



User Manual

QUALITY ANALYSIS

PROPLANNER

March 29, 2023

By: Proplanner Team

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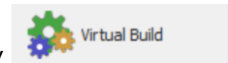
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QUALITY ANALYSIS IN VIRTUAL BUILD MODULE

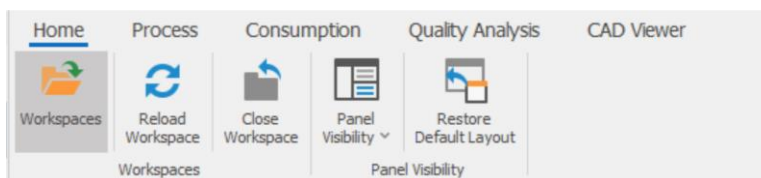
1. WORKSPACE

Virtual Build works on the concept of Workspace, which includes assigning one or multiple Routings and CAD files. CAD files are not a mandatory requirement to create a workspace.

1.1 Open the Assembly Planner application, and navigate to Virtual Build Library

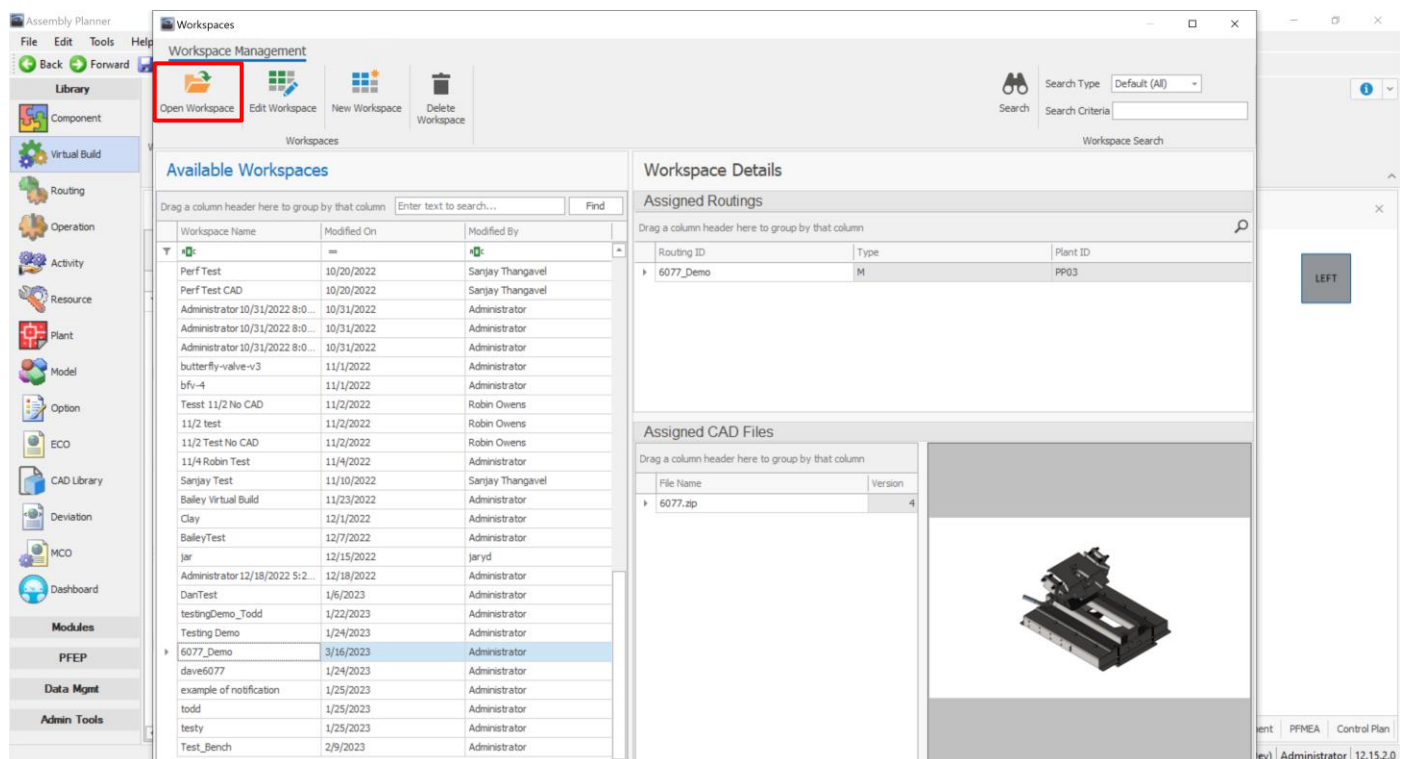


1.2 Click on Workspaces from the ribbon.



1.3.1 Open existing Workspace

- Select the Workspace from the available list of Workspaces (left).
- Respective routing and CAD file details are shown on the right side.
- Click Open Workspace from the Workspace Management ribbon> Application will navigate the user to the Virtual Build Module.





1.3.2 Create new Workspace

a. Navigate to New Workspace> Add Routings

The screenshot shows the 'Create New Workspace' dialog box. The 'Define Workspace Details' tab is selected. It contains a 'Workspace Name' input field, two buttons labeled 'Add Routings' and 'Add CAD Files', and a 'Clear Form' button with a red X icon.

- i. Select the required Routing to be added to the Workspace and click the add selected button.
 - o Users can select one or more Routings.
 - ii. If a new Routing needs to be added, right-click on the Routing list> Click Add New> Update the Routing details> Click OK> Refresh the Routing list> Now, new Routing will be available for the workspace selection.
- b. If the user needs to add CAD files, navigate to Complete Selections> Add CAD Files
- i. CAD Files are not mandatory to create a workspace or to work in Virtual Build module.
 - ii. Users can select more than one CAD files.

The screenshot shows the 'Create New Workspace' dialog box with the 'Define Workspace Details' tab. The 'Workspace Name' is '6077_Demo'. The 'Routing Search' section is expanded, showing a list of routings. The 'Routing Assignments' section shows a table of assigned routings.

