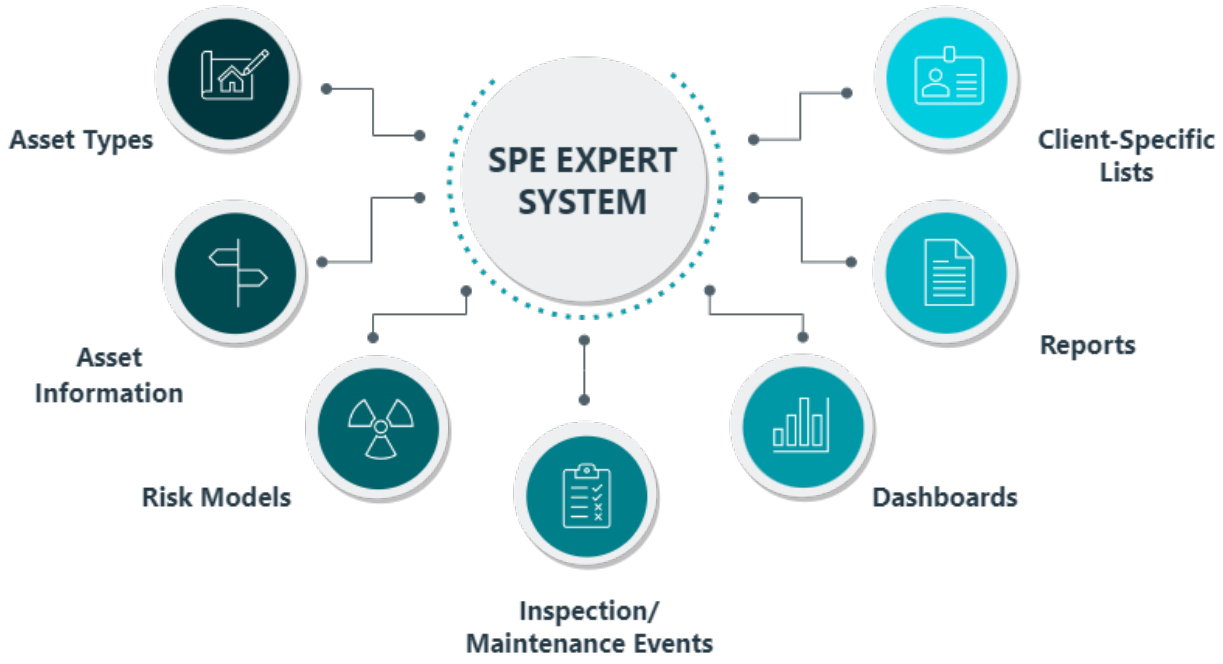
- Fully pre-constructed and tested methodology aligned to industry standards
- Access to API 581 (and other) engineering calculations/tools as standard
- Software-led RBI provides:
  - Fast application of RBI rule set and assumptions
  - Quickly identify areas of high risk
  - Consistent report content
  - Repeatability: update of RBI with minimal effort

As a consequence, using the SPE expert system can provide the following commercial benefits:

- Direct RBI cost reduction (no methodology development time, minimal configuration time)
- 80% reduction in report cost
- Follow-up RBI cost reduction of over 50%

22.1.7.1.3 Content

The following figure shows the elements that are delivered with the SPE expert system. For more information, click on the nodes of the figure below or see *SPE Expert System Content*.



22.1.7.1.4 Codes/Standards

- "Risk-Based Inspection", API Ref. API RP 580, 4th Edition, Addendum 1, March 2025
- "Risk-Based Inspection Methodology", API Ref API RP 581, 3rd Edition 2019
- "Damage Mechanisms Affecting Fixed Equipment in the Refining Industry", API ref. API RP 571, 3rd Edition, 2020
- "Guidelines for management of coatings for external corrosion protection", The Energy Institute, 1st Edition, January 2012.

22.1.7.1.5 Deployment Prerequisites

The following configuration is not automatically deployed as part of the "out-of-the box" expert system and needs to be configured manually:

- Client corporate logos (used in header/footers in reports)
- Report styles (corporate fonts and colours used in reports)
- Client risk matrix (corporate risk matrix)
- Security groups (Wood can recommend typical security groups if required)

22.1.7.1.6 Revision History

The following table summarises new and updated features that have been included in major releases of the expert system:

Revision No.	Description
85-106	• New Asset Type named 'Anode' and new Event Type 'Anode Condition' used to track depletion of internal vessel anodes. • New AIG 'Anode Inspection Plan and History' interrogates and summarises latest anode condition. • CVI (Internal) campaign interval now considers internal vessel anodes when deriving inspection interval. • AS1210 Structural Minimum Thickness calcs updated for Post 2010 nozzles. • RBI Update - Ensures all inspections meet a user configurable maximum interval criteria from new field 'Maximum Allowable Interval'. • RBI Update - Allow a default interval to be defined to non RBI'd assets • Minor bug fixes and improvements
33-84	• Rationalisation of design data AIGs to minimise duplication of data entry and visualisation. • Upgraded inspection schemes to align with API 581 based logic. • Removal of fixed 'SPE reports' and creation of a configurable 'report elements' reporting template • Created new Grid UT event • Vessel Data AIG transferred to tube bundles (previously used piping data AIG) • Vessel Data AIG: Component geometry types added to vessel data (Piping, tubes, header box, flat head) inclusive of tmin calcs • (Optional) Structural min thickness for vessels added based on AS1210 • Rationalisation of lookup functions to improve performance

Customers with a current subscription to this expert system can access a comprehensive (technical) list detailing all minor UI changes and bug fixes. You can email support@nexusic.com to request the complete list.

22.1.7.1.6.1 SPE Expert System Content

The Static Pressure Equipment (SPE) expert system comes with the following elements:

22.1.7.1.6.2 Asset Types

Asset Type	Description
CML	Condition Monitoring Location
Corrosion Circuit (lvl 0)	RBI Component (API 580)
Corrosion Loop	Corrosion Loop Grouping
Dead Leg	Piping Dead Leg
Fired Heater	Pressure Systems Equipment Parent
Fired Heater Segment (lvl 0)	RBI Component (API 580)
Heat Exchanger	Pressure Systems Equipment Parent
Heat Exchanger Bundle (lvl 0)	RBI Component (API 580)
Heat Exchanger Vessel (lvl 0)	RBI Component (API 580)
Nozzle	Nozzle
Piping	Pressure Systems Pipework Parent
Piping Line	Line level piping (below Corrosion Circuits - NOT RBI'd)
Storage Tank	Pressure Systems Equipment Parent
Storage Tank Segment (lvl 0)	RBI Component (API 580)
Vessel	Pressure Systems Equipment Parent
Vessel Component	Line level vessel (below Vessel Component (lvl x)- NOT RBI'd)
Vessel Segment (lvl 0)	RBI Component (API 580)
WML	Weld Monitoring Location

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22.1.7.1.6.3 Asset Information Groups (AIGs)

AIG Name	Category	Description
Availability / Operability Status	General Data	
Calculation Parameter	General Data	
CML Inspection Plan	Inspection / Mitigation	
CML WT History	Inspection / Mitigation	
CoF Review	CoF	
Dead Leg Assessment		
External Inspection Plan	Inspection / Mitigation	
External: Metal Loss / Cracking	DM Review	
General Data	Pressure Systems Model	
HE External Cracking	DM Review	Identical to IC, but for outside of HE tube bundles
HE External Metal Loss	DM Review	Identical to IML, but for outside of HE tube bundles
Inspection History	Inspection / Mitigation	
Inspection Planner	Inspection / Mitigation	Layout of individual inspection tasks
Inspection Scheme	Inspection / Mitigation	Summarises the inspection requirement for the asset
Internal: Cracking	DM Review	
Internal: Metal Loss	DM Review	
Metallurgical / Mechanical	DM Review	Metallurgical / Misc Damage Mechanisms from API 571
Piping Data	General Data	
Risk Overview	RBI	
Vessel Data	General Data	
WML History	Analysis	
WML Inspection Plan	Inspection / Mitigation	

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22.1.7.1.6.4 Risk Models

High-level diagram summarising risk assessment approach. It should identify each damage mode/mechanism as a single item and also call out compliance with individual codes.

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22.1.7.1.6.5 Inspection / Maintenance Events

Event Type	Description	Assigned to Types
Ad-Hoc Updates		All
Anomaly (Ad-Hoc)		All
CML - Grid UT		CML
CML - WT Reading		CML
CML - WT Reading Rejected		CML
Coating Application		RBI Level, Piping Line, Vessel Component, CML, WML, Dead Leg, Nozzle
Cracking Inspection		RBI Level
CUI Visual Inspection		RBI Level, Piping Line, Vessel Component
CVI (External)		RBI Level, Piping Line, Vessel Component, CML, WML, Dead Leg, Nozzle
CVI (Internal)	Invasive Visual inspection of Equipment	RBI Level, Piping Line, Vessel Component
Dead Leg Survey		RBI Level, Piping Line, Vessel Component, CML, WML, Dead Leg, Nozzle
DPI Pre-Inspection		RBI Level, Piping Line, Vessel Component, CML, WML, Dead Leg, Nozzle
ECI Pre-Inspection		RBI Level, Piping Line, Vessel Component, CML, WML, Dead Leg, Nozzle
FM		RBI Level, Piping Line, Vessel Component, CML, WML, Dead Leg, Nozzle
GVI		RBI Level, Piping Line, Vessel Component
Lining Visual Inspection		RBI Level, Piping Line, Vessel Component
MPI Pre-Inspection		RBI Level, Piping Line, Vessel Component, CML, WML, Dead Leg, Nozzle
RT Pre-Inspection		RBI Level, Piping Line, Vessel Component, CML, WML, Dead Leg, Nozzle
Surface Prep		RBI Level, Piping Line, Vessel Component, CML, WML, Dead Leg, Nozzle
UT Pre-Inspection		RBI Level, Piping Line, Vessel Component, CML, WML, Dead Leg, Nozzle
WML - Cracking Inspection		WML
WT Survey		RBI Level

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22.1.7.1.6.6 Dashboards

Template Name	Description	Category
Anomaly Dashboard	Primary interface for anomaly status, assignment and actions	
Inspection Dashboard	For inspection scheduling and task assignment	
Risk Dashboard	Overview and interface for high level risk assignment	

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22.1.7.1.6.7 Reports

Template Name	Description	Category
SPE - CML WT Tasks	Generates CML WT Tasks as import sheet for selected workpack, with guidance included	SPE Reports
SPE - CML/WML IMR Listing	[Generate in Excel] For child assets of the asset selected, this report displays a listing of the Inspection Plan for CMLs	SPE Reports
SPE - Dead Leg Register	[Generate in Excel] For child assets of the asset selected, this report displays a list of dead legs along with dead leg details and last/next inspection date.	SPE Reports
SPE - DLR/TR Register	For child assets of the asset selected, this report displays a list of defined life repair and temporary repair actions as well as the corresponding anomaly details including anomaly risk score	SPE Reports
SPE - Inspection Plan Listing	For child assets of the asset selected, this report displays a listing of the Inspection Plan	SPE Reports
SPE - Inspection Plan Report	This report displays Asset Description, Design Information, Current Condition, RBI Summary, Inspection Plan, Examination Scheme and associated Drawings	SPE Reports
SPE - RBI Summary Report	For Corrosion Circuits select the RBI Asset only. For Pressure Vessels or Heat Exchangers select the Parent level Vessel or Heat Exchanger to generate for each RBI child asset. This report displays the PoF's and CoF's for RBI'ed Assets	
SPE - Elements	A report containing multiple reports from the base system that can be used to help accelerate construction of other reports. Use the "Retrieve Element" button to transfer selected items to your new report.	Miscellaneous

Note

All dashboards and reports are present within the 'SPE Elements' report template and are created as required by the customer during configuration and are therefore editable.

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22.1.7.1.6.8 Client-Specific Lists

Wood delivers "out-of-the-box" configuration for the global tables and lookup lists listed below. These tables and lookup lists are delivered without data. To ensure that the system works effectively, customers must populate them with their own company-specific data upon deployment. Wood can provide sensible default data if required.

Type	Name	Description
Lookup List	Coating Type	A list of client specific coatings which map to None, Medium, High eg. Epoxy Phenolic; Epoxy Zinc Phosphate; Asphalt Mastic
Lookup List	CoF Scores	List of CoF categories to suit client Risk Matrix eg. A;B;C;D;E
Lookup List	Condition of Work	List of shutdown conditions required for enactment of inspection eg. Total plant shutdown; Online inspection
Lookup List	Material Spec and Grade - Piping	List of Client Piping Material Specs eg. ASTM A105 / Gr. . . ; ASTM A106 Gr A; ASTM A106 Gr B; ASTM A106 Gr C
Lookup List	Material Spec and Grade - Storage Tank	List of Client Tank Material Specs eg. A36; A131-A, B, CS; A131-EH 36; A573-58
Lookup List	Material Spec, Grade and Condition	List of Client Vessel Material Specs eg. SA/GB 713 / Gr Q370R / Normalized; SA/JIS G3118 / Gr SGV480 / . . . ; SA–1008 / Gr CS–A / . . .
Lookup List	PoF Scores	List of PoF categories to suit client Risk Matrix eg. 1;2;3;4;5
Lookup List	System Type / Fluid - Lookup	Client System Types eg. Isomerization; Sour Water Stripper; Sulfur Recovery
Lookup List/s	Inspection Event Attributes	There are ~50 lookup lists which are used in inspection event definitions that can be populated to suit existing client practices/procedures. eg. Coating Types; Coating Condition; Insulation Type
Global Table	Applicable Damage Mechanisms	For each System Type add applicable DMs from set list eg. Isomerization; 09. Hydrochloric Acid Corrosion
Global Table	Database Configuration	High level database specific info
Global Table	Inspection Effectiveness	Assigns Effectiveness A..D for each Cof/PoF combination eg. 1,1,D; 1,2,D; 1,3,D
Global Table	Inspection Frequency Matrix	Assigns Frequency (in days) CoF/PoF combination eg. 1,1,144; 1,2,144; 1,3,120
Global Table	Remaining Life Factor	Assigns RL ranges for each PoF
Global Table	Risk Rank Categories / Scoring	Assigns PoF and CoF ranges for failures/year, Consequence Area, Financial Consequence, Spill Volume, No. Affected personnel etc.
Global Table	Risk Rank Categories / Scoring (Tube Bundle)	Assigns PoF and CoF ranges for failures/year, Consequence Area, Financial Consequence for Tube Bundles only
Global Table	Risk Rank to Risk Score	Assigns text value to each PoF/CoF combination
Global Table	Stress Value and MDMT	List of Client Material Types with associated From/To Temps and From/To Stress Values eg. SA 240 Gr 2507 UNS S32750, 204.44, 260, 242005.99, 237869.13
Global Table	Table 1A ASME BPVC II Part D and DM Applicability	
Global Table	Table 4-1 - Max Allowable Shell Stresses and DM	
Global Table	Table 5A ASME BPVC II Part D	
Global Table	YS and TS (Piping) and DM Applicability	
Global Table/s	Inspection Plan -	There are 12 lookup tables which are used for the generation of inspection schemes, they include **Inspection Plan - External Cracking** and **Inspection Plan - Internal Metal Loss** etc.

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22.1.7.2 SPE Plus Expert System

22.1.7.2.1 Overview

The Static Pressure Equipment Plus (SPE+) Expert System contains the *SPE* configuration and adds on a semi-quantitative Risk Based Inspection Methodology that integrates with the SPE AIGs and enhances the assessment of equipment probability of failure.

This methodology enables semi-quantitative assessment of all damage mechanisms identified within API 571. Where possible, elements of API 581 are used for definition of probability of failure; when not assessed by API 581, alternative guidance is deployed based in line with API RP 571 guidance and Wood's engineering experience.

22.1.7.2.2 Codes / Standards

In addition to the references listed here, SPE Plus includes *Codes/Standards* defined in the **SPE** Expert System.

"Managing Sand Production and Erosion", DNV ref. DNV-RP-O501, 2015 (amended2021) "Petroleum and Natural Gas Industries —Materials for use in H2S-containing environments in oil and gas production", NACE reference, MR-0175 / ISO 15156, 2020 "Guidelines for the avoidance of vibration induced fatigue failure in process pipework", The Energy Institute, 2nd Edition, January 2008 "Calculation of Heater Tube Thickness in Petroleum", API Ref. APISTD 530,7th Edition, 2015. Andijani, S. Turgoose, Prediction of oxygen induced corrosion in industrial waters, Water Science and Technology, 2004, Vol 49, Iss 2, pp 115-120.

22.1.7.2.3 Asset Types

In addition to the Asset Types listed in the follow table, SPE Plus includes *Asset Types* defined in the **SPE** Expert System.

Asset Type	Description
Corrosion Circuit (lvl 0+)	RBI Component (SPE+)
Fired Heater Segment (lvl 0+)	RBI Component (SPE+)
Heat Exchanger Bundle (Lvl 0+)	RBI Component (SPE+)
Heat Exchanger Vessel (lvl 0+)	RBI Component (SPE+)
Storage Tank Segment (lvl 0+)	RBI Component (SPE+)
Vessel Segment (lvl 0+)	RBI Component (SPE+)

22.1.7.2.4 Asset Information

Asset	Description	Assigned to Type(s)
Creep (API 530)	Tmin and accumulated damage calculations for RBI	RBI Level
EML/EC PoF	Semi-quantitative data for External Metal Loss and Corrosion	RBI Level
HE EC PoF	Semi-quantitative data for External Corrosion on Heat Exchanger components	RBI Level
HE EML PoF	Semi-quantitative data for External Metal Loss on Heat Exchanger components	RBI Level
IC PoF	Semi-quantitative data for Internal Corrosion	RBI Level
IML PoF	Semi-quantitative data for Internal Metal Loss	RBI Level
MET PoF	Semi-quantitative data for Metalurgical damage mechanisms	RBI Level

22.1.7.2.5 Risk Models

High level diagram summarising risk assessment approach. (Should identify each damage mode/mechanism as a single item & also call out compliance with individual codes)

22.1.7.2.6 Inspection / Maintenance Events

There are no additional event definitions in SPE Plus over and above the *Inspection / Maintenance Events* defined in the **SPE** Expert System.

22.1.7.2.7 Dashboards / Reports

Template Name	Description	Category
SPE+ (semi-quantitative POF) Analysis		'How to' Guides
CML WT Tasks	Generates CML WT Tasks for selected workpack	Inspection

22.1.7.2.8 Client Specific Lists

An implementation of SPE Plus will require the population of the *Client-Specific Lists* defined in the **SPE** Expert System.

22.1.7.2.9 Revision History

The following table summarises new and updated feature sets that have been included in major releases of the Expert System.

Revision No.	Description
23-43	• Assessment of Liner condition is now included in the Internal Metal Loss AssessmentnLiner condition is assessed in accordance with API 581 - a damage factor (and equivalent PoF) is calculated based on the time since last inspection. As time since last inspection increases, so does PoF of the liner condition. Theoretical PoF is calculated as the minimum of Liner PoF and PoF of the baseline material based on exposure to process fluids. • Assessment of Internal Anode condition now included within Internal Metal Loss Assessment. CP condition is used as a 'PoF multiplier' where a ratio of expected remaining life (based on degradation to date vs. installation date) to required remaining life is calculated. Theoretical PoF (the output of Liner / base material POF) is reduced progressively based on the remaining life ratio of the internal anodes. • New Quantitative Inspection Interval Calculation option created - Interval can be defined as a multiple of calculated remaining life, where the multiple can be determined based on the risk of the asset. • All changes in SPE to Rev 106 (*Revision History*)
1-22	• Inspection scheme logic updated to align to API581 logic. • Inspection Coverage recommendations provided and based on 581 logic. • All changes in SPE to Rev 84 (*Revision History*)

A comprehensive (technical) list detailing all minor UI changes and bug fixes can be made available to customers who

have a current subscription to this Expert System. You can email support@nexusic.com to request the complete list.

22.1.7.3 API 581 Expert System

22.1.7.3.1 Overview

The API 581 expert system incorporates the *SPE* and SPE+ expert system and provides a fully compliant API 581 assessment tool for analysis of equipment risk and inspection planning. This methodology is integrated into the SPE API 580 RBI functionality such that qualitative override – or assessment of non-API581 damage mechanisms – is possible. In addition to this, an API581 / SPE+ hybrid functionality is used which deploys SPE+ PoF assessment and API581 CoF assessment in the event that damage mechanisms are present that are NOT covered by API 581.

API 581 provides additional fully quantitative RBI methodology on top of *SPE Plus*.

22.1.7.3.2 Codes / Standards

"Risk-Based Inspection Methodology", API Ref API RP 581, 3rd Edition 2019

22.1.7.3.3 Asset Types

In addition to the Asset Types listed in the follow table, API581 includes *Asset Types* defined in the **SPE** Expert System and *Asset Types* defined in the **SPE Plus** Expert System

Asset Type	Description
AST Bottom (lvl 1)	RBI Component (API 581)
AST Course (lvl 1)	RBI Component (API 581)
Corrosion Circuit (lvl 1)	RBI Component (API 581)
HE Tube Bundle (Contained)(lvl 1)	RBI Component (API 581)
HE Tube Bundle (Uncontained)(lvl 1)	RBI Component (API 581)
Heat Exchanger Vessel (lvl 1)	RBI Component (API 581)
Inventory Groups	RBI Component (API 581)
PRD (lvl 1)	RBI Component (API 581)
Vessel Segment (lvl 1)	RBI Component (API 581)

22.1.7.3.4 Asset Information

Asset	Description	Assigned to Type(s)
External Metal Loss / Cracking	PoF Calculation using API RP 581 3rd Edition	
HTHA and Brittle Fracture	PoF Calculation using API RP 581 3rd Edition	
Internal Cracking	PoF Calculation using API RP 581 3rd Edition	
Internal Metal Loss	PoF Calculation using API RP 581 3rd Edition	
Inventory Group Information		
L2 CoF Calculations (1)		
L2 CoF Calculations (2)		
L2 CoF Calculations (3)		
L2 CoF Calculations (4)		
L2 CoF Calculations (5) - Flammable		
L2 CoF Calculations (6) - Toxic		
L2 CoF Calculations (7) - NFNT, Area, Financial		
L2 CoF Calculations Summary		
L2 CoF Inputs		
Mechanical Fatigue	PoF Calculation using API RP 581 3rd Edition	
PRD Data and Assessment		
PRD RBI - Protected Component		

22.1.7.3.5 Inspection / Maintenance Events

In addition to the events listed below, SPE Plus includes *Inspection / Maintenance Events* defined in the **SPE** Expert System and *Inspection / Maintenance Events* defined in the **SPE Plus** Expert System.

Event Type	Description	Assigned to Type(s)
Defect Assessment (Part 5 Lvl1)	API 579 Part 5 level 1 defect Assessment	
Defect Assessment (Pt4 lvl1) - GWL	General Wall Loss	
PRD Inspection		
Tube Bundle Inspection or Record		

22.1.7.3.6 Dashboards / Reports

Template Name	Description	Category
API 581 COF Analysis		'How to' Guides
API 581 POF Analysis		'How to' Guides
API 581 Risk Assessment Results		'How to' Guides

22.1.7.3.7 Client Specific Lists

An implementation of API581 will require the population of the *Client-Specific Lists* defined in the **SPE** Expert System.

22.1.7.3.8 Revision History

The following table summarises new and updated feature sets that have been included in major releases of the Expert System.

Revision No.	Description
1-10	• Refined inspection plan output to based coverage on risk as calculated at the target risk date and not immediate risk • Inspection Coverage recommendations provided and based on 581 logic • Hybrid asset (SPE+ PoF and API 581 CoF) created • All changes in SPE to Rev 84 (*Revision History*) • All changes in SPE+ to Rev 22 (*Revision History*)

A comprehensive (technical) list detailing ALL minor UI changes and bug fixes can be made available to customers who have a current subscription to this Expert System. Please email support@nexusic.com to request the complete list.

22.1.8 Wells Expert System

22.1.8.1 Overview

The Wells Expert System is an "off the shelf" configuration in NEXUS IC that is tailored to Oil and Gas, Geothermal and UGS Operations in both onshore and offshore locations. It is seamlessly integrated with NEXUS standard functionality such as anomaly management, workpacks and inspection data.

It can be configured to suit any client risk matrix or severity grading profile and provides all necessary functionality to define and manage safe operating limits.

The Wells expert system includes:

- Barrier integrity status monitoring (OLF 117)
- MAASP Calculation (ISO 16530-1)
- Well Failure Scenario Analysis
- Risk Assessment
- Well Barrier Schematic generation
- Configurable performance traffic lighting
- Dispensation management
- Erosion and Corrosion modelling
- Inspection planning
- Dashboard generator
- Report generator

If you have been using the iWIT well integrity management software, migrating to the NEXUS Wells expert system provides a number of benefits. For more information, see *Migrating from iWIT to Wells Expert System*.

22.1.8.2 Benefits

The Wells expert system offers the following benefits:

- Fully pre-constructed and tested methodology aligned to industry standards
- Access to ISO16530/API 6A (and other) engineering calculations and tools as standard
- Automated process workflows, which reduce engineering resource burden
- Interactive dashboard allows you to focus on priorities as they arise
- Get a 'helicopter view' of each region
- Highlight high-risk areas easily

As a consequence, using the Wells expert system can provide the following commercial benefits:

- Direct RBI cost reduction (no methodology development time, minimal configuration time)
- 80% reduction in reporting cost
- 40% reduction in inspection reporting costs (through digital enactment)

22.1.8.3 Content

The following figure shows the elements that are delivered with the Wells expert system. For more information, click on the nodes of the figure below or see *Wells Expert System Content*.

22.1.8.4 Codes/Standards

- ISO 16530-1 1st ed. Well Integrity – Part 1: Life cycle governance
- NORSOK D-010 Corr 2. Well Integrity in Drilling and Well Operations

- NORSOK U-001 5th ed. Subsea Production Systems
- API Spec 17D 3rd ed. Specification for Subsea Wellhead and Tree Equipment
- API Spec. 6A 21st ed. Specification for Wellhead and Tree Equipment
- API Spec. 5CT 10th ed. Casing and Tubing
- API RP 14A 12th ed. Specification for Subsurface Safety Valve Equipment
- API RP 14B 6th ed. Design, Installation, Operation, Test, and Redress of Subsurface Safety Valve systems
- API STD 6AV2 2nd ed. Installation, Maintenance, and Repair of Safety Valves
- API RP 90-1 2nd ed. Annular Casing Pressure Management for Offshore Wells
- OLF 117 rev 6 Recommended guidelines for Well Integrity (Norwegian Oil Industry Association)

22.1.8.5 Deployment Prerequisites

The following configuration is not automatically deployed as part of the "out-of-the box" expert system and needs to be configured manually:

- Client corporate logos (used in header/footers in reports)
- Report styles (corporate fonts and colours used in reports)
- Client risk matrix (corporate risk matrix)
- Security groups (Wood can recommend typical security groups if required)

22.1.8.6 Revision History

This is the first major release of the expert system.

22.1.8.6.1 Wells Expert System Content

The Wells expert system comes with the following elements:

22.1.8.6.1.1 Asset Types

Some predefined asset types are available for Wells assets and the components underneath it. A complete list of available asset types can be provided upon request.

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22.1.8.6.1.2 Asset Information Groups (AIGs)

AIG Name	Category	Description
Qualitative Risk Assessment	Risk	Inputs into the Base Qualitative Risk Model
Risk Assessment Sign off / Actions	Approvals	Sign off / approvals for Risk assessments with action register
Drilling Programme Information	Design Data	Drilling Programme
Tubing Design	Design Data	Tubing
Packers	Design Data	
Perforations	Design Data	
Well Overview	Design Data	Well Overview

continues on next page

Table 2 – continued from previous page

AIG Name	Category	Description
Xmas Tree Installation	Design Data	Xmas Tree
Valve Performance	Inspection Results	
Inspection / Test Plan	Inspection	
Well Component - General Data	Design Data	SCE Component - General Data (Wells)
Annulus Data	Design Data	
Deviation Survey	Design Data	Deviation Survey
Casing Design	Design Data	Casing Summary
MAASP Inputs	Design Data	
MAASP Summary	Design Data	
Pressure Test Performance	Inspection Results	
Weak Point Formation	Design Data	
Integrity Status Configuration	Integrity Status	
Well Integrity Status	Wells	
MAASP Results	Design Data	
Well Risk Assessment	Well Risk Assessment	
MAXIMO	External References	Standard Maximo Asset Identification attributes
ExSys Revision History		
Well Barrier Schematic	Well Barrier Schematic	
FMECA	Probability Assessment	
Failure Assumptions	Consequence Assessment	
FMECA General Information	General Information	
Asset Configuration	Probability Assessment	
Annulus Performance	Inspection Results	
Cement Data	Design Data	
Mud Data	Design Data	
Sensor General Information	Design Data	
IOW ML Information	IOW	IOW ML information, allowing connection to external source
IOW Management	IOW	
Reminders	Wells	
Availability / Operability Status	Maintenance	
ECE Sensor Configuration	ECE - Expert System	
ECE Calculator	Analysis	
Corrosion Analysis	Analysis	
Well KPIs		
WBS Element Reference		

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22.1.8.6.1.3 Inspection / Maintenance Events

Event Type	Description
Well - Annulus Leak Test	
Well - Caliper Log	
Well - Component Pressure Test	
Well - Elevation Monitoring	
Well - Integrity Test	
Well - Leak Test	
Well - Marine Survey	
Well - Sub Surface Integrity Test	
Well - Sustained Annulus Pressure Test	
Well - Valve Function Test	
Well - Visual Inspection	

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22.1.8.6.1.4 Dashboards

The Wells Expert System inherits all the dashboards from the Default Configuration (see *Reports and Dashboards*). In addition, the **Wells - Dashboard Elements** template is available, from which you can pick Wells-specific dashboard elements to create your own dashboard as required.

See examples for Wells-specific dashboards below:

Wells Integrity Overview Dashboard

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22.1.8.6.1.5 Reports

The Wells Expert System inherits all the reports from the Default Configuration (see *Reports and Dashboards*). In addition, the **Wells - Report Elements** template is available, from which you can pick Wells-specific report elements to create your own reports as required.

See examples for Wells-specific reports below:

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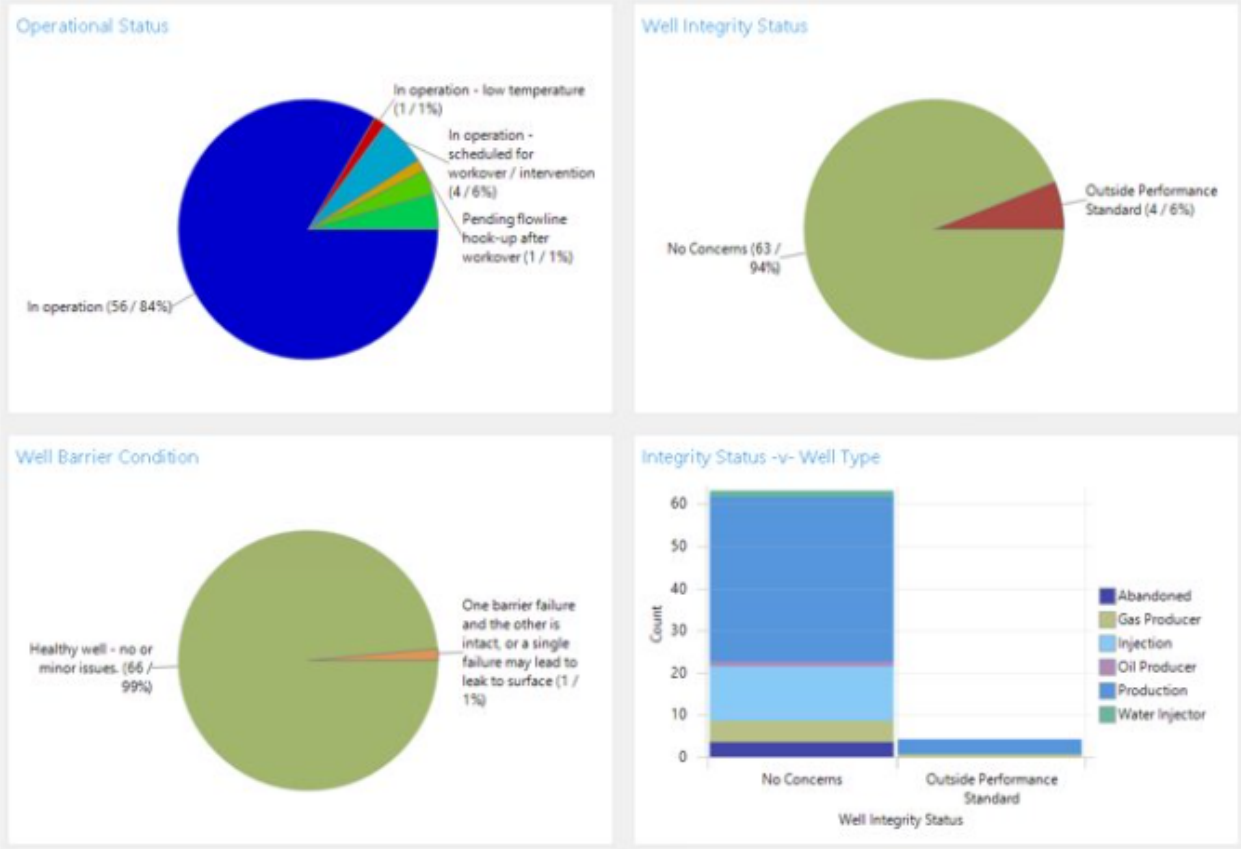
22.1.8.6.1.6 Client-Specific Lists

Wood delivers "out-of-the-box" configuration for the global tables and lookup lists listed below. These tables and lookup lists are delivered without data. To ensure that the system works effectively, customers must populate them with their own company-specific data upon deployment. Wood can provide sensible default data if required.



Type	Name	Description
Lookup List	WFAM Severity	
Global Table	Annulus Pressure Traffic Light	
Global Table	Inspection Intervals	
Global Table	Inspection Windows	
Global Table	MAASP Components	
Global Table	MAASP Pressure Derating Factors	
Global Table	MAASP Safety Factors	
Global Table	Performance Standards	
Global Table	Well Anomaly Asset Applicability Matrix	
Global Table	Well Traffic Light Configuration	
Global Table	WFAM Scenarios	

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22.1.8.6.2 Migrating from iWIT to Wells Expert System

The Wells expert system of NEXUS is replacing the iWIT well integrity management software as the main Well integrity management software offering and Wood plans to end support for iWIT at the end of 2024.

22.1.8.6.2.1 Benefits

Migrating to the NEXUS Wells expert system from iWIT offers a number of direct improvements and benefits to you, including:

- NEXUS Integrity Centre is developed on SQL Server, which means that you won't be required to have an Oracle application available (which is the current database structure for iWIT).
- Moving to the NEXUS IC system will provide you with the flexibility to either internally host the database as an on-premise application, or subscribe to a SaaS cloud-based system. IWIT currently only provides on-premise deployment options.
- The NEXUS IC infrastructure allows you to subscribe to the Wells Integrity Expert System, which allows us to rapidly deploy enhancements, upgrades, changes to codes and standards in an efficient manner.
- NEXUS IC accommodates bespoke modifications to suit your own business needs (for example, bespoke dashboards, reporting, notifications) while leveraging all the benefits associated with the expert system subscription.
- NEXUS IC is designed to accommodate considerable end-user modifications, which avoids the need for personalised modifications having to be an expensive programmer involved process. Expert users in your own organisation or our extensive team of operational support and deployment technicians can perform rapid modifications to the system (for example, adding a new report function).
- NEXUS IC has a number of expert systems covering a wide range of applications and as such has a large global development support team and our ability to quickly provide operational support which will greatly enhance your current support network.

22.1.8.6.2.2 Additional Features

NEXUS provides all iWIT functionality with the following additional features:

- Digital workpack management and enactment through IC Inspector (see *IC-Inspector*)
- Inspection management interface to store multimedia, trend data and identify anomalies
- Library functionality to capture drawings and documentation referenced by components
- Anomaly management interface to ensure well failures are appropriately risk assessed and remediated
- Customisation reporting engine to enable creation of bespoke reports independently
- Enhanced, configurable dashboarding system (including ISO compliant WBS dashboard) to create your own bespoke interfaces

For detailed information about the features offered by iWIT as compared to the NEXUS software suite, see *iWIT-NEXUS Feature Comparison*.

22.1.8.6.2.3 iWIT-NEXUS Feature Comparison

See the tables below for a comparison of features offered by iWIT versus the NEXUS Software Suite.

> **Note**
>
> The NEXUS Software Suite offers different solutions and deployment options and there may be differences in the features that they support. For more information, see *NEXUS Feature Matrix*.

