
Synergi Plant Training

Thickness and corrosion management

Work Package

Two types of work package

➤ **Inspection associated work package**

For managing monitor data, e.g. wall thickness loading, with linked to inspections.

User perform work pack no creation and grouping of inspections.

➤ **Ad hoc work package**

For managing monitor data, e.g. wall thickness loading, without or not linked to inspections

User input ad hoc work pack no directory when generating measurement loading sheets

Inspections and Work Packages

Type	Asset	Work Pack No.	Work Pack Status	Work Pack Category	Work Pack Due Date	Work Pack Complete...	Previous Date
TAG	X-27			Wall Thickness Monitor...	2023/07/13		
TAG	D-211			Wall Thickness Monitor...	2023/05/27		
TAG	8-HM-13-0143-N-A2-1			Wall Thickness Monitor...	2023/07/13		
TAG	D-211			Wall Thickness Monitor...	2023/07/13		
TAG	2-WW-13-0140-S-A2-1			Wall Thickness Monitor...	2023/07/13		
TAG	D-211			Wall Thickness Monitor...	2023/07/13		
TAG	8-HM-13-0143-N-A2-1			Wall Thickness Monitor...	2023/07/13		
TAG	8-HM-13-0179-N-A2-1			Wall Thickness Monitor...	2023/07/13		
TAG	X-171			Wall Thickness Monitor...	2023/07/13		
TAG	D-211			Wall Thickness Monitor...	2023/04/27		
TAG	2-WW-13-0140-S-A2-1	2023/0020	INITIATED	Wall Thickness Monitor...	2025/12/25		
TAG	8-HM-13-0143-N-A2-1	2023/0020	INITIATED	Wall Thickness Monitor...	2023/04/24		

- Inspection activities without assigned work pack no.

- Inspection activities with assigned work pack no (2023/0020)

Assign Work Pack No. – For the First Inspection Activity

The screenshot shows a software interface with a table of work packs and a 'Work Pack' dialog box. The dialog box is open for the selected activity 'X-27'. The fields in the dialog box are:

- Asset: X-27
- Work Pack Link Scope: DNV
- Work Pack No.: 2023/0024
- Work Pack Status: INITIATED
- Previous Data Entry Mgmt.: Not Applicable
- Work Pack Due Date: 2023/07/13

The 'Save' button is highlighted in the dialog box. The table below shows the work packs:

Type	Asset	Work Pack No.	Work Pack Status	Work Pack Category	Work Pack Due Date	Work Pack Complete...	Previous Da
<input checked="" type="checkbox"/>	TAG	X-27		Wall Thickness Monitor...	2023/07/13		
<input type="checkbox"/>	TAG	D-211					
<input type="checkbox"/>	TAG	8-HM-1					
<input type="checkbox"/>	TAG	D-211					
<input type="checkbox"/>	TAG	2-WW-1					
<input type="checkbox"/>	TAG	D-211					
<input type="checkbox"/>	TAG	8-HM-1					
<input type="checkbox"/>	TAG	8-HM-1					
<input type="checkbox"/>	TAG	X-171					
<input type="checkbox"/>	TAG	D-211		Wall Thickness Monitor...	2023/04/27		
Work Pack No.: 2023/0020 - 3 items							
<input type="checkbox"/>	TAG	2-WW-13-0140-S-A2-1	2023/0020	INITIATED	Wall Thickness Monitor...	2025/12/25	
<input type="checkbox"/>	TAG	8-HM-13-0143-N-A2-1	2023/0020	INITIATED	Wall Thickness Monitor...	2023/04/24	

• Step 1. Select one activity

• Step 2. Modify activity

• Step 3. Generate new work pack no.

• Step 4. Save the change

The summary view shows a list of work packs:

- Work Pack No.: - 9 items
- Work Pack No.: 2023/0020 - 3 items
- Work Pack No.: 2023/0022 - 3 items
- Work Pack No.: 2023/0024 - 1 item

The last item is expanded to show a table:

<input type="checkbox"/>	TAG	X-27
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• New work pack 2023/0024

Assign Work Pack No. – For Another Inspection Activity

The screenshot shows a software interface for managing work packs. A 'Work Pack' dialog box is open, showing 'Plant A' selected for the 'Work Pack Link Scope'. Below it, a 'Single Linking Work Pack' dialog box is open, displaying a table with one entry selected. The entry has '2023/0024' as the 'Work Pack No.', 'Inspection' as the 'Inspection Type', 'Wall Thickness Monitoring Campaign' as the 'Category', 'INITIATED' as the 'Work Pack Status', and '2023/07/13' as the 'Work Pack Due Date'. The 'Apply' button is highlighted.

• Step 1. Select one activity

• Step 2. Modify activity

• Step 3. Specify the plant in the link scope, and select the existing work pack no.

• Step 4. select the existing work pack no.