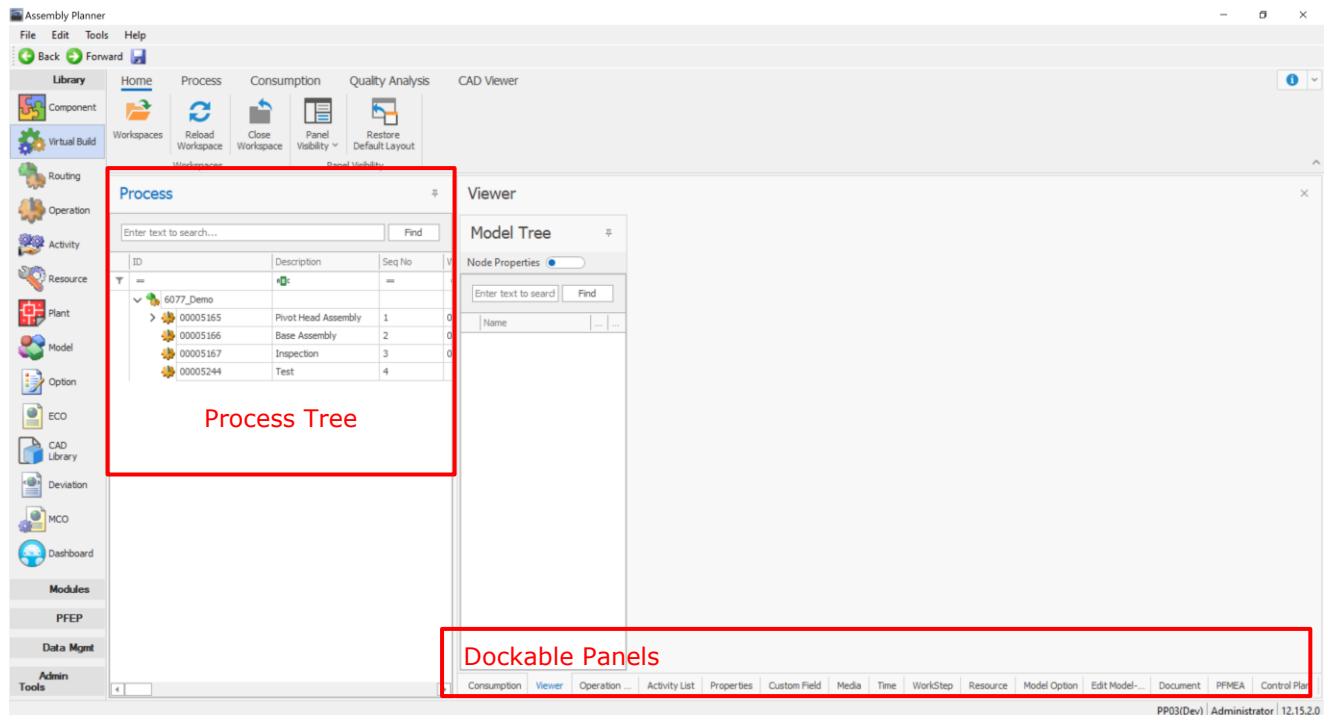
ID	Routing Type	Description	Plan
00004317		Autosideab	F
00004755		Head Trailer Finish b	F
01-HT-Finish	M	DUCATO DESTRO	F
37.391.000	M	DUCATO DESTRO	F
37.391.000 REV1	M	DUCATO DESTRO	F
6077 Sanjay	M		F
6077.1	M		F
6077_Demo	M		F
6077_PA	M	Process Auth.	F

Up	Down	Remo...	Routing ID	Description	Type	Plant ID	MultiUserStat...
↑	↓	×	6077_Demo		M	PP03	CheckedOut

- c. Give a Workspace name.
- d. Click Create New Workspace> Application will take the user to the Virtual Build module.

2. NAVIGATING IN VIRTUAL BUILD

- Process Tree (Left): Encompasses Routing, Operations/ Work Stations, activities, and detailed work steps.
- Process Panels (Right).
- Panel Docking: Each panel can be dragged and docked according to user comfort. Very useful when the user has multiple screens to work with.



- Ribbon Control
 - Home
 - Panel Visibility – Users can turn the visible panels on/off.
 - Restore Default Layout – Takes the user back to the system's default view.
 - Process
 - Actions – Process check in/out.
 - Add/ Remove – Add process data (Operation/ Activity/ Workstep) based on process tree selection.
 - Move/ Copy – Move or copy the selected process.
 - Quality Analysis
 - Manage Revisions – Revisions library for the selected sheet/ process.
 - Import/ Copy - For bulk upload of QA data (Note: Templates need to be defined for this function to work, contact ProPlanner support).

- Reports – QA Report (WYSIWYG), Revision comparison (highlights adds/changes between selected revisions).
- Header Layout – Customize view for header layout.
- Load Default View – This takes the user back to the company-specific default view of QA sheets. (Note: All the customizations done to the QA sheets will be gone)

3. PROCESS AUTHORIZING IN VIRTUAL BUILD

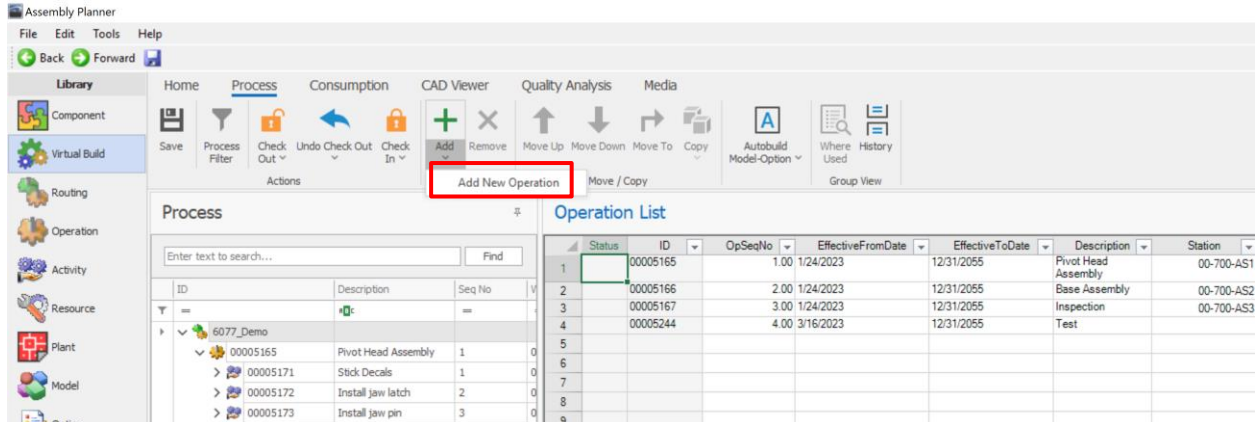
Quality analysis (PFMEA and Control Plans) can be performed on Routing, Operation, and Activity levels. For the users to start entering quality-related data, their corresponding process must be defined.

3.1 Routing

- Already defined when creating a workspace.

3.2 Operation

- Select the Routing from the process tree (Routing must be checked out).



The screenshot shows the Assembly Planner software interface. The 'Process' ribbon is active, and the 'Add New Operation' button is highlighted with a red box. The 'Operation List' table is visible, showing a list of operations with columns for Status, ID, OpSeqNo, EffectiveFromDate, EffectiveToDate, Description, and Station.