22.1.8.6.2.4 Generic Features

Feature Category	Feature Subcategory	iWIT	NEXUS Software Suite
Data Entry/Updates	Annulus Pressures	●	●
	Safety Critical Equipment Test Data	●	●
	Wellhead Movement Monitoring Data	●	●
	Visual Inspection Data	●	●
	Well Activity Data	●	●
	Dispensation/MOC Data	●	●
	Setup Reminders	●	●
	Sample Analysis (Oil/ Gas/ Water/Production/Scale)	●	●
	Sand Production Data	●	●
	Caliper Log Data (Tubing/ Casing/ Liner/ Misc & CBL)	●	●
	Marine Survey	●	●
	Well Communication	●	●
	Corrosion Coupons	●	●
	Asset Hierachy	●	●
	Move Asset Hierachy	●	●
	Asset Information		●
	Assets Sensors		●
	Drawings		●
	Drawing Layers		●
	Inspection Events		●
	Inspection Multimedia		●
	Library Items		●
	Planning/Workpacks		●
	Customisable Report Generation	●	●*
	Risk Model Assignments		●
Data Source Connectivity	Manual Entry	●	●
	Energy Component	●	●
	Open Wells (Master Views)	●	●
	PI	●	●
	Bulk Import	●	●*
	Background Imports		●*
	Shortcut Execution		●
	Automated Subsea Data Acquisition		●
	Onsite/Field Data Acquisition	●	●
Data Views	Asset Charts	●	●
	Asset Hierachy	●	●
	User Audit Logs	●	●
	History	●	●
	Asset Hierachy on Drawings		●
	Asset Hierachy	●	●
	Asset Information	●	●
	Assets Sensors	●	●
	Drawings	●	●
	Drawing Layers Navigation		●
	Drawing Layers & Traffic Light Statuses		●
	Inspection Events		●
	Inspection Multimedia		●
	Inspection Event and Findings		●
	Inspection Video Playback		●
	Planning/Workpacks		●
	Risk	●	●
Design Data	High-Level Well Information	●	●
	Tubing Record	●	●
	Casings Data	●	●
	Liner Data	●	●
	Deviation Survey	●	●
	Perforation & Lateral Record	●	●
	Safety Critical Equipment	●	●
	Wells Completion Diagrams	●	●
	Xmas Tree & Wellhead Configuration	●	●
	MAASP for Each Available Annuli	●	●
	Well Handover Documents	●	●
	Well Barrier Design	●	●
	Drawings		●
Operational Data	Traffic Light Statuses for Different KPI's	●	●
	Assessed Risk	●	●
	Production/Injection Data	●	●
	Annulus Pressures	●	●
	Safety Critical Equipment Test Data	●	●
	Visual Inspection Data	●	●
	Well Activity Data	●	●
	Well Activity Frequency Data	●	●
	Dispensation/MOC Data	●	●
	Setup Reminders	●	●
	Sample Analysis (Oil/Gas/Water)	●	●
	Sand Production Data	●	●
	Caliper Log Data (Tubing/Casing/Liner/Misc & CBL)	●	●
	Marine Survey	●	●
	Sustained Annulus Pressure	●	●
	Well Communication	●	●
	Drawing Layers Traffic Light Statuses		●
	Inspection Events		●
	Inspection Multimedia		●
	Inspection Event and Findings Review		●
	Inspection Video Playback		●
	Planning/Workpacks		●
	Risk Model Assignments		●
Report Functions	On-Demand Report Generation		●
	Scheduled Report Generation		●
	Background Report Generation		●
	Customisable Reports		●
	Customisable Dashboard Reports		●

* Supported only in specific NEXUS solutions or deployments

22.1.8.6.2.5 Fixed Reports (Legacy iWIT Reports)

Report Category	Report	iWIT	NEXUS Software Suite
Annulus Pressures	Annulus Pressure Trend Report	●	●
	Pressure Report	●	●
Operational Reports	Well Status Report	●	●
	Field Survey Summary Report	●	●
	Activities Report	●	●
	Reminders Report	●	●
	Well Dispensation Reports	●	●
SCE Reports	SCE Valves Report	●	●
	SCE Reliability Report	●	
	Test Dates Report	●	●
	SCE Leak-Test Report	●	●
	SCE MTTF report	●	●
Integrity Reports	Field Statistics Report	●	●
	WIMS Schedule	●	●
	Field Integrity Summary Report	●	●
	Well Failure Model	●	●
	Risk assessment	●	●

22.1.8.6.2.6 Configuration/Administration Features

Feature Category	Feature Subcategory	iWIT	NEXUS Software Suite
Audit History	User Audit Logging	●	●
Configuration	Asset Types & Information Groups		●
	Event & Survey Data Types		●
	Lookup Lists	●	●
	Functions & Charts		●
	Shortcuts		●
	Report & Dashboard Templates		●
Database	Subscriber Creation & Synchronisation		●
Security Settings	Security Group Permissions	●	●
	Security User Group Assignment	●	●

22.1.8.6.2.7 Migration Process

There are two different migration processes from iWIT to NEXUS depending on the deployment option you select.

22.1.8.6.2.8 Migration - SaaS Deployment

1. You contact Wood to request migration.
2. Based on your requirements, a SaaS agreement is prepared and executed.
3. You take the iWIT database offline and provide a copy of it to Wood.
4. Wood migrates your data to NEXUS. This process may take approximately one to two weeks.
5. Wood provides training and handover.

22.1.8.6.2.9 Migration - On-Premises Deployment

1. You contact Wood to request migration.
2. You take the iWIT database offline and provide a copy of it to Wood.
3. Wood migrates your data to NEXUS. This process may take approximately one to two weeks.
4. Wood sends you an installer for NEXUS software and the migrated SQL database backup.
5. You deploy the NEXUS infrastructure (see *Deployment On-Premises*).
6. You restore the NEXUS SQL database backup.
7. Wood provides training and handover.

CHAPTER

TWENTYTHREE

FAQS

Q: *I have an on-premise NEXUS implementation, can I subscribe to an Expert System?*

A: Yes, you can.

Q: *How can I purchase an Expert System configuration?*

A: Email support@nexusic.com. Someone from our team will contact you to let you know the one-off cost of the Expert System configuration. Each Expert System will attract a nominal annual subscription fee to allow you to obtain future updates to the Expert System. Expert System costs will depend on the complexity of the configuration.

Q: *I want to request a change to an Expert System, can I?*

A: Certainly, email support@nexusic.com and the SME responsible for the Expert System will evaluate all requests from the subscribers. If the request is generic and all other subscribers would benefit from the change, then it is likely that the change will be implemented and an new revision published to the subscribers.

Q: *I have a subscription to an Expert System, how will I know when there is an update available?*

A: You will be notified by Wood when an Expert System update is available. To get the latest version of the Expert System, a person with sufficient permissions in your NEXUS IC database can login to NEXUS and download it. The changes will be applied to your database and details of the revision are shown.

Q: *Will the Expert System subscription process work with different versions of NEXUS?*

A: It depends, the Expert System subscription process checks the database Schema version to determine whether or not the subscription update is allowed. As a general rule, database schema versions will not change between major releases. For example, if you are running v6.8.14587 and the Expert System is currently on v6.8.25897, then the subscription will be allowed because both versions will be running on the same database schema version (8.211).

Q: *Can I add new attributes to Asset Information forms which belong to the Expert System?*

A: Yes, you can. Adding new fields will not break the link between your database and the Expert System you have subscribed to. However, we recommend that if you need additional attributes, then you should create new Asset Information forms.

Q: *Can I edit attributes of an Asset Information form which belongs to an Expert System?*

A: No, not without breaking the link between your database and the Expert System you have subscribed to. If you decided that you want to obtain future updates to the Expert System, then changes that you made will revert back to the Expert System configuration.

CHAPTER

TWENTYFOUR

GENERAL INFORMATION

This section provides supporting reference material to help you better understand and work with NEXUS. It includes background details, guidance for common scenarios and resources that complement the main documentation. Use these topics to clarify technical aspects, explore additional features, and stay informed about updates and best practices.

24.1 Technical Information

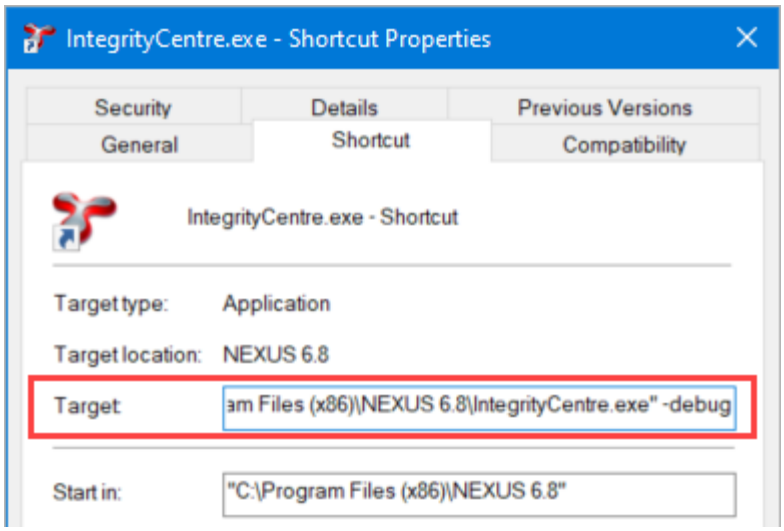
You can find additional technical information as described below:

- NEXUS provides support for a number of command-line switches. For more information, see *Command-Line Switches*.
- You can download the latest version of the database schema diagram from *Database Schema Diagram*.
- To understand the mechanics of the solution, visit the *Software Based Licensing* page.
- For information about common administration tasks in NEXUS, see *NEXUS Administration Tasks*.
- IC-Web includes a REST API. For more information, see *REST Service Specifications v2.0*.
- If you want to understand the technical background behind the way video playbacks work, see *Managing Videos*.
- A PDF version of these Help pages can be downloaded from https://docs.nexusic.com/6.9/nexus.pdf.

24.1.1 Command-Line Switches

You can launch NEXUS IC with various command-line switches. The NEXUS IC executable is named 'IntegrityCentre.exe'. This can be useful when launching NEXUS IC from a Windows Explorer shortcut, or when configuring a RemoteApp icon.

Below is an example of how to run NEXUS IC with debugging information enabled. These steps can also be used for IC-Inspection, by using the 'Inspection.exe' instead of 'IntegrityCentre.exe'.



Method 1: *Launch NEXUS via Desktop Shortcut*

- Create a desktop shortcut to Integrity Centre
- Right click on the shortcut and select 'Properties'.
- On the 'Shortcut' tab page add -debug after the location in the **Target** field - *See image on right*
- Click Ok to save the changes.
- Run the shortcut to launch Integrity Centre with debugging enabled.

Method 2: *Launch via Command Prompt*

- Click Start - type 'cmd' and press enter to open Command Prompt.
- Paste the following and press enter:

```
start "" "C:\Program Files (x86)\NEXUS\IntegrityCentre.exe" -debug
```

You must include the **""** (empty double quotes) before the exe location in your command. The file path must point to your local installation path for NEXUS.

Log File:

The log file is located at:

```
C:\Users\[username]\AppData\Roaming\NEXUS
```

For Integrity Centre, the log file is named 'IntegrityCentre_Trace.log', for IC-Inspection the log file is 'Inspection_Trace.log'

A shortcut to this location is:

```
%AppData%\NEXUS
```

24.1.1.1 General Options

Name	Command	Example Usage	Description
Dock	`-dock`	`IntegrityCentre -dock=Anomalies`	If you use a command-line switch beginning with '-dock=' and ending with a dock name, NEXUS IC will launch with that dock open. Valid dock names are 'Dashboards', 'Assets', 'Library', 'Planning', 'Workpacks', 'Inspection', and 'Anomalies'. They are case-insensitive.
Disable Single Sign-On	`-DisableSSO`	`IntegrityCentre -DisableSSO`	If you have previously logged in to a NEXUS database using domain credentials, then on subsequent runs you will be automatically logged in again with those credentials. You can either select *Database* → *Close*, or you can run NEXUS IC with the command-line switch '-DisableSSO'.
Offline Mode	`-offline`	`IntegrityCentre -offline`	When limited/no internet connection is available, startup times can be reduced by running NEXUS IC in 'offline' mode. This will prevent NEXUS from re-validating the license. The licenses check will still fail if the grace period has been exceeded.
Prevent display of *Library* dock or *Export Repository*	`/iad`	`IntegrityCentre /iad`	You can use command-line switch /iad to prevent NEXUS IC displaying the *Library* dock or *Database* → *Export Repository*.

24.1.1.2 Debugging and Tracing

NEXUS IC and IC-Inspection log information to the folder *C:Users[username]AppDataRoamingNEXUS*. Note that you should only use debug switches if instructed to do so by Wood technical support, as they can significantly impact performance. If you start NEXUS IC with a debug switch, you will see a dialog reminding you of this.

Nar	Command	Example Usage	Description
In-for-ma-tion	-informatio	IntegrityCentre -informational	Log informational messages.
Er-ror	-error	IntegrityCentre -error	Log error messages and everything less verbose
De-bug	-debug	IntegrityCentre -debug	Log debug, informational and warning messages.
De-bug (1-4)	-debug1 -debug2 -debug3 -debug4	IntegrityCentre -debug#	Log debug information. These are ordered here from least verbose to most verbose.
Lau witl cre-den-tials	/dbuser= /dbpass=	IntegrityCentre / dbuser=username / dbpass=pA55w0rd	Log in with predefined username and password. If, in the *Connect to Database* wizard you have selected "Specific Windows / Domain User", the dbuser and dbpass you specify will be passed to SQL Server as domain credentials.
Lau witl cre-den-tials (SQ Ser Au-ther ti-ca-tion	/dbuser= /dbpass= /sqlauth	IntegrityCentre / dbuser=username / dbpass=pA55w0rd / sqlauth	If you would like to connect to the database using SQL Server Authentication, then use the /sqlauth switch along with the username and password. The user will still be given a login prompt allowing them to provide NEXUS credentials, which will determine which NEXUS user account will be used to identify any changes they make to the database.

24.1.2 Utility Tools

You can use a database management utility tool to perform database backups and restores. This tool can be operated via the command line and is available in the base installation folder (where IntegrityCentre.exe is stored). Therefore, this tool is only available for On-Premise or Offshore deployments, it's not available for Software as a Service (SaaS).

See below for detailed information about its usage:

Name	Command	Example Usage	Description
Help	`-h`	`DBManagement.exe -h`	Provides information about usage, example and parameters for each of the Backup, Restore, and Restore (with Credentials) commands.
Backup	`/backup`	`DBManagement.exe /backup /sql=MySQLServer /db=MyDatabase /username=admin /password=admin /path="C:\Database Backups"`	Tells NEXUS IC to backup a database. For example, it can be used for automated backups of a live database.
Restore	`/restore`	`DBManagement.exe /restore /sql=MySQLServer /db=NewDatabase /path="C:\Database Backups\MyDatabase.nexus-backup"`	Tells NEXUS IC to restore a database. For example, it can be used for automated refreshing of a sandpit database.
Restore (with Credentials)	`/restore`	`DBManagement.exe /restore /sql=MySQLServer /db=NewDatabase /path="C:\Database Backups\MyDatabase.nexus-backup" /username=admin /password=admin`	If you are overwriting an existing database, you must additionally supply credentials, to demonstrate that you have the appropriate authority to overwrite.

24.1.3 Database Schema Diagram

Click to download a copy of the latest core database schema diagram `pdf`

24.1.3.1 Change History

24.1.3.1.1 8.221

- Add missing field to Report_Schedule

24.1.3.1.2 8.220

- Added Risk_Status
- Added Description, ReadOnly, Date_Created, RS_ID, Link_ID to Risk_Model_Component

24.1.3.1.3 8.219

- Added Workflow_Item.Input_Workflow_ID

24.1.3.1.4 8.218

- Updated Task.Is_Completed to recognise Sensor data

24.1.3.1.5 8.217

- Added Static Calcuations
- Removed Drawing table
- Added Function_Test.Error_Result
- Added Personnel.Qualifications
- Added Series.Sort_Style

- Added Status.Description
- Added Multimedia.Comments
- Added Task.MD_ID
- Added Schedule_Kind table, Report_Format table, Report_Schedule.RF_ID, and Report_Schedule.SK_ID
- Added LTIP_Task.Reference_Number
- Added Client.Survey_Threshold
- Added Security_User.Locked
- Added Library_Conn.Task_ID
- Added Code.Colour
- Added Series.Item_Order
- Added Field_Category.Is_System
- Removed Personnel.CV_ID
- Added Security_Group.Notes
- Added Comp_Overlay_Category table, and Comp_Overlay.COC_ID
- Added Finding_Status.Item_Order
- Added Revision.Colour
- Added Workflow.Comments and Workflow.Item_Order
- Added Action_Task table, removed Task.Action_ID
- Added Field_Def.Allow_Template_Change
- Added Session.Keep_Alive, removed Session.db_spid

24.1.3.1.6 8.216

- Removed Report_Parameters.Last_Value
- Added Multimedia.Source
- View_Node.Has_Children changed to a calculated field

24.1.3.1.7 8.215

- Added Approval_Group table
- Added Approval.Operation

24.1.3.1.8 8.214

- Added Report_Template.Asset_Dashboard
- Removed Report_Template.Is_Asset_Dashboard
- Removed Signoff.Description
- Added Signoff.Comments
- Removed Finding_Signoff.Description
- Added Signoff.Comments

- Removed Header.HasComments
- Removed Finding.HasComments
- Added Repository_Data.Thumbnail_Data
- Added Personnel.Job_Title
- Added Description, Category to Chart
- Added Vertical_Align, Text_Orientation and numerous field changes to Report_Style
- Added Form_Page.Page_Order
- Added Table_Def.Supports_Attributes
- Added Comp_Type.Prevent_Duplicates
- Added Report_Category.Enabled
- Added Finding_Status table and Finding.FS_ID
- Added Drawing_Properties, Client.Job_Retention, remove unused fields.

24.1.3.1.9 8.211

- Added User_Setting table.

24.1.3.1.10 8.210

- Added table indexes to optimise some calculations and row retrievals.
- Updated 'Library' icon.

24.1.3.1.11 8.209

- Added Comp_Type.Category
- Added Action.Is_Due
- Added Anomaly.Assigned_To_ID
- Renamed Anomaly.Created_By to Anomaly.Created_By_ID
- Added Anomaly.CV_ID

24.1.3.1.12 8.208

- Added Report_Schedule.SU_ID

24.1.3.1.13 8.207

- Increased Session.IP_Address to 45 characters

24.1.3.1.14 8.206

- Added Security_Hash.Session_ID

24.1.3.1.15 8.205

- Added Visible and Order (IC-Inspector) to Field Definition as passthrus
- Changed Personnel.Email to be 254 characters
- Added Category to Scenario
- Added RBI_Model_Comp_Type table
- Added Filter_Order to Workflow_Filter

24.1.3.1.16 8.204

- Added Server_Job table
- Added Est_Timing_FD_ID and Requires_Shutdown_FD_ID to LTIP_Task
- Added Allow_Adhoc to LTIP_Task
- Added Enabled to Workflow
- Added LinkTD_ID to Field_Def
- Added Include_Timestamp to Report_Schedule

24.1.3.1.17 8.201

- Increase Workpack.Abbreviation to 15 characters

24.1.3.1.18 8.199

- New chart series types
- Added Function_Definition.Readonly
- Added Approval.Link_ID
- Added Active_Inspection.Is_Inspecting

24.1.3.1.19 8.198

- Increased size of Library.Name to 100 characters

24.1.3.1.20 8.196

- Added Layer.Auto_Layer_Id

24.1.3.1.21 8.195

- Added Expert_System.Signature
- Added Expert_System_Row.Manual
- Added Task.Retasked_Same
- Added Task.Is_Held

24.1.3.1.22 8.194

- Added Form_Caption, Visible_Mobile, Mobile_Order and Mobile_Caption to Field_Layout
- Added LTIP.WPG_ID and LTIP.Revision_ID
- Added Series.Opacity
- Added Chart.Available
- Added Layer.Relative_Asset
- Change Action.Created_By and Assigned_To to FK's to Personnel
- Added Table_Def.Allow_History
- Added Finding.Status
- Added LTIP_Task.Instructions_FD_ID
- Added Bound.Include_Bounds
- Added Report_Schedule.FD_ID
- Added Overlay_Value.Legend_Order
- Added Finding.Finding_Number
- Added Finding.Has_Comments
- Added Export_System, Expert_System_Row, and Expert_System_Version tables.

24.1.3.1.23 8.193

- Added Table_Def.Auto_Calculate field

24.1.3.1.24 8.191

- Added Keepalive to Report_Schedule

24.1.3.1.25 8.188

- Added Field_Def.Require_Unique and Field_Def.Unique_FD_ID
- Added Task.Reference_Number
- Added Line Weights for Series
- Added Planning Task.Asset_Location

24.1.3.1.26 8.187

- Added Library.Force_2D
- Added Bound.Date_From, Bound.Date_To

24.1.3.1.27 8.186

- Added Workflow_Item_Input.Attribute_Name
- Added Approval, Approval_Note and Approval_Field tables
- Added Client.Secondary_Logo

24.1.3.1.28 8.185

- Added Asset_Location to Task, Finding, Event, Anomaly
- Added Asset_Location to Library_Conn
- Added Asset_Location to Component
- Added RS_ID to Report_Template, and Report_Status table
- Added Unit.Description
- Added Workpack.Event_Count

24.1.3.1.29 8.184

- Added Report_Schedule.Status

24.1.3.1.30 8.181

- Removed Report_Template.IsWelcomePage
- Renamed Report_Template.IsDashboard to Is_Asset_Dashboard
- Added Chart.Show_X_Axis_Title and Chart.Show_Y_Axis_Title

24.1.3.1.31 8.180

- Renamed function GetDate to 'Current Date/Time', added 'Current Date'.
- Removed Range Event Type.

24.1.3.1.32 8.179

- Removed Report_Template.Last_Generation_Time
- Added new Report_Generation table.

24.1.3.1.33 8.178

- Added FP_ID to Workflow_Item_Input.

24.1.3.1.34 8.177

- Changed Report_Part.Name to 200 characters.
- New calculated fields for Library_Conn and Library.

24.1.3.1.35 8.176

- Added Allow_Adhoc (bit) to Task.
- Added Adhoc_Complete (bit) to Task.
- Added Report_Favourite table.
- Added Dashboard_Report (bit) to Report_Template.
- Added Supports_Dashboard (bit) to Report_Part_Type.
- Added Schedule_Repeat table.

- Added Report_Schedule table.

24.1.3.1.36 8.174

- Added Map_Server table.

24.1.3.1.37 8.173

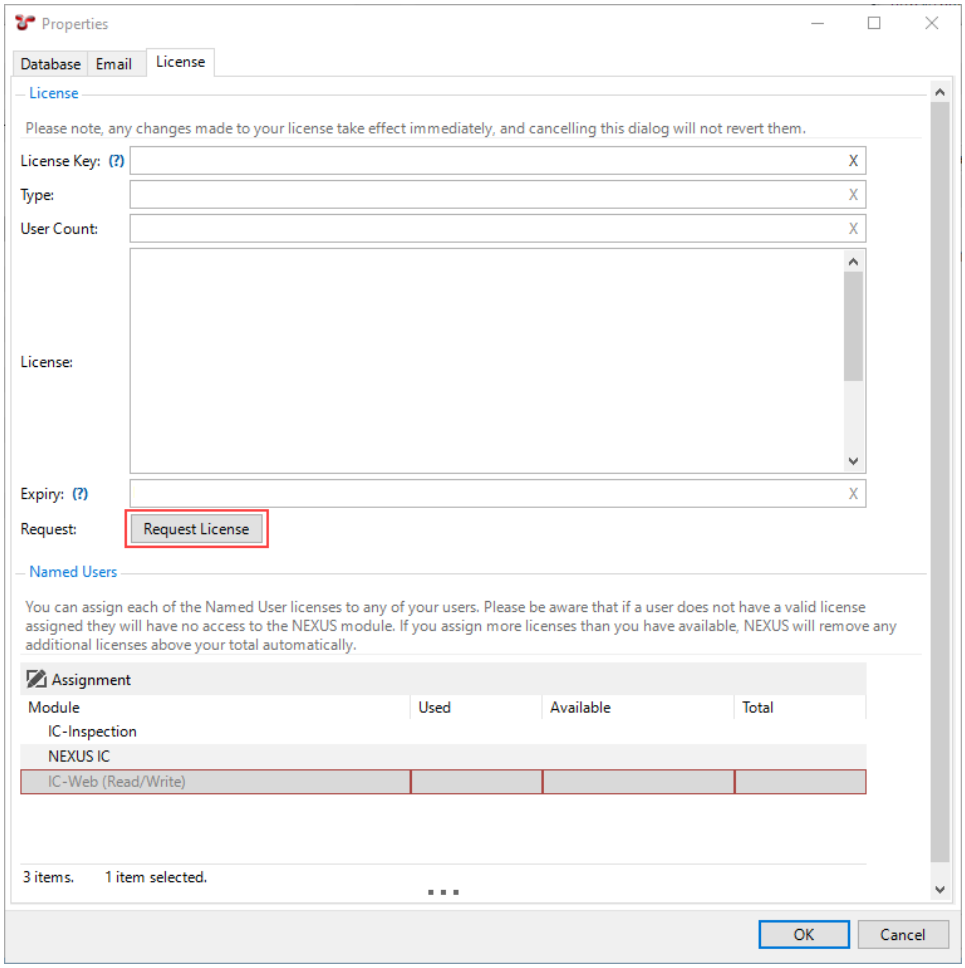
- Added Expiry (datetime) field to Repository_Data table.
- Added Text_Align table and TA_ID (int) field to Field_Layout table.
- Added Allow_Add (bit) to Form_Page table.

24.1.4 Software Based Licensing

Licenses are controlled in NEXUS through a software license key and occasional communication with a License Server. The NEXUS application contacts the software license server using the standard HTTPS protocol. All information is encrypted in transit between your computer and the NEXUS License Server.

24.1.4.1 Validate the Software Based License

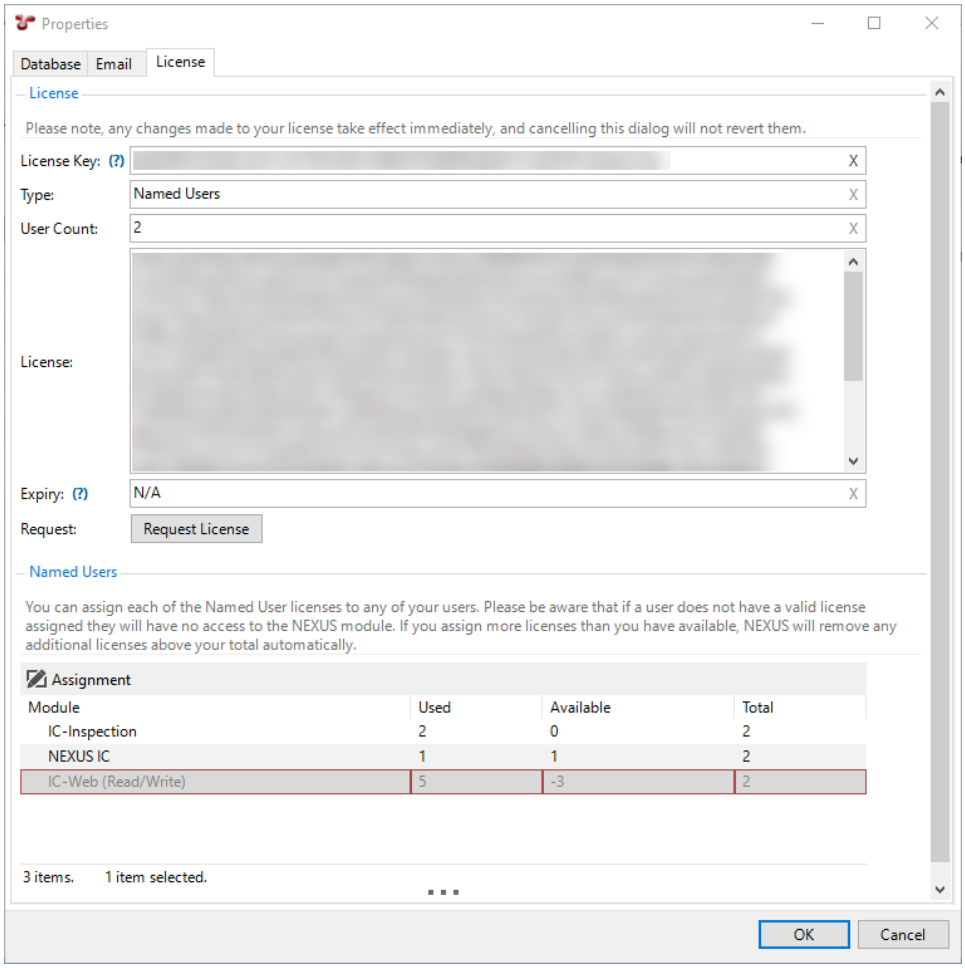
1. Launch NEXUS.
2. When you connect to the database the first time, you will be prompted to enter the license key. This brings up the dialog under *Database* → *Properties* → *License*.
3. Enter the license key that was provided by Wood.
4. Click on **Request License**.



5. NEXUS communicates with the **NEXUS License Server** via the internet and exchanges license information associated with your implementation including:

- Server Name
- Database Name
- License type
- Number of licenses available to your organisation
- [GRACE PERIOD] in days. Usually this is set to 30 days.

6. This information is then stored (encrypted) in the database, and is shown in the dialog:



24.1.4.2 Assign Licenses to Users

If you are using Named Users licensing, a **Named Users** section will appear at the bottom of the **License** tab in the **Properties** dialog. In this case, you can assign licenses to one or more users as follows:

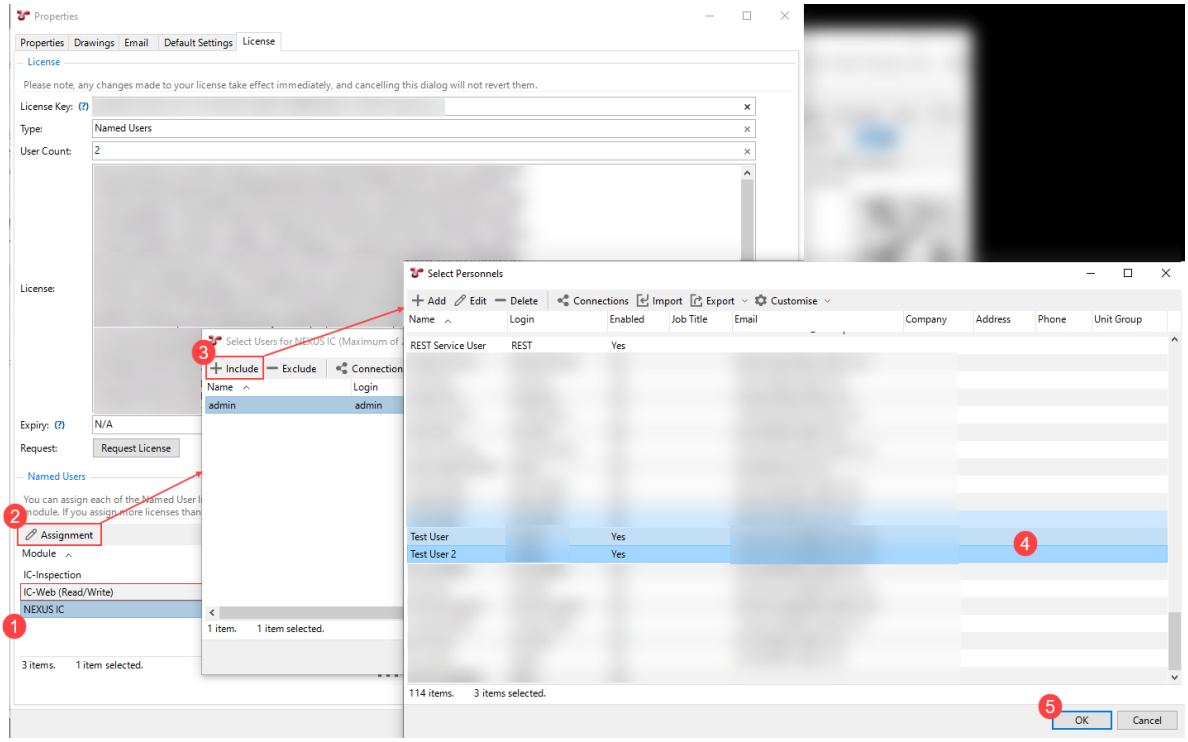
1. Select the row of the module you want to assign licenses for, for example, *NEXUS IC*. 1

2. Click **Assignment**. 2

   The **Select Users** dialog appears, showing accounts that currently have licenses assigned. To remove an assignment, select a user and click **Exclude**.

3. To assign licenses to new users, click **Include** in the **Select Users** dialog. 3

4. In the **Select Personnels** dialog, select the users to whom you want to assign the licenses. 4



> **Note**
>
> If the license limit has been reached and you select more users than the available licenses, the system will assign licenses to the users that were selected last during the selection process.

5. Click **OK**. 5

Users who are not selected will get a message saying that they are not authorised. This includes the user account that you are logged in under when you set up this license.

24.1.4.3 Subsequent License Validations

Each time a user launches the NEXUS application, it will contact the **NEXUS License Server** to validate the license stored in the database against the license issued from the server. Upon successful connection and validation, the grace period is re-set.

If NEXUS is unable to contact the **NEXUS License Server** for some reason (external Internet connection is not available, for example), then NEXUS will still run providing the license has been validated within the grace period.

> **Note**
>
> If nobody launches NEXUS for more days than the grace period, the next time NEXUS is launched, it will contact the **NEXUS License Server** to validate and reset the grace period.

24.1.4.4 Re-authentication

The only circumstances under which re-authentication is required is when the database name OR the database server name is changed.

> **Note**
>
> Your license validation is tied to your database server name. If the database server name changes, the license will show as invalid. This can happen if you have two different client executables (NEXUS IC, IC-Inspection, etc.) connecting to the same server under different names. For example, one might be connecting to a server named "." while the other is connecting to a server named "127.0.0.1" or "localhost" or "192.168.0.1" or "databaseservername". If this happens, ensure that all clients are using the same database server name, and validate the license again.

24.1.4.5 Offshore Use

Software licensing is designed with offshore use in mind. Note the following:

- If you plan to use NEXUS IC in an offshore area without internet connectivity, it is important to connect a single workstation to the internet before leaving the internet range. You can do this by hot-spotting it to a mobile phone. After connecting to the internet, start NEXUS IC on that workstation to validate the license. This will ensure that you have your full grace period. If you expect to be without internet access for more than the grace period, please contact support@nexusic.com, and we can temporarily increase your grace period.
- While backing up your database from one server and restoring it to another, you will be asked to re-validate the license. To do this, you will need to connect a workstation to the internet temporarily. This usually happens during mobilisation, but may also occur in case of catastrophic failure of the primary database server. Please note that complete failure of a database server is rare.

24.1.5 NEXUS Administration Tasks

The following sections describe common administration tasks around the deployment and maintenance of NEXUS IC.

24.1.5.1 Regular Backups

Daily scheduled SQL backups should be performed by an SQL Maintenance job. Retention policy is at your discretion.

24.1.5.2 Ad Hoc Backups

Standard NEXUS users can take backups as and when required using *Database → Backup* menu item. Backups are recommended prior to imports or large scale database changes. For more information, see *Create a Backup*.

24.1.5.3 Database Restores

Database restores must be performed by the NEXUS SQL Admin. We recommend using the NEXUS application to perform database restore of the proprietary **.nexus-backup** (or **.aimbak** for older versions) files. If restoring from the daily backup then restore should be performed using SQL tools. Confirm that the User Group has [dbowner] permissions on any restored databases.

24.1.5.4 Restore a Database

Set up a shared network folder, which is accessible to both the database server and to NEXUS IC. This may be a UNC path (like '\\MyServer\MyShare') or, if the database server and NEXUS IC are running on the same machine, it may be a Windows path (like 'C:\Database Backups'). Copy the NEXUS IC database backup file into this folder.

> **Note**
>
> When restoring the NEXUS IC Database to the SQL Server, you may not have sufficient permissions to create databases on the SQL Server. In this case, contact your SQL Administrator to restore the database using SQL Management Studio (or similar).

24.1.5.5 Add a User

There are two steps to adding a new user to the NEXUS database:

1. In Active Directory, add the user to **NEXUS Users Group**.
2. In NEXUS IC, go to *Database* → *Security* and add a new user as described in *Create a New User*.

24.1.5.6 Edit User's NEXUS Permissions

In NEXUS IC, go to *Database* → *Security* and set up permissions as described in *Set Up Permissions for User/User Group*.

24.1.5.7 Remove a User

Although it is possible in NEXUS we do NOT recommend deleting a user because this will delete all audit history associated with that user. To disable a user:

1. In NEXUS IC, go to *Database* → *Security* and edit the user profile. On the **Login** tab, deselect the **enabled** checkbox.
2. In Active Directory, remove the user from the NEXUS Users Group (or disable the user account).

24.1.5.8 Refresh or Update Software License

If the database name or SQL server name change, then the NEXUS licensing will become invalidated. To refresh the license, proceed as follows:

1. Navigate to *Database* → *Properties* (see *Properties Dialog*).
2. Go to the **License** tab.
3. Enter the unique license key, overwriting whatever text is presently there.
4. Press the **Request License** button.

   License information will be retrieved over the internet within a minute or so.

24.2 Frequently Asked Questions

- *User Management*
- *Usability*
- *Performance*
- *Integration*
- *Support*
- *Data Integrity*
- *Data Validation*
- *Security*

- *Encryption Protocols*
- *Accreditation*
- *Mobility*

24.2.1 User Management

Question	Answer
Are there definable and configurable user roles and permissions?	We provide fully configurable security groups and associated permissions defined at table level. For more information, see *Manage User Security and Permissions*.
How does security event logging work?	Audit log tracks sessions, create, update and delete actions. Read actions are not tracked, but logins and logouts are.
How does user authentication take place: local AD domain (for example, integration with Purchaser's environment)/cloud domain (for example, Azure AD)/other?	Authentication is managed through a cloud domain using Microsoft Entra ID. Users are authenticated via Single Sign-On (SSO) with their company user accounts. SSO has to be set up by the company as described in *Software as a Service (SaaS) Deployment*. Note that for security reasons, authentication is restricted to a single customer domain.
Does the system enable enforcing password complexity? If so, what parameters can the Purchaser control and what are the standard/initial settings?	Yes, per Microsoft Azure AD standards.

24.2.2 Usability

Question	Answer
Can the NEXUS suite be used offline?	• A number of applications in the NEXUS suite are specifically designed for offline use - for example, IC-Inspection and IC-Inspector. • Web-based applications require an internet connection to function. • For field-based campaigns, a "subscriber" database can be used as an offline copy that can be synced into the master on return to base.
What help tools and information are available? Are they database-specific or generic to all databases?	• Typically training material is customised to the final configuration of the customer database. • System help is provided in the form of hover-hints and labels for fields. • Generic application help is available online via the online documentation and accessible from within the app.
Is the software for mobile use or desktop use?	• NEXUS IC and IC-Web are primarily designed for desktop use. • IC-Inspector is our mobility app which is specifically designed for field-based data acquisition in tablet-sized screens. • There are no apps designed for smartphone-sized devices.