• Step 5. Apply the change

▶	Work Pack No.: - 8 items
▶	Work Pack No.: 2023/0020 - 3 items
▶	Work Pack No.: 2023/0022 - 3 items
▲	Work Pack No.: 2023/0024 - 2 items
<input type="checkbox"/>	TAG X-27
<input checked="" type="checkbox"/>	TAG X-171

• Two activities in work pack 2023/0024

Assign Work Pack No. – Linking Multiple Activities

The screenshot shows a software interface for managing work packs. On the left is a treeview showing a hierarchy of plants (Plant A, B, C, D, E) and their associated inventory groups and production units. The main area displays a 'Multiple Linking Work Pack' dialog box. This dialog has a 'Filter Work Pack List' section with a search bar and a table of existing work packs. One work pack, '2023/0024' with category 'Wall Thickness Monitoring Campaign' and status 'INITIATED', is selected. Below this is a 'Filter Inspection List' section with another search bar and a table of activities. Two activities, 'AG D-211' with category 'Wall Thickness Monitoring Campaign' and due date '2023/07/13', are selected. At the bottom of the dialog are 'Apply' and 'Cancel' buttons. Blue boxes and arrows highlight these elements: the 'Plant A' selection in the treeview, the 'Multiple Linking Work Pack' dialog title, the selected work pack in the first table, the selected activities in the second table, and the 'Apply' button.

• Step 1. Focus on the plant

• Step 2. Click "Multiple Linking Work Pack"

• Step 3. select the existing work pack no.

• Step 4. select activities to add to the work pack.

• Step 5. Apply the change

Work Pack No.: - 4 items

Work Pack No.: 2023/0024 - 4 items			
Type	Asset	Work Pack No.	Work Pack Due Date
<input type="checkbox"/>	TAG	D-211	2023/0024
<input type="checkbox"/>	TAG	X-27	2023/0024
<input type="checkbox"/>	TAG	X-171	2023/0024
<input type="checkbox"/>	TAG	D-211	2023/0024

• Two more activities in work pack 2023/0024

Using Work Pack in Thickness Loading – Scope Definition (1)

The screenshot shows the Synergi Plant software interface. The main window is titled 'Synergi Plant - AIRMS' and has tabs for Facility Data, RBI, Work Pack, Thickness Monitoring, Dashboard, Utilities, and RBI Setup. The 'Work Pack' tab is active, showing 'Workpack Details' for Work Pack No. 2023/0024, with Start Date 2023/07/20 and End Date 2023/07/20. A 'Select UTW workpack' dialog box is open, displaying a table of assets and their parent units. A 'Filter' dialog box is also open, showing a list of filters with 'Next Parent D-211' selected. The 'Filter' dialog box has a warning message: 'Filter is not case sensitive and doesn't work for empty text.' The 'Apply' button is highlighted in the 'Filter' dialog box.

Asset Name	First Parent
CML-01	X-27-Shell
CML-01	8-HM-13-0179-N-A2-1-EL
CML-01	8-HM-13-0179-N-A2-1-EL
CML-01	8-HM-13-0179-N-A2-1-EL
CML-01	8-HM-13-0179-N-A2-1-EL
CML-01	8-HM-13-0179-N-A2-1-EL
CML-01	8-HM-13-0179-N-A2-1-EL
CML-01	8-HM-13-0179-N-A2-1-EL

Filter
<input type="checkbox"/> Asset Name
<input type="checkbox"/> First Parent
<input checked="" type="checkbox"/> Next Parent D-211
<input type="checkbox"/> Measurement Position
<input type="checkbox"/> Design thickness
<input type="checkbox"/> Baseline thickness
<input type="checkbox"/> Baseline date
<input type="checkbox"/> Current thickness
<input type="checkbox"/> Measured date
<input type="checkbox"/> Renewal thickness
<input type="checkbox"/> Measured CR