Status	ID	OpSeqNo	EffectiveFromDate	EffectiveToDate	Description	Station
1	00005165	1.00	1/24/2023	12/31/2055	Pivot Head Assembly	00-700-AS1
2	00005166	2.00	1/24/2023	12/31/2055	Base Assembly	00-700-AS2
3	00005167	3.00	1/24/2023	12/31/2055	Inspection	00-700-AS3
4	00005244	4.00	3/16/2023	12/31/2055	Test	
5						
6						
7						
8						
9						

- Adding/ Editing Operations

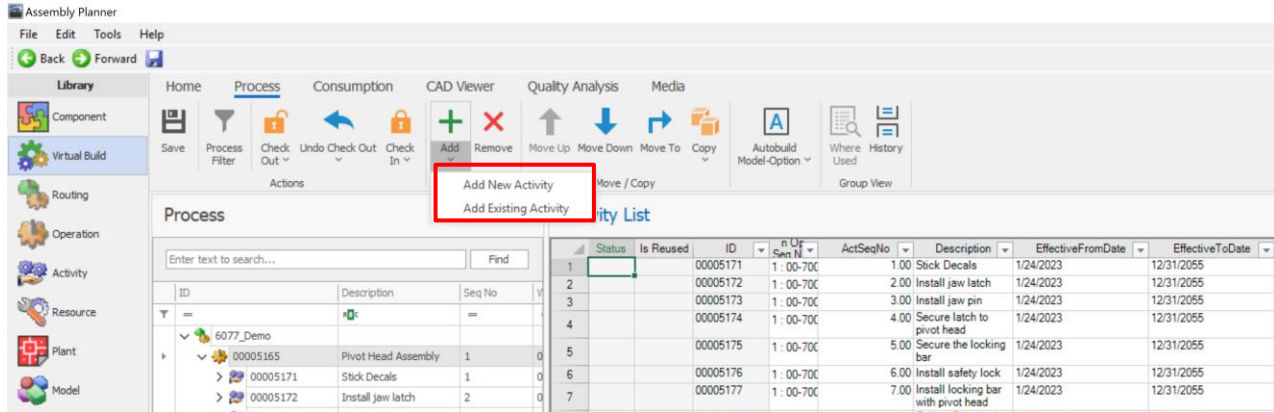
- Navigate to process ribbon> Add Operation> Update the Operation details> Ok (OR)
- Open Operations list panel> update the Operations list> Click save

Key Fields: OpSeqNo, Description, Workstation, and Effective From/To Dates



3.3 Activity

- a. Select the required Operation from the process tree (Selected Operation must be checked out).



- b. Adding/ Editing Activities

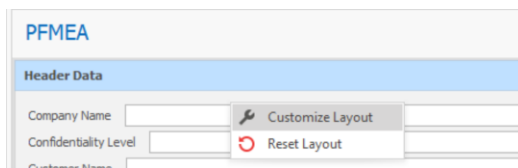
- i. Navigate to the process ribbon> Add New Activity> Update the Activity details> Ok (OR)
- ii. Open Activity list panel> Add/ update the activity list> Click save

Key Fields: ActSeqNo, Description, and Effective From/To Dates

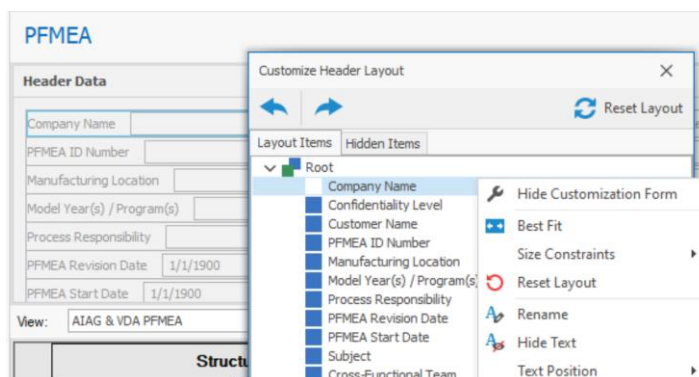
4. CUSTOM VIEW FUNCTIONS (QA MODULE)

4.1 Header Layout Customize view

- a. Right-click on the QA sheet header data or select Header layout menu button from QA ribbon.



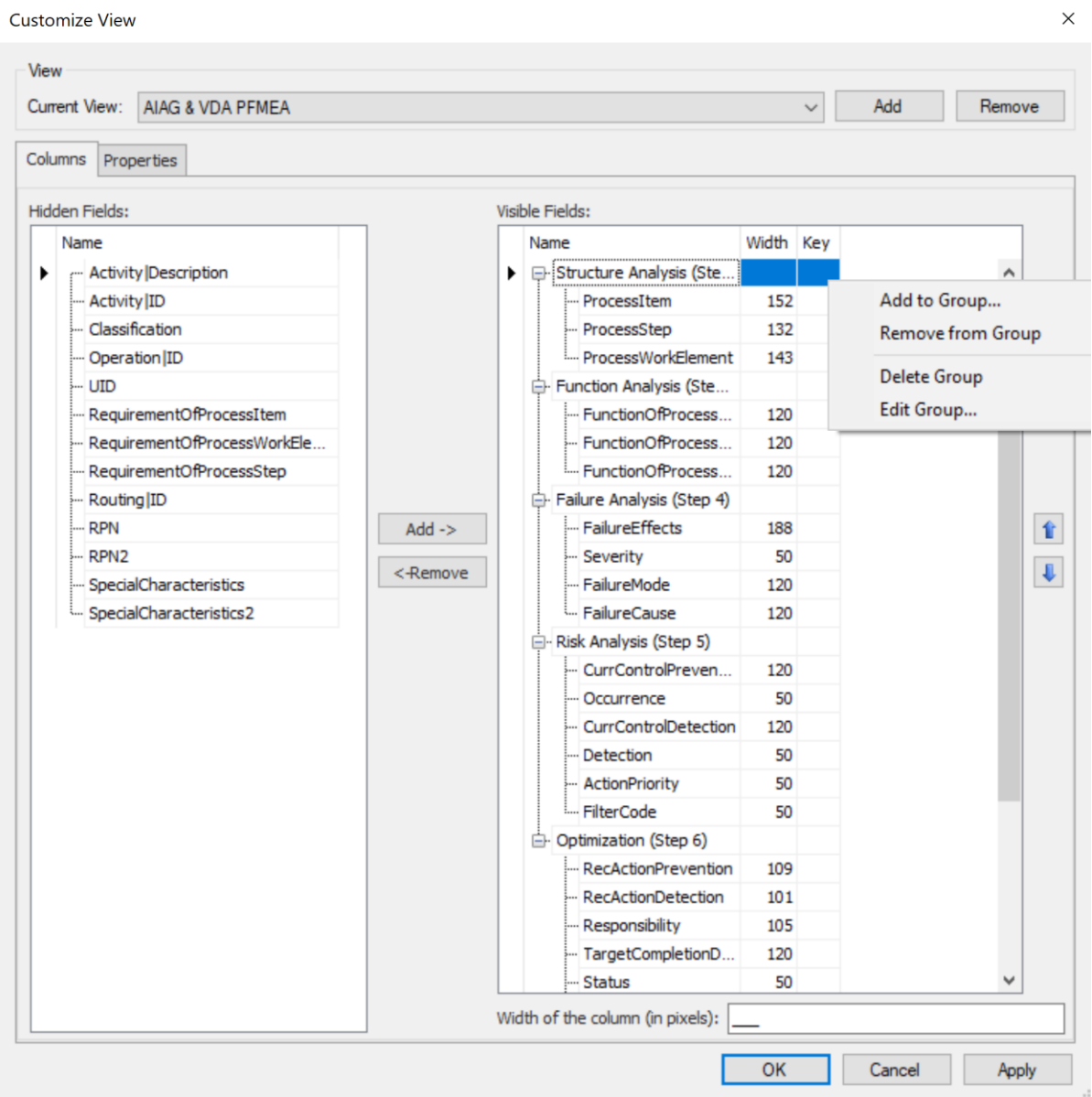
- b. Customize header layout popup will open, where various restructuring functions can be performed.