24.2.3 Performance

Question	Answer
How is software performance affected by customer configuration changes?	• Performance optimisation is a key element of testing and development. • Complexity of customer-specific configuration can have a performance impact. Wood will work with the client to ensure reasonable system performance.
Where are the reports and RBI calculations done, are they performed in the Client or in the DB?	Calculations are performed in the Client, not in the database.
Does the solution have the ability to refresh information, run reports and calculation updates quickly without causing system crashes or long delays?	Performance of the calculations depend on calculation complexity.
What is the general system availability/uptime?	• SaaS hosting is deployed in MS Azure and has a proven history of greater than 99.9% uptime. • Access to NEXUS via SaaS may be temporarily unavailable for scheduled maintenance or for unscheduled emergency maintenance due to causes beyond Wood's control. The window for daily automated maintenance of servers is typically out of hours (for example, 0200 to 0400) and will NOT always result in service downtime. This maintenance window allows critical security issues to be addressed promptly after the release of a relevant patch. Any necessary 'non-routine' downtime during business hours is scheduled and approved with client contact.

24.2.4 Integration

Question	Answer
Does the system have integration APIs?	NEXUS has a published REST API for data-level integration with third-party systems. For more information, see *REST Service Specifications v2.0*.
What ports are required to provide the service?	Port 443 (using HTTPS).
What's the process for CMMS PM/MM integration?	Experience has shown us that the most effective system connectors are implemented in a collaborative partnership between the company technical experts and NEXUS technical experts. The scope of the CMMS integration will be guided by company requirements, which may or may not include two-way communication. Our standard approach for creating system connectors is the following: • Workshop workflows and data flows between systems • Identify each connector and their requirements • Implement any required changes in NEXUS and/or other system (for example, SAP) • Collaboratively define, configure and test the connector script (with each expert team writing the appropriate section of the connector) See integration.connector.example for an example of the workflow.

24.2.5 Support

Question	Answer
On solution upgrades, can the process be performed without vendor participation, unless requested?	• For on-premise deployments: The upgrade process is performed by running the new setup file. The setup process will automatically handle all changes needed including database schema updates. • For SaaS deployments: The NEXUS infrastructure team will handle the upgrades with minimal interruption to operations.
How are support tickets sent by clients processed?	There are 2 tiers of support: 1. Tier 1 - Regional office support: The regional Wood office can be supported any time (via phone, or email) to provide support. 2. Tier 2 - Global support system: Tickets are raised and managed in a central tracking system that is monitored by Wood's NEXUS team globally. This allows prompt response.
What is the escalation process of a sustainment ticket?	• Support requests are logged into central tracking system and monitored by global support personnel. • Support tickets are triaged and either addressed, or assigned to relevant person/team for investigation.
Is there a regular release cycle?	NEXUS follows a continuous delivery model rather than fixed release cycles, bringing clients new features faster and more frequently.
What support hours do you offer your global customer base?	The Support Portal is monitored office hours 9:00am to 5:00pm by personnel in 4 main regions: • Perth - GMT +8 • Brisbane - GMT +10 • Aberdeen - GMT • Houston - GMT -6
What type of support is provided?	Support is typically provided via email, screen share, or phone where necessary.
How long does it take to get a response and a resolution for an issue that we are experiencing?	Normal response time is within 24 hours, with a target maximum resolution time of 72 hours. User management requests and other high priority issues are usually addressed within 24 hours.

24.2.6 Data Integrity

Question	Answer
How do you ensure zero data loss system failure/data redundancy?	MS SQL database backend stores all data after commit. SaaS via MSAzure provides levels of redundancy and recovery. The hosted service is resilient to single server failures through the use of redundant Azure infrastructure and provides coverage in the event that a data centre goes offline. Wood replicates database backups to other geographical regions.
Where is my data stored?	SaaS hosting is deployed in MS Azure, at data centres appropriate to the client solution. Wood currently has deployments in UK South, South Central US and Australia East. See Data residency in Azure.
How are actions logged for auditing?	Audit log tracks sessions, create, update and delete actions. Read actions are not tracked.
How is the backup task executed?	Database backups are taken automatically each business day.
Who can configure a backup task?	End users with appropriate permissions can initiate a backup from within the application on demand.
How long is the backup stored?	Backups are retained for 14 calendar days. Additional backups for longer term retention can be held by agreement or transmitted to customer. This may have a cost impact.
How are backups secured?	All backups are retained in dedicated storage secured for each customer. Storage is encrypted using AES256-based encryption keys.
Are there separate development, testing and production environments available?	Yes. We provide a test database by default. Development environment is available upon request. This may have a cost impact.
What is the backup/data restoration methodology? Are disaster recovery tests conducted regularly?	Yes, tests are performed at least annually. The service level objectives are: • Restore Point Objective: maximum 24 hours • Restore Time Objective: maximum 48 hours
What is the procedure for managing client data after the termination of a SaaS contract?	Upon the conclusion of a SaaS contract, we adhere to a stringent data management protocol to ensure the security and integrity of client data. The process is as follows: 1. Transmit final database backup and any video files to customer. 2. Confirm receipt. 3. Delete all virtual machines and client data.

24.2.7 Data Validation

Question	Answer
What data is validated?	All input data is validated for type consistency (numeric, Boolean, and so on). Field-specific validation rules can be defined.
Import utilities must provide logging or an audit trail of both success and errors encountered during import. How do you ensure this?	Import engine performs test import before modifying data. If errors are found, the import process is aborted and user must rectify errors before data will be modified.
What data export utilities are available to extract data in standard formats (that is, Excel or CSV)?	Almost anything in the database can be dumped to CSV, or push/pulled from REST calls, provided users have appropriate permissions.

24.2.8 Security

Question	Answer
What is your application security model that ensures avoiding unauthorised access and/or deletion of data?	Users are assigned to security groups. Security groups have permissions to tables allowed/restricted. Users can only access or edit tables permitted by their security permissions.
Is the solution able to lock down fields coming from Maximo interface?	Specific fields can be configured to be Read-Only, regardless of the data source.
Can NEXUS track changes within the database for reporting and audit purposes?	The Audit log in NEXUS logs every change to every field in the database.
Does the solution have the ability to secure data modifications on specific fields to only Admin or defined User Roles?	Specific fields can be configured to be Read-Only based on a pre-defined workflow logic. This includes the logged-in user.
How do you ensure Incident Response Compliance?	• Wood has developed its security infrastructure using industry standards and guidelines to be complaint with ISO27001/27002, cyber essentials, NIST, government, and department of defense information technology and European union (EU) general data protection regulations (GDPR). • Wood has a global procedure for crisis and emergency management, which supports a robust IT and information security incident response process that covers all levels of security incident or data breaches scenarios. Wood has third-party forensics capabilities, ERS and incident response resources and will ensure that the customer is notified of any breach and the following actions.
How are systems patched to avoid system downtime?	Under SaaS deployment, the application and/or server infrastructure may be patched automatically as required. The window for daily automated maintenance of servers is typically out of hours (for example, 0200 to 0400) and will NOT always result in service downtime. This maintenance window allows critical security issues to be addressed promptly after the release of a relevant patch. Any necessary 'non-routine' downtime during business hours is scheduled and approved with client contact.
What is the average patch time for systems and service applications?	Typically patches are applied within maintenance window and takes 10-15 minutes.
Do you offer network segmentation to protect individual services and databases?	Every customer has its own dedicated server cluster to ensure data security.
Can users be authenticated against an external identity management system? For example, Microsoft Active Directory (AD) for on-premise, Azure Active Directory (AAD) via SAML2 for cloud hosted, Single Sign-On (SSO).	Authentication in SaaS deployments is managed through a cloud domain using Microsoft Entra ID. Users are authenticated via Single Sign-On (SSO) with their company user accounts.
Who controls access to our data under SSO?	With SSO, your organisation will have complete control over user access. Your IT team will manage domain accounts and, if configured, Active Directory (AD) group memberships that determine access to NEXUS.
What login credentials will users need? **(SaaS only)**	Users must authenticate using a corporate domain account created by your IT team. Temporary or transient users can be provisioned without Office 365 licences or email accounts if required; however, these accounts must still be created and managed within your organisation's domain.
Can third-party contractor domains be granted access to NEXUS?	No, Wood cannot grant access. Allowing access to third-party contractor domains poses a security risk and may lead to unintended data exposure. For example, if your organisation grants access to AAA Inspection Company, and

24.2.9 Encryption Protocols

Question	Answer
What data encryption practices do you follow?	All data is encrypted in motion and at rest. Data will likely be travelling over public networks and is protected from unauthorised viewing and tampering. Web app and hosted solution both use HTTPS, which encrypts data in flight. Our Azure VMs are encrypted using Azure Platform Managed Keys. These are encryption keys that are generated, stored, and managed entirely by Azure. Customers do not interact with platform-managed keys (PMKs).
How is data encrypted in motion?	Data transmitted over public networks is protected from unauthorised viewing and tampering. Our web and desktop apps use HTTPS, which encrypts data in flight using the cryptographic protocol TLS 1.2 or higher.
How is data encrypted at rest?	Data at rest is stored in Microsoft Azure virtual machines using Server Side Encryption (SSE) with Platform Managed Keys (PMKs). Data on Azure-managed disks is encrypted transparently using 256-bit AES encryption, which is compliant with Federal Information Processing Standards (FIPS) 140-2. By default, managed disks use PMKs, which are managed by Microsoft. All managed disks, snapshots, images, and data written to existing managed disks are automatically encrypted-at-rest with PMKs. Customers do not have to interact with these keys.

24.2.10 Accreditation

Question	Answer
What certification or accreditation of the solution is maintained?	The NEXUS team is currently working towards obtaining ISO27001:2022 accreditation for the NEXUS solution.
Are there independent audits of security practises?	Third-party threat detection tools are used as an automated part of the build process to provide security scorecard and vulnerability detection. Any newly identified risks are promptly reviewed and mitigated. Additionally, both internal and independent audits and penetration testing are carried out to maintain the ISO27001:2022 accreditation.

24.2.11 Mobility

Question	Answer
Can you describe the mobility capabilities of your solution? Can tablets be used as Read/Write vehicles?	• IC-Inspector is the fully integrated mobility solution. IC-Inspector is a tablet application optimised for inspection data collection using an iPad. • IC-Inspector communicates with a NEXUS REST server to receive tasks and drawings, and to upload inspection data. It can be used for inspection with no Internet connectivity, although it does require connectivity to initially receive tasks and finally sync inspection data back to the master database.
What platforms are supported for using IC-Inspector?	iPad, Windows tablet, Android tablet

24.3 Known Issues

This section lists known issues and limitations that may affect the behaviour of NEXUS applications. Where possible, workarounds or recommended actions are provided. Items are updated as issues are identified, investigated or resolved.

Feature	Issue	Wood Internal Reference
Video Playback	The playback quality of high-definition video files from Azure Blob Storage may occasionally be sub-optimal, resulting in pixelation or jerkiness. For best results, use IC-Web, where video quality is displayed as recorded.	#55164
High DPI Displays	NEXUS may appear scaled incorrectly on high DPI displays. To resolve this: 1. Press *Ctrl+Alt+End* and sign out of the NEXUS application. 2. Go to the desktop. 3. Right-click and select *Display Settings*. 4. Set the scale to **100%** for all displays. 5. Select a resolution that works with scaling set to 100%. 6. Close *Settings*. 7. Reboot the machine (required).	#53354
Reports (Hosted Clients Only)	Reports may display Date fields in an unexpected format. As a workaround, pass the Date field into a function that forces formatting to the required output.	#48638
Library – Sorting by Connected To	Sorting by the *Connected To* column on large grids (more than ~500 rows) may take a long time. The **Cancel** button does not stop the sorting operation once started. **Recommendations:** • Hide the *Connected To* column if possible. • Avoid sorting by this column unless required. • If sorting is necessary, allow the sort to finish (may take up to 30 minutes), then immediately sort by another column (for example, *Name*, *Doc Ref*, *Doc Date*). **Warning:** If you do not sort by another column afterwards, the sort order is saved. You will then experience the same delay when reopening the **LIBRARY** screen.	#45063
ECE Configuration	*Electronic Corrosion Engineer (ECE)* is not supported in the 64-bit version of NEXUS IC.	#42062
Dark Mode	NEXUS IC, IC-Inspection and IC-Recorder do not fully support the Windows **Dark mode** colour setting.	N/A
Copy and Paste (SaaS only)	To copy and paste data from NEXUS to other applications, the browser clipboard must be enabled. Some browsers prompt for permission, but others (such as Safari) block clipboard access by default. If required, disable content blockers for the NEXUS application in your browser settings.	#72409
4K and 5K Monitors (SaaS only)	On very high-resolution monitors at maximum display settings, the application window may not fill the browser window completely.	#76037
Application Window Resizing (SaaS only)	After maximising the application window, the application may appear cropped within the browser. Click **Restore Down**, then maximise again, or manually resize the browser window to force the application to redraw correctly.	#80327
SVG Grey Scale	When viewing SVG images in **Grey Scale** mode, the background may appear solid black, making black image elements difficult to see.	#8358
3D DWG Drawings	Some 3D drawings originally created in SESAM GeniE and converted to DWG may not display. This is due to limitations in the third-party 3D DWG viewer and may indicate non-standard DWG formatting.	#8331
2D DWG Hovering	Hover highlighting does not work for 2D DWG files. When hovering over a region, the opacity does not change as it does for JPG or PDF drawings.	#7725
3D DWG Rendering	Some 3D DWG files show minor rendering errors due to limitations in the third-party 3D DWG viewer.	#7630

24.4 Other Documentation

A `training manual`, showing how to use IC-Inspection for offshore eventing and NEXUS IC for offshore review, is available.

24.5 Dialog Help

Find below the list of help pages that describe settings in specific dialogs in NEXUS. These help pages are available when you click the **Help** button in these dialogs.

24.5.1 Add/Edit Anomaly Dialog

See below for the description of fields in the **Add Anomaly/Edit Anomaly** dialogs.

In the **Add Anomaly** dialog, only the **Anomaly** tab is visible, the other tabs get displayed once you have saved a new anomaly and start editing it.

Anomaly

Field/Checkbo Name	Description
Asset	The name of the asset that the anomaly is attached to. This is a required field.
Name	A name that uniquely identifies the anomaly. Note that the name cannot exceed 50 characters.
Description	A 100-character field that provides more descriptive information of the anomaly.
Code	A code that identifies the type of anomaly. Anomaly codes are customizable by users and can be configured as explained in *Configure Anomalies*. Typical examples of anomaly codes are "CD", "PD" or "VIB" (Coating Damage, Physical Damage or Vibration).
Severity	You can choose from a list of pre-defined severity levels. These severity levels are customizable by users and can be configured as explained in *Configure Anomalies*. Examples of severity levels include: • "Level 1 - Contributor" • "Level 2 - Degraded" • "Level 3 - Damaged" • "Level 4 - Danger" • "Level 5 - Extreme Danger" Anomaly severities can also be assigned to anomaly triggers and will be pre-populated from the initial automatically generated finding, through the anomaly that the finding is linked to.
Anomaly Number	A numerical property that can be used to store a number against the anomaly. This number is not automatically populated.
Reference Number	A 200-character limit field that can be used to reference or cross-reference anomalies.
Date Created	The initial creation date for the anomaly, which defaults to today but is editable afterward.
Created By	The name of the person creating the anomaly record. This defaults to the currently logged-in user, but is editable afterward.
Anomaly Set	The value of this field can be used as an alternative option for grouping anomalies. Anomaly sets are customizable by users and can be configured as explained in *Configure Anomalies*. Typical examples of anomaly sets include "Topside" and "Subsea".
Assigned To	The name of the person to which the anomaly record is assigned.
Comments	A large free-text field designed to capture additional information about the anomaly, which may not be adequately represented in the anomaly's properties.
Priority	You can choose from a list of pre-defined priorities. These priorities are customizable by users and can be configured as explained in *Configure Anomalies*. Examples of priorities may include "Very High", "High", "Medium", "Low" or "Very Low".
Status	You can choose from a list of pre-defined statuses. These statuses are customizable by users and can be configured as explained in *Configure Anomalies*.
Risk Score	This is a calculated field, the function assigned to this field is named "System - Anomaly - Risk Score" and must be configured (see *Set Up Anomaly Risk Matrix*). Different fields, such as "Severity" and "Priority", of the anomaly can be used as the input parameters for the function.
Closed Out	Indicates whether the anomaly is open or closed. Closed anomalies are normally excluded from anomaly statistical reporting. If you use this checkbox to close an anomaly, no anomaly action will be created for the close-out of the anomaly. We recommend that you close an anomaly as described in *Close Anomalies*.

Attributes

This tab is visible only if the **Anomaly** system table has been extended with additional fields in your configuration. You can fill those custom fields on this tab. For more information, see *Configure Attributes*.

Findings

On the **Findings** tab, you can see the findings linked to the anomaly being edited. This corresponds to the finding records that are shown on the **Findings** tab of the **ANOMALIES** screen when you select the same anomaly in the anomaly list above. Note that on this tab, however, you cannot see the source event information that you see on the **Findings** tab of the **ANOMALIES** screen. The columns that you see on this tab mostly correspond to those on the **Findings Listing** tab of the **INSPECTION** screen (see *Findings Listing*).

Actions

On the **Actions** tab, you can see the anomaly action items linked to the anomaly being edited. This corresponds to the anomaly action items that are shown on the **Actions** tab of the **ANOMALIES** screen when you select the same anomaly in the anomaly list above.

Library

On the **Library** tab, you can see the library items linked to the anomaly being edited. This is similar to the **Library** tab of the **ANOMALIES** screen when you select the same anomaly in the anomaly list above, however, in this specific dialog, you cannot see the library items that are linked to the anomaly's asset, but only the library items that are directly attached to the anomaly. If you want to see the library items attached to the relevant asset, check the **Library** tab of the **ANOMALIES** screen.

History

See *Checking History*.

See also

Anomalies

24.5.2 Add/Edit Anomaly Action Dialog

See below for the description of fields in the **Add Anomaly Action/Edit Anomaly Action** dialogs.

In the **Add Anomaly Action** dialog, only the **Anomaly Action** tab is visible, the other tabs get displayed once you have saved a new anomaly action and start editing it.

Anomaly Action

Field/Checkbo Name	Description
Anomaly	The name of the anomaly that this action belongs to. To change the anomaly that the action is assigned to, click the ··· button to the right.
Name	A name that uniquely identifies the anomaly action. Note that the name cannot exceed 50 characters.
Status	You can optionally select a status for the anomaly action. This list is user-definable and you can add/edit/delete statuses from the **Select Status** dialog that is triggered when you click the ··· button in the field.
Reference Number	A number that can be used to reference (or cross reference) the anomaly action. For example, the number may relate to a Work Order number in your Planned Maintenance System.
Action Type	Allows you to categorise your actions. Click the ··· button in the field to select an action type to be assigned to the anomaly action. The list is user-definable and you can add/edit/delete action types as required. You can also assign an event type to the anomaly action by selecting one in the **Event Type** field when creating or editing an action type. If you want to assign a task to the anomaly action, you must assign an event type to the action type here.
Created At	Enter the date when the anomaly action is created. This defaults to the current date, but is editable thereafter.
Created By	Select the name of the person creating the anomaly action. This defaults to the currently logged in user, but is changeable thereafter.
Action Before	Enter a due date that the anomaly action should be completed by.
Assigned To	Select the name of an individual or department that is responsible for progressing or completing the anomaly action.
Completed At	Enter the date when the anomaly action was completed. Note that an anomaly action is not deemed "completed" until there is a valid date entered in this field.
Percent Complete	Enter a value between 0 and 100. This is for reporting and information purposes only.
Comments	A large free text field that allows you to specify additional information about the anomaly action, which could not be captured in the properties of the anomaly action.

Attributes

This tab is visible only if the **Anomaly Action** system table has been extended with additional fields in your configuration. You can fill those custom fields on this tab. For more information, see *Configure Attributes*.

Tasks

Shows *tasks* associated with the anomaly action. You can also:

- Add or edit tasks, which opens the **Add Task** or **Edit Task** dialog (see *Add/Edit Task Dialog*).
- Import, export or delete tasks.
- Launch an incomplete task to record event data in an event form and complete the task (see *Launch Tasks*).

Planning Tasks

Shows *planning tasks* associated with the anomaly action. You can also:

- Add or edit planning tasks, which opens the **Add Planning Task** or **Edit Planning Task** dialog (see *Add/Edit Planning Task Dialog* and *Assign Planning Task to Anomaly Action*).
- Import, export or delete selected planning tasks.

Anomaly actions can also be assigned to a planning task when editing the planning task (see *Assign Anomaly Action to a Planning Task*).

History

See *Checking History*.

See also

Anomaly Actions

24.5.3 Add/Edit Asset History Dialog

The **Add/Edit Asset History** dialog appears when you create or edit an asset history record for an asset on the **Asset History** tab on the **ASSETS** screen (see *Asset History*).

See below for the description of fields in the **Add/Edit Asset History** dialog:

Asset History

Field/Checkbox Name	Description
Title	The title of the asset history record, for example, *De-rated Pipeline*.
Asset	The asset associated with the history record. By default, this is set to the selected asset in the asset tree. You can change it by clicking the ellipsis (**...**) button.
Date Completed	The date when the recorded event occurred.
Comments	Additional information or context relevant to the recorded event.
Workpack	*(Optional)* Select the relevant Workpack if the asset history record relates to specific Workpack data.
Event Type	*(Optional)* Select the relevant Event Type if the asset history record corresponds to a specific event category.
Calculated Date	This field is automatically populated and may reflect one of the following: • The **Date Completed**, if specified. • The **Workpack Date**, if specified and **Date Completed** is not provided.

History

See *Checking History*.

24.5.4 Add/Edit Chart Template Dialog

See below for the description of fields in the **Add Chart Template/Edit Chart Template** dialogs.

Chart Template

Field/Checkbox Name	Description
Name	Enter a name that uniquely identifies the chart template.
Description	You can optionally provide more descriptive information about the chart template. This can be a maximum of 100 characters.
Category	You can optionally define a category for grouping chart templates.
Available	Controls whether the chart is available for display in the relevant **Charts** panes on the **ASSETS** and **INSPECTION** screens. All chart templates are available for use in *Configure Report Templates*, regardless of this setting.
Show Zoom Bar	Controls whether a mini version of the chart will be shown at the bottom of the chart on the **INSPECTION** screen. This is useful if you want to zoom a long way into the chart (which is often the case on KP-based charts, for example).
Show Drawings	Shows a drawing as the background of the chart. See *Charts and Drawings* for more details.
Show X Axis Title/Show Y Axis Title	Controls whether the chart will contain text showing a title for each axis.

Series

You can assign series to the chart template from this tab. You can use the standard grid toolbar functionality (see *Using the Grid*) to add, edit, delete, import or export series records. For more information, see *Maintain Series for Chart Templates*.

History

See *Checking History*.

See also

Configure Chart Templates

24.5.5 Add/Edit Field Definition Dialog

See below for the description of fields in the **Add Field Definition/Edit Field Definition** dialogs. Self-explanatory fields are not explained.

This dialog is triggered when you configure fields for Asset Information Groups (AIGs) (see *Configure Asset Information Groups*), global tables (see *Configure Global Tables*) or event types (see *Configure Event Types*).

Note that depending on where you trigger this dialog from, some tabs may or may not be visible.

Field Definition

On this tab, you must specify a name and a field type. The remainder of the tab will change, depending on the field type you select. The fields described below are common to all field types.

Field/Checkbo Name	Description
Name	Enter a name that uniquely identifies the field. This will appear on the user interface.
Field Type	You must specify the type of the field, which determines the behaviour of the field.
Allow User Comments	This feature is not supported currently.
Default Value	Specifies the value of the field if the user doesn't specify any other values. You can also use this field as follows: • **Auto-increment fields:** It's possible to set a field to auto-increment. For example, if you want each new anomaly you created to automatically have an as-yet-unused anomaly number pre-populated, you would do this by setting the *Anomaly Number* field to be an auto-increment field. To do this, set the field's default value to `@autoinc`. For system tables like Anomaly, you can't do this through the NEXUS IC user interface, so ask support@nexusic.com for assistance. • **Auto-populate date/time or user name**: Similar to `@autoinc`, you can set a field to pre-populate with the date/time the record was created by setting its default value to `@now`. This works for any sub-event, AIG or sub-AIG field. You can also set a field to pre-populate with the logged-in user's name by setting its Default to `@user`. This works for any event, sub-event, AIG or sub-AIG field. These default values are populated when the row is created. For an AIG, that's when the asset is created. For an event, it's when the event is created. For a sub-event or sub-AIG, it's when the user clicks the '+' to create the new sub-event or sub-AIG row.
Format	This field is visible when you selected the *Numeric* field type. This field determines in what format the numeric value will be displayed.
Number of Decimal Places	This field is visible when you selected the *Numeric* field type. This field determines the number of decimal places that is displayed for a numeric field. NEXUS IC still allows entering more decimal places in the numeric field, however, when the value is displayed, it will be truncated based on the value that you configured here. Note that IC-Inspector handles this setting differently; it may not allow you to enter more decimals than what you have configured here.
Survey Input	If you want this field to be automatically populated from an incoming ROV survey string (such as KP or Depth), then enter the name of the matching survey string field which is configured in IC-Inspection (see *Survey Values*).
Comments	Provides additional information about the field, which is displayed as a hint when the user hovers over the field.
Minimum Value	If the field has the type 'number', then you can define a minimum value that must be entered for this field. The user will be required to enter a value greater than or equal to the minimum value. If the value entered is less than the minimum value, then the record cannot be saved until a valid number is entered.
Maximum Value	If the field has the type 'number', then you can define a maximum value that must be entered for this field. The user will be required to enter a value less than or equal to the maximum value. If the value entered is greater than the maximum value, then the record cannot be saved until a valid number is entered.
Required	If your configuration requires that this field must have a value entered, then tick this checkbox. A field is typically marked as required if key calculations are dependant on the data entered in this field.

Field Layout

This tab has various sections that control the display of the field in different modes.

Grid

Field/Check Name	Description
Visible	Determines whether this field will be visible when the form data is viewed as a grid (for example, on the **Children** tab for asset forms, or in the **Event Listing** for events). You have the following options to choose from: • *Yes* - The field is always visible. • *No* - The field is always hidden. • *Yes, with Customisation* - The field is hidden by default, but can be made visible by the user by selecting the field under the *Customise* → *Columns* toolbar option.
Order	Controls the column order within the grid. The column with the lowest Column Order will be at the left of the grid, and so on. Grid order is also used to set the order of columns in a Custom Export of *assets* or events.
Text Alignment	Controls whether this field aligns left, centre or right. If you do not set an alignment, text fields will default to left, numeric fields to right, and date fields to centre.
Caption	Allows you to have a title on the grid column for this field that is different from the field's underlying name.

Form

Field/Check Name	Description
Visible Form	Determines whether this field is visible on the form.
Order	Controls the order of fields within categories, and the order of categories on the form. The category that contains the field with the lowest order will be displayed first. Within the category, the field with the lowest order will be displayed first.
Show Caption	Untick this checkbox if you want this field to appear *without* a caption next to it on forms.
Columns	Controls how wide this field appears on a form: if this is a two-column-wide form, setting this field's columns to 1 will cause the field plus caption to fill 50% of the width of the form; setting it to 2 will cause it to fill the full width. Forms default to two columns wide, unless you specify otherwise in a Category.
Form Caption	Allows you to have a title on the form next to the field that is different from the field's underlying name.
Category	Groups fields within a form. You can create a new category or edit an existing one and set its columns. While editing the category, you can also set an image or descriptive text to appear at the top of this category. This might be instructions on how to fill in the form, details of how calculations on the form are worked out, and so on.

Report

The **Visible** checkbox controls whether this field will be shown when the table is exported in a report template.

IC-Inspector

The **Visible** checkbox controls whether this field will be shown in IC-Inspector. If you set an event field to visible, it will be available to inspectors to fill in. If you set an asset information field to visible, it will be displayed to inspectors above any forms they may be filling out. Use this sparingly: a long list of visible asset information fields will fill the inspector's screen and force them to scroll to reach the form they are trying to fill out.

Order and **Caption** work analogously to those in Grid and Form.

General

Field/Check Name	Description
Editor Type	Controls what type of editor the user will see when they edit the value in this field.
Blank Text	If you enter a text here, this text will be displayed greyed out whenever the field is empty. You can see several fields with Blank Text set right here on the **Field Layout** tab.

Workflow Rules

If you want a field's properties to be controlled by other data, you can set up workflow rules for the field. For more information, see *Set Up Workflow Rules*.

External Connection

If you have configured a point-to-point connector for an AIG field (see *Configure Connections*), this connection is displayed on this tab.

Field Specific Units

This feature works in coordination with *unit groups*. For example, if you want Easting and Northing to display in metres, even when US Weights and Measures are selected, you can specify that on this tab. You'll need to specify it once for the Easting field, and once for the Northing field.

Function

This tab is available only if you selected the *Calculation* or the *Global Lookup* field type on the **Field Definition** tab. You can assign a function to a field if you want the system to calculate the value of the field based on the function you specify. You can select predelivered system functions or custom functions that you configured (see *Configure Functions*).

Anomaly Triggers

On this tab, you can set up anomaly triggers for fields on an AIG or an event form. When an anomaly trigger is violated, a yellow exclamation mark ( ) will appear next to the field. For information about setting up anomaly triggers, see *Set Up Anomaly Triggers*.

History

See *Checking History*.

Hint

As you add (or edit) fields, you can see a preview next to the dialog, showing how the fields will appear on either a form or a grid. Fields that are selected will be shown with a exclamation mark next to them in the form preview. If the field is a lookup list, you can drop down the lookup list to see its values. (You can also see and edit a lookup list's values when choosing the lookup list: on the "Select Lookup List" dialog, click **Edit**, click **Items**.)

See also

- *Configure Global Tables*
- *Configure Asset Information Groups*
- *Configure Event Types*

24.5.6 Add/Edit Finding Dialog

See below for the description of fields in the **Add Finding/Edit Finding** dialogs.

In the **Add Finding** dialog, only the **Finding** tab is visible, the other tabs get displayed once you have saved a new finding and start editing it.

Finding

Field/Checkbox Name	Description
Event	Specifies the event which the finding is connected to.
Code	A code that identifies the type of finding. These are the same codes that are used to classify anomalies. For example, a code can be "CD", "PD" or "VIB" (Coating Damage, Physical Damage or Vibration); however, anomaly codes are user-definable and can be configured under *Configure Anomalies*.
Severity	Choose from a list of pre-defined severity levels. For example, severity levels can be "Level 1 - Contributor", "Level 2 - Degraded", "Level 3 - Damaged", "Level 4 - Danger" and "Level 5 - Extreme Danger". Severity levels are user-definable and can be configured as described in *Configure Anomalies*. These are the same severities that are used to classify anomalies. Anomaly severities can also be assigned to anomaly triggers.
Status	Choose from a list of pre-defined finding statuses. Finding statuses are user-definable and can be configured as described in *Finding Status*.
Finding Number	Optional. This field can be used to label findings.
Reason	You can enter a reason for creating the finding. There's no character limit for this text field.
Remedial Action	You can enter possible actions to resolve the finding. There's no character limit for this text field.
Anomaly Required	If you want to link the finding to an anomaly, tick this checkbox. In this case, a new **Anomaly** field appears in the dialog, from which you can select the anomaly that you want to link to (see *Link Finding to Anomaly*). If you deselect this checkbox, it indicates that the finding can be considered as insignificant and the status of the finding changes to green colour.
Anomaly	Specifies the anomaly that this finding is linked to. This field only appears if the **Anomaly Required** checkbox is ticked. When you click the ... ellipsis, you can select an existing anomaly or create a new anomaly to which you want to link the finding.
Trigger	If this finding was automatically generated by an anomaly trigger, that trigger is shown in this field. This field is filled automatically and cannot be changed manually.
Is Auto Generated	If this finding was automatically generated by an anomaly trigger, this checkbox is selected. This field is filled automatically and cannot be changed manually.

Review

Allows you to view, edit or create review records for the finding.

This tab corresponds to the **Review Status** pane on the **INSPECTIONS** screen, see *Review Status* for more information about its functionality.

Event

Shows the key data and survey values from the event that the finding is linked to. You can update all values on this tab.

Multimedia

Displays the multimedia files associated with the event that the finding is linked to.

This tab corresponds to the **Multimedia** pane on the **INSPECTIONS** screen (see *Multimedia Toolbar*), except that it is read-only. You cannot add, edit, crop or remove multimedia files from this tab.

History

See *Checking History*.

See also

- *Create Findings*
- *Edit Findings*

24.5.7 Add/Edit Layer Dialog

The **Add/Edit Layer** dialog appears when you create or edit a layer for a drawing on the **Drawing** tab on the **ASSETS** screen (see *Create Layers* or *Edit Layers*).

See below for the description of fields in the **Add/Edit Layer** dialog:

Layer

Field/Checkbo Name	Description
Layer Type	Specifies the way the layer will be rendered on the drawing. Only **Region** and **Button with Region** let you create complex outlines.
Colour	Indicates the colour of the layer. This colour is used for both the outline and the fill.
Opacity	Specifies the opacity of the filled part of the layer. 0 is transparent; 100 is solid.
Show Caption	Indicates if the caption (defined below) is visible on the drawing.
Caption	Specifies the text string to show for this layer. This caption text grows/shrinks as you zoom in/out. It can be moved using the "grab point" at its top left. The text can be replaced with other text when the drawing is used in a report template or the drag AIG feature is used.
Caption Colour	Indicates the colour of the caption text.
Caption Angle	0° is horizontal, right way up. Positive angles rotate the text anticlockwise.
Associated Field	You can select an an Asset Information Group (AIG) field whose value can be displayed in the caption on this layer. The text will be appended after the fixed text specified in **Caption**.
Asset	If you want the layer to link to an asset, select the relevant asset from this field. For more information, see *Direct Asset Reference*.
Relative Asset	Instead of specifying a particular asset, you can enter text here. NEXUS will search for children that match that name. If multiple children match and the user clicks this layer and chooses **Navigate to**, there will be one entry for each in the context menu. This field is automatically filled with the name of the relevant asset if you extract layers from a PDF drawing. For more information, see *Relative Asset Reference*.
Associated Drawing	You can link to another drawing from this layer. When you click this layer and choose **Navigate to**, you will be navigated to the relevant asset and its specified drawing. That drawing must be available on that asset. This field is only visible if you have specified a direct asset reference in the **Asset** field. You can then select any drawings that are associated with that asset from the **Select Associated Drawing** dialog.

History

See *Checking History*.

See also

Manage Layers in Drawings

24.5.8 Add/Edit Library Dialog

The **Add/Edit Library** dialog allows you to define the properties of a library item. The fields are described below.

Library

Field/Checkbo Name	Description
Library Type	Select the library type to which you want to assign the library item.
Name	Enter a name that identifies the library item. This is a 100-character mandatory field. Most often, you use either the document title or the document number as the name of the library item.
Description	A 100-character field that provides more descriptive information of the library item.
Document No.	A 50-character field that stores the Document Number or Reference.
Revision	Can indicate at what stage the library item is based on your own requirements (for example, '01' or 'A').
Reference Date	You can assign a specific date to the library item as required.
Physical Location	If this library item is a reference to a hard copy document, then enter the physical location of the document.
Hyperlink	When linking this document to a UNC or URL, you can specify the full hyperlink in this field. Examples of valid URL and UNC paths: • `https://www.<webpage>.com/` • `\\example.com\groups\eng\this_doc.docx` **Note** If you define a mapped drive as a hyperlink location (for example, `H:\Working\document.docx`), then you must ensure that the drive letter `H:\` is mapped for every other potential NEXUS IC user. Instead of mapped drives, we recommended that you use UNC paths for network drive locations.
Attachment	Allows you to add an attachment to the library item in one of the following ways: • *Import* - Loads a document into the NEXUS IC database, or replaces an existing document. If it is a drawing and it has associated layers, the layers will not be deleted. • *Link* - Links to a file on a mapped drive. A copy of the file will be stored in the NEXUS database and updated when the file changes. • *Export* - Saves the document to a folder location of your choice. • *Launch* - Launches the attached item in the default Windows viewer. • *Copy* - Copies the attachment to your clipboard. • *Clear* - Removes the attachment from the library item. If it is a drawing, all associated layers will be deleted too.
Show Grey Scale	When enabled, DWG or DXF drawing layers are displayed in black and white instead of designed colours. This is only applicable to documents that are selected to be shown as drawing.
Show Captions	Shows or hides caption layers of a DWG or DXF drawing. This is only applicable to documents that are selected to be shown as drawing.
Show Dimensions	Shows or hides dimension layers of a DWG or DXF drawing. This is only applicable to documents that are selected to be shown as drawing.
Use in Reports	Determines if the library item is output to reports.
Force 2D	If you have DWG or DXF drawings which NXUS detects as 3D, and you'd prefer NEXUS to treat them as 2D, tick this checkbox on those drawings.
Background Colour	Allows you to define the background colour of a document. Note that this functionality only works on drawing types that support transparency (for example, DXF, DWG, GIF).

Attributes

This tab is visible only if the **Library** system table has been extended with additional fields in your configuration. You can fill those custom fields on this tab. For more information, see *Configure Attributes*.

Connections

On this tab, you can manage library connections associated with the library item. For more information, see *Library Connections*.

History

See *Checking History*.

See also

- *Library Items*
- *Manage Drawings*

24.5.9 Add/Edit Library Connection Dialog

The **Add/Edit Library Connection** dialog allows you to define or update how a library item is linked to another record. The fields in the dialog are described below.

Library

Field/Checkbo Name	Description
Library	Shows the library item for which the connection is being created or edited. To select a different library item, click the ellipsis ⋯ and choose another record.
Connect To:	Specifies the type of record that the library item is linked to. Select the required type from the drop-down list.
[Record Type]	The label of this field changes based on your selection in **Connect To**. For example, if you choose **Event**, the field will be labelled **Event**. Click the ellipsis ⋯ to select the appropriate record.
Task	Allows you to associate a workpack task with the connection. Click the ellipsis ⋯ to select the required task.