• Step 1. Focus on the Process Unit

• Step 2. Go to Thickness Monitoring -> Scope Definition

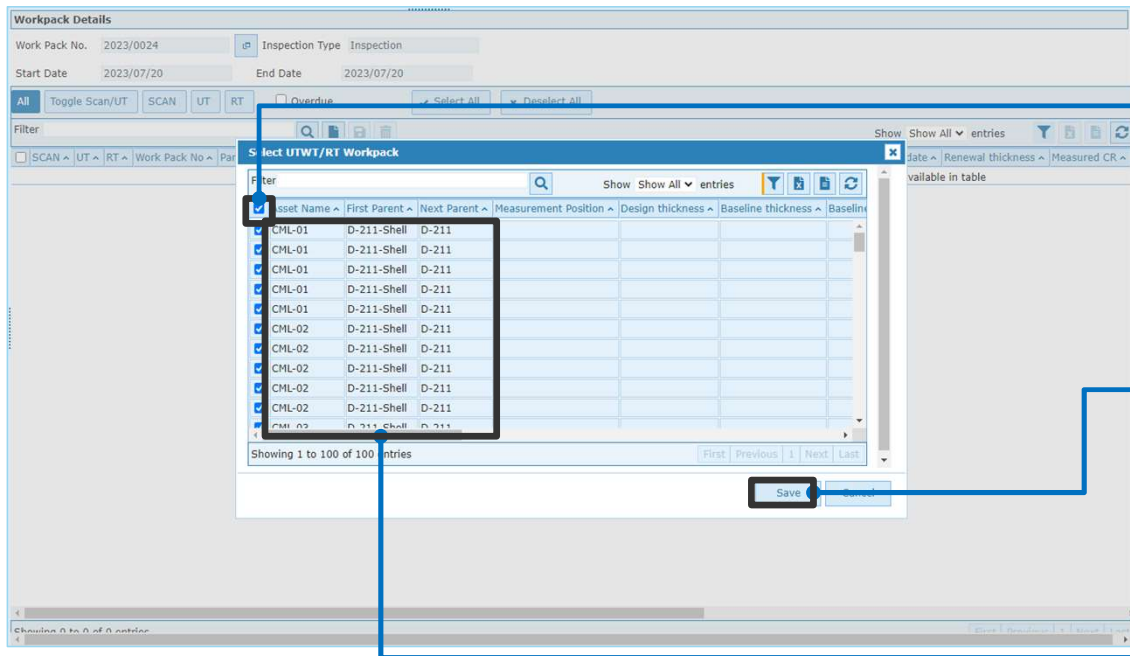
• Step 3. Select the Work Pack No.

• Step 4. Add CMLs

• Step 5. Set the select list filter.

• Step 6. Set Next Parent = D-211 as the filter. Then apply the filter.

Using Work Pack in Thickness Loading – Scope Definition (2)



• Step 1. Click the 'Check All' checkbox to select all rows in the list

• Step 2. Click the 'Save' button to add all CMLs in the list to the scope

• As there are multiple rows for the same CML names from different units, we will apply a result list filter in the next process.

Using Work Pack in Thickness Loading – Scope Definition (3)

The screenshot displays the Synergi Plant software interface. The main window shows 'Workpack Details' for Work Pack No. 2023/0024, Inspection Type Inspection, with Start and End Dates of 2023/07/20. Below this is a table of workpack entries with columns for SCAN, UT, RT, Work Pack No, Parent3, Parent2, Parent1, Asset Name, Design thickness, Baseline thickness, Baseline date, Current thickness, Measured date, Renewal thickness, and Measured CR. A 'Filter' dialog box is open, showing a warning that the filter is not case sensitive and doesn't work for empty text. The 'Filter' dialog has a search field containing 'Unit X01' and a list of filter options. The 'Parent3' option is checked and highlighted with a red box. The 'Apply' button is also highlighted with a red box. A red arrow points from the 'Filter' dialog to the 'Filter' button in the top right corner of the table. Another red arrow points from the 'Apply' button to the 'Filter' dialog.

SCAN	UT	RT	Work Pack No	Parent3	Parent2	Parent1	Asset Name	Design thickness	Baseline thickness	Baseline date	Current thickness	Measured date	Renewal thickness	Measured CR
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	2023/0024	Unit X04	D-211	D-211-Shell	CML-01							
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	2023/0024	Unit X01	D-211	D-211-Shell	CML-01							
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	2023/0024	Unit X03	D-211	D-211-Shell	CML-01							
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	2023/0024	Unit X02	D-211	D-211-Shell	CML-01							
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	2023/0024	Unit X05	D-211	D-211-Shell	CML-01							
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	2023/0024	Unit X01	D-211	D-211-Shell	CML-02							
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	2023/0024	Unit X02	D-211	D-211-Shell	CML-02							
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	2023/0024	Unit X05	D-211	D-211-Shell	CML-02							
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	2023/0024	Unit X03	D-211	D-211-Shell	CML-02							
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	2023/0024	Unit X04	D-211	D-211-Shell	CML-02							
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	2023/0024	Unit X02	D-211	D-211-Shell	CML-03							
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	2023/0024	Unit X04	D-211	D-211-Shell	CML-03							
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	2023/0024	Unit X05	D-211	D-211-Shell	CML-03							
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	2023/0024	Unit X01	D-211	D-211-Shell	CML-03							
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	2023/0024	Unit X03	D-211	D-211-Shell	CML-03							

- Step 1. Click the filter button on the right-top corner of the result list to add result list filter

- Step 2. Set Parent3 to the Process Unit, e.g. Unit X01, then apply the filter.