- c. Users can also restructure the layout using drag and drop.

4.2 QA Sheet Customize view

- a. Right-click> Customize view on the QA Sheet that needed to be customized.
 - b. Columns tab:
 - i. Fields can be made hidden and visible, and their sequence can be altered
 - ii. Fields can be clustered into a group or multiple groups.
 - o Select a field or multiple fields that need to be grouped.
 - o Right-click on the visible fields section, where users can add the selected fields to a group.
- (Note: A group can only be deleted and cannot be removed)



c. Properties tab

- i. Header/ Column properties of the selected group or fields can be edited.
- ii. Select a field or multiple fields (left).
- iii. Update the properties and click OK, for the customizations to be applied.

Customize View X

View

Current View: AIAG & VDA PFMEA ▼ Add Remove

Columns Properties

Visible Fields:

Name	Width	Key
Structure Analysis (Ste...		
... ProcessItem	152	
... ProcessStep	132	
... ProcessWorkElement	143	
Function Analysis (Ste...		
... FunctionOfProcess...	120	
... FunctionOfProcess...	120	
... FunctionOfProcess...	120	
Failure Analysis (Step 4)		
... FailureEffects	188	
... Severity	50	
... FailureMode	120	
... FailureCause	120	
Risk Analysis (Step 5)		
Optimization (Step 6)		

Column Header Row Settings

Row No: 1 ▼ Row Height: 30

Column Header Settings

Back Color: 230, 230, ... ▼ Border Color: 0, 0, 0 ▼

Fore Color: 0, 0, 0 ▼ Border Width: 1

Font Name: Microsoft Sans S... ▼ Border Sides: Left ▼

Font Size: 10 ▼ VAlignment: Center ▼

Font Style: B I U ab ▼ HAlignment: Center ▼

Word Wrap: ☒ Rotation Angle: 0

Column Settings

Back Color: 0, 255, 25... ▼ Border Color: 0, 0, 0 ▼

Fore Color: 0, 0, 0 ▼ Border Width: 1

Font Name: Microsoft Sans S... ▼ Border Sides: ▼

Font Size: 8 ▼ VAlignment: General ▼

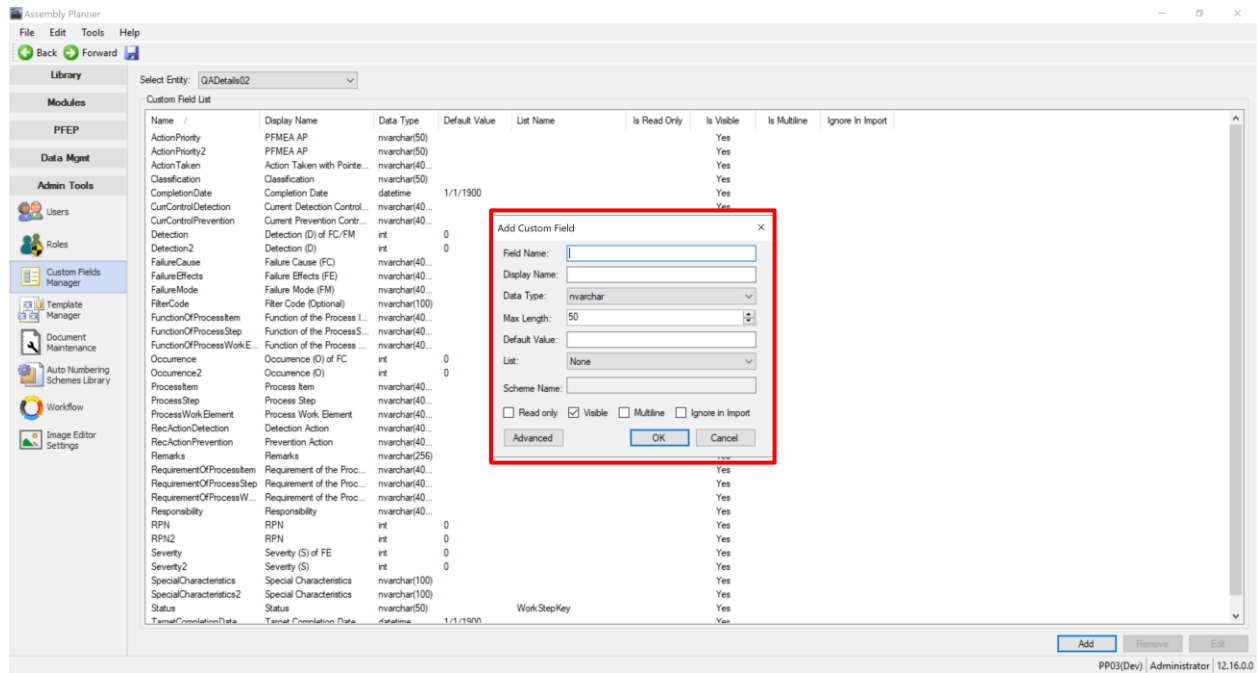
Font Style: B I U ab ▼ HAlignment: General ▼