History

See *Checking History*.

See also

Library Connections

24.5.10 Add/Edit Lookup List Dialog

The **Add Lookup List** and **Edit Lookup List** dialogs are used to define and maintain lookup lists.

See below for the description of fields and tabs in these dialogs.

Lookup List

Field Name	Description
Name	Enter a unique name for the lookup list. This name is used to identify the lookup list when it is referenced in forms.
Category	Optionally enter a category to group related lookup lists and make them easier to locate.

Items

This tab is available only in the **Edit Lookup List** dialog and is not shown when creating a new lookup list. It becomes visible after the lookup list has been saved.

Use this tab to create, edit and delete items associated with the lookup list. The standard grid toolbar is available for managing items. For more information, see *Using the Grid*.

History

Available only in the **Edit Lookup List** dialog. Displays the change history for the lookup list. See *Checking History* for details.

See also

- *Configure Lookup Lists*
- *Add/Edit Lookup List Item Dialog*

24.5.11 Add/Edit Lookup List Item Dialog

The **Add Lookup List Item** and **Edit Lookup List Item** dialogs are used to define and maintain individual items within a lookup list.

See below for the description of fields in these dialogs.

Lookup List Item

Field Name	Description
Value	The value passed to functions that use this lookup list field as an input. If a lookup list item has a sensible numeric value, this is often entered in the **Value** field. For example, if the lookup list is called `Anode depletion` and an item has a **Comment** of `0 - 25%`, the **Value** might be set to `25`. If the lookup list items do not have a sensible numerical value, the **Value** is often set to the same text as the **Comment**.
Comment	The descriptive text displayed to users in the form field and in the drop-down list.
Icon	Optional field. You can import an icon or image that is displayed alongside the lookup list item in forms and in the drop-down list. **Note:** The size of image containers in the drop-down list is determined by the largest image used in the lookup list. For best results, use images of the same size.
Item Order	Optional field. Controls the order in which items appear in the drop-down list. If no item order is specified, items are sorted alphabetically by the **Comment** field. You can also manage item ordering by clicking **Item Order** at the top of the **Configuration - Lookup Lists** dialog. This opens the **Item Order** dialog, where you can reorder items using the **Move Up** and **Move Down** toolbar buttons.

History

Available only in the **Edit Lookup List** dialog. Displays the change history for the lookup list item. See *Checking History* for details.

See also

- *Configure Lookup Lists*
- *Add/Edit Lookup List Dialog*

24.5.12 Add/Edit Model Element Dialog

The **Add Model Element** and **Edit Model Element** dialogs are used to create and configure risk model elements while setting up risk models (see *Configure Risk Models*).

Only fields on the **Element** tab are available when creating a new model element. The remaining tabs become available after the element has been saved and subsequently edited.

Self-explanatory fields are not described below.

Element

Use this tab to define the basic properties of the model element.

- **Name**: Specifies the name displayed for the element in the risk model.
- **Comments**: Optional text that provides additional information about the element. In the risk model editor, this text is displayed in the **Description** column.

If the model element is a field-based element (that is, a **Value**, **Calculation**, or **Pass Thru** element), additional sections are displayed:

- **Field Definition**: Contains the field definition settings for the element. Available parameters depend on the selected field type and correspond to those on the **Field Definition** tab of the **Edit Field Definition** dialog (see *Add/Edit Field Definition Dialog*).
- **Validation**: Select **Required** to make the element mandatory. The risk assessment cannot be completed unless the element has a value.
- **Function**: Available only for Calculation elements. Assign a function to the element by clicking the ellipsis ... in the field and choosing a function from the list.

Layout

This tab controls how the element is displayed in different modes. The available settings correspond to those on the **Field Layout** tab of the **Edit Field Definition** dialog (see *Add/Edit Field Definition Dialog*).

History

Displays the change history for the model element. See *Checking History*.

See also

Configure Risk Models

24.5.13 Add/Edit Multimedia Dialog

The **Add/Edit Multimedia** dialog appears when you create or edit a multimedia image for an event on the **INSPECTION** screen or you edit a multimedia image on the **ANOMALIES** screen (see *Multimedia (INSPECTIONS)* or *Multimedia (ANOMALIES)*).

See below for the description of fields in the **Add/Edit Multimedia** dialog:

Multimedia

Field/Checkbo Name	Description
Name	A name that uniquely identifies the multimedia file.
Comments	Optional notes or additional information about the multimedia item. This field can be used to provide context or internal remarks that assist other users.
Can Report	Adds or removes a flag that determines whether the file can be included in reports when configuring report templates. You can add the **Can Report** column to the **Multimedia** pane under *Customise → Columns*.
Image	Allows you to upload or manage the multimedia file in one of the following ways: • *Import* - Uploads the file into the NEXUS IC database or replaces an existing one. • *Link* - Links to a file on a mapped drive. A copy of the file is stored in the NEXUS database and updated when the file changes. • *Export* - Saves the file to a folder location of your choice. • *Launch* - Opens the file in the default Windows viewer. • *Copy* - Copies the file to the clipboard. • *Clear* - Removes the file attachment from the event record. If you add a file using drag and drop, it is automatically *imported* (not *linked*).
Source	Indicates the platform from which the multimedia file originated. If uploaded using IC-Inspector, this field is auto-filled (for example, iOS, Android, Windows). Otherwise, you can enter a source manually (for example, NEXUS IC).

History

See *Checking History*.

See also

- *Multimedia (INSPECTIONS)*
- *Multimedia (ANOMALIES)*

24.5.14 Add/Edit Overlay Value Dialog

The **Add Overlay Value** and **Edit Overlay Value** dialogs allow you to define how specific values map to traffic light colours when the rule does not use a colour field in an AIG.

The fields in the dialog are described below.

Overlay Value

Field Name	Description
Name	Enter a name that uniquely identifies the overlay value. This text is used as the label of the traffic light colour in the legend that appears under the asset tree.
String Value	If the **Value Field** is an alphanumeric field, specify the actual field value for which the given traffic light colour should be applied.
Min Value	If the **Value Field** is a numeric field, specify the minimum value for which the given traffic light colour should be applied. The traffic light colour will be used in case the value in the **Value Field** is *larger than* or *equal to* the minimum value you specify here.
Max Value	If the **Value Field** is a numeric field, specify the maximum value for which the given traffic light colour should be applied. The traffic light colour will be used in case the value in the **Value Field** is *less than* the maximum value you specify here.
Colour	Select the colour to use for this overlay value.
Legend Order	Sets the order of the item in the traffic light legend that appears under the asset tree.

History

See *Checking History*.

See also

- *Configure Traffic Lights*
- *Add/Edit Traffic Light Dialog*

24.5.15 Add/Edit Personnel Dialog

The **Add/Edit Personnel** dialog appears when you add or edit a user on the **Users** tab of the **Security Settings** dialog, available under *Database → Security...*. The **Permissions** and **History** tabs are available only when editing an existing user.

The fields in the dialog are described below.

Personnel

Field/Check Name	Description
Name	The user's full name.
Email	Email address for identification and communication.
Job title	The user's role or professional position.
Qualifications	Relevant certifications or credentials.
Company	The organisation the user belongs to. You can add new company records or select from predefined entries (see *Configure Company*).
Address	Postal or office address (if required).
Phone	Contact telephone number.
Unit Group	Preferred measurement system (Metric or US Weights and Measures).

Login

Field/Check Name	Description
Name	Username used to sign in (for example, *sample.user*).
Enabled	Enables the user account for sign-in. Clear this to disable access.
Locked	Blocks sign-in and prevents the user from being assigned any items; locked users also appear greyed in the **Users** list.
Force Password Reset	Requires the user to choose a new password at their next login.
Password	Select **Change Password** to set or update the password.
API Key	API key assigned to the user. Select **Reset API Key** to generate a new one, or use the copy button to copy the current key.
Single Sign-on - Windows User	Links the account to a Windows domain user for SSO. See *Set Up Single Sign-On (SSO)*.

Member Of

Select the security groups to assign to the user. Groups are created as described in *Create a New User Group*. Use **Select All** to select every group, or **Clear Selection** to remove all selections.

Permissions

Configure permissions specific to the user, if needed. See *Set Up Permissions for User/User Group*.

History

See *Checking History*.

See also

- *User Management*
- *Set Up Permissions for User/User Group*

24.5.16 Add/Edit Planning Task Dialog

The **Add Planning Task** and **Edit Planning Task** dialogs allow you to define the properties of a *planning task* and manage its related data.

See below for the description of fields in the **Add Planning Task/Edit Planning Task** dialogs.

Planning Task

Field/Check Name	Description
Planning Template	Specifies the planning template that contains this planning task.
Asset	Specifies the asset on which the task is to be performed. Select an asset from the hierarchy. You must specify either an asset or an asset type.
Asset Type	Use this option if the task applies to a group of assets of a specific type rather than to a single asset. Click the ellipsis button to select an asset type.
Ad Hoc Task	If selected, tasks generated from this planning task are flagged as *ad hoc tasks*.
Start KP/EL / End KP/EL	Defines the start and end kilometre point (KP) or elevation location where the task is to be performed. These fields are optional.
Event Type	Specifies the type of event or sensor reading to be scheduled. You may select from any preconfigured event types (see *Configure Event Types*) or sensor types (see *Configure Sensors*). The selected type determines which specific event form or sensor data form must be launched to complete the resulting task. This field is mandatory.
Schedule Type	Optional field used for grouping or categorising planning tasks.
Category	Optional task category used to further group tasks (for example, tasks that require rope access, tasks that should only be undertaken on days ending in a 'y', etc.).
Reference Number	Company-specific reference number for the planning task. When the planning template is applied and a task is created, this reference number is inherited by the task.
Requires Shutdown (Manual)	Indicates whether the asset requires shutdown before the task can be completed.
Requires Shutdown (Lookup)	Select a *Yes / No* AIG field that provides the shutdown requirement for this task.
Approx Timing (Manual)	Estimated time required to complete the task. This value is used to estimate the overall duration and, optionally, the cost of workpacks.
Approx Timing (Lookup)	Select a *Numeric* AIG field that contains the estimated time to complete this task.
Order Number	Specifies the order in which tasks are intended to be completed (for information purposes only). For example, if an asset must be cleaned before GVI, assign the Cleaning task a lower order number than the GVI task. Repeated values are allowed. The **Order Number** also determines the order in which tasks appear in the inspector's list in IC-Inspector (see *Tasks Screen*).
Instructions (Manual)	Enter task-specific instructions. These instructions can be included in workpack reports to guide inspection engineers.
Instructions (Lookup)	Select the AIG field that contains instructions for this task.
Start (Manual)	Specifies the first occurrence (or workpack) at which the task is created. This can be a numeric value representing the first occurrence, or a date value (such as "last inspected date"). If a date value is used, the Update/Apply process calculates the corresponding occurrence based on that date.
Repeat (Manual)	Enter a value that defines the frequency that the task is to be created. This can be either a numeric value (which will be considered a frequency), or a date value (such as "next inspection date"). For example, if you enter *3* in this field, a task will be created at every third occurrence. If a date is used, the Update/Apply process will calculate the occurrence based on the date.
Start (Lookup)	Choose the AIG field that defines the first occurrence (or workpack) to create the task. This can either be a numeric value that specifies the first occurrence, or a date value (such as "last inspected date"). If a date-type field is used, it automatically populates the **Due Date** field for planning tasks generated by this template.

History

See *Checking History*.

See also

- *Manage Planning Tasks*
- *Planning Templates*

24.5.17 Add/Edit Planning Template Dialog

See below for the description of fields in the **Add Planning Template/Edit Planning Template** dialogs.

In the **Add Planning Template** dialog, only the **Planning Template** tab is visible, the other tabs get displayed once you have saved a new planning template and start editing it.

Planning Template

Field/Checkbo Name	Description
Name	Enter a name that uniquely identifies the planning template. Note that the name cannot exceed 50 characters.
Base Asset	This field is non-required. However, if you select an asset here, then the planning template tasks will be limited to the assets for the Base Asset and all child assets of the Base Asset.
Frequency	Determines how often tasks in the planning template should be completed. Options are *Yearly*, *Half Yearly*, *Quarterly* or *Monthly*. For example, a planning template set up for Annual Subsea ROV Inspections could be set to *Yearly*, however, a planning template set up for quarterly oil change on a gear box would be set to *Quarterly*.
Occurrences	The number of occurrences defines how many times the tasks in the planning template should be completed. This is equal to the number of columns displayed on the **Summary** tab when editing planning templates.
Format	Specifies the naming convention used for creating new workpacks when applying the planning template. Using [yyyy] inserts the year into the workpack name, or [yy] the abbreviated year. Using [mm] inserts the month in the workpack name. For example, workpacks generated where the format is defined as "[yyyy]-Annual UT", will be titled "2018-Annual UT", "2019-Annual UT", and so on. [oc] represents the Occurrence Number and will increment as the workpack is generated.
Workpack Group	When workpacks are created from this planning template, they will be created in the workpack group that you specify here.
Revision	When workpacks are created from this planning template, they will be created with the revision that you specify here.
Read Only	If you tick this checkbox, the workpacks are created from this planning template will be created as read-only.
Respect Task Move	If you tick this checkbox and tasks (which are generated from a planning template) are rescheduled, the subsequent tasks are moved relative to the date of the moved task based on their frequency. If you do not tick this checkbox, then tasks are simply created in the predetermined occurrences. **Note** The **Respect Task Move** option is selected by default for all new planning templates. For databases converted from v5, the **Respect Task Move** option will be deselected by default.

Attributes

This tab is visible only if the **Planning Template** system table has been extended with additional fields in your configuration. You can fill those custom fields on this tab. For more information, see *Configure Attributes*.

Summary

On the **Summary** tab, you can do the following:

- In the top half of the tab, you can check a visual summary of the planning tasks, which shows where the tasks will be created once the planning template is applied. For more information, see *Check Summary*.
- In the bottom half of the tab, you can manage planning tasks. For more information, see *Manage Planning Tasks*.

Applied To

On this tab, you can check the name of each of the workpacks that has been created from, or linked to this planning template, as well as the planning template occurrence number relevant to that workpack. Note that it is possible for a workpack to contain tasks from multiple planning templates.

History

See *Checking History*.

See also

- *Planning Templates*
- *Manage Planning Tasks*
- *PLANNING Screen*
- *Apply Planning Templates*

24.5.18 Add/Edit Report Template Dialog

See below for the description of fields and screen areas in the **Add Report Template/Edit Report Template** dialogs.

This dialog is triggered when you configure report templates (see *Configure Report Templates*) and you add a new or edit an existing report template.

24.5.18.1 *Report Template* Screen Area

Field/Check Name	Description
Name	Enter a name that uniquely identifies the report template. This will appear on the user interface.
Status	You can assign a status to the report template. You can choose from the statuses that you defined under *Configure Report Statuses*.
Category	You can assign a category to the report template. You can choose from the categories that you defined under *Configure Report Categories*.
Dashboard Report	Select this checkbox if you want the template be available as a dashboard when navigating to the **DASHBOARDS** screen. If you select this checkbox, Section Heading, Multimedia Thumbnails and Table of Contents types will be marked with a sign to indicate that these elements will not be displayed in a dashboard template.
Asset Dashboard	Select this checkbox if you want the template be available as a dashboard on the **Dashboard** tab of the **ASSETS** screen.
Comments	Enter any information that you want to be stored with the report template.

24.5.18.2 *Template Definition* Screen Area

In the bottom half of the dialog, you can set up the actual design of the report template. This screen area is split into two main parts:

- On the left-hand side of this screen area, you can see a view of available elements. There are two types of available elements:
  - *Elements* contains all the visual elements of the report, that is, things that you can display in the report (with the exception of elements group).
  - *Sources* contains the things you can get data from, these are the links between the database data and the visual elements. Most elements need a source to get data from. A single source can give data to more than one element.
- On the right-hand side, you'll see the Report Layout tree showing all the elements currently in the report. This is the area where you design the actual structure of the report template. You can drag and drop the available elements to this screen area or use the toolbar buttons to add or move around elements in the report template. For more information, see

From the **toolbar** of this screen area, you can perform the following functions:

Toolbar Option	Description
Add/Edit/Delete	Performs the selected operation on the element currently selected in the Report Layout tree. For example, when you select an element and choose **Add**, it inserts the element to the *Report Layout* structure above the element that was selected there.
Retrieve Element	You can copy elements or sources from other report templates into this report template. Note that "child" elements will be brought across too, that is, if you copy an element group that contains other elements, all those other elements will be copied in at the same time. Your new element will have "Copy of" prepended to its name. Filter values may not be fully copied across, so check your simple sources' *Filter* tabs after copying.
Parameters	This function allows you to configure selection parameters for the report. Each time the user generates the report, they can select values for these parameters before the actual report is generated. Selection parameters are created when you set up a filter for a Simple Source in your report template (see *filter*). A selection parameter is also created when you add a *Multimedia Thumbnails* element to your report parameter, in which case the parameter *MergeLastRow* is created with a checkbox assigned. Using this toolbar button, you can configure how these selection parameters actually appear when the user generates the report. Double-click the parameter or select it and choose **Edit** to make changes. You can configure the following: • In the **Name** field, you can specify the actual text of the selection parameter as it appears on the selection screen. • In the **Blank Text** field, you can enter a hint text to be displayed for the user. • In the **Order** field, you can specify the actual place of the selection parameter among other parameters on the selection screen. For example, if you enter **1**, this parameter will appear as the first field on the selection screen. • In the **Columns** field, you can specify the width of the field for the selection parameter. For example, if you enter **2** in this field, the field for this parameter will be two-column wide. **Note** • *Dashboard* reports should not use parameters. • *Asset Dashboard* reports should use a parameter that specifies the asset. NEXUS will automatically supply this value to the template based on the user's selection in the *Asset tree* when the asset dashboard report is run.
Generate	You can generate output from your report template from here without having to click **OK** and go back to the **Configuration - Templates** dialog. Note that when you generate the report with this option, no selection parameters will be displayed even if you have set up parameters for the report. Your report will be generated with the previously selected parameter values. This option is only used for testing.
Move Up	Moves the element selected in the Report Layout tree up by one spot within the same element group. You can also do this with Ctrl-Up arrow.
Move Down	Moves the element selected in the Report Layout tree down by one spot within the same element group. You can also do this with Ctrl-Down arrow. **Tip** You can also move items up and down by drag-dropping them within the Report Layout tree. You can also *reparent* items by drag-dropping them onto an element group.

See also

- *Configure Reports and Dashboards*
- *Configure Report Templates*
- *Elements*
- *Sources*

24.5.19 Add/Edit Risk Model Dialog

The **Add Risk Model** and **Edit Risk Model** dialogs are used to create and configure risk models (see *Configure Risk Models*).

Only fields on the **Risk Model** tab are available when creating a new risk model. The remaining tabs become available after the risk model has been saved and subsequently edited.

Self-explanatory fields are not described below.

Risk Model

Use this tab to define the basic properties of the risk model.

- **Name**: Specifies a name that uniquely identifies the risk model.
- **Chart**: Specifies the risk chart used by the risk model. Select a chart from the list (see *Configure Risk Charts*).
- **Model Status**: Specifies the status of the risk model, for example whether it is in development or finalised.
- **Category**: Assigns one or more categories to the risk model. Click to create categories.

Asset Types

Use this tab to assign asset types to the risk model.

- Click **+ Include** to assign one or more asset types to the risk model.
- Select an assigned asset type and click **- Exclude** to remove the assignment.

Asset type assignments determine which assets can use the risk model. When assigning a risk model to an asset, users can select only risk models that have been assigned to the asset's type (see *Assign Asset Types to a Risk Model*).

Library

Use this tab to associate library items with the risk model.

- Click **+ Add** to add a library item to the risk model.
- Select a library item and use the available toolbar options to modify or remove the association as required.

For more information, see *Library Items*.

History

Displays the change history for the risk model.

See *Checking History*.

See also

- *Configure Risk Models*
- *Configure Risk Charts*
- *Assign Asset Types to a Risk Model*
- *Library Items*
- *Add/Edit Model Element Dialog*

24.5.20 Add/Edit Security Group Dialog

The **Add/Edit Security** dialog appears when you add or edit a security group on the **Groups** tab of the **Security Settings** dialog, available under *Database* → *Security*.... The **Members** and **History** tabs are available only when editing an existing security group.

The fields in the dialog are described below.

Security Group

Field/Check Name	Description
Name	A unique name that identifies the security group
Description	(Optional) A short summary of the group's purpose (maximum 100 characters).
Notes	(Optional) Any additional information relevant to the security group.

Members

Add or remove users belonging to the security group.

- Select **Include** to choose users to add. Users are configured as described in *Create a New User*.
- Select **Exclude** to remove users from the group.

Permissions

Configure permissions specific to the user group, if needed. See *Set Up Permissions for User/User Group*.

History

See *Checking History*.

See also

- *User Management*
- *Set Up Permissions for User/User Group*

24.5.21 Add/Edit Series Dialog

See below for the description of fields in the **Add Series/Edit Series** dialogs. Fields that are self-explanatory are not explained.

In the **Add Series** dialog, only the **Series** tab is visible. The other tabs become visible after you save the series and reopen it for editing.

Series

The availability of fields on this tab depends on the type of the chart that you choose in the **Series Type** field.

Field/Checkbo Name	Description
Name	Enter a name that uniquely identifies the series within the chart template. For charts with only one series, this is often the same as the chart name.
Series Type	Specifies the type of chart used to display the series data. The availability of other fields on this tab depends on the selected series type.
Order	Specifies the painting order when multiple series are included in the same chart. Series with lower numbers are painted first and appear first in the legend. For the **Gauge Indicator** series type, the order number must be the last so the series is painted last; otherwise, it will not be visible. If no order is set, NEXUS paints the **Gauge Indicator** series last by default.
Sort Style	Determines how slices in a pie chart or donut chart are ordered. Available only for the **Pie Chart** and **Donut** series types. *Example:* If the X axis represents categories and the Y axis represents values, sorting by **X Value** orders slices by category, while **Y Value** orders them by the associated values.
Colour	Allows you to select the colour used to draw the series.
Opacity	Sets the transparency of the series on a scale from 0 to 100. A value of 100 makes the series fully opaque, while 0 makes it fully transparent.
Point Style	Defines the shape used for data points. This option is available for series types that display individual points.
Shaded	If you tick this checkbox, the area between your line series and the horizontal axis will be shaded in a paler version of the series' colour. This checkbox is available only for the **Lines**, **Horizontal Lines**, **Bezier Lines** and **Polygon** series types.
Checkboxes under **Statistics** and **Trend Line** screen areas	If you tick the checkboxes under these screen areas, you will see the corresponding lines displayed on your chart. **Standard Deviation** shows horizontal lines one deviation above and one deviation below the mean. These screen areas are available only for the **Lines**, **Horizontal Lines**, **Bezier Lines**, **Bubble** and **Points** series types.

Axis

On this tab, you can configure one or more axes for a series. For more information, see *Configure Axes for a Chart Template Series*.

History

See *Checking History*.

See also

Maintain Series for Chart Templates

24.5.22 Add/Edit Table Definition Dialog

See below for the description of fields in the **Add Table Definition/Edit Table Definition** dialogs.

This dialog is triggered when you configure tables for Asset Information Groups (AIGs) (see *Configure Asset Information Groups*), global tables (see *Configure Global Tables*) or event types (see *Configure Event Types*).

Note that depending on where you trigger this dialog from, some tabs may or may not be visible.

Table Definition

Field/Checkbox Name	Description
Name	Enter a name that uniquely identifies the table. This will appear on the user interface.
Description	If required, describe the main purpose of the table.
Category	If required, enter a category to classify the table. The category of a table may help in grouping, for example, asset information groups with the same category will appear grouped together. In IC-Inspection, event types can be grouped by category in the **Event Launcher** pane.
Icon	If you're configuring an event for use in IC-Inspection, the icon that you upload here will appear in the **Event Launcher** pane of IC-Inspection. The recommended size for event icons is 24x17 pixels.
Colour	The colour that you specify here can be referenced in charts using the Colour axis. A common use case would be a pie chart that shows the events recorded by event type.
Shape	This function is not in use currently.
Allow Inheritence	This function is not in use currently.
Auto Calculate	Disables the automatic execution of calculated fields when editing this item.
Allow Security	If you tick this checkbox, then in the *Database → Manage User Security and Permissions* menu, you can control which users (and groups of users) will have what type of access to this form or table (no ability to view, ability to view but not modify, or ability to view and modify).

Library

On this tab, you can optionally add one or more *Library Items* to the form or table. This might be useful if you want instructions for filling out the form to be stored in the database.

Form Pages

This tab is used only for non-configurable system tables. It is not relevant for a typical end-user configuration scenario.

Asset Types

On this tab, you can select the asset types for which the form will be available. This tab is relevant only for AIGs. By default, no asset types are selected, so this form won't be available anywhere in the database.

History

See *Checking History*.

See also

- *Configure Global Tables*
- *Configure Asset Information Groups*
- *Configure Event Types*

24.5.23 Add/Edit Task Dialog

The **Add Task** and **Edit Task** dialogs allow you to define the properties of a task and manage its related data. In the **Add Task** dialog, only the **Task** tab is available. The additional tabs become visible once you have saved the new task and begin editing it.

See below for the description of fields in the **Add Task/Edit Task** dialogs.

Task

Field Name	Description	Optional Lookup
Asset	Indicates where the task is to be completed. Enter the relevant asset and its location.	
Ad Hoc Task	Some tasks are used to create multiple events in IC-Inspector. Select this checkbox to indicate that the task is an *ad hoc task*. Tasks created from planning templates with the ad hoc attribute selected will have this option enabled by default.	
Start KP/EL / End KP/EL	Defines the starting and ending kilometre point or elevation of a task (if required).	
Workpack	You must specify a workpack to contain your task.	
Event Type	The type of event or sensor reading that is used to complete this task. You may select from any preconfigured event types (see *Configure Event Types*) or sensor types (see *Configure Sensors*). This field is optional.	
Schedule Type	A non-required field, used for grouping or categorising.	
Category	You may optionally create task categories to further group your tasks (for example, tasks that require rope access, tasks that should only be undertaken on days ending in a 'y', etc.).	
Reference Number	If you use a company-specific reference number for the task, enter it in this field.	
Assigned To	You can assign particular tasks to particular personnel. See *Assigning Tasks*.	
Requires Shutdown	In plant inspection, some work requires the asset to be shut down — for example, inspecting the interior of a vessel. Tick this checkbox for such tasks.	Yes
Order	Specifies the order in which the tasks are to be completed (for information purposes only). For example, if an asset should be cleaned and then GVI'ed, give the Cleaning task a lower order number than the GVI task. Repeated numbers are OK. Specifying the **Order No** attribute for individual tasks determines the order they appear in the IC-Inspector *Tasks Screen* list.	
Approx Timing	This value is used to estimate the overall duration (and optionally, cost) of workpacks.	Yes
Due Date	You can optionally set a due date by which you want this task to be completed. If this task is generated by a planning template, and the template's *Start* field is in the form of a date lookup, the Due Date will be filled with this date value.	
Instructions	Any descriptive text relating to this task that may assist the inspector. If you find you are using the same instruction for every event of this type, you should instead put those instructions on the Event Type. (It is similarly possible to put instructions on a planning template.)	
Task Origin	Specifies where the task is originated from. You cannot exceed 150 characters.	
Anomaly Action	If this task was created from an anomaly action, the name of the anomaly action is displayed.	
Planning Template	If this task was created from a planning template, the name of the planning template is displayed.	
Event	If an event has been used to complete this task, the name of the event is displayed.	
Sensor	If a sensor record has been created to complete this task, the unique ID of the sensor record is displayed. This field is visible only if the value of the **Event Type** field is a sensor event type.	
Adhoc Complete	Available only for ad hoc tasks. Selecting this option marks the ad hoc task as completed.	
Task Status	You can optionally create task statuses to classify your tasks.	
Is Completed	If an event has been used to complete this task, the value of this field is *Yes*.	
Is Deferred	If the task has been deferred to another inspection, the value of this field is *Yes*.	

Attributes

This tab is visible only if the **Task** system table has been extended with additional fields in your configuration. You can fill those custom fields on this tab. For more information, see *Configure Attributes*.

Library

On this tab, you can manage library items linked to the task (see *Library Items*).

History

See *Checking History*.

See also

- *Tasks*
- *Create Tasks*
- *Edit Tasks*

24.5.24 Add/Edit Traffic Light Dialog

The **Add Traffic Light** and **Edit Traffic Light** dialogs allow you to configure the fields of a traffic lighting rule.

The fields in the dialog are described below.

Traffic Light

Field Name	Description
Name	Enter a name that uniquely identifies the traffic lighting rule.
Description	Describe the main purpose of the traffic lighting rule. This text is also displayed directly under the rule's menu option in the **Traffic Lighting** toolbar menu.
Category	Assign a category to place the rule inside the corresponding submenu of the **Traffic Lighting** toolbar. Categories are managed as described in *Configure Traffic Light Categories*.
Value Field	Select the field that provides the value used to determine the traffic light colour.
Colour Field	Specify the field in the asset's Asset Information Group (AIG) that calculates the traffic light colour. If you select a colour field from the AIG, the calculated value of this field is used directly to determine the traffic light colour and you do not need to set up overlay values. If you leave this field empty, you must define overlay values to determine the colour mapping.
Hint Field	Specify the text that you want to appear when the user hovers over the traffic light in the asset tree. If you leave this field empty, the hint text will be the value of the **Value Field**.

Permissions

For information about setting up permissions for traffic lights, see *Set up Permissions*.

History

See *Checking History*.

See also

- *Configure Traffic Lights*
- *Add/Edit Overlay Value Dialog*
- *Configure Traffic Light Categories*

24.5.25 Add/Edit Workpack Dialog

The **Add Workpack** and **Edit Workpack** dialogs allow you to define the properties of a workpack and manage its related data. In the **Add Workpack** dialog, only the **Workpack** tab is visible, the other tabs get displayed once you have saved a new workpack and start editing it.

See below for the description of fields in the **Add Workpack/Edit Workpack** dialogs.

Workpack

Field/Checkbo Name	Description
Name	Enter a name that uniquely identifies the workpack. Note that the name must be unique and cannot exceed 50 characters.
Workpack Group	You can optionally define a workpack group to group work as per your own requirements. For example, you can have different groups for different geographical areas, different groups for different kinds of inspections (GVI, non-destructive measurement, destructive measurement, etc.) and so on.
Abbreviation	You can specify a short name for the workpack that may be useful, for example, in reports. The character limit is 15 characters.
Description	A 100-character field that provides more descriptive information of the workpack.
Asset	Indicates the asset that the workpack is attached to. You should choose as specific an asset as you can, while still including all the assets that tasks in this workpack will be on. For example, if all the tasks in this workpack were within MyCompany / MyField / Gas Plant, you could specify that as your asset for the workpack.
Revision	This field is used for quickly managing the status of workpacks. For example, when a workpack is complete, you can change its revision to Completed. Workpack Revisions are user-definable.
Read Only	When this option is enabled, users will be restricted from adding or editing any records linked to the workpack. This includes tasks, events, findings, multimedia, and other related items. Users will only be able to modify the basic properties of the workpack.
Actual Start	Specifies the date when the workpack is scheduled to commence.
Task Time	A sum of how long all the tasks in this workpack will take to complete. For this to be meaningful, you must have given each task an Approx Timing.
Work Hours (per day)	Used to estimate duration, based on Task Time.
Duration (Estimated)	The result of Task Time divided by Work Hours (per day).
Duration (Contingency)	You can optionally add a value onto the estimated duration here, to allow for downtime.
Duration (Override)	You can optionally enter a value here instead of relying on the calculated process above. This would be useful if, for example, you have another management system that estimates duration for you.
Actual End	The result of Actual Start plus Duration.
Day Rate	If you would like NEXUS IC to estimate cost, enter a day rate here. This should be the full cost of one inspector if inspectors will be working on different tasks in parallel, or the full cost of the team if they are not.
Cost based on Day Rate	The result of Day Rate x Duration.
Costs (Fixed)	You can optionally enter any fixed costs here (for example, cost of mobilisation/demobilisation).
Cost (Total)	The result of Cost based on Day Rate + Costs (Fixed)
Cost (Override)	You can optionally enter a value here instead of relying on the calculated process above. This would be useful if, for example, you have another management system that estimates cost for you.
Final Estimate	If you have entered an override value, Final Estimate will be the override value. Otherwise, it will be the Cost (Total) value.
Cost Code	Cost Codes are optional and user-definable and can be used to group workpacks based on your requirements.

Attributes

This tab is visible only if the **Workpack** system table has been extended with additional fields in your configuration. You can fill those custom fields on this tab. For more information, see *Configure Attributes*.

Asset History

On this tab, you can view, add or edit asset history records that are linked to the workpack asset. You can also import or export these records as required.

Tasks

Shows *tasks* associated with the workpack. You can also:

- Add or edit tasks, which opens the **Add Task** or **Edit Task** dialog (see *Add/Edit Task Dialog*).
- Import, export or delete tasks.
- Launch an incomplete task to record event data in an event form and complete the task (see *Launch Tasks*).

Library

On this tab, you can manage library items linked to the workpack (see *Library Items*).

Associated Planning Templates

On this tab, you can check planning templates that are associated with the workpack. For example, if the workpack was created from a planning template, the originating planning template will be shown here.

History

See *Checking History*.

See also

- *Create Workpacks Manually*
- *Edit Workpacks*
- *Tasks*

24.5.26 Audit Log

You can access the audit log from the **Database** menu.

The audit log contains two tabs:

Change Tracking

User Sessions

The top section lists all user sessions in the database. Each login creates a session with a recorded login time. When the user logs out, the logout time is added. The IP address for each session is also displayed.

Changes

When you select a user session at the top section of the tab, the lower section shows all related data changes. Each row represents a record inserted, updated or deleted during that session.

The left side of this area contains three columns. Their visibility can be toggled from the **Customise** toolbar option:

Column	Description
Table Definition	Indicates the table in which the change occurred. This may be: • *System* tables. For example, moving an asset creates a record under *Asset Location*. • *User* tables, where the name reflects your Asset Information Group, Event or other user-defined structure.
Operation	Shows the type of change: • **Insert**: A new record was added. • **Update**: An existing value was changed. • **Delete**: A record was removed.
Date Changed	Shows the date and time when the operation took place in the database. The list is ordered chronologically by default.

The operation type determines which toolbar options are available and what information appears on the right side of the screen area:

- **Insert** and **Delete**

  The **Form** toolbar button is available. It allows you to see the name of the user and the values of the inserted or deleted items on the right-side of the screen.

- **Update** operation type:

  The following toolbar buttons are available:

  – **Original Values** - Shows values *before* the change. A icon appears next to changed fields; hovering over the icon shows details about the change.

  – **Changed Values** - Shows values *after* the change, again with the icon indicating modified fields.

For all operation types, you can use the **Summary** toolbar button to display a concise written summary of all changes within the selected record.

Failures

Shows details of all failures recorded during a user session, such as login failures. Each entry displays the timestamp, IP address and message associated with the failure.

24.5.27 Edit Lookup Dialog

See below for the description of fields in the **Edit Lookup** dialog:

Field/Check Name	Description
Name	Enter a name that uniquely identifies the lookup function.
Result Field	Specifies the field from which you want to fetch values for the lookup function. Almost any field from almost any table can be used as the Result Field.
Aggregate	Allows you to aggregate data from the **Result Field** by selecting a value from this field. If you select an aggregate, NEXUS IC will make a list of all the results and aggregate as appropriate. For example, if you chose a field from an event form as your **Result Field** and Min as your **Aggregate**, then NEXUS IC will look through all the events on that asset, and return the minimum value from that field in that list of events. If you choose the value *None*, you must ensure that your filters allow only one value to be returned. If multiple values exist, the Lookup will return the first value it finds.
Return Type	If the **Result Field** you select has a display type different from its field type, then you can set the **Return Type** to be either the functional value or the display value. The display value is usually a readable text, whereas the functional value is the underlying numeric key value, which may be useful for feeding into subsequent function elements for comparisons.
Asset Input	You can specify an **Asset Input**, if the result table you have selected has Asset or Component_ID as a key field (for example, if your Result Field is an asset information field). Only use this for Asset or Component_ID. For any other table's key field, add a **Filter**, as shown below. An Asset Input must have a type of whole number (not numeric).
Asset Filter	You can choose from the following values: • The default, *No Children* value returns results from only the single asset specified by the Asset Input. • *This Asset and dependent Assets* returns results from the asset specified, and also from that asset's children, grandchildren, great-grandchildren, and so on. • *Dependant Assets but not this Asset* does almost the same thing, but leaves out results for the asset specified. • *Immediate Children* returns results from the specified asset's immediate descendants, but not from the asset itself, nor from any grandchildren, great-grandchildren, and so on. • *Parent Assets* looks up the tree instead of down, returning results from the specified asset's parent, grandparent, great-grandparent, and so on, all the way to the root of the asset tree. • *Direct Parents* returns results from the specified asset's immediate parent. If you are using an Asset Filter option other than *No Children* or *Direct Parents*, you will typically also want to specify a value for **Aggregate**. If an asset appears in multiple asset views, it may have different parents and different descendants in different views. These asset filters will match parents and descendants in *all* asset views.
Workpack Filter	You can set up a workpack filter if the **Result Field** is an event field. Choose a filtering option from the drop-down list as required.
Filters	Allows you to filter the list of results that would otherwise be returned to a shorter list (possibly containing exactly one item, thus avoiding the requirement to use an Aggregate). You can drag extra inputs onto the Lookup element for use as Filter inputs. You can choose from the following comparison options: • Use the first six comparisons (=, <>, >, >=, <, <=) as usual. • The various *closest* filters (*closest (either)*, *closest (lower or equal)*, *closest (higher or equal)*, *closest (lower)* and *closest (higher)*) are special. For example, if you want to find the event whose KP is closest to a particular value, use *closest (either)*. Or if you want to find the event just *before* this one, that is, the event with KP closest to a particular value, but lower, use *closest (lower)*. And similarly, use *closest (higher)* to find the next event after a particular KP. • For *highest* and *lowest*, you need to specify no input. These simply return the single result that has the highest or lowest value in whatever field you specified in the filter. Note though that using an Aggregate of Max or Min is usually faster than using a filter for highest or lowest. • *contains* lets you search for a substring within an alphanumeric input. You can use "_" and "%" as wildcard characters, with "_" matching any single character

See also

Function Elements

24.5.28 Profile Dialog

The **Profile** dialog (accessible from *Database* → *Your Profile…*) allows you to view and manage information related to your NEXUS user account. It contains three tabs that provide access to your account details, user-specific settings and favourite reports.