Using Work Pack in Thickness Loading – Scope Definition (4)

Workpack Details

Work Pack No. 2023/0024 Inspection Type Inspection

Start Date 2023/07/20 End Date 2023/07/20

All Toggle Scan/UT SCAN UT RT Overdue Select All Deselect All

Filter

SCAN	UT	RT	Work Pack No.	Parent3	Parent2	Parent1	Asset Name	Design thickness	Baseline thickness	Baseline date	Current thickness	Measured date	Renewal thickness	Measured CR
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	2023/0024	Unit X01	D-211	D-211-Shell	CML-01							
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	2023/0024	Unit X01	D-211	D-211-Shell	CML-02							
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	2023/0024	Unit X01	D-211	D-211-Shell	CML-03							
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	2023/0024	Unit X01	D-211	D-211-Shell	CML-04							
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	2023/0024	Unit X01	D-211	D-211-Shell	CML-05							
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	2023/0024	Unit X01	D-211	D-211-Shell	CML-06							
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	2023/0024	Unit X01	D-211	D-211-Shell	CML-07							
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	2023/0024	Unit X01	D-211	D-211 Head	CML-08							
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	2023/0024	Unit X01	D-211	D-211 Head	CML-09							
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	2023/0024	Unit X01	D-211	D-211 Head	CML-10							
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	2023/0024	Unit X01	D-211	D-211 Head	CML-11							
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	2023/0024	Unit X01	D-211	D-211 Head	CML-12							
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	2023/0024	Unit X01	D-211	D-211-Shell	CML-13							
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	2023/0024	Unit X01	D-211	D-211-Shell	CML-14							
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	2023/0024	Unit X01	D-211	D-211 Head	CML-15							

Showing 1 to 20 of 20 entries

First Previous 1 Next Last

- After filtered by the selection list and the result list, the CMLs in the scope should be only all CMLs of D-211 for one Process Unit. Also check the number of rows to confirm.

Using Work Pack in Thickness Loading – Generate Template

WT template

Ad hoc

Parent3	Parent2	Parent1	Cml	Reading Procedure	CML	CML_ACTIVE	Spot	Outside Diameter	Nominal Thickness	MAWT	Measured min. thickness	Measured Max. Thickness	Reading date
Unit X01	D-211	D-211-Shell	CML-01	Cml	CML-01	Y			500				
Unit X01	D-211	D-211-Shell	CML-02		CML-02	Y			500				
Unit X01	D-211	D-211-Shell	CML-03		CML-03	Y			500				
Unit X01	D-211	D-211-Shell	CML-04		CML-04	Y			500				
Unit X01	D-211	D-211-Shell	CML-05		CML-05	Y			500				
Unit X01	D-211	D-211-Shell	CML-06		CML-06	Y			500				
Unit X01	D-211	D-211-Shell	CML-07		CML-07	Y			500				
Unit X01	D-211	D-211-Head	CML-08		CML-08	Y			500				
Unit X01	D-211	D-211-Head	CML-09		CML-09	Y			500				
Unit X01	D-211	D-211-Head	CML-10		CML-10	Y			500				
Unit X01	D-211	D-211-Head	CML-11		CML-11	Y			500				
Unit X01	D-211	D-211-Head	CML-12		CML-12	Y			500				
Unit X01	D-211	D-211-Shell	CML-13		CML-13	Y			500				
Unit X01	D-211	D-211-Shell	CML-14		CML-14	Y			500				
Unit X01	D-211	D-211-Head	CML-15		CML-15	Y			500				
Unit X01	D-211	D-211-Head	CML-16		CML-16	Y			500				
Unit X01	D-211	D-211-Head	CML-17		CML-17	Y			500				

- Step 1. Go to Thickness Monitoring -> WT template to generate the template

- Step 2. Select all CMLs in the scope

- Step 3. Generate Excel template

- To use **Ad hoc work pack** without inspection:
 - Check the 'Adhoc' checkbox
 - Type in a 'Work Pack No'
 - Click the 'Add' button to add CMLs
 - Generate Excel template

Input Thickness, Date, and Check the Work Pack No.

Measured min. thickness(mm)	Measured Max. Thickness(mm)	Reading date (yyyy/MM/dd)	Reading Temperature(°C)	Measurement Position	Previous Reading 1 (MM-yy / mm)	Previous Reading 2 (MM-yy / mm)	Baseline Thickness (MM-yy / mm)	Work Pack No
5.71	5.71	2022/04/01	28					2023/0024
5.72	5.72	2022/04/01	28					2023/0024
5.72	5.72	2022/04/01	28					2023/0024
5.68	5.68	2022/04/01	28					2023/0024
5.73	5.73	2022/04/01	28					2023/0024
5.68	5.68	2022/04/01	28					2023/0024
5.73	5.73	2022/04/01	28					2023/0024
5.73	5.73	2022/04/01	28					2023/0024
5.68	5.68	2022/04/01	28					2023/0024
5.73	5.73	2022/04/01	28					2023/0024
5.72	5.72	2022/04/01	28					2023/0024
5.68	5.68	2022/04/01	28					2023/0024
5.73	5.73	2022/04/01	28					2023/0024
5.74	5.74	2022/04/01	28					2023/0024
5.68	5.68	2022/04/01	28					2023/0024
5.73	5.73	2022/04/01	28					2023/0024
5.72	5.72	2022/04/01	28					2023/0024
5.68	5.68	2022/04/01	28					2023/0024
5.72	5.72	2022/04/01	28					2023/0024
5.68	5.68	2022/04/01	28					2023/0024