OK Cancel Apply

5. CUSTOM FIELD FUNCTIONS (QA MODULE)

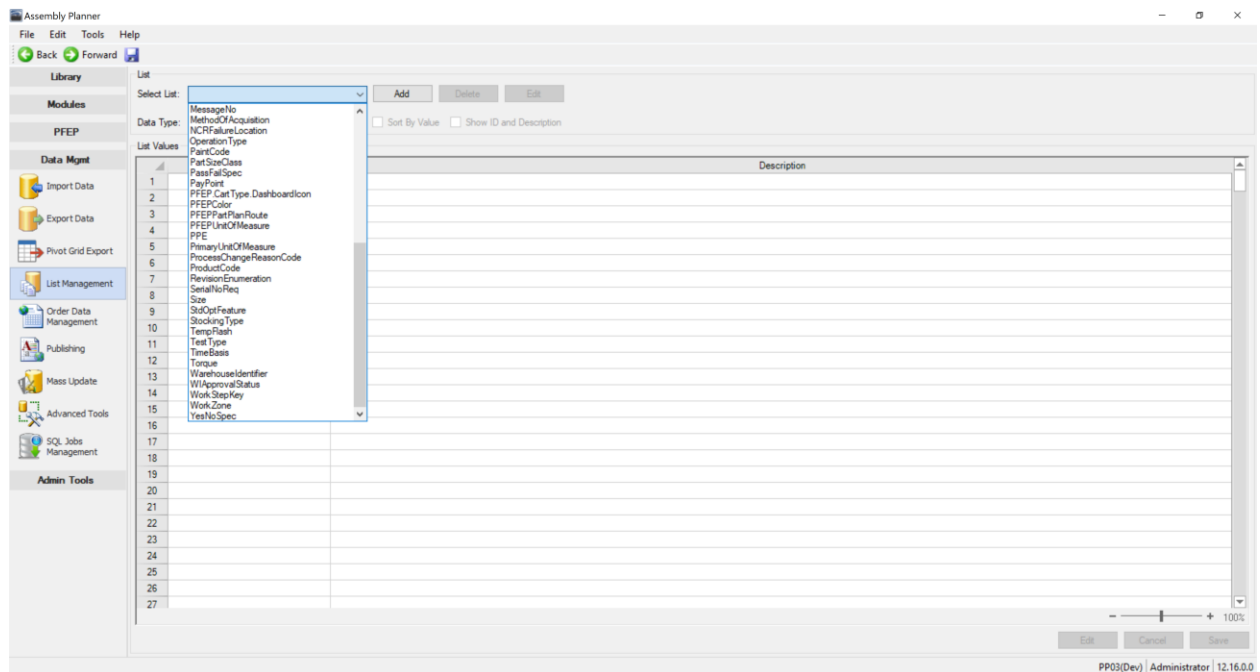
5.1 Adding a new custom field

- a. Navigate to Admin Tools> Custom Fields Manager> Select the entity where the respective field is present.
- b. Click Add> Update the field properties and click Ok.
- c. Restart the application for the changes to get applied.



5.2 Adding dropdown list values to a field

a. Navigate to Data Mgmt > List Management



b. Updating existing list values

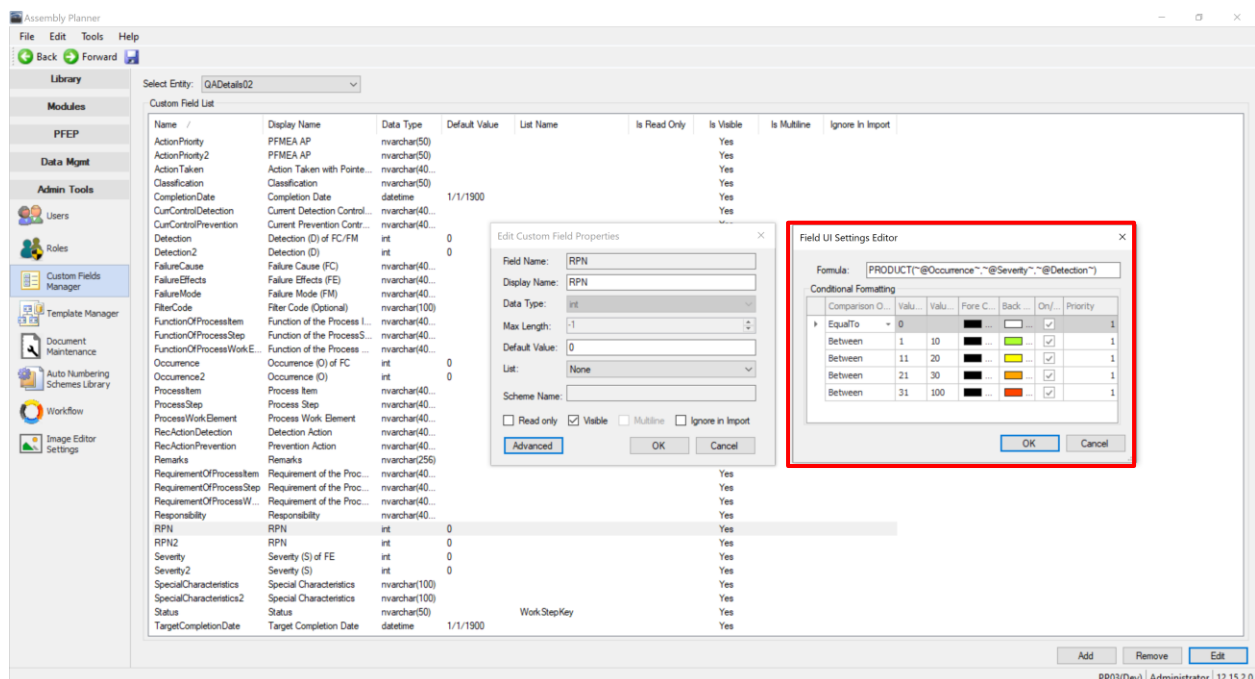
i. Search for the list, click edit, update the values, save, and restart the application

c. Adding new list

- Click add, name the list, update the list values sheet, and save.
- Now, the created list needs to get mapped to a field.
- Navigate to Admin Tools> Custom Fields Manager> Select the entity where the respective field is present.
- Select the field> Edit> List> Select the respective list you created> Click Ok.
- Restart the application for the changes to get applied.

5.3 Adding Formulas and Conditional Formatting to a field

- Navigate to Admin Tools> Custom Fields Manager> Select the entity where the respective field is present.
- Select the required field> Click edit> Advanced (a new popup window will open).



c. Adding Formula

- In the formula field, type the formula that needs to be added.
- Ex: Multiplication formula> PRODUCT(~@FieldName1~,~@FieldName2~,.....)
- Check with ProPlanner support for other formulas.

d. Adding Conditional Formatting

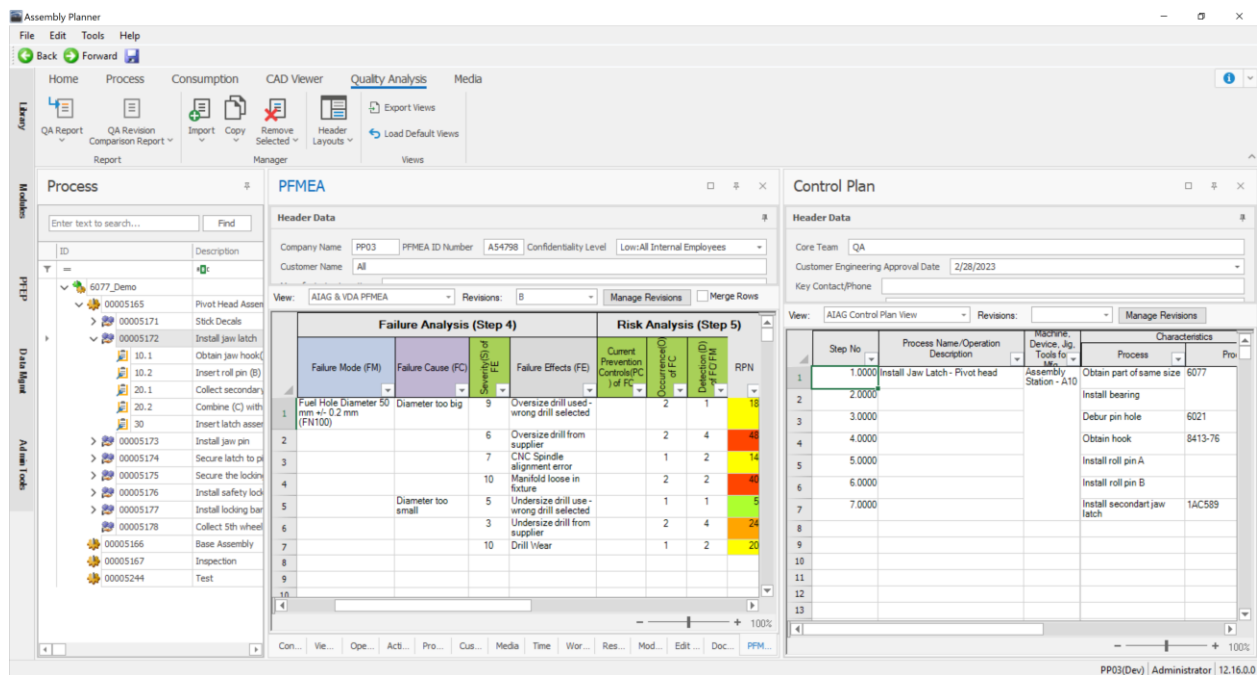
- Right-click on the conditional formatting space.
- Add instance> Fill in the required formatting options.
- Click Ok

- Restart the application for all the changes to be applied.