Profile

On this tab, you can view and change your NEXUS user account details. If unit groups (metric or US weights and measures) are defined in your database, you can select your preferred unit group.

Settings

Shows your user-specific settings for NEXUS functions. These settings are stored automatically and restored when you reopen the application or return to a screen, helping maintain your preferred workspace layout and report settings.

Stored settings can include:

- The last selected asset and active screen
- Screen-specific view settings, such as which tabs or panes are visible or hidden
- Grid layout preferences, including column positions and column grouping
- Parameters used when running reports, allowing previously used values to be loaded automatically the next time the report is run

Column filter settings are not stored.

These settings enable NEXUS to restore the way screens and grids were configured during your previous session, reducing the need to repeatedly customise layouts and report parameters.

Actions available on this tab include:

- **Revert** selected settings to their default values
- **Copy to User** to apply the selected settings to other users by selecting one or more users in the dialog that opens
- **Set Default** to define the selected settings as the default for all users
- **Export** settings to a file or send them by email

Favourite Reports

Manage the list of favourite reports available from the **Reports** toolbar button (see *Reports*).

- Choose **Include** to add reports to your favourites.
- Choose **Exclude** to remove selected reports from your favourites.

See also

- *Your Profile*

24.5.29 Properties Dialog

The **Properties** dialog (accessible from *Database* → *Properties*) contains configuration options for database-level behaviour. The fields in the dialog are described below.

Properties

On this tab, you can set up various properties related to your database, such as client name, client logo, paths for videos or risk models.

Field/Checkbox Name	Description
Name	Stores a client name, but the value is not used elsewhere in the application.
Details	Optional notes or comments. The value is stored but not used elsewhere in the application.
User Upgraded	Displays the username that performed the most recent database schema upgrade.
Date Upgrade	Shows the date of the most recent schema upgrade.
Retention (Jobs)	Sets the job-history retention period (in days). Records older than the defined period are purged automatically.
Global Video Path	The root folder or UNC path for all inspection video linked to events under **INSPECTION**. This can also be an Azure SAS URL, which allows linking to cloud-based storage. For details on SAS URLs, see https://docs.microsoft.com/en-us/azure/storage/storage-dotnet-shared-access-signature-part-1. See *Managing Videos* for more information.
Temporary Inspection Video Path	Used during offline video review, typically in offshore campaigns, to specify a local, temporary storage location for inspection video on this NEXUS IC instance. See *Managing Videos* for more information.
Filename Format	Defines the file naming format to be used with IC-Recorder/DVR.
Survey Threshold	Defines the time window used to match survey data to events. Survey points occurring within this window around an event timestamp are considered valid matches. For detailed information, see *Matching Survey Sets to Events*.
Anomaly Number (Auto Increment)	Enables or disables automatic incrementing of the **Anomaly Number** field when creating new anomalies. You must restart the application for the change to take effect.
Finding Number (Auto Increment)	Enables or disables automatic incrementing of the **Finding Number** field when creating new findings. You must restart the application for the change to take effect.
Anomaly Risk Chart	Allows you to select the anomaly risk chart that you want to be displayed on the **ANOMALIES** screen. To ensure that you can select the anomaly risk chart in this dialog, you must have configured the anomaly risk chart as described in *Configure Risk Charts*. You must also set up the **System - Anomaly - Risk Score** function that calculates the **Risk Score** for each anomaly. For more information, see *Set Up Anomaly Risk Matrix*.
Logo	You can upload logos (primary and secondary) to be used in the headings of report templates. The logo is included in the *Dashboards Page* report and the *Asset Dashboards* report by default.

Drawings

On this tab, you make settings specific to drawings, such as a variety of default colours associated with drawings and settings associated with 3D or SVG drawings.

Field/Checkbox Name	Description
Default Traffic Light Colour	If the currently selected traffic lighting (see *Traffic Light*) does not specify a colour for the asset's actual value, the drawing region or button on the relevant layer is shown in the colour set here. This layer is visible when you select *Layer Colour → Traffic Light* on the **Drawings** tab of the **ASSETS** or **INSPECTION** screens.
Known Asset Colour	On the **Drawings** tab of the **ASSETS** or **INSPECTION** screens (see *Drawings*), when you select *Layer Colour → Unknown Asset*, this colour is shown for drawing regions and buttons if the relevant layer is linked to an asset and the linked asset exists in the database.
Unknown Asset Colour	On the **Drawings** tab of the **ASSETS** or **INSPECTION** screens (see *Drawings*), when you select *Layer Colour → Unknown Asset*, this colour is shown for drawing regions and buttons if the relevant layer is linked to an asset but the linked asset cannot be found in the database.
Missing Asset Colour	On the **Drawings** tab of the **ASSETS** or **INSPECTION** screens (see *Drawings*), when you select *Layer Colour → Unknown Asset*, this colour is shown for drawing regions and buttons if the relevant layer is not linked to any asset.
Attribute (3D)	In 3D DWGs, you can use a tag in the DWG to specify what asset the element refers to. NEXUS IC will then match that tag to the field you specify under *Configuration → Assets → Features → Asset Serial Number → Edit* (see *Configure Features*). In this field, you are specifying the DWG tag that NEXUS IC will attempt to match on. See *3D Drawing Setup Example* for more information on how to configure 3D drawings.
Attribute (SVG)	In SVG drawings, you can use an attribute to specify what asset the element refers to. NEXUS IC will then match that attribute to the field you specify under *Configuration → Assets → Features → Asset Serial Number → Edit* (see *Configure Features*). In this field, you are specifying the attribute that NEXUS IC will attempt to match on.
Missing Attribute Colour	If NEXUS IC finds an attribute in the 3D/SVG drawing but is unable to find an asset with a matching 3D/SVG attribute in the database (as specified above), it will highlight the asset in the colour you select here.
Grid Size	Specifies the size of a grid cell at scale 1 for the 3D drawings.
Grid Colour	Determines the colour of the grid for 3D drawings.
North Layer Name	Name of the 'True North' layer for 3D drawings.

Email

Configure the email host that allows NEXUS IC to send emails (for example, to email a generated report or the contents of any of the grids). For more information, see *Set Up Email*.

Default Settings

Shows all default settings stored in the database, grouped by category and subcategory. You can modify grouping as required (see *Grouping*).

Use **Copy to User** to apply these defaults to selected users. **Revert** restores selected settings to their original values.

License

Displays licence key details and allows you to manage software-based licensing. See *Software Based Licensing*.

See also

- *Properties*

24.6 What's New in 6.9

NEXUS 6.9 introduces a range of new features and enhancements, delivering significant updates across various modules to ensure better performance, enhanced functionality, and greater ease of use. Key highlights of this release include:

- NEXUS IC changes:
  - Improved grid functionality
  - Better search and filtering functions
  - Better memory of grid settings and the ability to transfer user profile settings between users
  - New and improved features for dashboards, asset information management, workpack management, planning, and inspection functionality
  - Refined permission settings
  - You can now extend several system tables with additional fields. This will add an **Attributes** tab in the corresponding create/edit dialogs, where users can fill in the new custom fields.
  - New and enhanced configuration options
- IC-Inspector is available for Android tablets. Further key enhancements include improved management of ad hoc tasks and events, optimised synchronisation, as well as enhanced settings and task management.
- For IC-Web, several improvements are available, including enhanced functionalities for grids, maps, charts, and multimedia.
- A new Software as a Service (SaaS) authentication model with Single Sign-On (SSO) has been introduced.

For a detailed description of changes, see the sections below.

Note

NEXUS 6.9 was the last packaged release before changing to a continuous delivery model. For information about the changes delivered after the release of NEXUS 6.9, see *What's New*.

24.6.1 NEXUS Applications

- *What's New in NEXUS IC*
- *What's New in IC-Inspector*
- *What's New in IC-Web*

24.6.2 Software as a Service (SaaS)

In this release, a new SaaS authentication model has been introduced, which supports Single Sign-On (SSO) with your company user account. This also allows you to access NEXUS applications directly through a web browser via a single link, providing seamless access to all available applications. SaaS customers currently using RemoteApp have been gradually migrated to this new solution.

For more information, see *Software as a Service (SaaS)*.

24.6.3 External Tools and Calculators

Integration with auxiliary applications extends NEXUS IC capabilities:

- **ECE**: Closer integration with Wood's Electronic Corrosion Engineer (ECE) Web API and Data Historians (PI) to calculate real-time corrosion rates based on live process data. This update also facilitates the estimation of cumulative corrosion and the determination of corrosion profiles along the length of pipelines and tubing strings.
- **FFS**: Integration with Wood's Fitness for Service (FFS) Web API application enables API 579 calculations. This application is fully compatible with the Static Pressure Equipment (SPE).
- **Well Barrier Schematics**: Connection to Wood's well barrier schematic generator tool, which enables the creation of well schematics directly from your well asset tree.

24.6.4 Upgrade Warnings

- After the upgrade, all user profile settings in the application will be reset.
- System table extensions previously requested through change requests will revert to the default state. These custom fields will now appear on the **Attributes** tab of the corresponding create/edit dialog. Please ensure that all references to these custom fields (for example, from reports, functions, or shortcuts) are updated.
- By default, all three-state checkboxes have changed as described above. If you want to retain a three-state checkbox, you must change the default control for that specific field.
- Drawings now display only the first page of any multi-page PDF files. This provides a better and more consistent user experience. We recommend reviewing your database for multi-page PDF drawings and splitting them into individual files before upgrading. Please note that any marked-up layers on subsequent pages will need to be recreated.
- v1.0 REST calls are no longer supported. If you have used v1.0 REST calls in building connections to external systems, you will need to update those connectors to use the v2.0 REST commands. Note that changing passwords in IC-Web will no longer be possible.

24.6.5 SQL Server Support

Version 6.9 officially supports Microsoft SQL Server 2019 and newer.

24.6.6 What Was New in Previous Releases

What Was New in 6.8, 6.7, 6.6, 6.5, 6.4, 6.3, 6.2, 6.1.

24.6.7 Version Upgrade

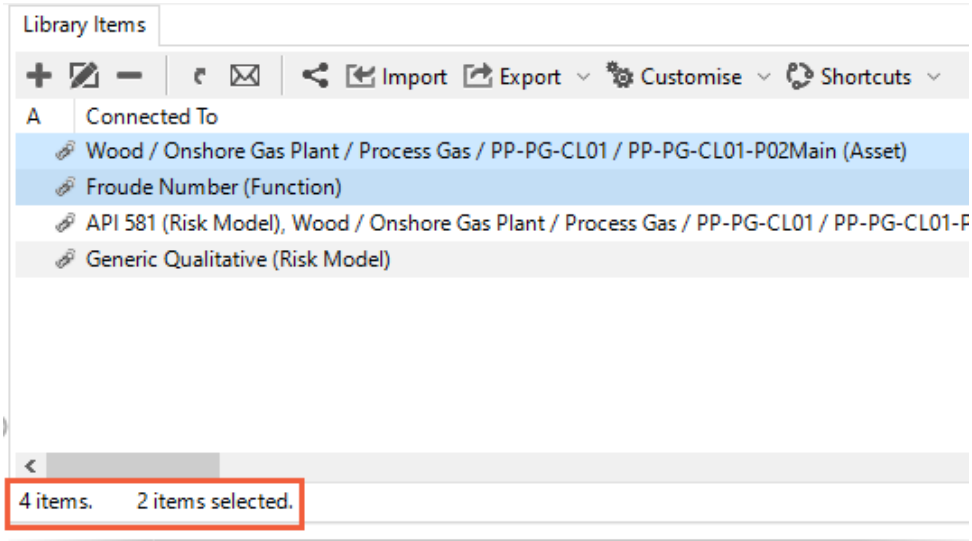
For information about upgrading to version 6.9, see *Upgrading*.

24.6.7.1 What's New in NEXUS IC

The following new or enhanced features are available for NEXUS IC in release 6.9:

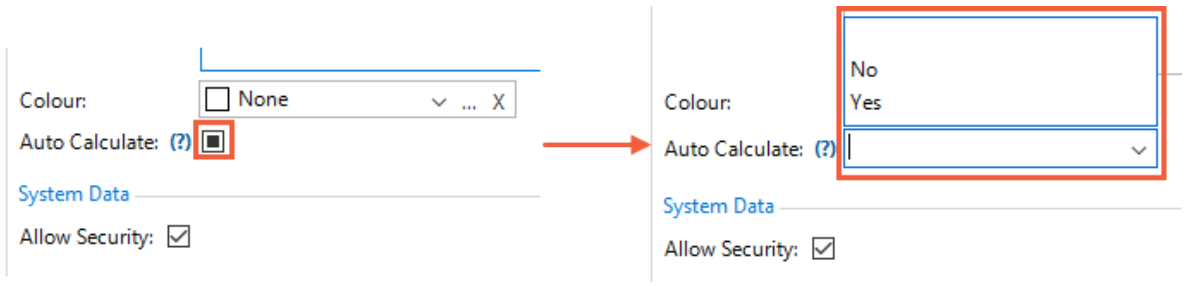
24.6.7.1.1 Features

- Grid controls have been replaced, which offers the following improvement in grid functionality:
  - Faster processing of large data sets
  - Better fitting of data to the columns, less need to manually resize columns
  - The possibility to quickly hide and reorder columns
  - Non-editable rows are now shown in italics
  - Text wrapping within a cell enabled for large text fields
  - Status bar showing information about the number of items selected or filtered, for example:

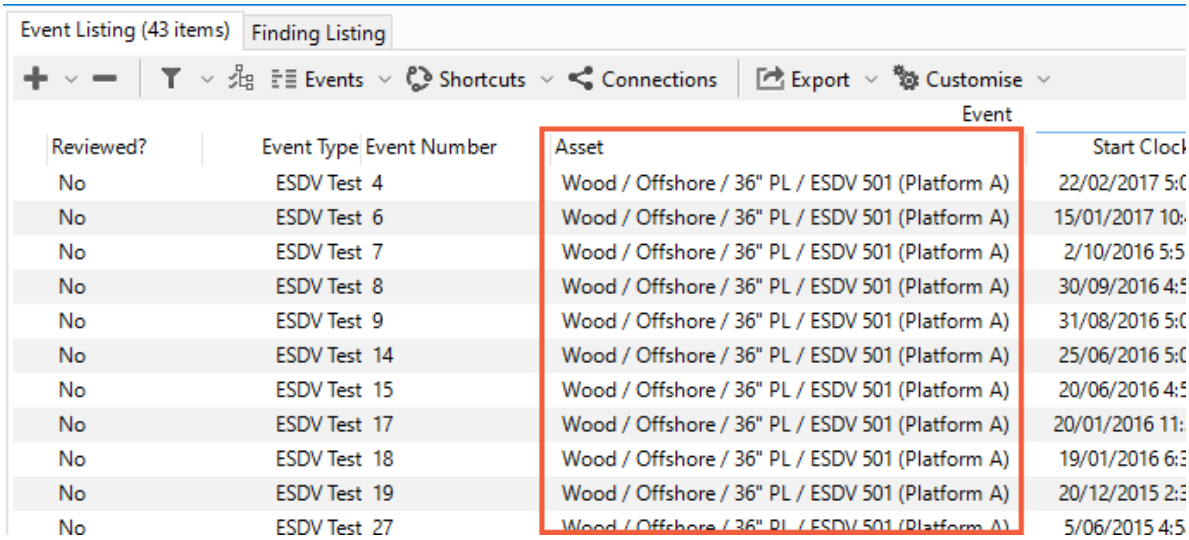


  For detailed information about the grid functionality, see *Using the Grid*.

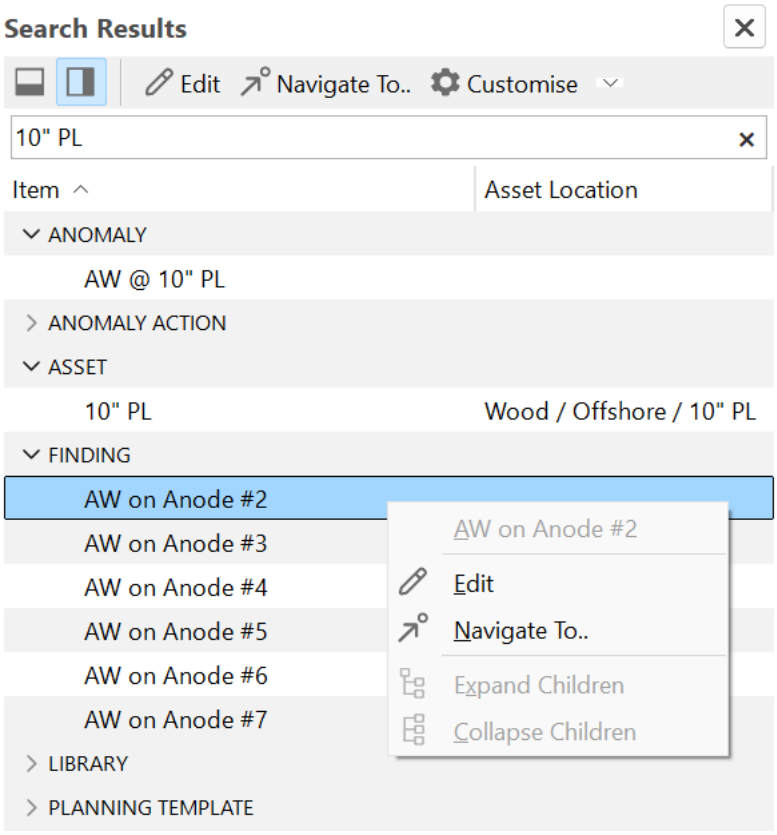
- User profile settings are now stored directly in the database instead of settings files in Windows. Under *Database → Your Profile...*, new toolbar options are available on the **Settings** tab of the **Profile** dialog, which enable the following:
  - Reverting user profile settings to default values
  - Copying a user's profile settings to another user
  - Set a user's profile settings as default for all users
  - Export user profile settings to a file or an email
- Three-state checkboxes have been replaced with fields that allow you to select from three values (*Yes*, *No*, and empty value) from a drop-down list:



- For improved filtering and sorting capability, the **Asset** column in all the asset grids now shows the full location of the asset instead of only the asset name:

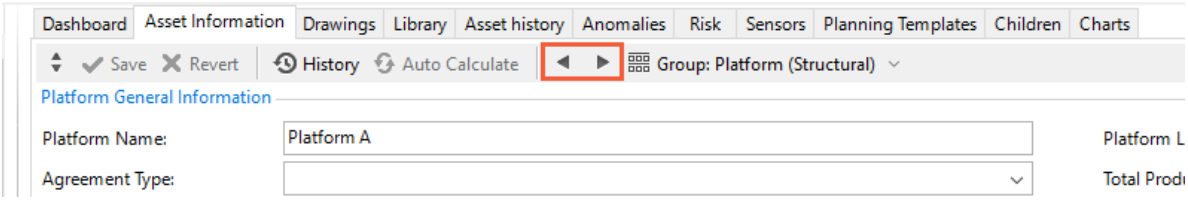


- When using the **Search** functionality, you can edit or navigate to items in the search results using the new **Edit** and **Navigate To..** toolbar buttons as well as the new **Edit** and **Navigate To..** options in the context menu that opens when you right-click the selected item:



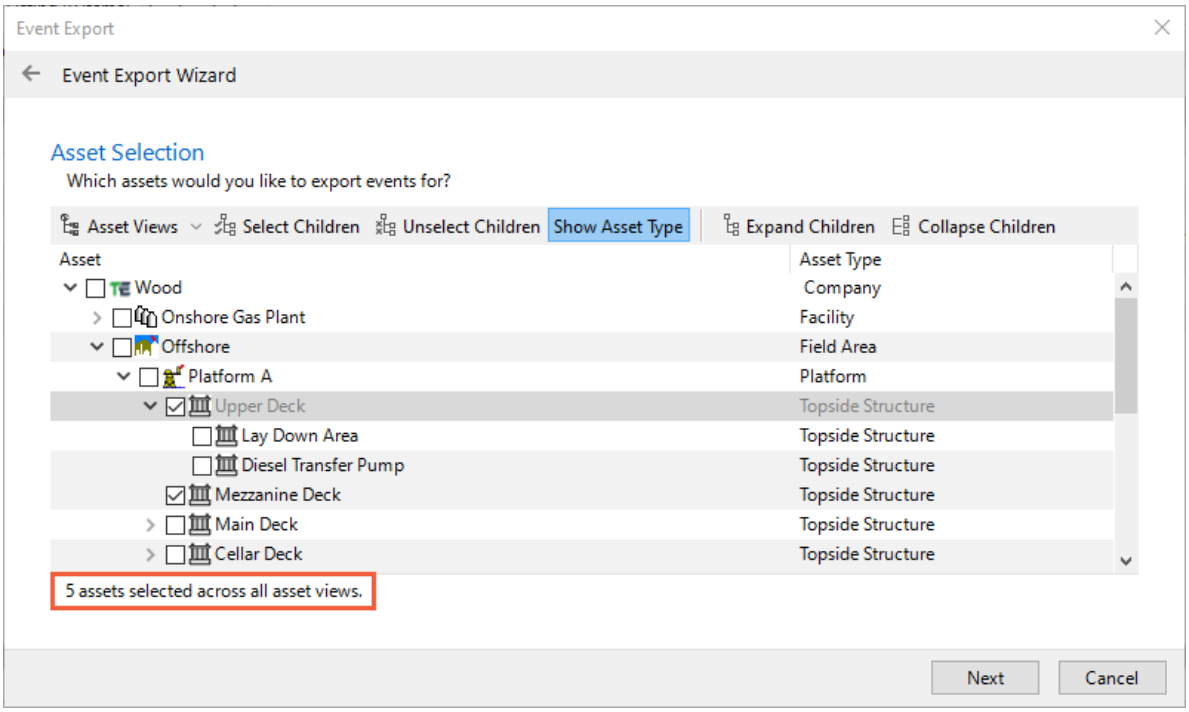
- You can now cancel the search process using the new **Cancel** button in the search line of the **Search Results** dialog:

- Certain screens and tabs on the user interface are now hidden if the user lacks the necessary permissions for the underlying tables. For more information, see *Permission Requirements for User Interface Elements*.
- You can now navigate back and forward between AIGs using the new buttons, which are available from the toolbar of the **Asset Information** tab on the **ASSETS** and **INSPECTION** screen.

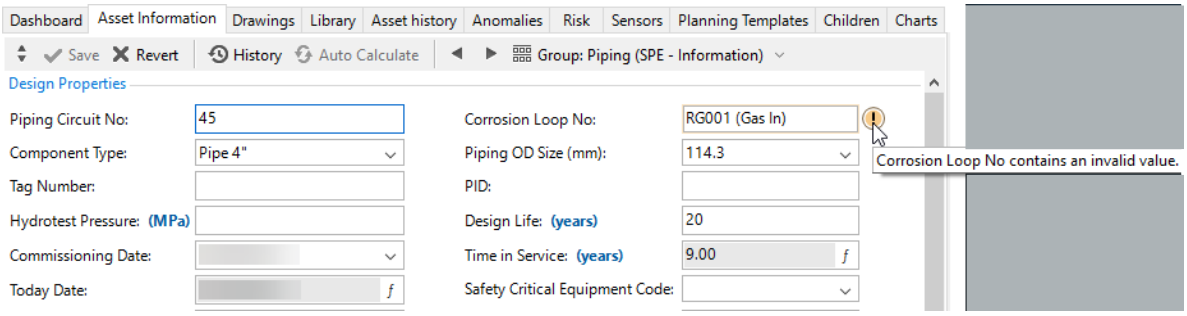


- On the **ASSETS**, **PLANNING** and **INSPECTION** screens, the standard Find As You Type grid functionality for the asset tree has been replaced by an asset search function. For more information, see *Searching*.
- The dialog for Asset Selection has been improved.

  When selecting assets (for example, while performing custom export for assets and events, asset selection in the report template wizard, or anomaly asset filtering), the status bar in the dialog for Asset Selection now shows the total number of assets selected in all asset views (including the asset view currently displayed and other asset views that are not visible):



- When creating a database backup, the name of the backup file no longer includes the MD5 checksum (32 hexadecimal characters). Instead, the checksum is now embedded in the file using an SQL Server feature. For more information, see *Create a Backup*.
- You can now assign a function to validate the value of individual AIG fields. A visual indicator is shown on the form when the entered data is invalid:

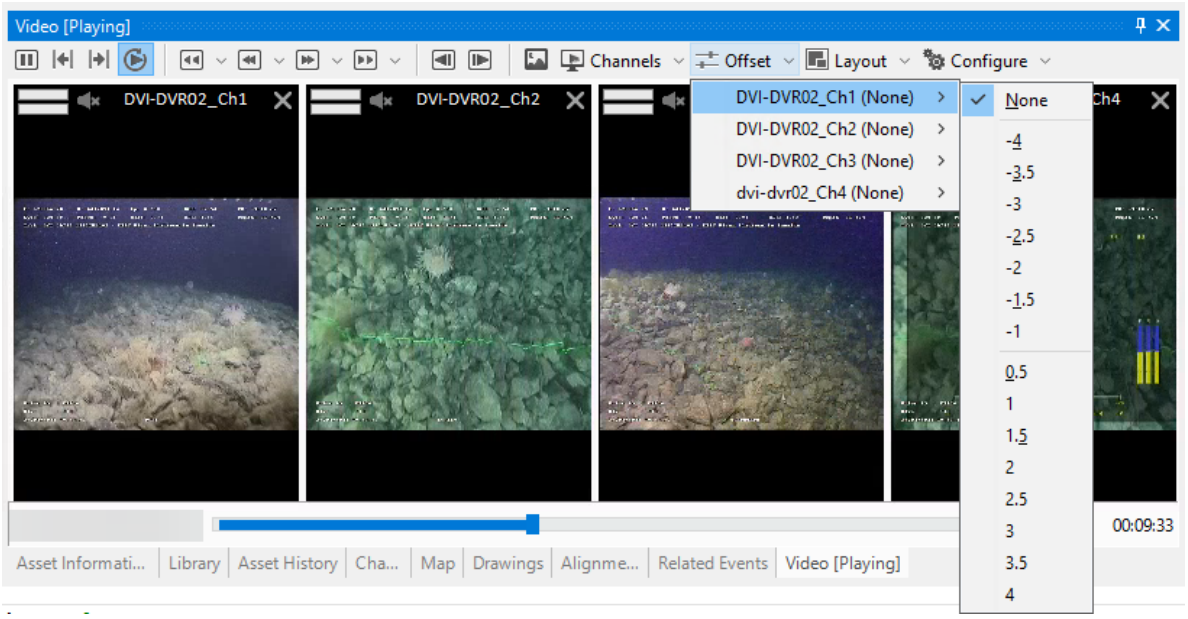


For more information, see *Add/Edit Field Definition Dialog*.

- On the **Drawings** tab of the **ASSETS** screen, the following new functions are available:
  - You can view EXIF data for 2D drawings using the new **Information** toolbar button.
  - Thumbnails for image files associated with the selected asset are now stored in the database after the initial load, resulting in significantly faster thumbnail loading the next time you open the tab. Additionally, you can use the new **Thumbnails** toolbar button to toggle the display of thumbnails on or off.

  For more information, see *Drawings Toolbar*.
- On the **Dashboard** tab of the **ASSETS** screen, you can now select from multiple asset dashboards using the drop-down list under the **Dashboard** toolbar button in case the relevant report templates have been marked as asset dashboards.
- In the **Edit Workpack** dialog (see *Add/Edit Workpack Dialog*), you can now view, add or edit asset history records associated with the workpack on the new **Asset History** tab. For more information, see *Edit Workpacks*.
- The character limitation for entering review comments for events and findings (see *Review Events* and *Review Findings*) has been removed. You can now enter over 100 characters (we recommend that you do not exceed 8000 characters though).

  Due to performance reasons, the **Comments** column is no longer available on the **Event Listing** (see *Event Listing*) and **Finding Listing** (see *Findings Listing*) tabs.
- In the toolbar of the **Video** pane on the **INSPECTION** screen, a new **Offset** button is available with a drop-down menu, which allows you to select the required number of seconds with which you want to offset the playback of a given video channel:



- On the **INSPECTION** screen, the **History** button is now available on the **Finding** pane (visible when the **Finding Listing** tab is active).
- On the **Tasks** tab of the **PLANNING** screen, a new toolbar menu option, *Customise → Instructions Preview*, is now available. This option adds an **Instructions** column to the grid, displaying any instructions defined for the tasks in the list. This new option is also available in IC-Inspection.
- In AIG and event forms, fields with "Large Text" field type now dynamically adjust their height based on the content. This enhancement ensures a better user experience by providing a more flexible and readable layout.
- Video parsing is now executed as a background job, allowing users to monitor progress and status via the blue ribbon above the Status Bar or through the Job Management Console.

24.6.7.1.2 Configuration

- In your report category configuration settings, you can now enable or disable report categories from being displayed when generating reports using the **Reports** toolbar button. For more information, see *Configure Report Categories*.
- You can now extend the following system tables with additional fields:
  - **Anomaly** (Anomaly_ID)
  - **Anomaly Action** (Action_ID)
  - **Library** (Library_ID)
  - **Planning Template** (LTIP_ID)
  - **Task** (Task_ID)
  - **Workpack** (Workpack_ID)

When you extend any of these tables, an additional **Attributes** tab will appear in the corresponding create/edit dialog. This tab allows users to fill in the fields you have configured. For more information, see *Configure Attributes*.

- A new configuration option is available for AIG and event forms, which allows fields to be hidden by default in the grid but then be made visible by the user under the *Customise* → *Columns* toolbar option. This can be configured using the new *Yes, with Customisation* option under the **Visible** field of the **Field Layout** tab of the **Edit Field Definition** dialog (see *Add/Edit Field Definition Dialog*).
- In the **Configuration - Templates** dialog (accessible via *Configuration* → *Reports and Dashboards* → *Templates*), the following two new columns are available:
  - **Last Generated** - Displays the date and time when the report was last run.
  - **Average Duration** - Displays the average time taken to generate the report.
- The way you mark a report template as an asset dashboard has changed. In the **Configuration - Templates** dialog (accessible via *Configuration* → *Reports and Dashboards* → *Templates*), the **Asset Dashboard** toolbar button has been removed and you can no longer use the right-click menu either. Instead, to mark the report template as an asset dashboard, you must edit the template from the **Configuration - Templates** dialog and tick the **Asset Dashboard** checkbox in the **Edit Report Template** dialog.
- A new configuration option allows you to define internal statuses for findings. These statuses can be assigned to findings, which can be useful in your review and approval workflows. To enable this feature, the new *Configuration* → *Anomalies* → *Finding Status* menu option is available, where you can define your own status list. When creating or editing findings in the **Add Finding/Edit Finding** dialog (see *Add/Edit Finding Dialog*), you can assign these statuses using the new **Status** field.

24.6.7.2 What's New in IC-Inspector

The following new or enhanced features are available for IC-Inspector in release 6.9:

24.6.7.2.1 Platform Compatibility

- IC-Inspector for Android is now available. It is available for free from the Google Play Store.
- IC-Inspector is now compatible with iPadOS 16 or later.

24.6.7.2.2 Single Sign-On (SSO)

You can now use your company credentials to log in to IC-Inspector using Single Sign-On (SSO). See *Log In to IC-Inspector*.

24.6.7.2.3 Improved Synchronisation

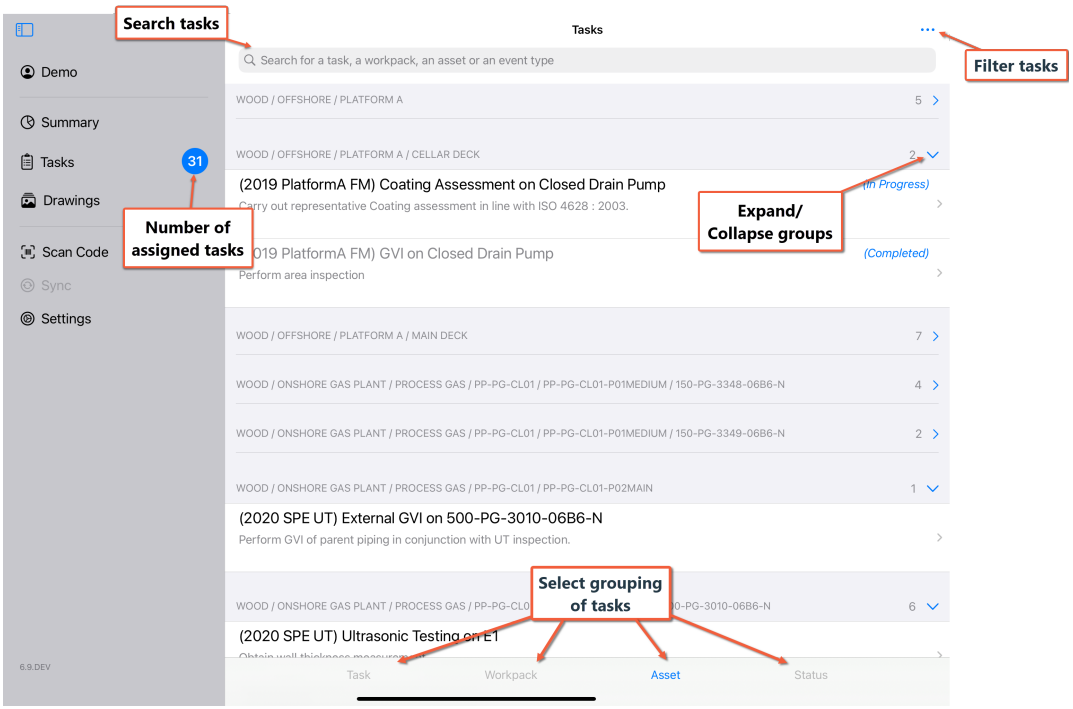
- Sync has been optimised resulting in faster sync times that conserve both battery life and bandwidth.
- The app's reliability in low-connectivity environments has been enhanced, allowing it to manage brief dropouts more effectively.
- The handling of background sync has been refined. When the app enters background mode during sync, it will now retry syncing once focus is restored.

24.6.7.2.4 User Interface Enhancements

- The new icon is available in the top left corner of each screen, which allows you to toggle between showing or hiding the sidebar.

- A new **Status** view is now available at the bottom of all screens that display task lists, such as **Summary**, **Tasks** and **Drawings**. This feature allows you to group tasks by their current status, such as *In Progress*, *Completed*, or *Failed to Sync* (see *Grouping of Tasks*).
- The total number of all assigned tasks are now displayed next to the **Tasks** element of the sidebar, and the task count is also shown for each grouping header visible on the **Task**, **Workpack**, **Asset**, and **Status** screens.
- You can expand or collapse the list of tasks under the grouping header they belong to.

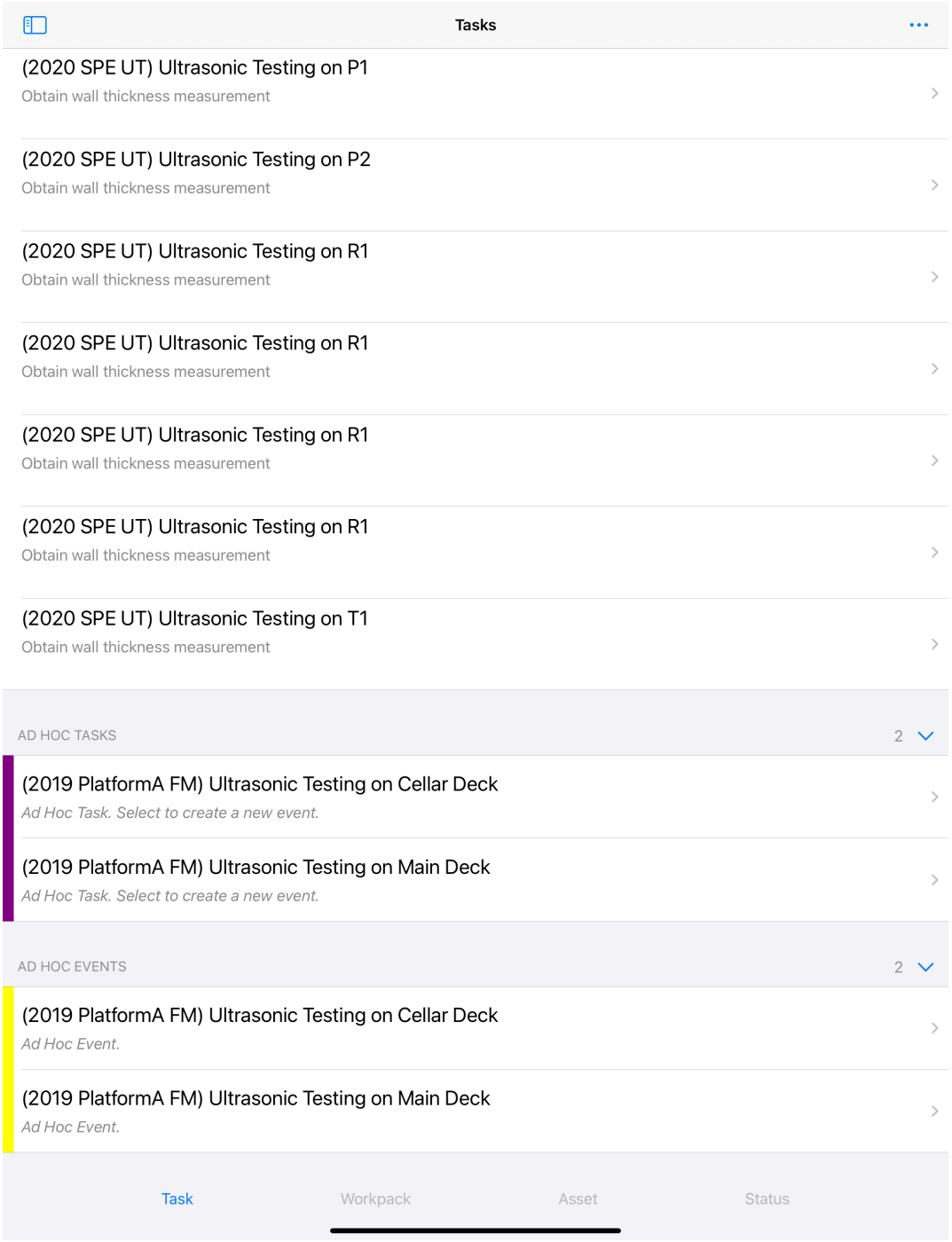
  For each group, a new drop-down icon is visible for the headers on the **Tasks** and **Summary** screens, which you can use to expand or collapse the list of tasks under that.