- In the normal process, inspector / contractor needs to input the min and max thickness, and the reading date

- If you are using the template from any previous work pack, you will need to modify the Work Pack No to match the current work pack you are loading the measurements

Using Work Pack in Thickness Loading – Upload WT Data (1)

The screenshot shows the Synergi Plant software interface. The 'Thickness Monitoring' tab is active. The 'Upload WT data' button is highlighted. An 'Import Preview - Select Reading to Import' dialog box is open, displaying a table of data. The table has the following columns: 'OK - Ready to import', 'Unit', 'D-211 Shell', 'CML - CML', 'Outside Diameter', 'Nominal Thickness', 'MAWT', 'Measured min. thickness', 'Measured Max. Thickness', 'Reading date', and 'Reading Temperature'. The 'OK - Ready to import' column contains green checkmarks for all rows. The 'Import' button is visible at the bottom of the dialog box.

OK - Ready to import	Unit	D-211 Shell	CML - CML	Outside Diameter	Nominal Thickness	MAWT	Measured min. thickness	Measured Max. Thickness	Reading date	Reading Temperature
<input checked="" type="checkbox"/>	Unit 01	D-211 Shell	CML - CML 01 01	602.94	6.07	2.895	5.71	5.71	2022/04/01	
<input checked="" type="checkbox"/>	Unit 01	D-211 Shell	CML - CML 02 02	602.94	6.07	2.895	5.72	5.72	2022/04/01	
<input checked="" type="checkbox"/>	Unit 01	D-211 Shell	CML - CML 03 03	602.94	6.07	2.895	5.72	5.72	2022/04/01	
<input checked="" type="checkbox"/>	Unit 01	D-211 Shell	CML - CML 04 04	602.94	6.07	2.895	5.68	5.68	2022/04/01	
<input checked="" type="checkbox"/>	Unit 01	D-211 Shell	CML - CML 05 05	602.94	6.07	2.895	5.73	5.73	2022/04/01	

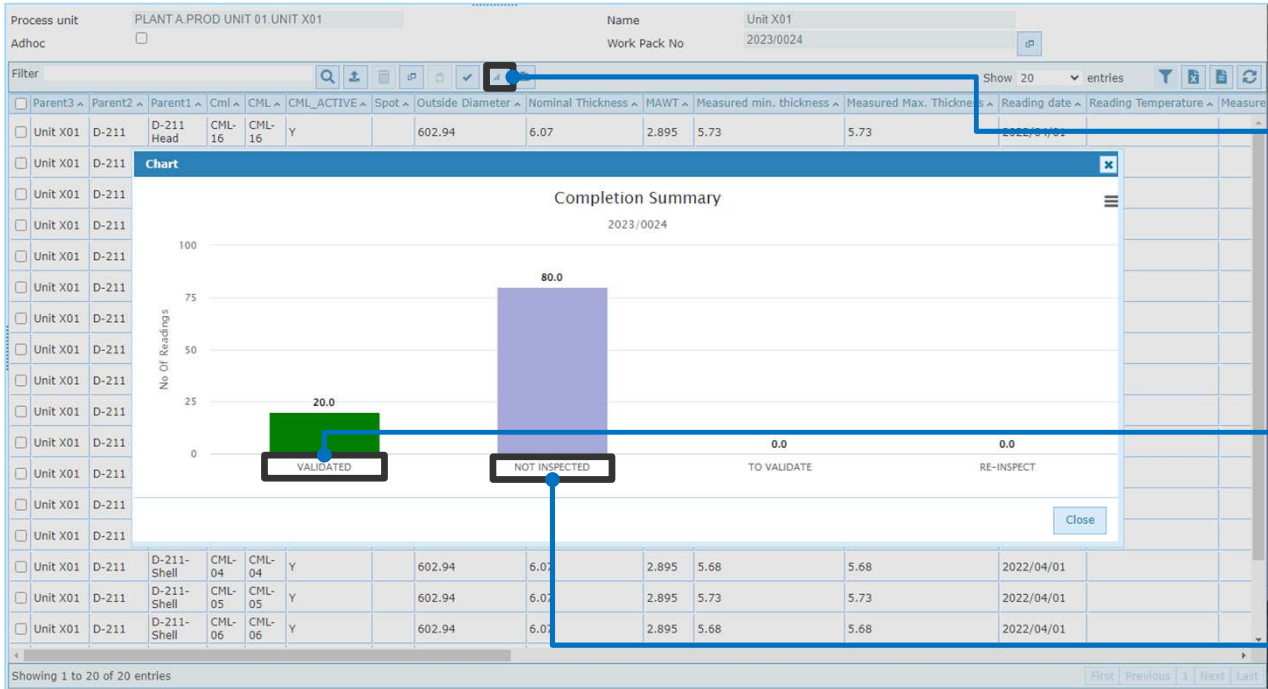
- Step 1. Go to Thickness Monitoring -> Upload WT data