6. AUTHORING QA DATA

Authoring QA data to the PFMEA/ Control Plans sheet is very straightforward.

- Select the respective entity level (Routing/ Op/ Act) from the process tree.
- Make sure the process entity is checked out.
- Open the required QA Panel (PFMEA/ Control Plan).
- Fill in the header data if necessary.
- Start populating/ copy-paste/ importing the QA Sheet for the selected process.
- Save the data.



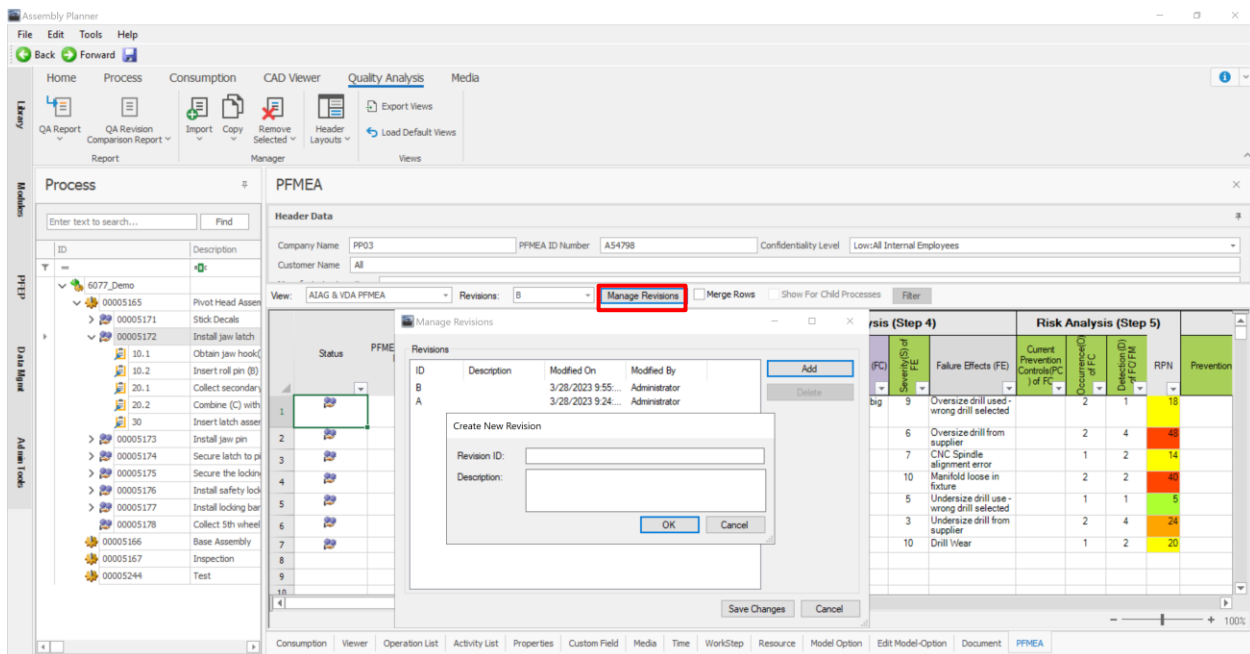
The screenshot displays the Assembly Planner software interface. The main window is divided into several panels:

- Process Tree (Left):** A hierarchical tree view showing the assembly structure. The selected process is "6077_Demo".
- PFMEA Panel (Center):**
 - Header Data:** Company Name: PP03, PFMEA ID Number: A54798, Confidentiality Level: Low:All Internal Employees, Customer Name: All.
 - Failure Analysis (Step 4):** A table with columns: Failure Mode (FM), Failure Cause (FC), Severity (S), Failure Effects (FE), Current Prevention Controls (PC), Documented FC, Detection (D), and RPN. The table contains 10 rows of failure data.
 - Risk Analysis (Step 5):** A table with columns: Step No., Process Name/Operation, Machine/Device/Jig/Tools for Mo., Process, and Characteristics. The table contains 13 rows of process data.
- Control Plan Panel (Right):**
 - Header Data:** Core Team: QA, Customer Engineering Approval Date: 2/28/2023, Key Contact/Phone: .
 - Table:** A table with columns: Step No., Process Name/Operation, Machine/Device/Jig/Tools for Mo., Process, and Characteristics. The table contains 13 rows of process data.

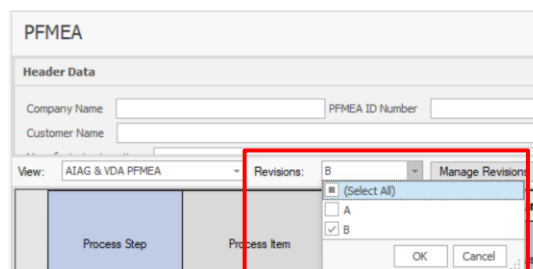
7. QA FUNCTIONS

7.1 Managing Revisions

- QA Module offers revision control for all the processes. Multiple Revisions can be created, tracked, and analyzed. Only the active revision is editable, and all the prior revisions are saved as read-only sheets.
- In the QA sheet Click Manage Revisions button> this will open the revision library, where the revisions can be created and managed.



- The revision dropdown will display the set of available revisions, where users can select one or multiple revisions.



- Based on the above selection, the QA sheet will display the results. In image below is showing the QA details for the revisions A and B, where A is the old revision (highlighted in grey – read only) and B is the current revision. This enables the users to perform before and after analysis.