- The Search icon at the top of the **Summary**, **Tasks** and **Drawings** screens has been replaced with a search bar.

24.6.7.2.5 Task Management Improvements

- You no longer need to assign ad hoc tasks to each inspector. Any unassigned ad hoc tasks in a workpack will be synchronised to all inspectors that have at least one assigned task in that workpack.
- Global Table Link field types are now supported in IC-Inspector.
- The new **AD HOC EVENTS** grouping is available on the **Tasks** screen when you're grouping by tasks. Any ad hoc event items that you create from ad hoc tasks are now inserted under this grouping.



- You can now delete ad hoc events using the new **Delete** button on the top of the **Event Details** screen.
- On the **Event Details** screen, you can now perform unit conversion for numeric fields (see *Convert Unit for Numeric Fields*).
- You can now add multiple photos from your tablet's photo library. You can then scroll through the images using

the scrollbar.

24.6.7.2.6 New Settings Options

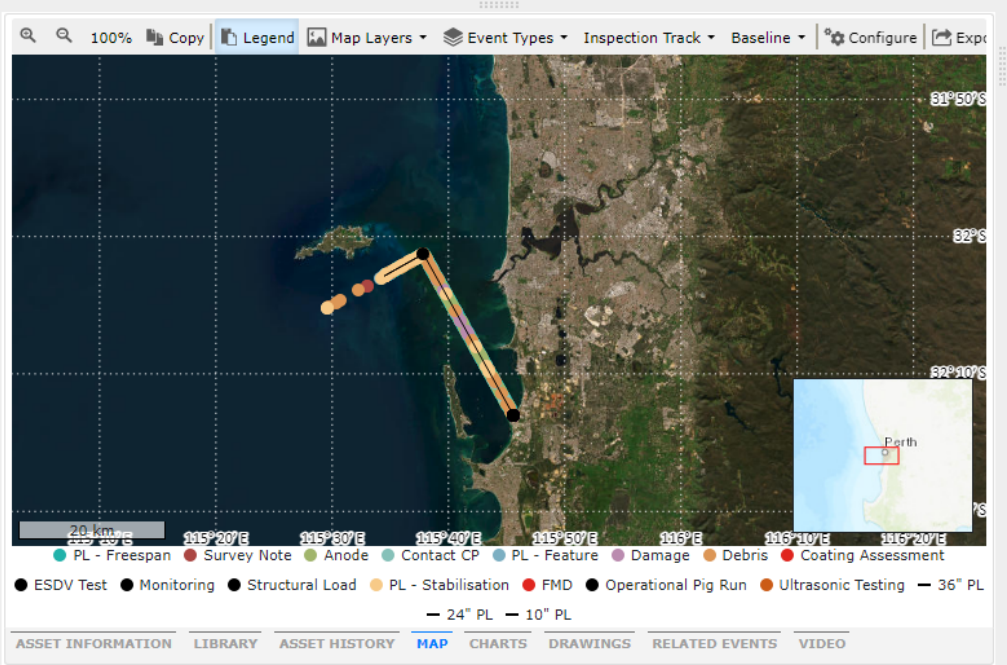
The following new options are available on the **Settings** screen:

- The new **Sign In Using** field is available under **SERVER**, which allows you to choose whether you want to sign in to IC-Inspector using SSO or using your database-specific credentials.
- The new **Sections Collapsed by Default** option is available, which allows you to determine whether you want the tasks to appear collapsed on the screens by default.
- The new **Save Captured Photos to Photo Library** option is available, which enables automatically saving photos to your iPad's photo library when taking new photos. This ensures that photos are not lost when tasks are removed from the iPad.
- You can set up a colour for distinguishing ad hoc tasks and events. The new **Adhoc tasks colour** and **Adhoc events colour** options are available, which allow you to select a colour to be applied for the relevant rows of the ad hoc tasks and events in the task list view. By default, no colour is applied.
- Under **SYNC**, the following new options are available:
  - **Upload Completed Tasks** enables you to upload completed task data to the NEXUS IC database without synchronising in the opposite direction. This means you can upload data without retrieving new tasks from the database.
  - **Send Sync Log to Support** allows you to send a sync log to NEXUS Support in case of issues with sync.
- Under **APP INFO**, you can click **About** for the following options:
  - View the current app version
  - Navigate to IC-Web
  - Access the documentation
  - Check for available app updates

24.6.7.3 What's New in IC-Web

The following new or enhanced features are available for IC-Web in release 6.9:

- You can now multi-select, multi-edit or multi-delete items in all the grids.
- You can no longer change the username or password in IC-Web.
- You can drag and drop single or multiple files onto the library grids of the **ASSETS**, **LIBRARY** and **ANOMALIES** screens.
- The following new features are available on the **INSPECTIONS** screen:
  - On the **EVENTS** pane, the **Event Reviewed** option is now available under the **Events** button, which allows you to mark an event as reviewed, reviewed with comments, or not reviewed.
  - The map functionality is now available under the new **Map** tab:



- The Charts functionality has been enhanced to align with the features of charts in NEXUS IC (**DASHBOARD** and **INSPECTION** screens). This includes improvements in appearance, interactivity, or zooming capabilities. Additionally, new or improved chart types are now available, such as Polygon, Bézier lines, and Gantt charts.

- The main menu of IC-Web has been redesigned offering new features under the **IC-Web** menu option:
  - You can now make changes to your profile settings and specify your favourite reports similarly to the *Database → Your Profile...* option in NEXUS IC (see *Your Profile*).
  - You can view the details of your jobs under the new **Jobs** menu option.
  - Instead of closing the database, you can now log out from IC-Web using the new **Logout** option.

  For more information, see *Main Menu*.
- The toolbar option for sharing URLs has been updated. You can now copy the URL to your clipboard by choosing *Navigation Link → Copy to Clipboard* from the toolbar.
- On the **Drawings** pane of the **ASSETS** and **INSPECTION** screens, thumbnails for PDF documents no longer appear with a PDF placeholder image. Instead, the thumbnail now displays the first page of the PDF, similar to NEXUS IC, and you don't need to click the thumbnail to view the actual image on the **Drawings** pane.
- The appearance of the notification bar showing job details at the bottom of the screen has been updated. You can check the job details or download generated reports from this notification bar.

CHAPTER

TWENTYFIVE

DEPLOYMENT

Before you use NEXUS, you must ensure that the software is deployed as required. See the sections below for information about on-premises, offshore or Software as a Service (SaaS) deployment:

25.1 Hardware and Software Prerequisites

This page outlines the hardware, software and infrastructure prerequisites for the NEXUS product suite. Select the relevant section to review the requirements for the product you intend to deploy.

NEXUS IC

Client Software

- **Client Operating System**

  Supported operating systems:

  - Windows 10 x64 (64-bit)
  - Windows 11 x64 (64-bit)
  - Windows Server 2016 or higher

- **ODBC Drivers:** Version 17 required. (Download)
- **Windows Media Foundation:** For clients running Windows Server, use the 'Add Roles and Features' wizard from the Server Manager. Skip through to 'Features' and select 'Media Foundation'.
- **Desktop Experience:** For clients running Windows Server, the Desktop Experience feature needs to be installed (Desktop Experience Overview).
- **Oracle Instant Client:** Only required if Oracle connectors are configured (Oracle Instant Client).

Other Client Software

Other software applications commonly installed on client machines include:

- **Microsoft Excel:** Used for viewing reports that are exported to XLS format. Also commonly used to compile source input files for bulk data imports and updates (CSV or TXT can be used as an alternative).
- **Microsoft Word:** Used for viewing Reports that are exported to RTF format (alternative viewer is WordPad).
- **Any web browser:** Used for viewing Reports that are exported to HTML format.
- **Any PDF reader:** Used for viewing PDF format reference documents that may have been uploaded to the NEXUS IC Library.

Client Hardware

- **Processor:** Minimum Intel Core i5 / i7

- **Graphics:** OpenGL-capable GPU required for 3D features
- **Memory:** Minimum 4 GB RAM
- **Storage:** Minimum 30 GB
- **Display:** Recommended 1920x1080 or higher at 100% scale (Dual monitors recommended for IC-Inspection)

Network

- Recommended network latency: **< 4 ms**
- Latency is displayed in the application status bar, as well as Memory Overhead and Memory used.
- Task performance varies by complexity; increased network latency may degrade performance (Degradation is at most linear: doubling the latency will at most double the time taken by the application.)

IC-Inspection

IC-Inspection uses the same hardware and software prerequisites as **NEXUS IC**.

The following additional recommendations apply specifically to IC-Inspection:

- Dual-monitor setup is recommended for optimal workflow
- GPU must support OpenGL for 3D inspection features

IC-Inspector

IC-Inspector can be installed on various platforms, including iPads, Android tablets, or Windows tablets. For detailed information about the requirements for the different platforms, see *Install IC-Inspector*.

IC-Web

IC-Web Supported Browsers

- Chrome 54.0 or above
- Microsoft Edge 79 or above
- Safari 9.1 or above
- Firefox 53.0 or above. 3D drawings may be slower in Firefox.

IC-Web Server

- **Processor:** Minimum Core i5 / i7
- **Memory:** Minimum 4GB RAM
- **Hard Disk:** Minimum 30GB
- **Server OS:** Microsoft Windows Server 2016 (or higher) supported.
- **Web server software:** Microsoft Internet Information Services (IIS) 8.5 with
  - ISAPI Extensions
  - IIS Management Studio (highly recommended)
- **ODBC Drivers:** Version 17 required. (Download)
- Connection to SQL server running a NEXUS IC database

IC-Recorder

Client Operating System

Supported operating systems:

- Windows 10 x86 (32-bit) and x64 (64-bit)
- Windows 11 x86 (32-bit) and x64 (64-bit)

Additional Information

For detailed deployment and configuration requirements for IC-Recorder, see *Deployment*.

25.1.1 SQL Server

- **Version:** SQL Server 2019 or higher

  Note that NEXUS does not support connections to Azure SQL Managed Instances.
- **Processor:** Multi-core CPU
- **Memory:** 4GB+
- **Storage:** Separation of System, Database and Transaction Log storage

25.1.2 Internet Connectivity

- *Software Based Licensing* requires access to Internet (standard HTTPS port 443)
- Automatic Crash Logs requires access to Internet (standard HTTPS port 443)

25.2 Deployment On-Premises

To set up NEXUS on-premises, including best practice security recommendations, see the steps described below.

25.2.1 Prerequisites

Ensure that the minimum software and hardware requirements are met. For more information, see *Hardware and Software Prerequisites*.

25.2.2 Process

1. Create the required active directory groups and service accounts (see *Create Active Directory Groups and Service Accounts*).
2. Set up the backup folder (see *Set Up Backup Folder*)
3. Install NEXUS software (see *Install NEXUS Software*).
4. Set up permissions on the database server and the NEXUS database (see *Set Up Permissions*).
5. Set up the NEXUS single sign-on accounts. Refer to *Manage User Security and Permissions* section for instructions on *SSO* configuration.
6. Optionally, set up a deployment configuration file (see *Deployment Configuration File*).
7. If you want to use IC-Web, ensure that you make the steps described in *IC-Web Deployment*.

If you run into problems, see the *Troubleshooting* guide.

If you want to upgrade from a previous version, see *Upgrading*.

25.2.2.1 Create Active Directory Groups and Service Accounts

Wood recommends that the following Active Directory groups and service accounts are created in advance of the NEXUS IC software installation process. These Active Directory groups and service accounts enable streamlined management of the security permissions on the database and the database backup location.

25.2.2.1.1 Create Active Directory Groups

1. Create a new Windows Active Directory group called **NEXUS Backup Folder** (or similar). This group will contain users who will be permitted to perform NEXUS Database Backups using the NEXUS IC software interface.
2. Create a new Windows Active Directory group called **NEXUS Users** (or similar), make it a member of **NEXUS Backup Folder** Active Directory Group. The **NEXUS Users** group will contain all users who require access to NEXUS.
3. If it doesn't already exist, create a new Windows Active Directory group called **SQL Admins**. This group will contain users in your organisation who have been identified as the SQL Administrators.

> **Note**
>
> During SQL Server Setup, add the **SQL Admins** Active Directory group as an Administrator in the Setup Dialog.

25.2.2.1.2 Create Service Accounts

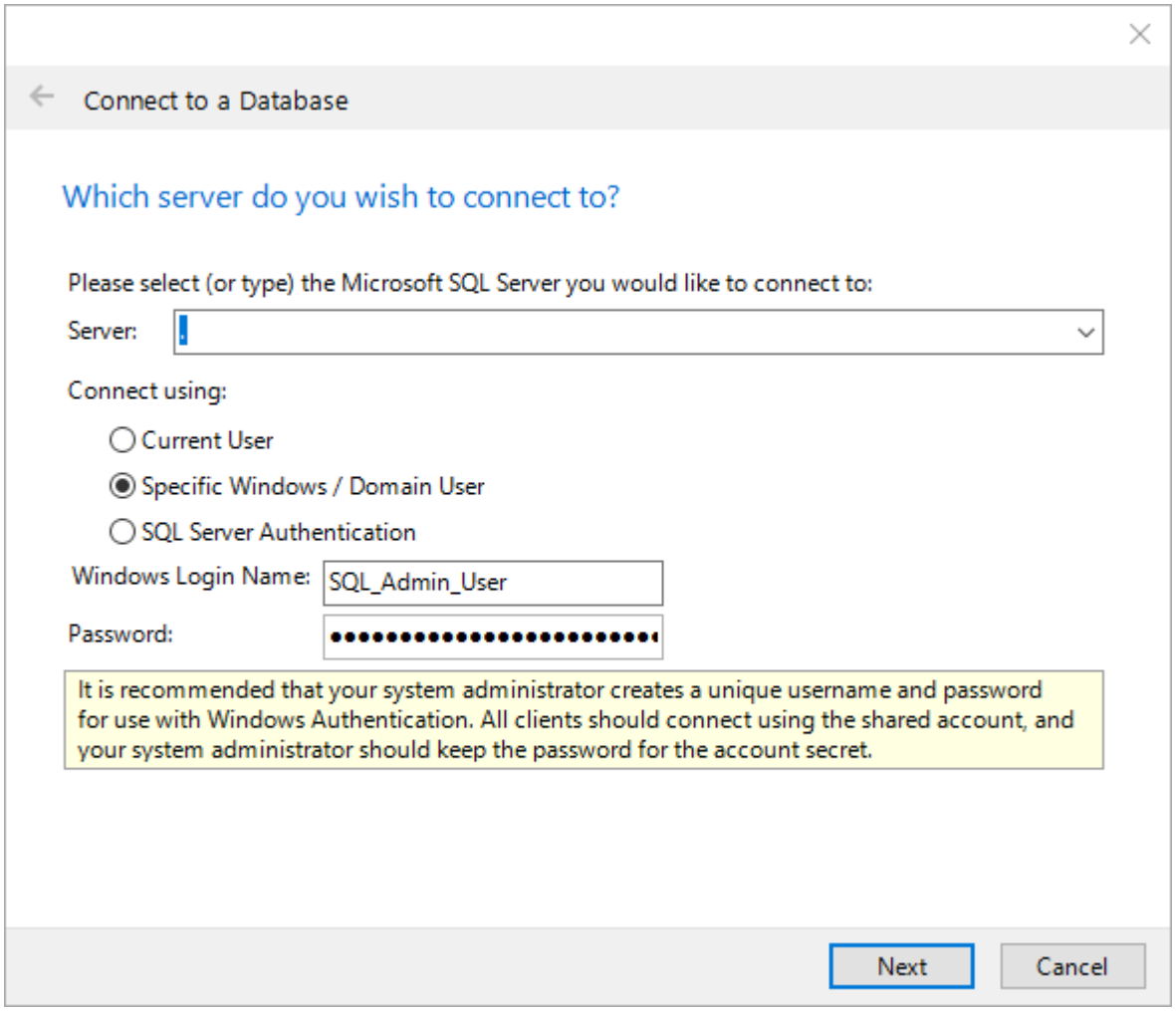
1. Create a new service account for running SQL Server called **NEXUS_SQL_Account**. The password on this account should not expire.
2. Add this service account to the **NEXUS Backup Folder** Active Directory group and the **NEXUS Users** Active Directory group.
3. When installing SQL Server, choose this account as the account to run the services, including SQL Agent and Browser.
4. For companies deploying **IC-Web**, create a new service account called **NEXUS_Web_Account**. The password on this account should not expire.
5. Add this service account to the **NEXUS Users** Active Directory group.

25.2.2.2 Set Up Backup Folder

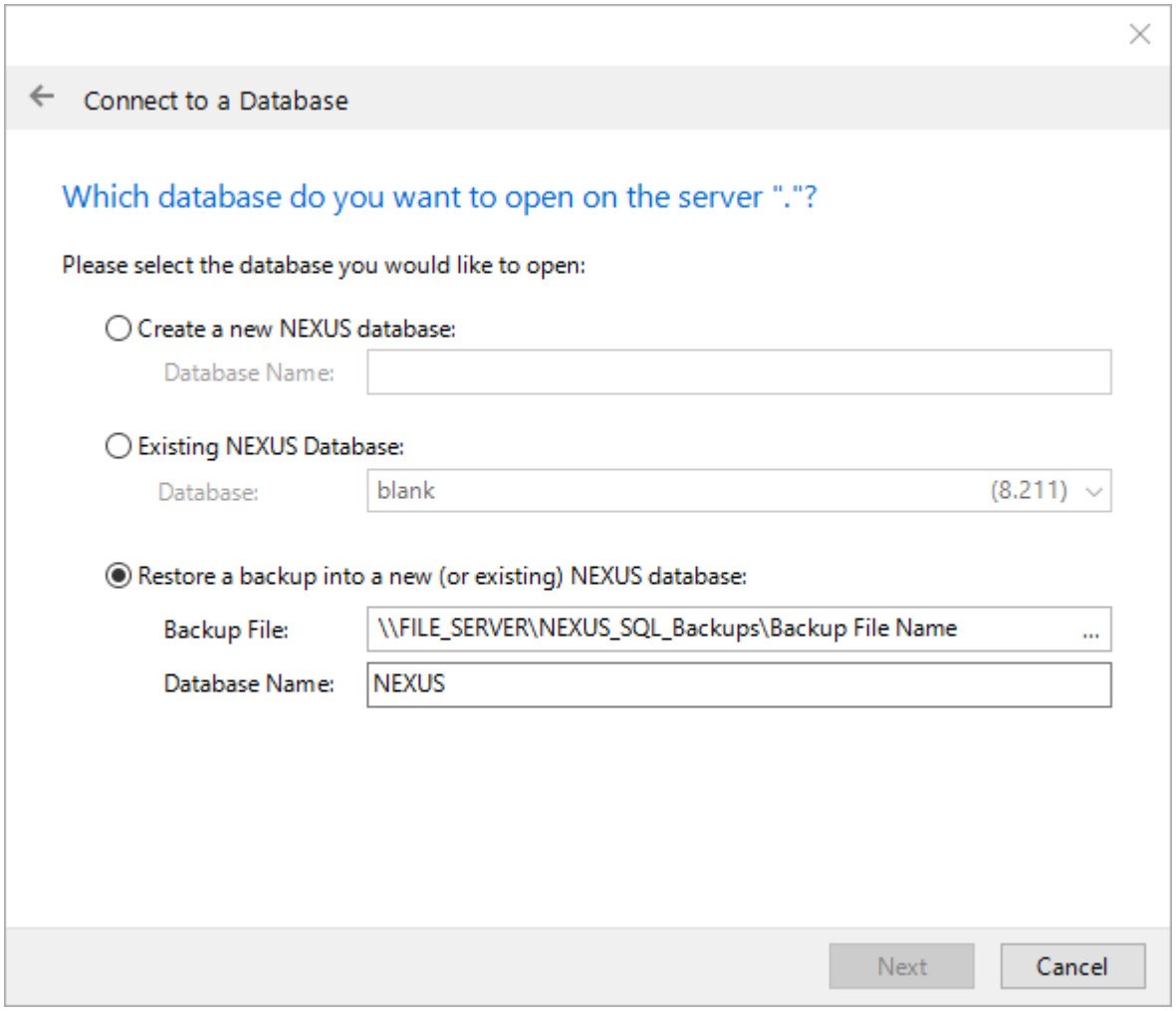
1. Create a Windows folder called **NEXUS_SQL_Backups** on a file server for storing database backups generated by users and the first time NEXUS database to restore from (we recommend that this folder location is NOT on the SQL Server itself).
2. Share this folder by granting read/write permissions to the **NEXUS Backup Folder** Active Directory group.
3. Copy the initial NEXUS database backup file into this folder for first time restoration.

25.2.2.3 Install NEXUS Software

1. Select a member of the **SQL Admins** Active Directory group to install NEXUS IC using the `NEXUS Setup YYYY.MM.nnnnn.exe` file provided to you by Wood. Ensure that this account is also a member of the **NEXUS Backup Folder** Active Directory group.
   - Genuine NEXUS setup installers are digitally signed by Wood Australia PTY LTD.
   - If you are installing via command line, see the installer manufacturer's website for details of command line parameters.
2. After installation, launch NEXUS application to trigger the Database Connection Wizard.
3. On the first page of the wizard, choose **Specific Windows / Domain User** authentication and provide the username and account password of a user in the **SQL Admins** Active Directory Group as shown below:



4. Click **Next**.
5. On the second page of the wizard, enter the following:
   - The full path to the NEXUS backup file. This may be a UNC path (for example, `\\FILE_SERVER\NEXUS_SQL_Backups`) or, if the database server and NEXUS IC are on the same machine, a local Windows path (for example, `C:\Database Backups`).
   - The name of the new database (for example, `NEXUS`).



6. Click **Next** to restore the database and confirm connection to the newly restored database.
7. When prompted for licensing, enter a valid license key and choose **Request License**. For more information on licensing, see *Software Based Licensing*.

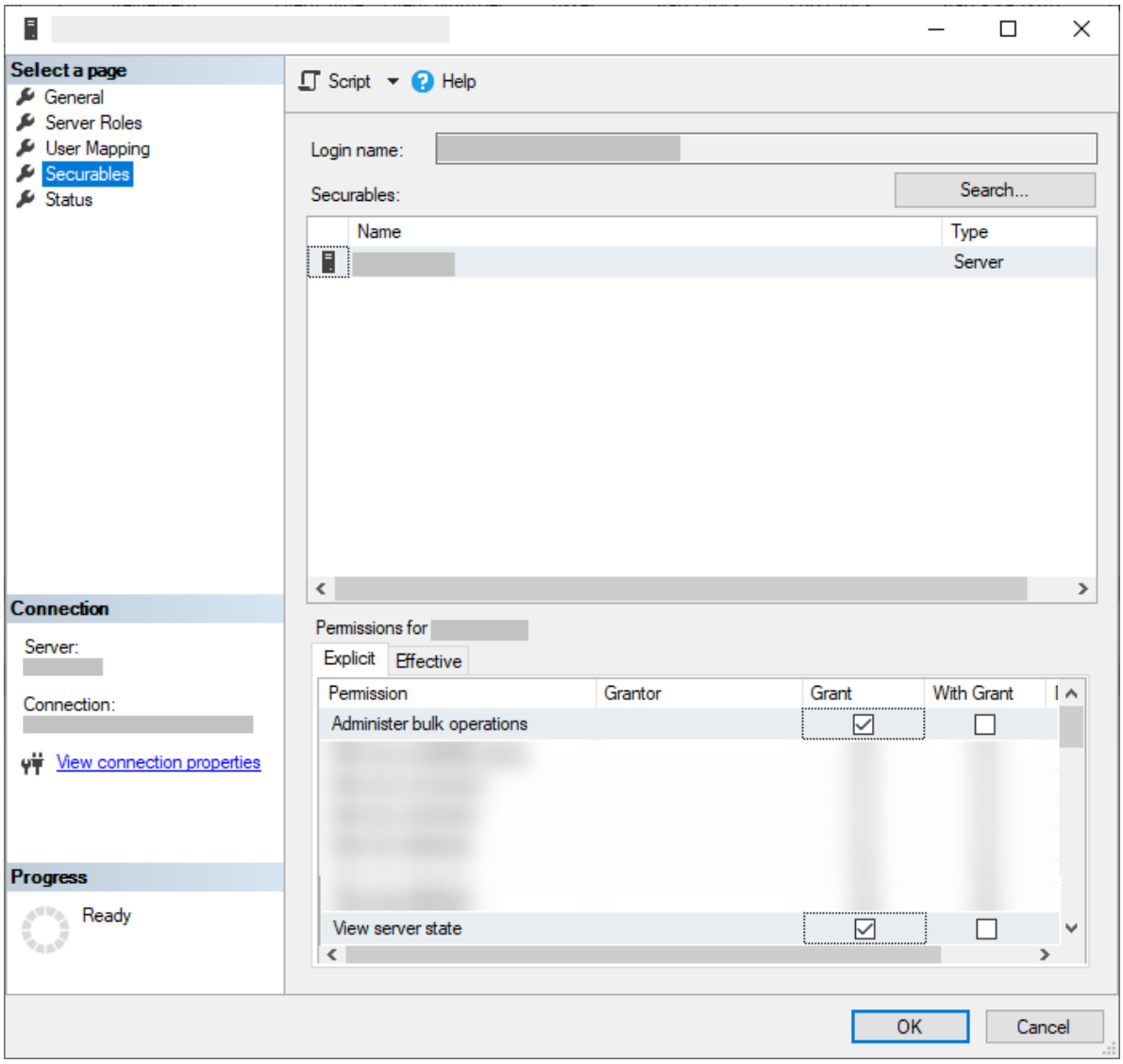
25.2.2.4 Set Up Permissions

Your SQL Server Administrator must make sure that users or user groups have the necessary permissions for the database server and the NEXUS database. The way security is set up is entirely up to the requirements of your company. The processes below show just one possible way of setting up these permissions.

25.2.2.4.1 Set Up Permissions on the Database Server

1. Using SQL Management Studio, navigate to *Security* → *Logins* under the database server.
2. Right-click the *Logins* node and choose **New Login…** to create a new login for the **NEXUS Users** Active Directory group.
3. In the **Login - New** dialog, under the **Server Roles** node, ensure that **public** is selected.
4. Under the **Securables** node, on the **Explicit** tab, ensure that the following options are selected:
   - Grant permission for *View server state*. This is required for the logged in user to query the active logins to display in the status bar, in addition to determining forced log-offs for Audit Log sessions.

- Grant permission for *Administer bulk operations*. Select this permission to grant bulk updates during import on some tables.



25.2.2.4.2 Set Up Permissions on the NEXUS Database

1. Using SQL Management Studio, navigate to the NEXUS database.
2. Add **NEXUS Users** Active Directory group to the "public" Database Role.
3. Add **NEXUS Users** Active Directory group to the "db_owner" Database Role.

25.2.2.5 Deployment Configuration File

On the first run of NEXUS on a particular PC under a particular user account, NEXUS will ask the user for details of the database to connect to: server name, database name (along with options to create a new database or restore a database from a backup file). This can be intimidating to new users. Instead, you can (optionally) supply these details in a databases.xml file, in the same folder as the IntegrityCentre.exe executable. If NEXUS finds this file during startup, it will connect to the named server and database. If *SSO* is specified for the user, no user interaction is necessary. If SSO is not specified, the user will be shown a NEXUS login dialog, to enter their NEXUS credentials.

The format of the databases.xml file is:

```
<databases Force="[force restricted?]" AdministratorEmail="[email]" allowedExtensions=
↪"[list]">
  <database server="[server name]" name="[DisplayName]" database="[database name]"␣
↪NetworkPath="[backup path]" SkipValidation="[skip validation?]"/>
</databases>
```

Force: determines whether users are restricted to only being able to connect to databases listed. If Force is Yes, they will be so restricted; if Force is No, users can use the *Database → Connect* menu to choose a different database to connect to. Force defaults to Yes.

AdministratorEmail: the email address shown when users attempt to connect to a database that they don't have access to.

allowedExtensions: a list of file extensions that can be launched by the user e.g. from library items. Defaults to "doc;docx;xls;xlsx;jpg;png;jpeg;bmp;tiff;gif;mpg;mp3;wav;ppt;pptx;txt;pdf;emf;zip;dwg;avi;rtf;mp4;csv;wmv".

If allowedExtensions includes a blank extension (e.g. "doc;docx;;") then users can launch library items that are just folders (e.g. "C:\myfolder\"). These will be opened in Windows Explorer. A single trailing semicolon in allowedExtensions is insufficient — you must use two, or use two at some other point in the string, e.g. "doc;;docx".

Server: Full SQL server name including instance. e.g. .\sql2019 or sqlserver\sql2019 or sqlserver (for the default instance).

Name: Name shown to the user when connecting.

Database: Physical database name.

NetworkPath: provides the path required for the user to perform a database backup. The SQL Service user account needs read/write permissions on this Network share. The users performing backups also need read/write permissions.

SkipValidation: if Yes, NEXUS will not attempt to verify the NetworkPath. This means that non-admin users can still carry out backup and restore operations.

Here's an example file:

```
<databases Force="Yes" AdministratorEmail="support@nexusic.com" allowedExtensions="doc;
↪xls">
   <database server="." name="Client Database 1" database="Database1" NetworkPath="C:\
↪Backups"/>
   <database server="." name="Client Database 2" database="Database2" NetworkPath="C:\
↪Backups"/>
   <database server="." name="Client Database 3" database="Database3" NetworkPath="\\
↪server\backupfolder" SkipValidation="Yes"/>
</databases>
```

25.2.2.6 IC-Web Deployment

- *Requirements*
- *Installation*
- *Updating*
- *Configure IIS*
- *Configure IC-Web*

- *Authentication*
- *Common Errors and Troubleshooting*

25.2.2.6.1 Requirements

IC-Web Supported Browsers

- Chrome 54.0 or above
- Microsoft Edge 79 or above
- Safari 9.1 or above
- Firefox 53.0 or above. 3D drawings may be slower in Firefox.

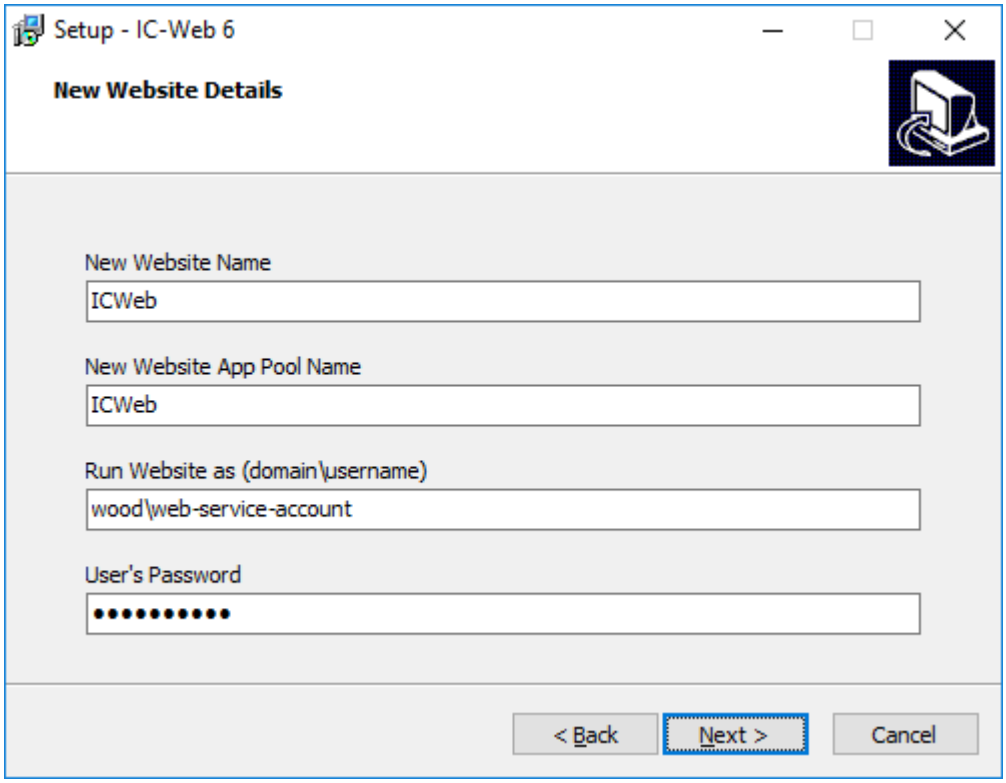
IC-Web Server

- **Processor:** Minimum Core i5 / i7
- **Memory:** Minimum 4GB RAM
- **Hard Disk:** Minimum 30GB
- **Server OS:** Microsoft Windows Server 2016 (or higher) supported.
- **Web server software:** Microsoft Internet Information Services (IIS) 8.5 with
  - ISAPI Extensions
  - IIS Management Studio (highly recommended)
- **ODBC Drivers:** Version 17 required. (Download)
- Connection to SQL server running a NEXUS IC database

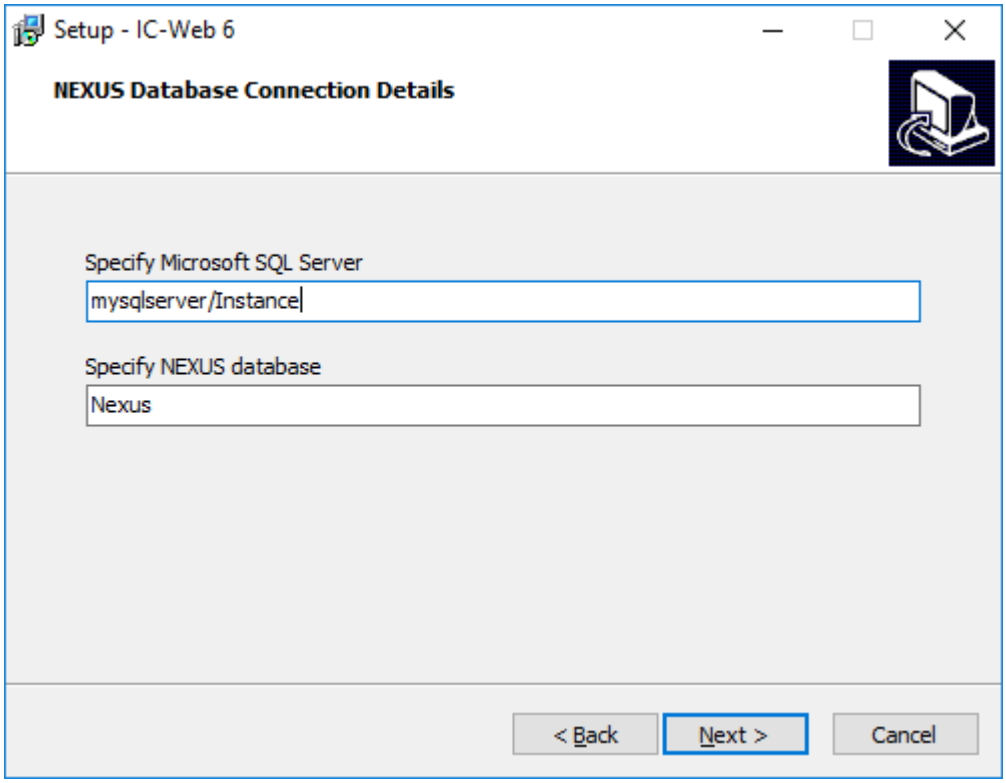
25.2.2.6.2 Installation

Perform the following steps on the web server:

1. Run `IC-Web Setup YYYY.MM.nnnnn.exe`.
2. Accept the License Agreement.
3. If you don't have Internet Information Service (IIS) installed, then select *Yes*, otherwise select *No*.
4. Select *New Website*.
5. On the **New Website Details** page, enter data as follows:
   - *New Website Name* - Enter the name of the website in IIS.
   - *New Website App Pool Name* - Specify the name of the Application Pool the website will use.
   - *Run Website as* - Specify the username of an account with rights to connect to the SQL server and DB_OWNER of the NEXUS IC database. Note that in case of a domain account, this must be in the format domain\username.
   - *User's Password* - Specify the password of that account specified above.



6. On the destination page, specify the IC-Web path where the website will be installed to.
7. On the **Website Bindings** page, specify the following:
    - *Website Binding URL Name* - Set the URL of the website binding. Normally it is fine to leave as *.
    - *Port* - Leave it as port 80 unless your web server listens on a non-standard port.
8. On the **NEXUS Database Connection Details** page, enter data as follows:
    - *Specify Microsoft SQL Server* - Specify the IP address or domain name, and database server instances.
    - *Specify NEXUS Database* - Enter the name of the NEXUS IC database hosted on the SQL server.