- Step 2. Upload the template with thickness data in it

- Step 3. Select all CML thickness data to import

- Before import the data you should check the validation status and the color of data rows:
 - Green – Acceptable
 - Yellow – Accept with Anomaly
 - Red – Not Acceptable

Using Work Pack in Thickness Loading – Upload WT Data (2)



• Click the Completion Summary button to check the validation completion status

• These readings are the ones being imported

• There are other CMLs defined in the same work pack without thickness to import now, as they were filtered out of the scope

Using Work Pack in Thickness Loading – Upload WT Data (3)

Process unit: PLANT A.PROD UNIT 01.UNIT X01
 Name: Unit X01
 Adhoc:
 Work Pack No: 2023/0024

Filter: [Search, Filter, Refresh, Print, Export]

Parent3	Parent2	Parent1	Cml	CML_ACTIVE	Spot	Outside Diameter	Nominal Thickness	MAWT	Measured min. thickness	Measured Max. Thickness
Unit X01	D-211	D-211	CML-01	Y		602.94	6.07	2.895	5.73	5.73
Unit X01	D-211	D-211	CML-02	Y		602.94	6.07	2.895	5.73	5.73
Unit X01	D-211	D-211	CML-03	Y		602.94	6.07	2.895	5.73	5.73
Unit X01	D-211	D-211	CML-04	Y		602.94	6.07	2.895	5.73	5.73

Validation Dialog:

Validation Status: ALL
 Validation Rule: ALL

Cml	Tag	Process unit	Production unit
<input checked="" type="checkbox"/>	D-211	Unit X01	Prod Unit 01
<input type="checkbox"/>	D-211	Unit X01	Prod Unit 01
<input type="checkbox"/>	D-211	Unit X01	Prod Unit 01
<input type="checkbox"/>	D-211	Unit X01	Prod Unit 01

Showing 1 to 20 of 20 entries

Reading Details | Validation Status

Sequence	Rule Name	Description	Status	
<input type="checkbox"/>	1	READ DATE IN PAST	Measurement read date must be in past	Acceptable data
<input type="checkbox"/>	2	WT ALERT 1 - ABOVE 50 PERCENT NWT	Measured thickness exceeds 50% of Design thickness	Acceptable data
<input type="checkbox"/>	3	WT ALERT 2 - READING BELOW MAWT	Measured thickness below renewal thickness.	Acceptable data

Showing 1 to 4 of 4 entries

Acceptable data
 Accept With Anomaly
 Validate on Paper
 Reinspection to be done
 Not yet validated

• Step 1. Click the Validation button to check the validation status of CMLs against the validation rules

• Step 2. Select Validation Status and Validation Rule filters

• Step 3. Select the CML to check its validation status

• Step 4. Override the validation status for a rule if required.

Using Work Pack in Thickness Loading – Transfer Data

The screenshot shows the Synergi software interface for 'Thickness Monitoring'. The top menu bar includes 'Synergi Plant : AIRMS', 'Facility Data', 'RBI', 'Work Pack', 'Thickness Monitoring', 'Dashboard', 'Utilities', and 'RBI Setup'. The 'Transfer WT data' button is highlighted in the 'Thickness Monitoring' menu. The main window displays a table with columns: 'Process unit', 'Status', 'Parent3', 'Parent2', 'Parent1', 'Cml', 'CML', 'CML_ACTIVE', 'Spot', 'Outside Diameter', 'Nominal Thickness', 'MAWT', 'Measured min. thickness', 'Measured Max. Thickness', and 'Reading date'. A confirmation dialog box is open, asking 'Do you want to transfer the selected reading data?' with 'Transfer' and 'Cancel' buttons. The 'Transfer' button is highlighted.

- Step 2. Select all CML thickness data to transfer

- Step 3. Click the Transfer button

- Step 4. Confirm the data transfer

- Note: Before data transfer, all imported data are still in the buffer area, not affecting the asset data

- Step 1. Go to Thickness Monitoring -> Transfer WT data

Using Work Pack in Thickness Loading – Load 2nd Readings

The screenshot shows the Synergi software interface for 'Plant A'. The 'Thickness Monitoring' tab is active. The 'Upload WT data' button is highlighted in the top menu. A table of CML thickness data is displayed, with several rows selected. A 'Confirmation' dialog box is open, asking 'Do you want to delete the selected record(s)?' with 'Delete' and 'Cancel' buttons. The 'Delete' button is highlighted.