Home Process Consumption CAD Viewer **Quality Analysis** Media

QA Report QA Revision Comparison Report Import Copy Remove Selected Header Layouts Export Views Load Default Views

Report Manager Views

Process

Enter text to search... Find

6077_Demo

- 00005165 Pivot Head Assen
- 00005171 Stick Decals
- 00005172 Install jaw latch
- 00005173 Install jaw pin
- 00005174 Secure latch to pl
- 00005175 Secure the lodon
- 00005176 Install safety lock
- 00005177 Install locking bar
- 00005178 Collect 5th wheel
- 00005166 Base Assembly
- 00005167 Inspection
- 00005244 Test

PFMEA

Header Data

Company Name PFMEA ID Number Confidentiality Level

Customer Name

View: ADAG & VDA PFMEA Revisions: A, B Manage Revisions Merge Rows Show For Child Processes Filter

PFMEA Detail ID	Revision	Process Step	Process Item	Failure Analysis (Step 4)				Risk Analysis (Step 5)			
				Failure Mode (FM)	Failure Cause (FC)	Severity (S) of FC	Failure Effects (FE)	Current Prevention Controls (PC) of FC	Occurrence (O) of FC	Detection (D) of FC/FM	RPN
1	1762 A	100.80 CNC Drilling+C17.J21	Drill Holes in Fuel / Air Manifold	Fuel Hole Diameter 50 mm +/- 0.2 mm (FN100)	Diameter too big	9	Oversize drill used - wrong drill selected		2	1	18
2	1762 B	100.80 CNC Drilling+C17.J21	Drill Holes in Fuel / Air Manifold	Fuel Hole Diameter 50 mm +/- 0.2 mm (FN100)	Diameter too big	9	Oversize drill used - wrong drill selected		1	1	9
3	1763 A	Install Latch				10	Oversize drill from supplier		1	4	40
4	1763 B	Install Latch -A7				6	Oversize drill from supplier		2	4	48
5	1764 A					10	CNC Spindle alignment error		2	5	100
6	1764 B					7	CNC Spindle alignment error		1	2	14
7	1765 A					10	Manifold loose in fixture		1	2	20
8	1765 B					10	Manifold loose in fixture		2	2	40
9	1766 A				Diameter too small	10	Undersize drill use - wrong drill selected		1	1	10
10	1766 B				Diameter too small	5	Undersize drill use - wrong drill selected		1	1	5

Consumption Viewer Operation List Activity List Properties Custom Field Media Time WorkStep Resource Model Option Edit Model-Option Document PFMEA Control Plan

7.2 Show for child processes

- Checking the 'show for child processes' displays the QA results of the selected process and all its children. This function becomes handy when performing an overall detailed analysis of a line.
- In the example below, Routing is selected in the process tree and 'show for child processes' is checked on the QA sheet, where all the QA related data tied to Routing, Operation and Activity entity levels are displayed.

Assembly Planner

File Edit Tools Help

Back Forward

Home Process Consumption CAD Viewer **Quality Analysis** Media

QA Report QA Revision Comparison Report Import Copy Remove Selected Header Layouts Export Views Load Default Views

Report Manager Views

Process

Enter text to search... Find

6077_Demo

- 00005165 Pivot Head Assen
- 00005171 Stick Decals
- 00005172 Install jaw latch
- 00005173 Install jaw pin
- 00005174 Secure latch to pl
- 00005175 Secure the lodon
- 00005176 Install safety lock
- 00005177 Install locking bar
- 00005178 Collect 5th wheel
- 00005166 Base Assembly
- 00005167 Inspection
- 00005244 Test

PFMEA

Header Data

Company Name PFMEA ID Number Confidentiality Level

Customer Name

View: ADAG & VDA PFMEA Revisions: B Manage Revisions Merge Rows **Show For Child Processes** Filter

Status	Revision	Process Step	Process Item	Failure Analysis (Step 4)				Risk Analysis (Step 5)			
				Failure Mode (FM)	Failure Cause (FC)	Severity (S) of FC	Failure Effects (FE)	Current Prevention Controls (PC) of FC	Occurrence (O) of FC	Detection (D) of FC/FM	RPN
1	B	6077		Air Hole - No burrs (FN106)	Burrs present	8	None	Drill speed too slow	8	2	128
2	B	Operation		Fuel Hole Diameter 50 mm +/- 0.2 mm (FN100)	Diameter too big	10	Drill pre-setter check before each Operations checks drill diameter	Oversize drill used - wrong drill selected	1	0	10
3	B	100.80 CNC Drilling	Drill Holes in Fuel / Air Manifold	Fuel Hole Diameter 50 mm +/- 0.2 mm (FN100)	Diameter too big	10	Oversize drill used - wrong drill selected		2	3	60
4	B	100.80 CNC Drilling+C17.J21	Drill Holes in Fuel / Air Manifold	Fuel Hole Diameter 50 mm +/- 0.2 mm (FN100)		10	Oversize drill from supplier		1	4	40
5	B					10	CNC Spindle alignment error		2	5	100
6	B					10	Manifold loose in fixture		1	2	20
7	B					10	Undersize drill use - wrong drill selected		1	1	10
8	B				Diameter too small	10	Undersize drill from supplier		1	3	30
9	B					10	Drill Vilear		1	2	20
10	B					10			1	2	20

Consumption Viewer Operation List Activity List Properties Custom Field Media Time WorkStep Resource Model Option Edit Model-Option Document PFMEA Control Plan

c. The users can also filter the data for multi-selected processes from the process tree. The QA module has the ability to display results based on selected processes.

7.3 Merge Rows

a. By checking the 'Merge Rows,' unique rows values on the sheet will be merged.

Note: This function is currently applicable only for entire sheets, individual cells cannot be merged.

PFMEA

Header Data

Company Name

PFMEA ID Number

Confidentiality Level

Customer Name

View: AIAG & VDA PFMEA

Revisions: B

Manage Revisions

Merge Rows

Show For Child Processes

Filter

Status	Revision	Process Step	Process Item	Failure Analysis (Step 4)			Risk Analysis (Step 5)			RPN	
				Failure Mode (FM)	Failure Cause (FC)	Severity (S) of FE	Failure Effects (FE)	Current Prevention Controls(PC) of FC	Occurrence (O) of FC		Detection (D) of FC/FM
1	B	6077		Air Hole : No burrs (FN106)	Burrs present	8	None	Drill speed too slow	8	2	0
2		Operation									128
3		100.80 CNC Drilling	Drill Holes in Fuel / Air Manifold	Fuel Hole Diameter 50 mm +/- 0.2 mm (FN100)	Diameter too big	10	Drill pre-setter check before each Operations checks drill diameter	Oversize drill used - wrong drill selected	1	0	10
4		100.80 CNC Drilling+C17:J21					Oversize drill used - wrong drill selected		2	3	60

7.4 View

- Users can create their own views, instead of using the default/ system generated views.
- Right-click> Customize view on the sheet you wanted to copy from.
- Select Add View at the top> Give an ID and Hit Ok.
- Do the field customizations if any, and click Ok at the bottom. A new view for the specific user will be created.

Customize View

View

Current View: AIAG & VDA PFMEA

Columns Properties

Hidden Fields:

Name	Width	Key
Classification	90	
CurrControlDetection	72	
FilterCode	132	

Add View

ID:

- On the QA sheet, View dropdown, the created sheet will be available for user to select and work with. The user can work with any of the available views.