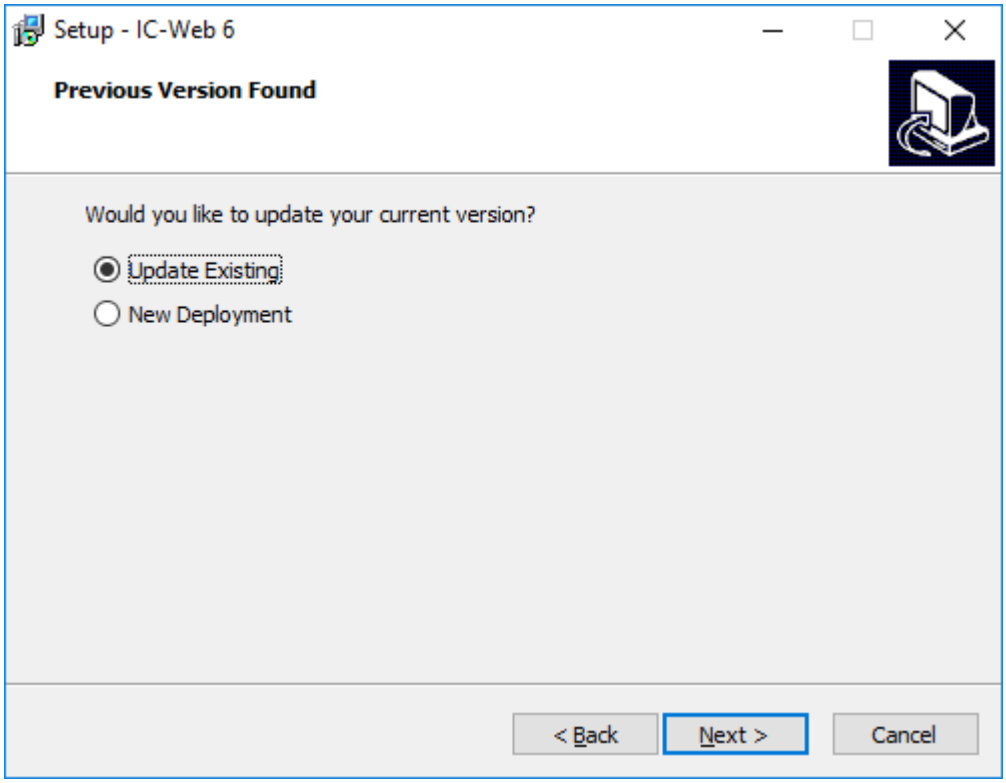


9. Click **Install** to set up the file and complete the configuration.
10. The last step contains a link to a driver for ODBC Driver 17 for SQL Server (Download). This must be downloaded and installed on the server before you run IC-Web.

25.2.2.6.3 Updating

If you have installed IC-Web once and just want to update to a new version without having to reconfigure the web server, follow the steps below on the web server:

1. Stop the World Wide Web Publishing Service via `services.msc`.
2. Run `IC-Web Setup YYYY.MM.nnnnn.exe`.
3. Accept the License Agreement.
4. Select *No* to install IIS (as you already have IIS installed).
5. Select *Update Existing* when asked if you want to update you existing version.



6. Click **Next**.
7. Click **Install**.

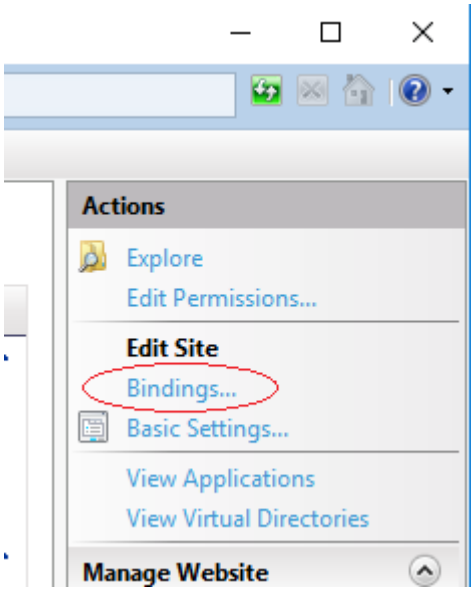
   This will install the new version of IC-Web but will leave the web server settings and configurations settings as they are.
8. Start the World Wide Web Publishing Service via `services.msc`.

25.2.2.6.4 Configure IIS

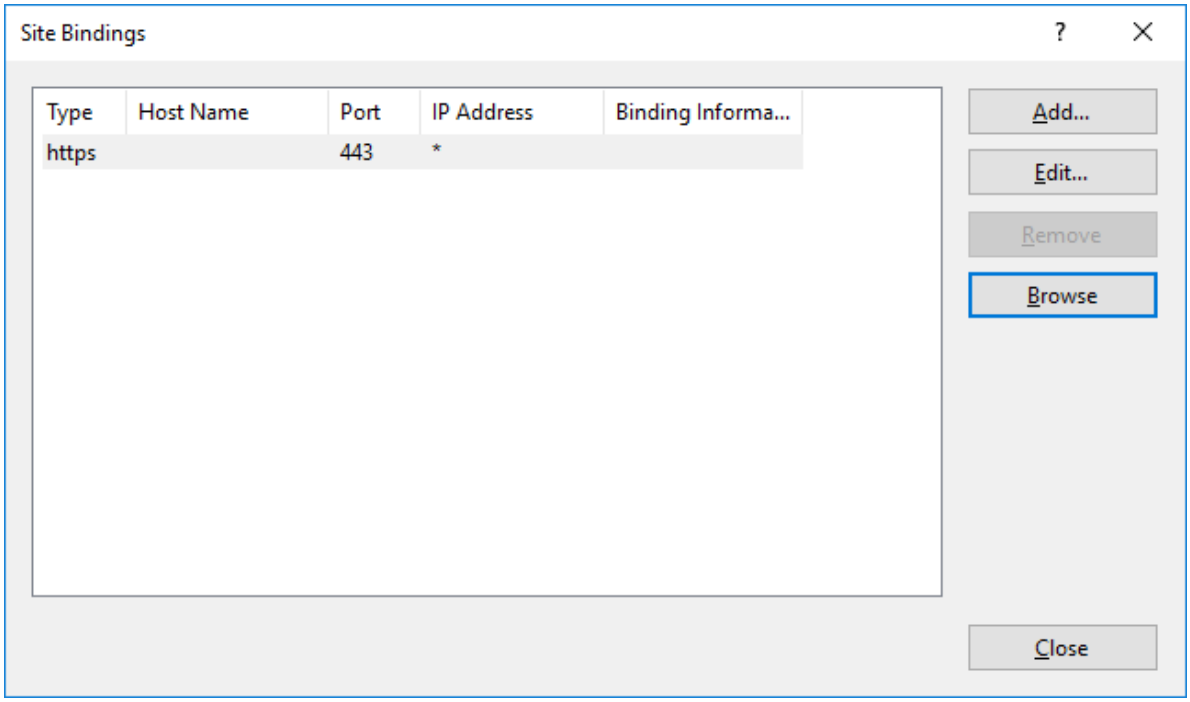
Once installed, IIS should be set up and IC-Web should be running on the HTTP protocol on port 80 of your web server. Running IIS on HTTP should only be done for initial testing. As soon as you are happy with the deployment, you must modify the IC-Web website to use Secure HTTP (HTTPS) and stop the IC-Web HTTP protocol or redirect it to HTTPS. Not doing this step is a security risk and exposes users' passwords so it is vital that this is done straight away.

25.2.2.6.4.1 HTTPS Configuration

1. Open IIS Manager, expand out the website tree and select the IC-Web website.
2. On the Actions section on the right of IIS Manager click on **Bindings...**.



3. Remove the HTTP item. (Note: you may leave this if you intend to redirect HTTP to HTTPS and understand the security ramifications. This is not covered by this deployment guide.)
4. Add an HTTPS item. This will require at least one SSL certificate on your server to do this without errors. Your bindings should now look like this:



5. You should now be able to browse to your website via https://<your site>, and http://<your site> should give you a 404 file not found error.

25.2.2.6.4.2 Web server

If you want to manually check server settings, follow the steps below:

1. Open IIS Manager and open the ISAPI and CGI Restrictions.
2. Make sure there is an entry for <the_path_you_set_during_installation>\webroot\data\ICWeb.dll.
3. Double click *Feature Delegation*. Make sure *Handle Mapping* is set to *Read/Write*.
4. Select *Application Pools* and select the ICWeb application pool.
5. Click on the *Advanced Settings*. Make sure *Enable 32-Bit Application* is set to *False*.
6. Ensure that the *Identity* in the application pool advanced settings is set to the correct username and password.
7. Open the ICWeb website in the IIS tree.
8. Expand out the tree and select the data directory under the ICWeb website.
9. Open *Handle* Mappings.
10. Click on *Edit Feature Permissions* on the right. Make sure *Execute* is ticked.

25.2.2.6.4.3 Website

The installer performs these settings for you, however, if you want to check the settings, follow the steps below:

1. Select the IC-Web website and select *Advanced Settings* in IIS Manager.
2. Check that the Physical Path is correct. Note that this should correspond to the destination path specified during installation with "\webroot" added. For example, if it was "c:\Websites\ICWeb", the physical path should be "c:\Websites\ICWeb\webroot".
3. Check the Physical Path credentials.

25.2.2.6.5 Configure IC-Web

The installer automatically configures IC-Web and populates the fields for you. However, if you want to check or modify these settings, proceed as described below.

1. Open the ICWeb website in the IIS tree.
2. Expand the tree and select the data directory under the ICWeb website.
3. Double-click the Configuration Editor.
4. Open the Collection. The Collection contains the following 6 entries (4 mandatory and 2 optional parameters):
    - `Server` - This is the domain name or IP address and instance of the SQL server.
    - `DatabaseName` - This is the name of the NEXUS IC database on the SQL server.
    - `Username` - This attribute contains the username of a NEXUS account that exists and is enabled in the Database.
    - `InstallPath` - This is the directory location of the directory that holds the IC-Web \webroot directory.
    - `LogLevel` - (optional) Allows you to specify the log level of the ICWeb.dll.
    - `TokenUrl` - (optional) The URL address of the ICWeb homepage - this is used by email/token authentication methods.

If you want to use SQL authentication instead of Windows authentication for the SQL connection between IIS and the SQL server, then the following parameters must be added:

- `sqlUserName` - User name used to authenticate to a database server.
- `sqlPassword` - Password used to authenticate to a database server.

> **Note**
>
> These values are case-sensitive.

25.2.2.6.6 Authentication

Authentication can be performed via a local NEXUS account or a *Single Sign On* account.

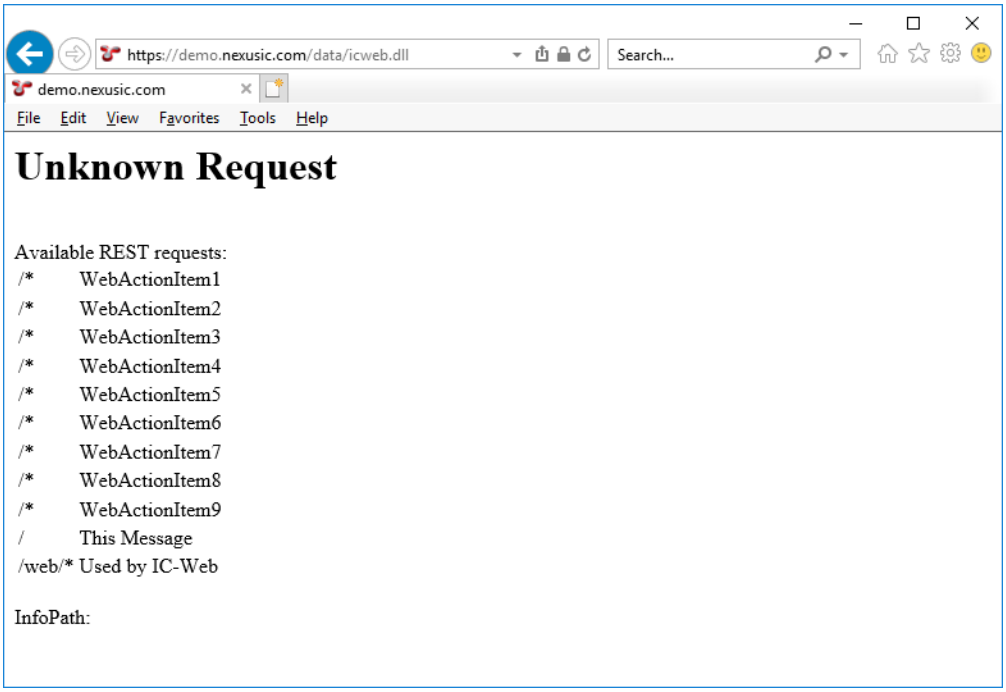
- If your IC-Web account is a local NEXUS IC account, just enter this as the username and password.
- If your account has been set up in NEXUS as a SSO account, then your username must be in full UPN format `username@domain`. Your password is just your normal SSO password.

25.2.2.6.7 Common Errors and Troubleshooting

25.2.2.6.7.1 Test the REST service

Test the REST services is working:

1. Turn on Error Pages by opening IIS manager and selecting the web server.
2. Open Error Pages.
3. Click *Edit Feature Settings* and set it to *Detailed Errors*.
4. Open ICWeb.dll by browsing to your website address and adding /data/ICWeb.dll to the end of the address URL. This should bring up a default page for the ICWeb.dll rest service similar to the image below. If there are any errors with the DLL, they should show here.

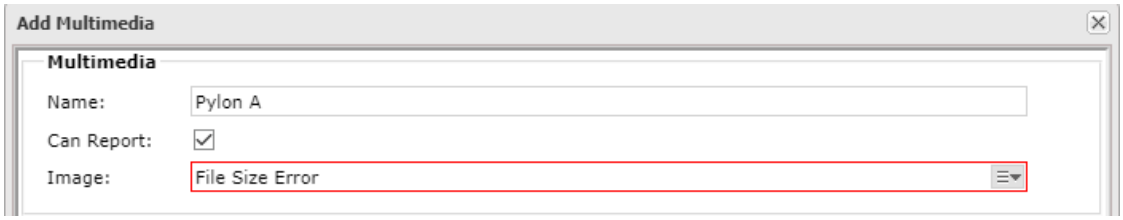


If you get a completely blank screen here, ensure that you have installed the ODBC Driver 17 for SQL Server (https://www.microsoft.com/en-us/download/details.aspx?id=56567).

If the ICWeb.dll tries to download instead of run, ensure that the web server is configured to execute ISAPI extensions. See the last item under *Configure IIS -> Web server*.

25.2.2.6.7.2 File Size Errors

You may encounter a “File Size Error” when uploading files:



In this case, you may need to adjust a setting on your IIS server to allow your users to upload larger files as described below:

1. Locate the `web.config` file.

   On your web server, navigate to the location where you installed IC-Web. Look for the <installedLocation>webrootdatadirectory, which contains the `web.config` file.

2. Open the `web.config` file with a text editor and make sure that the line circled below is included. If it's not included, you must add it there:

```
<?xml version="1.0" encoding="UTF-8"?>
<configuration>
  <system.webServer>
    <handlers accessPolicy="Read, Execute, Script" />
    <security>
      <requestFiltering>
        <requestLimits maxAllowedContentLength="1073741824" />
      </requestFiltering>
    </security>
  </system.webServer>
  <appSettings>
    <add key="Server" value="mySqlServer" />
    <add key="DatabaseName" value="NexusDB" />
    <add key="Username" value="admin" />
    <add key="LogLevel" value="" />
    <add key="InstallPath" value="C:\Websites\Nexus" />
    <add key="tokenUrl" value="" />
  </appSettings>
</configuration>
```

   The `maxAllowedContentLength` value represents the maximum file size allowed to be loaded onto the server and thus inserted into the NEXUS IC database, measured in bytes. In this example, it's set to 1073741824 Bytes (which is 1GB).

3. Save the modified file.

25.2.2.6.7.3 IIS Server Modules

Ensure the following modules are installed and running in IIS through the Add Roles and Features sections of your server:

- Default Document

- HTTP Errors
- Static Content
- Static Content Compression
- HTTP Logging
- ISAPI Extensions
- IIS Management Console

Ensure that the Application Pool and the website account have rights to run the website and connect to the SQL server and NEXUS Database.

25.2.2.7 Troubleshooting

Initial connection to a new database server can stumble at various points. Network connectivity might be a problem, or a firewall might be preventing access, or the database server might not be configured to listen for network connections, or authentication might not be configured correctly.

25.2.2.7.1 Firewall 1

Windows firewall, by default, blocks everything. If it is safe for you to turn off the firewall on the database server machine while troubleshooting connectivity issues, you should do so. (If there are several problems, you must have all the problems fixed simultaneously to succeed.) Then, once you have succeeded, configure the firewall to allow SQL Server, and turn it back on.

On the database server machine, to turn the firewall off, go to Control Panel. (On Windows 10, be sure to go to Control Panel, not Settings.) Look for **Windows Firewall**. (There is a search box at the top right — you can type "firewall" into it.) Click it. At the left, you will see **Turn Windows Firewall on or off**. Click this. For each of several locations you see here, select "Turn off Windows Firewall (not recommended)". (Note that you should not do this if you believe that you are connected to a network that might contain anything malicious.) Click **OK**. Remember that later you will need to turn these back on (or at least back into the state you found them in).

25.2.2.7.2 Network Connectivity

On the machine running NEXUS IC, open a cmd prompt. (Click the Windows **Start** button, type `cmd`, press Enter.) Ping the database server machine:

```
ping machinename
```

or:

```
ping ipaddress
```

If the machine responds, this is good: it means that you have basic connectivity to the database server machine. If you see "request timed out", you do *not* have connectivity. See your local TCP/IP guru for assistance.

25.2.2.7.3 Anti-virus

If you are using a third-party firewall, anti-virus, anti-malware, "optimiser", "cleaner", etc. product, we recommend disabling it while troubleshooting. (Windows Defender is fine.)

25.2.2.7.4 SQL Server Configuration Manager

On the database server machine, open Computer Management: click the Windows **Start** button, type `manag` and click on **Computer Management**. In the tree at left, expand **Services and Applications**. You should see one or more entries for **SQL Server Configuration Manager**. (There will be more than one if you have more than one SQL Server

installed on this machine.) Fully expand each of these (for example by clicking on each one and then pressing the numeric * key on the keyboard). (Size the window larger as required.)

For each entry that mentions "Protocols", click on it. Ensure that "TCP/IP" is set to Enabled in each case. (Right-click and choose **Enable** as necessary.)

If you enabled any, you will see a message telling you that you'll need to restart the service. Once you've gone through the list, if you enabled any, click on **Services** in the tree at the left. Scroll down to SQL Server in the list. (You may need to set the Name column wider.) (You may have several SQL Servers in the list.) Right-click on each and choose **Restart**. (Note that this may interrupt any users who were using those database servers.)

25.2.2.7.5 Allow remote connections

In SQL Studio, right-click on the database server name in the Object Explorer at the left. Choose Properties. Go to the Connections page. Ensure "Allow remote connections to this server" is ticked. (It is ticked by default, so you're just checking that no-one's changed it.)

25.2.2.7.6 No default instance

If your SQL Server is set up with an instance name like "SQLExpress", "SQL2019", etc., and does *not* have a "default" instance (i.e. one without an instance name) then when requests come in on the default port (1433), none of your instances may be listening. You can fix this by re-installing the database server as the default instance, by installing an additional database server as the default instance, or by reconfiguring the ports your existing server instance is listening on:

https://learn.microsoft.com/en-us/sql/database-engine/configure-windows/configure-a-server-to-listen-on-a-specific-tcp-port?view=sql-server-ver15

25.2.2.7.7 Firewall 2

Configure the firewall to allow inbound connections to your SQL Server executables:

https://learn.microsoft.com/en-us/sql/sql-server/install/configure-the-windows-firewall-to-allow-sql-server-access?view=sql-server-ver15

http://go.microsoft.com/fwlink/?LinkId=94001

25.2.2.7.8 Permissions

Set Up Permissions

25.2.2.7.9 Firewall 3

Now that you have fixed your connectivity issues (hopefully) or have temporarily admitted defeat and are returning to a secure state, it's time to turn the firewall back on. Once again, go to Control Panel, then to Windows Firewall. At the left, you will see **Allow a program or feature through Windows Firewall**. Click it. If there is a button marked **Change Settings**, and it is enabled, click it.

Click **Allow another program...**. Click **Browse**. Browse to the folder that contains your sqlservr.exe. This might be a path like `C:\Program Files\Microsoft SQL Server\MSSQL11.MSSQLSERVER\MSSQL\Binn`. This path may vary with your SQL Server version. In particular, x86 versions will be in "Program Files (x86)". Select `sqlservr.exe` and click **Open**. Click **Add**.

The list of allowed programs and features should now contain an entry like "SQL Server Windows NT - 64 Bit" (or similar). There may be two or three columns to the right of it, with checkboxes for Domain, Home/Work (Private), and Public (or just Private and Public). The process we have just stepped through should have ticked the required boxes.

Now click **Turn Windows Firewall on or off** and turn the firewall back on for each of the several locations. Check that you still have database connectivity: in NEXUS IC click *Database* → *Close*, then *Database* → *Reopen* and ensure the database can still be connected to.

25.2.2.8 Upgrading

25.2.2.8.1 Upgrading to Version 6.9

To simplify our code, version 6.9 only includes the ability to upgrade from version 6.7 or 6.8. If you are running an older version (v6.6 or earlier), backup your database, upgrade to 6.8, then upgrade to 6.9.

25.2.2.8.2 Upgrading from an Earlier v6 Version

1. Ensure that you have a NEXUS user account which is in the Administrators Security Group, and that the account has read/write access to special permission Upgrade Schema.
2. In your current version of NEXUS, perform a backup of the database (we suggest that this backup file is permanently archived).
3. Run the installer on the Application Server (or on users' individual PCs).
4. Have one of the users from Administrators security group launch NEXUS IC v6 from the desktop shortcut and click on OK to update the database schema. The schema update will take some time to complete (about 1-10 minutes), so please be patient when the Status dialog appears.

> **Note**
>
> If you are currently using a HASP key license, you will need to switch to *Software Based Licensing*.

> **Note**
>
> If you're upgrading from 6.0, 6.1 or 6.2, see this note about SQL Server permissions.

See the relevant *What's News* for highlights of changes.

25.3 Offshore Deployment

When deploying NEXUS, IC-Inspection, and IC-Recorder in an offshore environment, there are some differences to consider compared to a Wood-hosted or on-premise deployment. The main difference is the use of non-SSO user accounts to log in to the NEXUS database and the setup of SQL Server security.

The instructions and recommendations below assume that all machines on the inspection network are on a self-contained network with no internet access access and accessible only by trusted users. For ease of setup, the same credentials can be used to log in to all machines on the inspection network. Alternatively, if this is not an option, ensure that any of the logged-in users have sufficient permissions to connect to the SQL Server database from each machine on the inspection network.

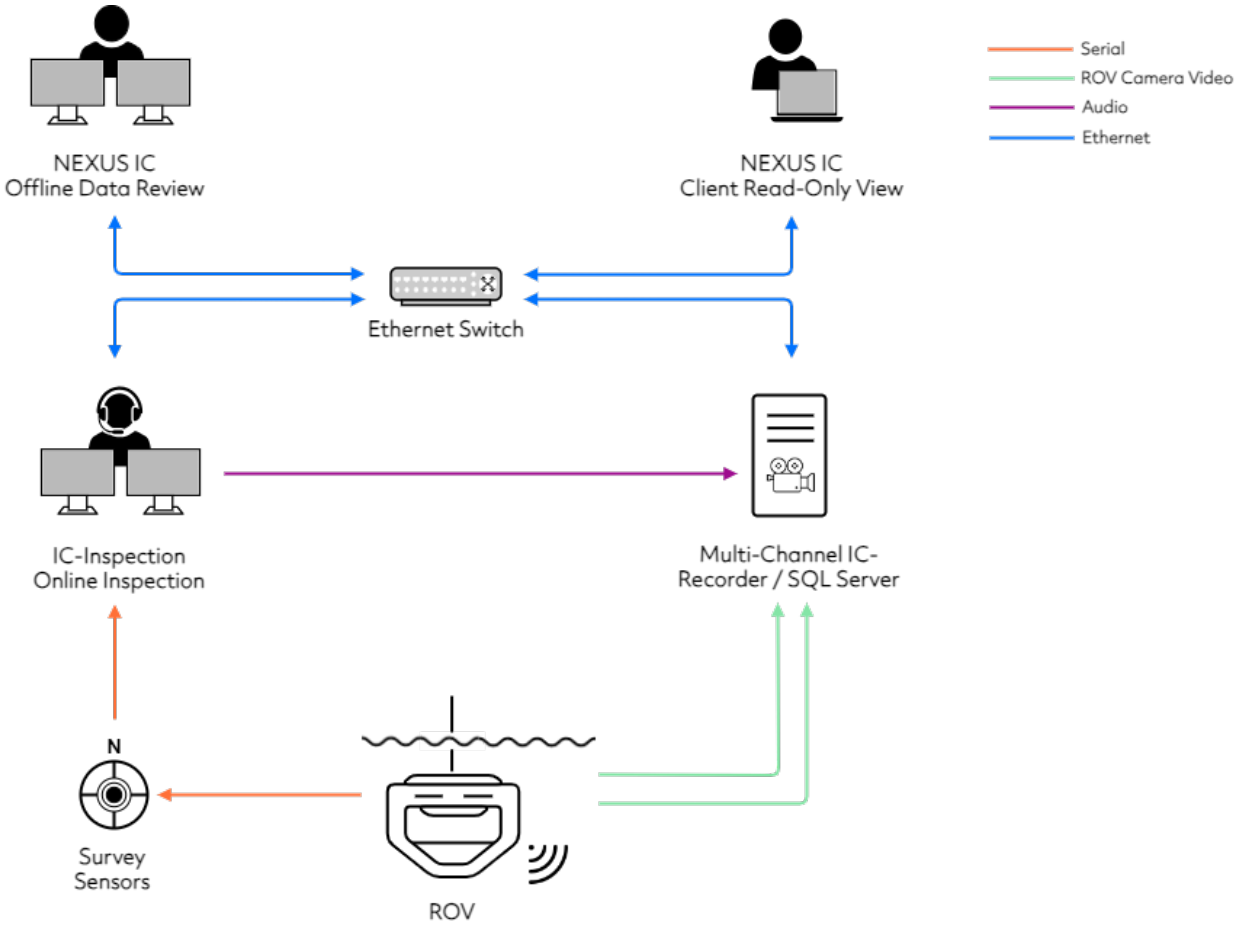
25.3.1 Prerequisites

Ensure that the minimum software and hardware requirements are met. For more information, see *Hardware and Software Prerequisites*.

25.3.2 Physical Setup of Equipment

An offshore setup typically includes equipment for IC-Inspection that performs online inspection, video recorders (such as IC-Recorder) for recording video, NEXUS IC for offshore data review and survey sensors. These can all work together with a ROV (remotely operated vehicle) equipped with cameras.

The following image shows an **example** equipment spread, which is installed on a boat performing offshore inspection:



This example setup involves the following:

- An underwater ROV that has multiple cameras, for example, a forward-facing camera and a manipulator camera installed. These cameras feed into a digital video recorder that has multiple instances of IC-Recorder running on it.
- An IC-Recorder, which is recording the video from the ROV.
- Survey sensors that feed survey data, such as depth or position into IC-Inspection. Usually this is going through a serial string.
- An online inspection station with an inspection engineer, who is performing online inspection through IC-Inspection installed on a computer. The inspection engineer is looking at the video, may be adding audio comments through a headset and recording events as required. The audio data is transmitted to IC-Recorder.

- A network switch, which is installed on the boat and connects the online inspection station with IC-Recorder, and two offline inspection stations.
- One inspection station with NEXUS IC installed for offline data review. An inspection engineer is reviewing the video and events that the online inspection engineer has logged. In case anything has been missed, this engineer can update or create new event records as required.
- Another station with NEXUS IC installed, where a client can view what happened on the job.

25.3.3 Software Installations

Software installations must be performed on all online data acquisition and offline review PCs/laptops, including SQL Server, NEXUS IC, IC-Inspection and, if applicable, IC-Recorder.

1. Set up the database backup folder location.
   a. Create a Windows folder called **NEXUS_Backups** on any of the machines on the inspection network.

      If you are not moving the backup files periodically to an external or NAS drive, then ensure that the machine with the **NEXUS_Backups** folder has enough storage space to store daily backups for the duration of the inspection campaign. For redundancy, we recommend having multiple copies of the database backup files.

   b. Share this folder with everyone by granting read/write permissions to **Everyone**.
2. Install SQL Server.

   When installing SQL Server, select *Mixed Mode Authentication* (both SA and Windows Authentication) and grant the current Windows user administrator privileges on the SQL Server Instance.

   Warning

   Confirm that you are using the same major version of SQL Server that is being used by the client. This ensures that the client is able to perform the synchronisation on completion of the campaign in the client environment once back onshore.

3. Set up permissions on the SQL Server Instance.

   Using SQL Management Studio, add the Windows user from the inspection network as a new Login by navigating to *Security* → *Logins* under the database server.
4. Install NEXUS software using the `NEXUS Setup YYYY.MM.nnnnn.exe` file provided to you by Wood.

   Note

   - This installer should be executed on all online data acquisition PCs and offline review PCs.
   - We recommend using the defaults in the installation wizard.
   - The setup file installs NEXUS IC and IC-Inspection. To install IC-Recorder, a separate executable file is provided.

5. Restore the NEXUS IC database backup file to the SQL Server.

   Launch NEXUS to restore the NEXUS backup to the SQL Server. A typical NEXUS backup file will have a "nexus-backup" file extension. For more information about restoring the database from a backup file, see *Connect to Database*.

   When entering the network path in the database connection wizard, use the shared folder that you set up in the first step of this process.

> **Note**
>
> - When you are prompted to enter credentials to log in to the database, use the non-SSO credentials that have been provided for the client for use during this inspection campaign.
> - Schema updates should never be applied in the offshore environment unless explicitly approved by the client NEXUS focal point.

6. Validate the Software License.

   For detailed instructions, see *Validate the Software Based License*. When performing this step, consider the following:

   - The machine that you are logged into on the inspection network needs to have temporary connection to the internet. After the license is validated, the internet connection can be disabled.
   - You will need the software license key issued to you from the client for use during this inspection campaign. Contact support@nexusic.com if you don't have a license key or if it does not work for you.

7. Set up NEXUS IC logins.

   After performing the steps above, you should now be logged into the NEXUS IC database using non-SSO credentials that you have been provided for offshore use. Perform the steps below:

   - From the menu, navigate to *Database* → *Security* and check that there are non-SSO login accounts for each of the users that will be logging in to NEXUS and IC-Inspection over the course of this inspection campaign.
   - If required, add new users to the *Inspectors Security Group* (or similar). For more information about adding new users, see *Manage User Security and Permissions*.

25.4 Software as a Service (SaaS) Deployment

When deploying NEXUS as a Software as a Service (SaaS), ensure that you meet the deployment requirements listed below. Additionally, your company must complete the necessary setup steps to enable SSO.

25.4.1 Supported Browsers

The following browsers are supported:

- Chrome 127 or above
- Microsoft Edge 127 or above
- Safari 17.6 or above
- Firefox 128 or above.

Internet Explorer is not supported.

25.4.2 Set Up Single Sign-On (SSO)

When logging in, users are authenticated using Single Sign-On (SSO) with their company user account. SaaS supports SSO via Microsoft Entra ID. Your company must set up SSO as follows:

1. Add an application registration for NEXUS in the Microsoft Entra admin center.
   a. Go to https://entra.microsoft.com/ to access the admin center.
   b. In the sidebar, go to *Applications* → *App registrations*.

c. Click **New registration** on the top of the page.

d. On the page that opens, enter data as follows:

- **Name**: Enter a display name, for example, *NEXUS IC*.
- **Supported account types**: Select *Accounts in this organizational directory only (Single tenant)*
- **Redirect URI (optional)**: Select *Single-page application (SPA)* and enter *https://license.nexusic.com/login/*

e. Click **Register**.

> **Note**
>
> Under **Authentication**, ensure that the options **Access tokens (used for implicit flows)** and **ID tokens (used for implicit and hybrid flows)** are NOT selected.

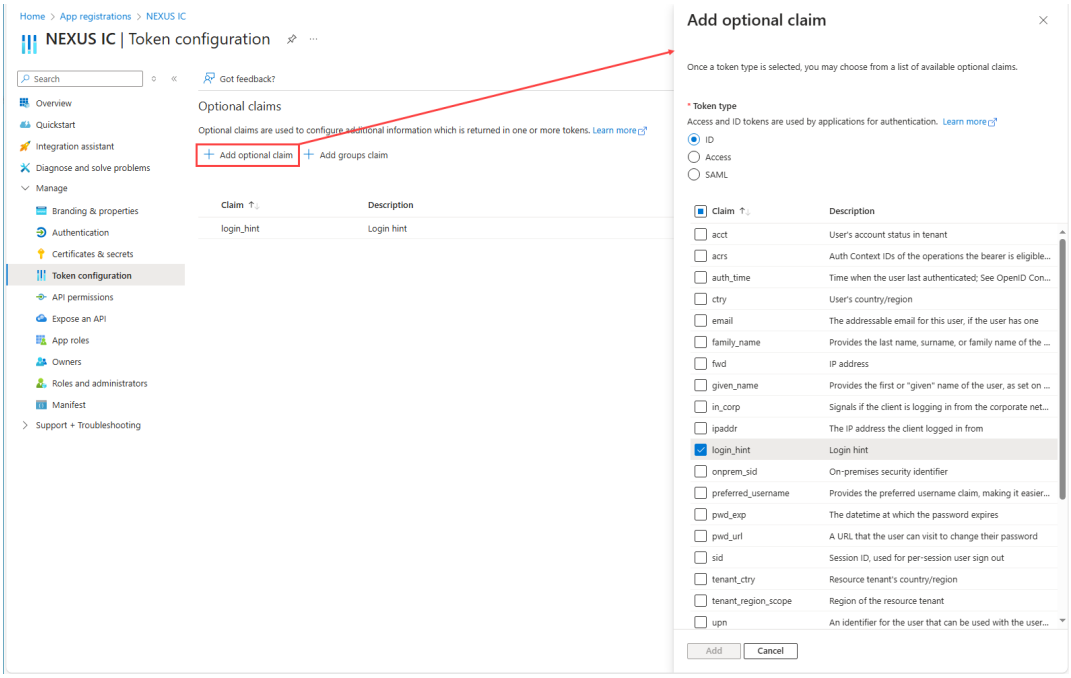
2. To enable secure logout from accounts, update token configuration as follows:

a. In the sidebar of the new app registration page, go to *Manage* → *Token configuration*.

b. Click **Add optional claim**.

c. Select **ID** for the token type.

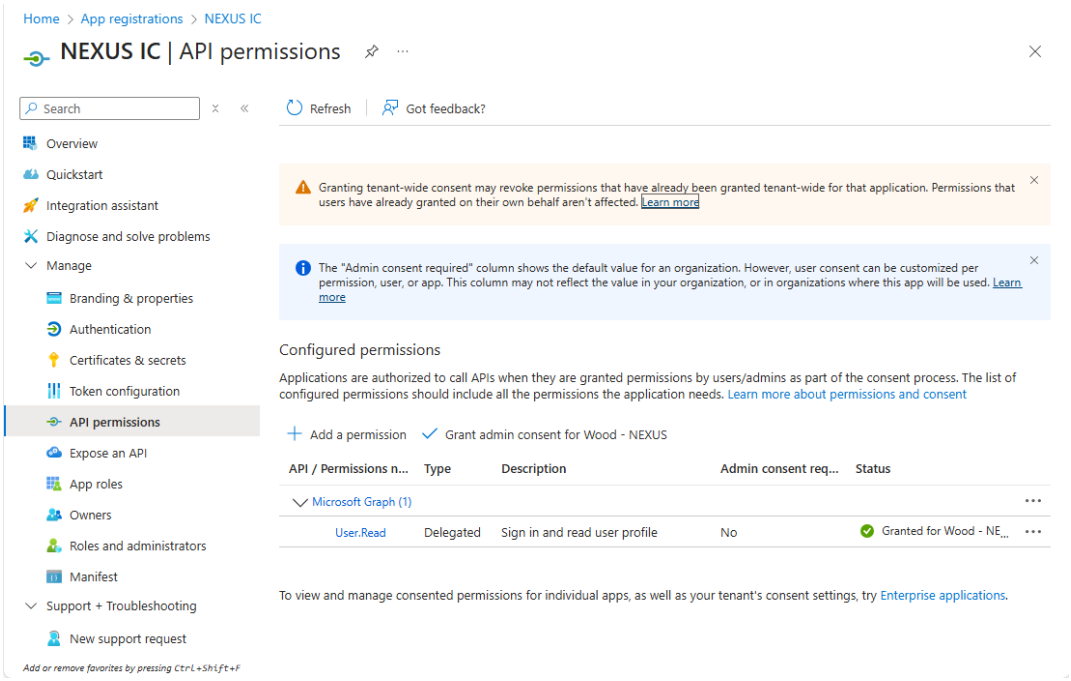
d. Select the **login_hint** option an click **Add**.



3. Verify API permissions:

a. In the sidebar, go to *Manage* → *API permissions*.

b. Ensure that the default API permission `User.Read` under `Microsoft Graph` is added:



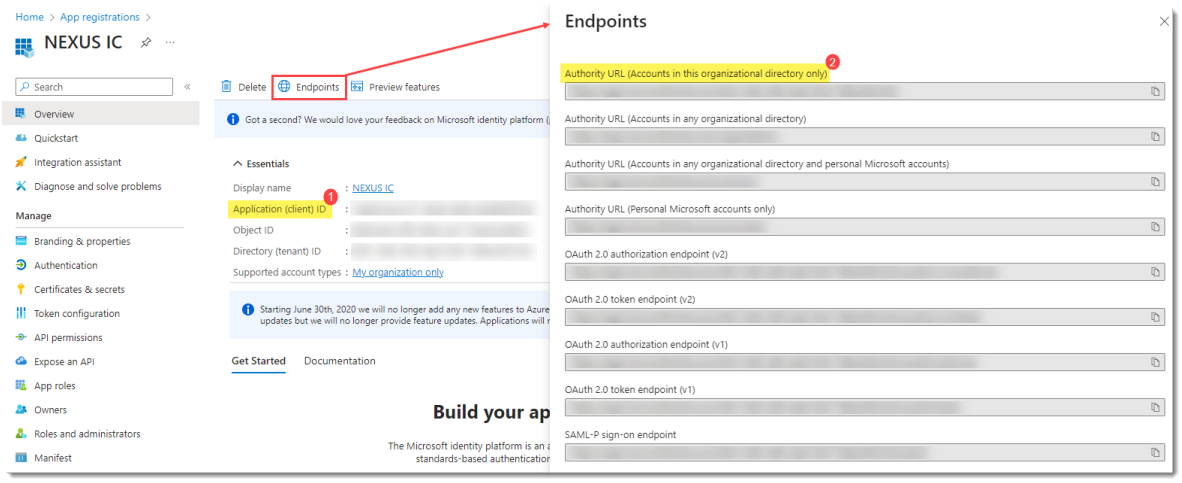
c. To require users to request access during their initial login, set the **Admin consent required** value to **Yes**. This is optional and the default setting is **No**.