Unit X01	D-211	D-211	CML	CML	CML_ACTIVE	Spot	Outside Diameter	Nominal Thickness	MAWT	Measured min. thickness	Measured Max. Thickness	Reading date	Reading Temperature	Measure
Unit X01	D-211	D-211	CML-16	CML-16	Y		602.94	6.07	2.895	5.73	5.73	2022/04/01		
Unit X01	D-211	D-211	CML-17	CML-17	Y		602.94	6.07	2.895	5.72	5.72	2022/04/01		
Unit X01	D-211	D-211	CML-18	CML-18	Y		602.94	6.07	2.895	5.68	5.68	2022/04/01		
Unit X01	D-211	D-211	CML-19	CML-19	Y		602.94	6.07	2.895	5.72	5.72	2022/04/01		
Unit X01	D-211	D-211	CML-20	CML-20	Y		602.94	6.07	2.895	5.68	5.68	2022/04/01		
Unit X01	D-211	D-211	CML-08	CML-08	Y		602.94	6.07	2.895	5.68	5.68	2022/04/01		
Unit X01	D-211	D-211	CML-09	CML-09	Y		602.94	6.07	2.895	5.71	5.71	2022/04/01		
Unit X01	D-211	D-211	CML-10	CML-10	Y		602.94	6.07	2.895	5.72	5.72	2022/04/01		
Unit X01	D-211	D-211	CML-11	CML-11	Y		602.94	6.07	2.895	5.72	5.72	2022/04/01		
Unit X01	D-211	D-211	CML-12	CML-12	Y		602.94	6.07	2.895	5.68	5.68	2022/04/01		
Unit X01	D-211	D-211	CML-15	CML-15	Y		602.94	6.07	2.895	5.68	5.68	2022/04/01		
Unit X01	D-211	D-211	CML-01	CML-01	Y		602.94	6.07	2.895	5.71	5.71	2022/04/01		
Unit X01	D-211	D-211	CML-02	CML-02	Y		602.94	6.07	2.895	5.72	5.72	2022/04/01		
Unit X01	D-211	D-211	CML-03	CML-03	Y		602.94	6.07	2.895	5.72	5.72	2022/04/01		
Unit X01	D-211	D-211	CML-04	CML-04	Y		602.94	6.07	2.895	5.68	5.68	2022/04/01		
Unit X01	D-211	D-211	CML-05	CML-05	Y		602.94	6.07	2.895	5.73	5.73	2022/04/01		
Unit X01	D-211	D-211	CML-06	CML-06	Y		602.94	6.07	2.895	5.68	5.68	2022/04/01		

• Step 2. Select all CML thickness data to delete

• Step 3. Click the Delete button

• Step 4. Confirm the Deletion of imported data

• Step 1. Go back to Thickness Monitoring -> Upload WT data

• After deleting the imported data you can upload and import more thickness reading templates.

Using Work Pack in Thickness Loading – Data Re-calculation

The screenshot shows the Synergi software interface with the 'Data recalculation' button highlighted. A 'Batch Recalculation Status' window is open, showing a table of assets and their calculation status. The table has the following columns: Asset, Status, Message, Updated By, and Updated On.

Asset	Status	Message	Updated By	Updated On
PLANT A.PROD UNIT 01.D-211.CML-02	INPROGRESS	DataSheet:Corrosion Rates	MGR	2023/06/22 3:50
PLANT A.PROD UNIT 01.X-27.CML-05	FINISHED	5 DataSheet Recalculated	MGR	2023/06/22 3:50
PLANT A.PROD UNIT 01.D-211.CML-16	FINISHED	5 DataSheet Recalculated	MGR	2023/06/22 3:50
PLANT A.PROD UNIT 01.X-27.CML-06	INPROGRESS	DataSheet:Corrosion Rates	MGR	2023/06/22 3:50
PLANT A.PROD UNIT 01.D-211.CML-01	FINISHED	5 DataSheet Recalculated	MGR	2023/06/22 3:50
PLANT A.PROD UNIT 01.D-211.CML-20	FINISHED	5 DataSheet Recalculated	MGR	2023/06/22 3:50
PLANT A.PROD UNIT 01.D-211.CML-02	FINISHED	5 DataSheet Recalculated	MGR	2023/06/22 3:50
PLANT A.PROD UNIT 01.X-171.CML-13	FINISHED	5 DataSheet Recalculated	MGR	2023/06/22 3:50
PLANT A.PROD UNIT 01.X-171.CML-14	FINISHED	5 DataSheet Recalculated	MGR	2023/06/22 3:50
PLANT A.PROD UNIT 01.X-171.CML-15	FINISHED	5 DataSheet Recalculated	MGR	2023/06/22 3:50
PLANT A.PROD UNIT 01.X-171.CML-16	FINISHED	5 DataSheet Recalculated	MGR	2023/06/22 3:50
PLANT A.PROD UNIT 01.X-171.CML-05	FINISHED	5 DataSheet Recalculated	MGR	2023/06/22 3:50
PLANT A.PROD UNIT 01.X-171.CML-06	FINISHED	5 DataSheet Recalculated	MGR	2023/06/22 3:50
PLANT A.PROD UNIT 01.X-171.CML-07	FINISHED	5 DataSheet Recalculated	MGR	2023/06/22 3:50
PLANT A.PROD UNIT 01.X-171.CML-08	FINISHED	5 DataSheet Recalculated	MGR	2023/06/22 3:50
PLANT A.PROD UNIT 01.X-171.CML-09	FINISHED	5 DataSheet Recalculated	MGR	2023/06/22 3:50
PLANT A.PROD UNIT 01.X-171.CML-10	FINISHED	5 DataSheet Recalculated	MGR	2023/06/22 3:50
PLANT A.PROD UNIT 01.X-171.CML-11	FINISHED	5 DataSheet Recalculated	MGR	2023/06/22 3:50
PLANT A.PROD UNIT 01.X-171.CML-12	FINISHED	5 DataSheet Recalculated	MGR	2023/06/22 3:50
PLANT A.PROD UNIT 01.X-171.CML-01	FINISHED	5 DataSheet Recalculated	MGR	2023/06/22 3:50