PFMEA

Header Data

Company Name PFMEA ID Number Confidentiality Level

Customer Name

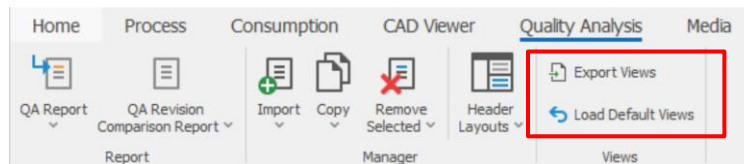
View:
 AIAG & VDA PFMEA
 AIAG & VDA PFMEA
 AIAG PFMEA 4th Edition
 Default

 Revisions:
 Manage Revisions ☒ Merge Rows ☒ Show For Child Processes

Failure Analysis (Step 4)

7. 5 Load/ Export views

- a. Load Default View: If the users modify their views and wish to reset to default view, with the load default view function, users can easily get back to the default/ company specific view.



- b. Export view: There are cases where the user wants to set up a specific QA standard view throughout the plant. In this case, the user can set up the required view on their machine and export the views.

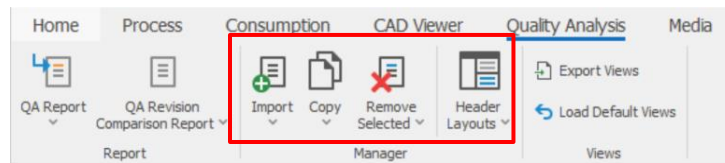
Administrator functions to deploy the new set of views,

- i. Apply customize view changes.
- ii. Click export views which will save as 'UserSettings.xml' file.
- iii. Rename the file as, 'InitialViewSettings.xml'
- iv. Upload the file to AP> Admin Tools> Template Manager> Configuration files.
- v. Refresh the templates/ restart the application
- vi. Now in the QA module, if any user clicks 'load default view,' the saved view will be loaded.

Note: Provide the new 'InitialViewSettings.xml' file to ProPlanner support, to include the views as part of standard deployment.

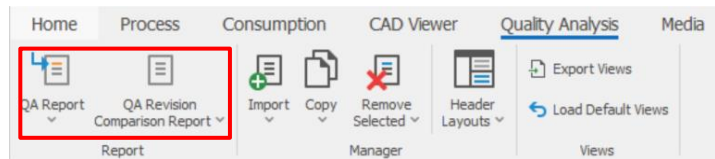
7.6 Import/ Copy

- a. Import/ Copy function: Enables the user to load/ export the QA data from Worksteps to QA sheets and from QA back to Worksteps. (Note: Templates need to be defined for this function to work, contact ProPlanner support).
- b. Remove Selected: Removes the selected QA data from the active sheet.



c. Header Layouts: Customize view for header layout.

7.7 Reports



a. QA Standard Report: Basically, generates an excel report of what's displayed in the QA Sheet. What You See Is What You Get (WYSIWYG).

Revision	Process Step	Process Item	Failure Mode (FM)	Failure Cause (FC)	Severity (S) of FE	Failure Effects (FE)	Current Prevention	Occurrence	Detection (D)	RPN	Pre
B	6077 Operation	Drill Holes in Fuel / Air Manifold	Fuel Hole Diameter 50 mm +/- 0.2 mm (FN100)	Diameter too big	9	Drill pre-setter check before each Operations checks drill diameter	Drill pre-setter check before each Operations checks drill diameter	8	8	512	
B	100.80 CNC Drilling	Drill Holes in Fuel / Air Manifold	Fuel Hole Diameter 50 mm +/- 0.2 mm (FN100)	Diameter too big	9	Drill pre-setter check before each Operations checks drill diameter	Drill pre-setter check before each Operations checks drill diameter	1	1	9	
B	100.80 CNC Drilling+C17-J21	Drill Holes in Fuel / Air Manifold	Fuel Hole Diameter 50 mm +/- 0.2 mm (FN100)	Diameter too big	9	Drill pre-setter check before each Operations checks drill diameter	Drill pre-setter check before each Operations checks drill diameter	2	1	18	
B	Install Latch				10	Drill pre-setter check before each Operations checks drill diameter	Drill pre-setter check before each Operations checks drill diameter	1	4	40	
B					10	Drill pre-setter check before each Operations checks drill diameter	Drill pre-setter check before each Operations checks drill diameter	2	5	100	
B					10	Drill pre-setter check before each Operations checks drill diameter	Drill pre-setter check before each Operations checks drill diameter	1	2	20	
B					10	Drill pre-setter check before each Operations checks drill diameter	Drill pre-setter check before each Operations checks drill diameter	1	1	10	
B					10	Drill pre-setter check before each Operations checks drill diameter	Drill pre-setter check before each Operations checks drill diameter	1	3	30	
B					10	Drill pre-setter check before each Operations checks drill diameter	Drill pre-setter check before each Operations checks drill diameter	1	2	20	

b. QA Revision Comparison Report: This report compares the selected two revisions and highlights the changes/ adds/ deletes on the generated excel report. Green- Newly added; Yellow- Edited/ change of content; Red- Content deleted.

Revision	Process Step	Process Item	Failure Mode (FM)	Failure Cause (FC)	Severity (S) of FE	Failure Effects (FE)	Occurrence (O) of FC	Detection (D) of FC/FM	RPN	Pre
[A]B	100.80 CNC Drilling+C17-J21	Drill Holes in Fuel / Air Manifold	Fuel Hole Diameter 50 mm +/- 0.2 mm (FN100)	Diameter too big	9	Drill pre-setter check before each Operations checks drill diameter	Drill pre-setter check before each Operations checks drill diameter	1	18	
B	(100.80 CNC Drilling+C17-J21)Install Latch	(Drill Holes in Fuel / Air Manifold)	(Fuel Hole Diameter 50 mm +/- 0.2 mm (FN100))	(Diameter too big)	(9)6	(Drill pre-setter check before each Operations checks drill diameter)Drill pre-setter check before each Operations checks drill diameter	(Drill pre-setter check before each Operations checks drill diameter)Drill pre-setter check before each Operations checks drill diameter	(1)4	(18)48	
[A]B	(Install Latch)				(10)7	(Drill pre-setter check before each Operations checks drill diameter)Drill pre-setter check before each Operations checks drill diameter	(Drill pre-setter check before each Operations checks drill diameter)Drill pre-setter check before each Operations checks drill diameter	(4)2	(40)14	
B					(6)10	(Drill pre-setter check before each Operations checks drill diameter)Drill pre-setter check before each Operations checks drill diameter	(Drill pre-setter check before each Operations checks drill diameter)Drill pre-setter check before each Operations checks drill diameter	(4)2	(48)40	
[A]B					(10)5	(Drill pre-setter check before each Operations checks drill diameter)Drill pre-setter check before each Operations checks drill diameter	(Drill pre-setter check before each Operations checks drill diameter)Drill pre-setter check before each Operations checks drill diameter	(5)1	(100)5	
B					(7)3	(Drill pre-setter check before each Operations checks drill diameter)Drill pre-setter check before each Operations checks drill diameter	(Drill pre-setter check before each Operations checks drill diameter)Drill pre-setter check before each Operations checks drill diameter	(1)2	(24)24	
[A]B					10	(Drill pre-setter check before each Operations checks drill diameter)Drill pre-setter check before each Operations checks drill diameter	(Drill pre-setter check before each Operations checks drill diameter)Drill pre-setter check before each Operations checks drill diameter	2	20	