4. Once the application has been registered, provide Wood with the required data, see *Information Required by Wood for SSO Setup*.
5. Wood configures the authentication records and informs the company when it is completed.

25.4.2.1 Information Required by Wood for SSO Setup

Once the application has been registered, you must provide Wood with the following information:

1. The domain name of your User Principal Name (UPN) and any subdomain that your user accounts use, for example, *@woodplc.com, or *@contractor.woodplc.com.
2. **Application (client) ID** from the app registration (1)
3. **Authority URL (Accounts in this organizational directory only)** from the app registration (2)



See also

- *Software as a Service (SaaS)*

CHAPTER

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SOFTWARE AS A SERVICE (SAAS)

Wood offers a Software as a Service (SaaS) solution hosted on Microsoft Azure cloud infrastructure. This deployment model provides secure remote access to NEXUS applications through a web browser and supports Single Sign-On (SSO) for seamless authentication. Users access the system directly through a single link using their company account. For details, see *SaaS Login*.

> **Note**
>
> Access to NEXUS applications via RemoteApp is no longer supported.

For high-level architectural information about SaaS, see *SaaS Architecture*.

Depending on the service agreement, user management tasks may be handled by your organisation's administrative personnel or by Wood. For details, see *User Management*.

26.1 Prerequisites

Before using the SaaS solution for NEXUS, ensure all requirements described in *Software as a Service (SaaS) Deployment* are met.

26.2 Features

When using the SaaS deployment model, consider the following features and operational characteristics:

Location	Wood currently operates cloud hubs in the UK, USA, Malaysia and Australia. We can deploy services in any Microsoft Azure data centre as required for clients with specific geographic restrictions on data storage. Note though that this may incur additional costs.
Sign-on	NEXUS supports Single Sign-on (SSO) via OAuth through Azure AD (Entra ID). Note that for security reasons, authentication is restricted to a single customer domain.
Availability	System availability is historically greater than 99.9%.
Downtime	Access to NEXUS may be temporarily unavailable during scheduled or emergency maintenance. Daily automated server maintenance typically occurs out of hours (for example, 0200–0400) and does not always result in downtime. This maintenance window allows critical security issues to be addressed promptly after the release of a relevant patch. Any non-routine maintenance during business hours is scheduled and approved with the client.
Response times and latency	Task execution times vary (from milliseconds to minutes) depending on complexity. Higher network latency can impact performance. Wood recommends less than 120 ms latency for acceptable performance with NEXUS IC and less than 300 ms for IC-Web.
Backup regime	Database backups are performed each business day and retained for 14 calendar days. Additional or long-term backups can be arranged or transmitted to the customer if required; costs may apply.
Disaster Recovery (DR) and Business Continuity (BC)	No client-side DR/BC requirements exist. The hosted service is resilient to hardware failures through redundant Azure infrastructure and maintains availability even if a data centre goes offline. All database backups use geo-redundant storage. The DR/BC plan includes automated deployment of new cloud infrastructure and restoration of the latest backup. • **Restore Point Objective (RPO):** Maximum 24 hours • **Restore Time Objective (RTO):** Maximum 48 hours
Privacy and Confidentiality	All data is stored securely in Microsoft SQL Server. Access is restricted to authenticated users only.
Security	Access to data within NEXUS is controlled by in-built functional security. • Users authenticate through Microsoft Entra ID using SSO with the customer's domain. • Each user is assigned security permissions. Security permissions can be defined for roles (for a group of users) or single users. • Azure infrastructure provides the underlying security controls and meets a broad range of international and industry-specific compliance standards.
Scalability	The SaaS service can be scaled both horizontally and vertically for expansion of scope and increased number of users.

26.3 Administration Services provided under SaaS

Because Wood manages the cloud instances of NEXUS IC more closely than on-premise deployments, SaaS customers benefit from additional administration services:

- *Scheduled reports*
- Import and export jobs are offloaded to a separate server, allowing users to exit NEXUS while jobs continue to execute
- REST API requests which generate and download reports are only available for SaaS clients
- Database maintenance
- Infrastructure optimisation
- Database configuration management across regions
- Wood users supporting your database will not consume a NEXUS license

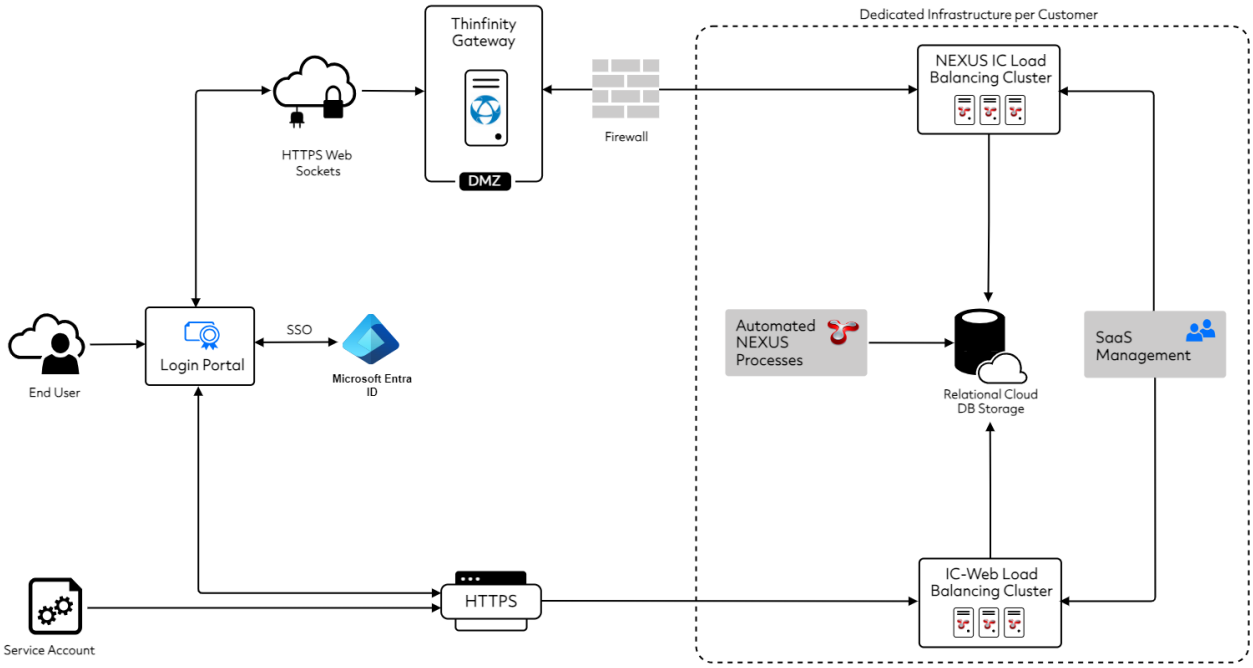
- Software update service, including early access to Beta releases
- Subscriber database creation and database synchronisation management services

See also

- *SaaS Architecture*
- *User Management*
- *SaaS Login*
- *Launch NEXUS IC as an App*
- *Keep NEXUS Active in Browser*

26.3.1 SaaS Architecture

The following diagram illustrates the high-level architecture of the Software as a Service (SaaS) deployment with Single Sign-On (SSO). It shows how users authenticate through Microsoft Entra ID and how secure communication is established between the client, the Thinfinity Gateway and the dedicated customer infrastructure hosted in Azure.



26.3.2 User Management

When using Software as a Service (SaaS), user management tasks can be handled either by your company's administrative personnel or by Wood, depending on the terms of the service agreement.

User management tasks may involve changing security permissions or assigning licenses.

26.3.2.1 Prerequisites

Before being able to change security permissions or assign licenses, ensure the user has logged in with their company credentials at least once and launched any of the applications.

26.3.2.2 Change Security Permissions

When users log in and launch an application for the first time, default security permissions are assigned to their user account. Administrators can manually change the user's security group and permissions at any time within NEXUS IC as described in *Set Up Permissions for User/User Group*.

26.3.2.3 License Management

Users are assigned a license in either of the following ways:

- If a spare NEXUS named-user license is available, it will be automatically assigned to the new user when the user first logs in and launches an application.
- If no spare licenses are available, administrators can reassign licenses from the available pool within NEXUS IC (see *Software Based Licensing*).

26.3.3 SaaS Login

When you use Software as a Service (SaaS) with Single Sign-On (SSO), you can access NEXUS applications as described below.

26.3.3.1 Log In to NEXUS IC and IC-Web

1. Open your web browser and navigate to https://license.nexusic.com/.
2. On the sign-in page, enter your company username (for example, `username@company.com`), password and click **Sign in**.

   If you have previously signed in and selected the option to stay signed in, this step is skipped.
3. On the next page, click the application that you want to launch.
4. The application opens in your web browser.

> **Note**
>
> When you log in for the first time, default security permissions are assigned to your user account. To change your security permissions and assign licenses, contact your administrator. For more information, see *User Management*.

> **Tip**
>
> - Launch NEXUS IC as an app to open it in its own window. For detailed steps, see *Launch NEXUS IC as an App*.

- If you are using NEXUS applications in a browser, you may need to adjust your browser settings to prevent disconnection in background tabs. For more information, see *Keep NEXUS Active in Browser*.

26.3.3.2 Log In to IC-Inspector

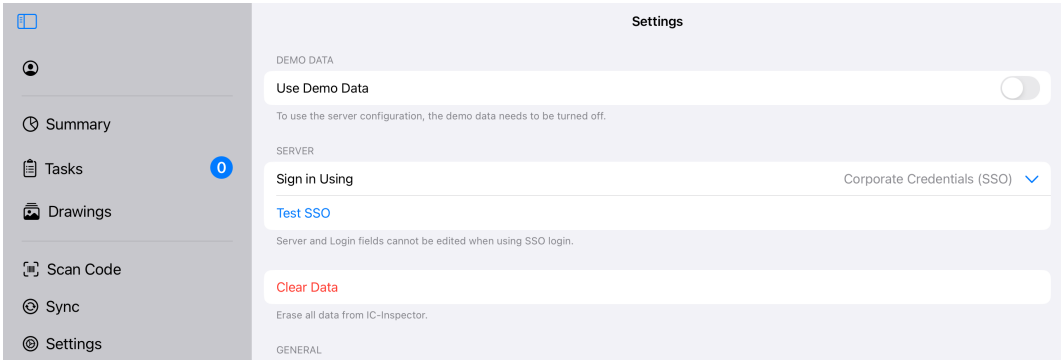
You can log in to IC-Inspector using one of the following methods:

- **Single Sign-On (SSO)**: Use your company credentials for seamless authentication.
- **Database-specific credentials**: Use a dedicated account to access IC-Inspector.

Both login methods are described below.

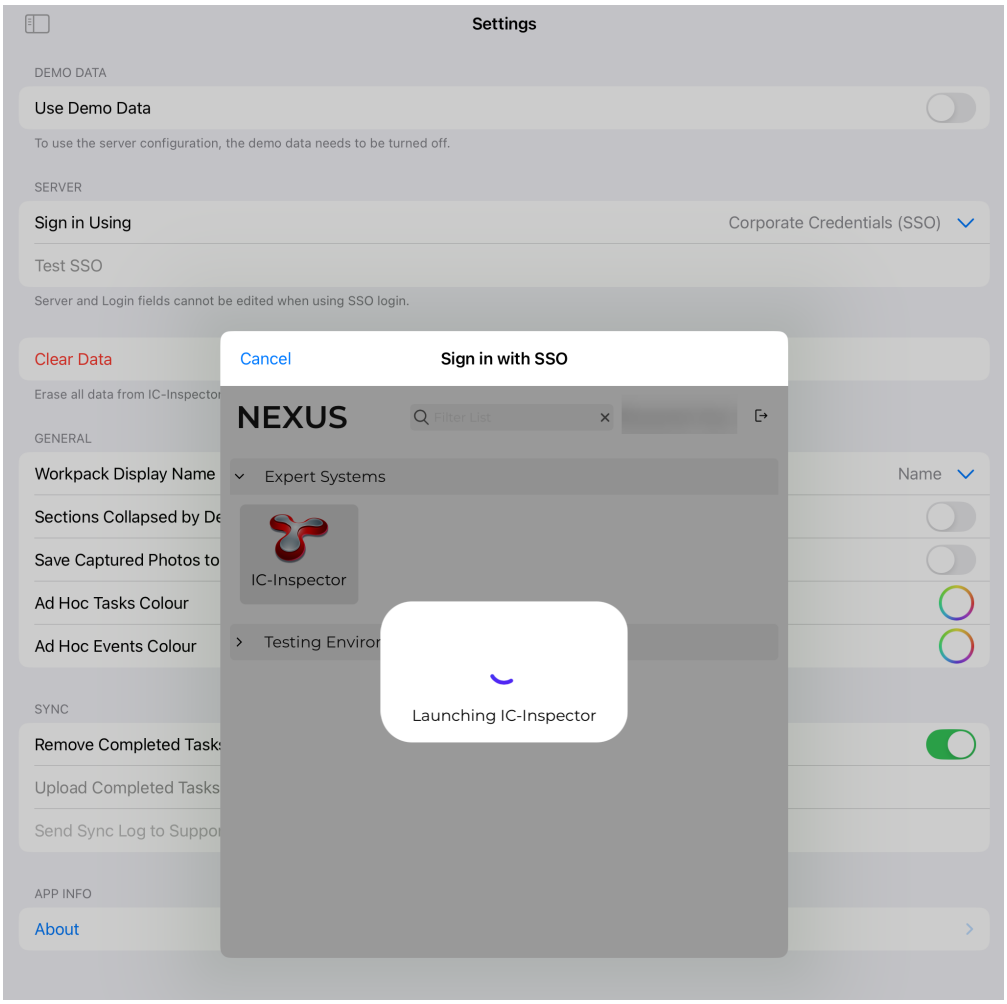
26.3.3.2.1 Log In Using SSO

1. Launch the IC-Inspector app on your tablet.
2. Go to **Settings**.
3. Ensure that the **Use Demo Data** option is turned off.
4. Under **SERVER**, confirm that **Corporate Credentials (SSO)** is selected in the **Sign in Using** field. This is selected by default.



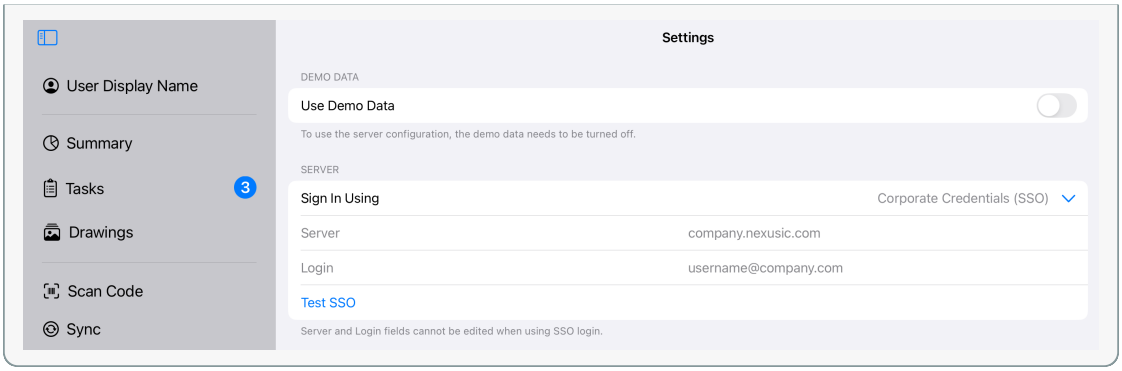
5. Each time you perform a sync (see *Sync to IC-Inspector* and *Sync to NEXUS IC*), IC-Inspector initiates the sign-in process unless you have already signed in and your SSO session and hash are still active. You can also tap **Test SSO** on the **Settings** page to verify SSO connectivity.
6. When prompted, enter your company username and password, and complete any multi-factor authentication steps required by your organisation's standard login process.

7. If you have access to more than one database, you will be prompted to select the appropriate IC-Inspector database by tapping its icon on the sign-in page.



Result

A success message confirms that SSO authentication was successful. Your username appears in the sidebar, and the **Server** and **Login** fields on the **Settings** page are automatically populated and locked.

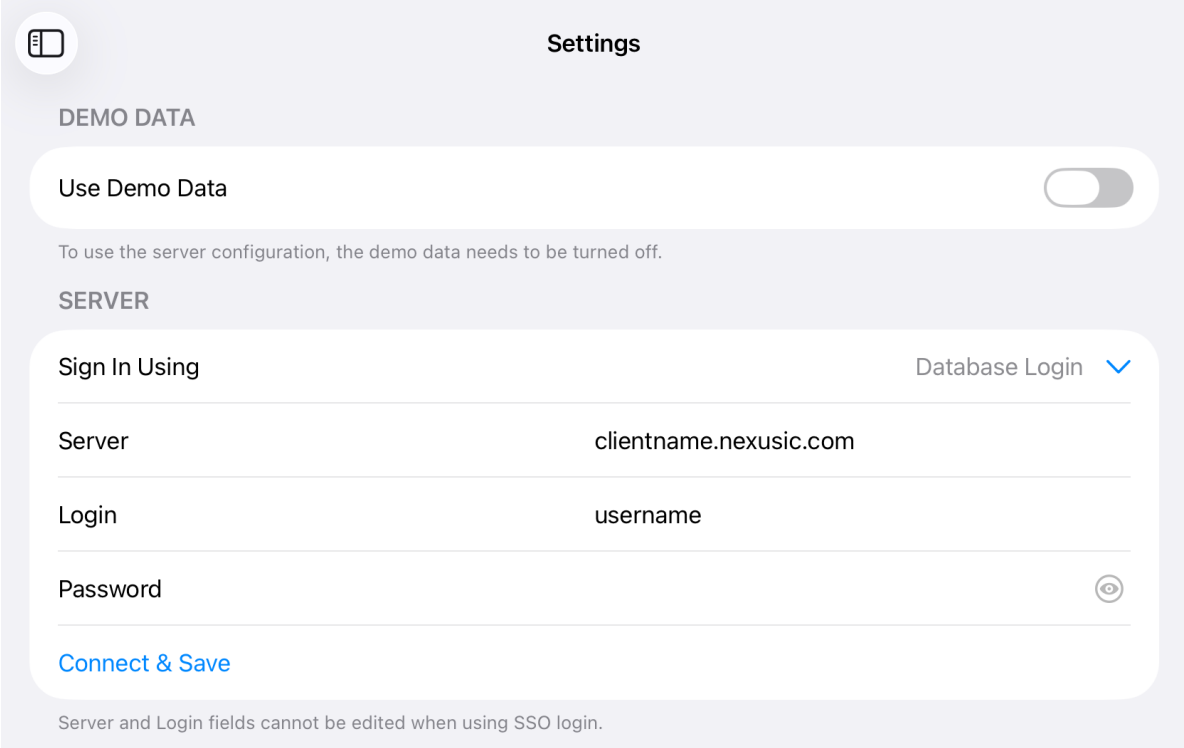


Note

- The SSO session and hash expire after a set period. After that, you'll be prompted to sign in again when performing a new sync.
- If you switch users or change the login method, the previous SSO session will be terminated. Any unsynchronised data from the previous session will be lost.

26.3.3.2.2 Log In Using Database-Specific Credentials

1. Open the IC-Inspector app on your tablet.
2. Go to **Settings**.
3. Ensure that the **Use Demo Data** option is turned off.
4. Under **SERVER**, select **Database Login** in the **Sign in Using** field.
5. Enter data as follows:
   - **Server**: Enter the server name.
     - For **SaaS** clients, this is the URL of the IC-Web instance, for example, *clientname.nexusic.com*.
     - For **on-prem** clients, contact your IT team for the correct server name.
   - **Login**: Enter your username stored in the database.
   - **Password**: Enter your password.



6. Tap **Connect & Save**.

26.3.4 Launch NEXUS IC as an App

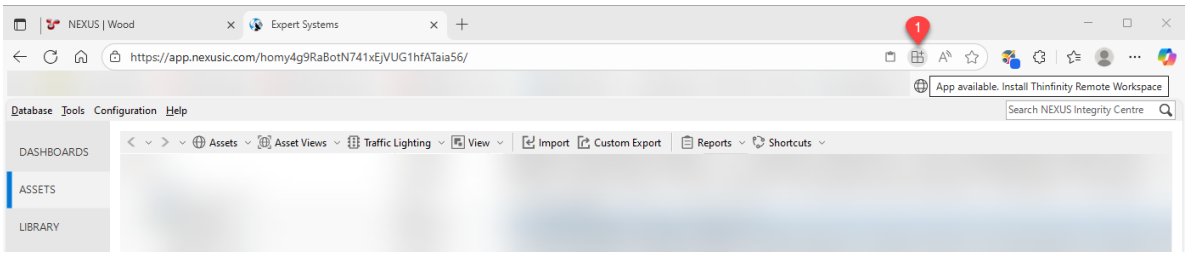
After you log in and open the NEXUS IC application (see *SaaS Login*), it runs in a browser tab by default. If you prefer, you can launch NEXUS IC as an app in its own window using the **Thinfinity Remote Workspace** app.

26.3.4.1 Install and Launch for the First Time

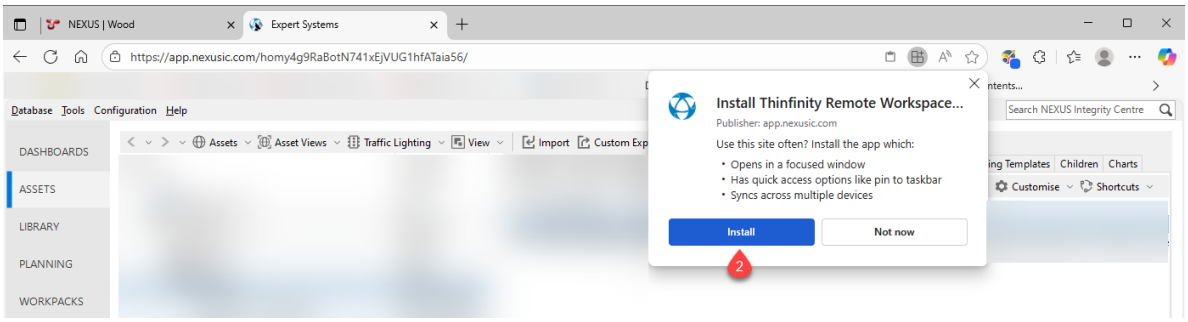
The first time you launch NEXUS IC as an app, you need to install the **Thinfinity Remote Workspace** app. The steps below use Microsoft Edge as an example:

1. Log in and open NEXUS IC in a browser tab following the standard process (see *SaaS Login*).

2. In the address bar, click the icon with the tooltip **Install Thinfinity Remote Workspace**.



3. In the dialog that appears, click **Install**. 2



Result

The application opens in a new Thinfinity Remote Workspace window. Depending on your browser, you may see a message confirming the installation. You may also be asked to allow actions such as creating a desktop shortcut, pinning the app to the taskbar or enabling auto-start on device login. We recommend not pinning the app to the taskbar because it will not launch NEXUS IC automatically. You must open NEXUS IC as an app from the browser each time.

Tip

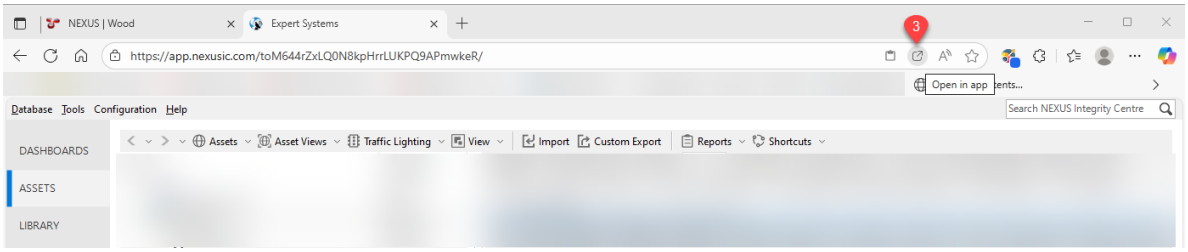
If the application does not fill the entire window, resize the window to refresh the display.

26.3.4.2 Launch After Installation

Once the **Thinfinity Remote Workspace** app is installed, you can launch NEXUS IC as an app using the steps below (examples from Microsoft Edge):

1. Log in and open NEXUS IC in a browser tab following the standard process (see *SaaS Login*).

2. In the address bar, click the icon with the tooltip **Open in app**. 3



3. If prompted, click **Open** in the dialog that appears.

> **Result**
>
> The application opens in a new Thinfinity Remote Workspace window.

26.3.5 SaaS Troubleshooting

If you experience reduced performance or unexpected issues when using the Software as a Service (SaaS) deployment of NEXUS applications, the following guidance may help diagnose and resolve common issues.

26.3.5.1 Latency issues

26.3.5.1.1 Possible causes

Network traffic may be slowed by inspection or security services that intercept or modify data before it reaches the SaaS environment. These may include:

- Deep packet inspection tools
- HTTP-modifying or SSL-decryption services
- VPN solutions, such as GlobalProtect, that route or filter traffic

Such tools can delay or interrupt the real-time communication required for optimal performance.

26.3.5.1.2 Solution

Ask your IT team to configure an exception for the following domain so that traffic is passed directly to the SaaS environment without inspection or modification:

- `*.nexusic.com`

26.3.5.2 Unexpected disconnections

26.3.5.2.1 Possible causes

Some browsers use power-saving features that suspend background tabs after a period of inactivity. When this occurs, NEXUS IC may lose connection to the SaaS environment.

26.3.5.2.2 Solution

To prevent the session from being paused or disconnected, you can:

- Adjust your browser settings to keep tabs active. For guidance, see *Keep NEXUS Active in Browser*.
- Launch NEXUS IC as an app so the session stays active even when the browser is not in focus. See *Launch NEXUS IC as an App*.

26.3.5.2.2.1 Keep NEXUS Active in Browser

Some browsers have power-saving settings that may cause NEXUS to disconnect when left open in the background. You can resolve this issue by adjusting your browser settings to keep tabs active.

The steps below show examples for Microsoft Edge and Google Chrome. If you use a different browser, look for similar settings that prevent sites from being put to sleep or allow tabs to stay active.

26.3.5.2.2.2 Example: Microsoft Edge

1. Open the browser settings (click **Settings** under the three dots in the top right corner).
2. Navigate to *System and performance* → *Performance* → *General* → *Always keep these sites active*.
3. Click **Add site**.
4. In your NEXUS session, check the address bar and copy the base URL (the first part of the address, for example, `https://app.nexusic.com` or `https://app-uks.nexusic.com`).
5. Paste the URL and click **Add**.

26.3.5.2.2.3 Example: Google Chrome

1. Open the browser settings (click **Settings** under the three dots in the top right corner).
2. Navigate to *Performance* → *General* → *Always keep these sites active*.
3. Click **Add**.
4. In your NEXUS session, check the address bar and copy the base URL (the first part of the address, for example, `https://app.nexusic.com` or `https://app-uks.nexusic.com`).
5. Paste the URL and click **Add**.

Note

Modifying these settings may result in increased power consumption and could prevent screensaver activation.

CHAPTER

TWENTYSEVEN

NEXUS SUPPORT

27.1 Creating User Account for NEXUS Support

When you send an email to support@nexusic.com from an email address that has not yet been registered, a new user account is automatically created for the NEXUS Support Portal as follows:

1. You send an email to support@nexusic.com.
2. The system automatically creates an account for you using your email address as your username and generates a ticket for the issue.
3. You receive an email about the account activation, which includes the credentials for logging on to the NEXUS Support Portal.

> **Note**
>
> The credentials that you get in this email are relevant only for the NEXUS Support Portal and are different from the credentials that you use to access NEXUS IC, IC-Web or IC-Inspector.

4. You can log on to the NEXUS Support Portal using the link and credentials provided in the email (see *Log In to NEXUS Support Portal*).
5. You can change the password as required.

Alternatively, you can create a new account for the NEXUS Support Portal on the https://support.nexusic.com/ page by clicking **Register** and submitting your data from there. However, we recommend that you use the process described above.

If you'd like to change your credentials in the future, choose **MY ACCOUNT** in the NEXUS Support Portal.

27.2 Log In to NEXUS Support Portal

Once you have an account in NEXUS Support (see *Creating User Account for NEXUS Support*), you can log in to the NEXUS Support Portal as follows:

1. Open your web browser and navigate to https://support.nexusic.com/.
2. In the **Login** field, enter your email address. This must correspond to the email address you used to create your account or submit an issue, for example, `test.user@company.com`.
3. In the **Password** field, enter your password.

> **Note**
>
> An initial password was sent to your email address when your account was activated. If you can't find this email, click **Lost password** to have a new password sent to your email address.

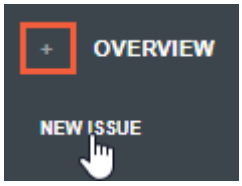
4. If you want your credentials to be remembered for future logins, select **Stay logged in**.
5. Click **Login**.

27.3 Creating a New Issue

When you send an email to **support@nexusic.com**, a new issue is generated automatically.

You can also create a new issue in the NEXUS Support Portal (https://support.nexusic.com/) in one of the following ways:

- On the **HOME** page, choose *Log a new support request*.
- Go to **PROJECTS** on the top of the page, choose **Issues** and select the New issue button in the top right corner of the page.
- Go to **PROJECTS**, jump to a project on the top right corner of the page (for example, *Support*) and choose *NEW ISSUE* under the **+** sign in the top left corner of the screen:



Once you have created an issue, you receive an email notification with the issue details. You can track your issue as described in *Tracking an Issue*.

27.4 Tracking an Issue

Once you have created an issue, you can track its status in the NEXUS Support Portal (https://support.nexusic.com/).

You can track your issues in one of the following ways:

- On the **HOME** page, you can click *View your support requests*. This takes you to the **Issues** page.
- On the **MY PAGE** page, you can see all your reported issues, issues assigned to you or issues that you're watching.
- On the **PROJECTS** page, you can choose **ISSUES** to navigate to the **Issues** page.

From the **Issues** page, you can set up any filter to restrict the list of issues that you want to see based on your requirements:

1. Under **Filters**, in the **Add filter** field, select the criteria based on which you want to filter the issues. You can add as many filters as many you require.
2. Select the values for each filter. If you want to select multiple values for a filter, use the **+** sign next to the values and press the *Shift* or *Ctrl* button on your keyboard for selecting multiple items as required.
3. Under **Options**, choose **Apply** to execute the filtering of issues.
4. If you want to use the same filtering criteria in the future, choose **Save** and specify a name for your filtering.

Whenever an issue is updated by you or the support team, you will receive an email notification detailing the update along with a hyperlink to the issue in the NEXUS Support Portal. To make settings to your email notification settings, choose **MY ACCOUNT** on the top of the NEXUS Support Portal page.

You can contact NEXUS Support to:

- Ask our support team for help when you encounter an issue
- Report a bug
- Request a feature
- Request new user accounts (SaaS customers only)

To use NEXUS Support, you need a user account for the NEXUS Support Portal. A new user account is automatically created when you first write an email to support@nexusic.com. For more information, see *Creating User Account for NEXUS Support*.

You can contact NEXUS Support in one of the following ways:

- Send an email to support@nexusic.com
- Log in to the NEXUS Support Portal (see *Log In to NEXUS Support Portal*) and create an issue (see *Creating a New Issue*)

For information about how to track your issues, see *Tracking an Issue*.

CHAPTER

TWENTYEIGHT

LEGAL INFORMATION

The following pages contain pertinent legal information.

28.1 End User License Agreement

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28.2 Cryptography Declaration

This product includes software developed by the OpenSSL Project for use in the OpenSSL Toolkit (http://www.openssl.org/)

This product includes cryptographic software written by Eric Young (eay@cryptsoft.com). This product includes software written by Tim Hudson (tjh@cryptsoft.com).

28.3 Third-Party Libraries

IC-Web uses third-party libraries that come with the following licenses:

Library	License	Copyright Year	Copyright Owner
GeoJson.js	MIT	2019	Casey Cesari
DateJS	Apache License 2.0	2008-2015	Object.NET, Inc.
Plotly.js	MIT	2022	Plotly, Inc
String Natural Compare	MIT	2015-2016	Nathan Woltman
three.js	MIT	2010-2023	three.js authors
NPM packages	See legal.npm.licenses for information about licenses and copyright notices for each library included.		

Find below the relevant copyright notices. For each library, you can substitute the <Year> and <Copyright Owner> values with the data provided above.

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CHAPTER

TWENTYNINE

GLOSSARY

Ad Hoc Event
A record created when an observation is logged using an ad hoc task. Each ad hoc event appears as a separate entry in an inspector's task list, while the original ad hoc task remains available for future use. Multiple ad hoc events can be recorded against the same ad hoc task, allowing inspectors to document related observations efficiently.

Ad Hoc Task
A task that is not assigned to a specific inspector but is available for use as needed. These tasks are created by engineers or work planners and linked to specific workpacks. If an inspector has an assigned task within a workpack, any related ad hoc tasks will also appear in their task list. When inspectors create an event for an ad hoc task and complete it, the ad hoc task stays in their list and they can create new and multiple events for that. Ad hoc tasks are useful, for example, for recording events like a damage, where inspectors must record any damage they see, even if it's not part of their assigned tasks.

Anomaly
A record that represents a highlighted item of concern on the asset, which has deviated from the intended design or changes the risk and therefore requires to be remediated. You can add actions to associated anomalies within NEXUS and assign completion dates to ensure anomalies are being remediated.

Asset Information Group (AIG)
A form that stores attributes associated with an asset. The visibility of AIGs against each asset is determined based on the asset type of the asset and whether this AIG has been assigned to this asset type. Typically, risk assessment information is stored in AIGs. The relationship between an asset and an AIG is 1-to-1.

Asset Tree
A hierarchy of asset nodes where each asset node represents an individual asset and stores all data related to that specific asset. Each asset node has a single direct parent, and may have multiple children or siblings in the hierarchy. You can build several asset trees and switch between them by selecting the relevant asset view.

Computerised Maintenance Management System (CMMS)
Software used to plan, manage and record maintenance activities, including work orders, assets, schedules and maintenance history, to support the efficient operation and upkeep of equipment and facilities.

Electronic Corrosion Engineer (ECE)
A tool provided by Wood that assists corrosion engineers through the quantitative estimation of corrosion rates and selection of corrosion-resistant materials.

Event
An inspection observation or measurement, or a record of a type of inspection or observation on a specific asset. The attributes of an event are configurable and can be aggregated. Its values can be used, for example, to calculate risks. You can import events in bulk, add them manually or create them from Tasks using IC-Inspector.

Expert System
Predefined database configurations that clients can subscribe to. Expert system databases are maintained by

Wood engineers in-house and are kept up-to-date in line with the latest codes, standards and industry best practices. Once subscribed, clients can get the expert system configurations or their new versions imported into their own databases and can customize them as required.

Factor (Risk Model)
An aggregate element within a risk model that combines the results of one or more Values, Pass Throughs, Calculations and other Factors into a single value using a defined function.

Failure Mode Effect and Criticality Analysis (FMECA)
An analytical tool that helps the identification and evaluation of a system's potential failures.

Field
Single data point or attribute in an AIG or Event table. The value of the field can be defined by the user or calculated dynamically by the system. Each AIG and event consists of one or more fields.

Finding
A record created to highlight possible concerns or significant observations associated with an event. Each finding is reviewed to determine if it has to be escalated and linked to an anomaly or it remains an observation on the source event. A finding can be raised on each event in NEXUS.

Fitness-for-Service (FFS)
An assessment used to determine whether an equipment or a structure is suitable for its intended use and is fit to continue operation.

Global Table
A configuration lookup table in NEXUS that does not have any referential integrity to any other data objects (for example, assets, workpacks). It is primarily used to store lookup values in drop-down lists.

Integrity Operating Window (IOW)
Sets of limits that ensure the safe operation of equipments and acceptable levels of equipment degradation to meet reliability expectations.

Library Item
A record that stores document metadata. Library items are electronic documents that can be linked to data and data types in NEXUS IC. Library item documents can be uploaded in the NEXUS IC library or linked using a URL.

Planning Task
A task in a planning template. Once a planning template is applied, a planning task becomes a task in a workpack.

Planning Template
A record that allows you to set up future workpacks and tasks. Once a planning template is applied, tasks in that planning template are created and assigned to a workpack.

Risk-Based Inspection (RBI)
A risk assessment and management process that aims to manage the risks of equipment failure through methods and inspection plan optimisation.

Reliability-Centred Maintenance (RCM)
A customised maintenance methodology that aims to optimise maintenance programs through the analysis of potential failure modes and their impact on system performance.

Shortcut
Shortcuts in NEXUS IC are sequences of actions that users can activate with a single menu item click.

Task
Represents the requirement for a specific inspection activity (event) to be carried out on a specific asset. Tasks are usually created by an integrity engineer/work planner using NEXUS IC or IC-Web and are completed by inspectors using IC-Inspector.

Sub Asset Information Group (Sub AIG)
A table within an AIG, which allows for a 1-to-many relationship between an asset and sub AIG rows.

Workpack
An umbrella record for a collection of events and tasks.