• Step 2. Select CML as the asset level to recalculate

• Step 3. Click the Recalculate button

• The calculation status window will show the calculate of data

• You can close the calculation status window and work on other things if the calculation takes more time

• Step 1. Go back to Thickness Monitoring -> Data recalculation

CML Remaining Life Calculation

The screenshot displays the 'CML-01: CML Detail' interface. The top navigation bar includes 'Synergi Plant : AIRMS', 'Facility Data', 'RBI', 'Work Pack', 'Thickness Monitoring', 'Dashboard', 'Utilities', and 'RBI Setup'. The main area is divided into sections: 'General Information', 'MAWT', and 'Corrosion Rate & Remaining Life Calculation'. The 'Remaining Life' tab is highlighted with a red box, and a blue arrow points from a text box on the right to this tab.

CML-01: CML Detail											
CML	CML-01	Active?	<input checked="" type="checkbox"/>	Linked Asset	D-211-Shell	Asset Type	ELEMENT				
Service start date	1993/01/01										
Description											
General Information											
Drawing Number				Drawing Ref Number							
Spot				Position / Location							
Rqrd Insp Method(s)	UT			Measurement Position							
MAWT											
Nominal Thickness	6.07	m	Corrosion Allowance	3.17	m	Max. Design Pressure	3.45	bar	Outside Diameter	0.6	m
MAWT Basis	Nominal Minus Corrosion Allowance										
Structural Tmin			Pressure Tmin			Minimum thickness - expert					
MAWT	2.9		m								
Corrosion Rate & Remaining Life Calculation											
Min. Measured Reading	5.66	m	Reading Date	2023/04/13	Position						
Short Term Corrosion Rate	0.048	mm/yr	User Corrosion Rate			Corrosion Rate Basis	*Use maximum of short te				
Long Term Corrosion Rate	0.048	mm/yr	Max. Measured Corrosion Rate	0.048	mm/yr	Corrosion Rate Used	0.048	mm/yr	CR Source	STCR	
Remaining Life	57.08	yrs	Retirement Date	2081/03/14	Interval Driver	*0.5					
Inspection interval - calculated	29	yrs	Next inspection date - calculated	28/03/2052	User inspection interval			yrs	Next inspection date	2052/03/28	

• After thickness data are imported, transferred, and re-calculated, you can go to the CML and check the Remaining Life result.

• Note: The current configuration will only calculate the result when there are 2 measurements loaded

CML T-min Calculation

CML-01: CML Detail

CML: CML-01 Active? Linked Asset: D-211-Shell Asset Type: ELEMENT

Service start date: 1993/01/01

Description:

Remaining Life | **Tmin Calculation** | Responsibility

Design Data

Type: Cylindrical Shell

Nominal Thickness: 6.07 mm Corr. Allowance: 3.175 mm Outer Diameter: 2603 mm Joint Efficiency: 0.85

Max. Design Pressure: 3.447 barg Max. Design Temp.: 150 °C

Mechanical Allowance: mm Allowable Stress Design Factor: 3.75 Pipe Design Factor:

Material Specification

Material Category: Carbon Steel Material: SA-516 \ Grade: 70 Design Code: Type of Joint:

Max. Allow. Stress: 3.75 MPa Tensile Strength: 0 MPa Temp. Coefficient: 0

Quality Factor: Yield Stress: MPa Weld Joint Reduction Factor: 1

Formula Input

Tmin formula: $(P \cdot D) / (2 \cdot ((S \cdot E) - (0.6 \cdot P)))$

Max. Design Pressure (P): 3.447 barg Inner Diameter (D): 2590.86 mm Joint Efficiency (E): 0.85 Max. Allow. Stress (S): 3.75 MPa

Tmin calculation

Calculated Min. Thickness: 149.811 mm

Including gauging tolerance: mm

- There is a configurable Tmin Calculation engine to calculate the Tmin based on various formula

- For MAWT, there are different options:
 - Nominal – CA
 - Structure Tmin
 - Pressure Tmin
 - Min of Structure and Pressure Tmin

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