## AutoPLANT to OpenPlant: WorkSet Configuration

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### AutoPLANT-to-OpenPlant Migration

This section describes migrating AutoPLANT Modeler content into OpenPlant Modeler.

This requires iModel Connector for AutoPLANT to publish data to iModelHub/PlantSight. Note that IModel Connector for AutoPLANT is available as a separate installer through Bentley Software Downloads. This utility is also available through AutoPLANT Modeler installer (and can be installed alongwith AutoPLANT Modeler).

## 1. Migration Workflow

The workflow to migrate AutoPLANT models and data to OpenPlant Modeler may consist of following steps:

1. Register a CONNECT Project.

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	*	1405		APQABridg	e			Oil Refineries			
	*	BSY_OG_UK_02		Oil and Gas	SureStart			Gas Processing Plants			_

2. Through OpenPlant Project Administrator, **Associate** to the CONNECT Project registered in step 1 above with an appropriate WorkSet.

- Configuration Settings Too	OpenPlant Projec	t Administrator CONNECT Edition		_ = ×
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📩 uks 21-1-19	uks 21-1-19		Other	Other
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7644	Metric_again	Pakistan	Buildings and Facilities	Airports
307-018	DemoProject		Oil and Gas	Oil Refineries
			As	sociate Cancel

**Note:** For the AutoPLANT-to-OpenPlant migration workflow, please use the specific OpenPlant WorkSet designed for this very purpose.

Refer to **Configuration** section for more details.

3. Also, **Setup** the WorkSet with OpenPlant Schema from within OpenPlant Project Administrator.

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Refer to OpenPlant Project Administrator documentation for more details.

- 4. Load AutoPLANT's Bentley Project Administrator and login to the AutoPLANT project containing models that need to be migrated to OpenPlant Modeler.
- 5. Now, through Bentley Project Administrator, **Associate Project** to the same CONNECT project as created in step 1 above:



**Note:** In order to use In-Session workflow to publish from within the AutoPLANT Modeler session, select the **iModel Provisioning** dialog and pick the iTwin that has already been Setup.

6. Once done, load **iModel Connector for AutoPLANT** to publish data to the CONNECT project on iModelHub/PlantSight.

$\blacksquare$ iModel Connector for AutoPLANT-v10.04.00.055 (Logged in as Adnan.Ulha $ imes$						
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iModel:	APiModel			~		
Custom AP2OPMap:						
			Publi	sh Close		

Refer to **iModel Connector for AutoPLANT** section for more details.

- 7. After publishing, load OpenPlant Modeler in the same WorkSet as used in step 3 and open a file.
- 8. From OpenPlant Modeler, select **Utilities > AutoPLANT Import** ribbon option:

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Utilities	Image	Macros 5	Design History	Security	Geographic	Drawing Scale	Plant Utilities

 First Load the AutoPLANT Model list in the dialog, import and upgrade the models to complete the migration through AutoPLANT Import dialog.
 Refer to Importing AutoPLANT models in OpenPlant Modeler section for more details:

## 2. iModel Connector for AutoPLANT

iModel Connector for AutoPLANT allows users to publish their models alongwith data to iModelHub / PlantSight based on OpenPlant schemas.

These published models can then be used directly through iModelHub or PlantSight for drawing review, walk throughs and Clash detection etc., or can be imported into OpenPlant Modeler for further usage.

There are two ways user can publish data into iModelHub / PlantSight:

- 1. Through iModel Connector for AutoPLANT interface
- 2. From within AutoPLANT Modeler (will be referred as In-Session workflow)

## 2.1. Publishing AutoPLANT models through iModel Connector for AutoPLANT interface

Users can directly publish all their models in a single go or a set of models to iModelHub / PlantSight based on OpenPlant schemas using iModel Connector for AutoPLANT by itself.

Remember that prerequisite steps to configure WorkSets and AutoPLANT project with CONNECT project should already be completed before starting the publish process.

Once user loads iModel Bridge for AutoPLANT, it will prompt to Sign In with email:

AutoPLANT iModel Bridge Sign In		×
Bentley		
Email Address		
© 2020 Bentley Systems, Incorporated Privacy   Terms of Use		

After Signing in with a valid account, the product requests permission. Press **Allow** to continue using Bridge.

🖺 Auto	PLANT iModel Bridge Sign In	—		×
	Request for Approva	I		^
		Logged in	as <b>Adnan</b>	
Auto	PlantBridge is requesting permission for the follo	wing:		
~	ACCESS TO YOUR USERNAME			
~	YOUR USER IDENTIFIER			
~	YOUR EMAIL ADDRESS			
~	USER PROFILE			
~	OFFLINE ACCESS			
~	ACCESS YOUR IMODELS			
	Client : AutoPlantBridge			
	Allow Don't Allow			~

AutoPLANT iModel Bridge will load with three options for model selection from AutoPLANT Settings section.

So with **AutoPLANT Project Selection** option, user can select the AutoPLANT project and then through Browse button, can pick multiple or All models from the list of models from the selected AutoPLANT project:

🚺 iModel Connector for AutoPLANT-v10.04.00.055 (Logged in as Adnan.Ulha 🛛 🗙							
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AutoPLANT Settir	ngs						
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O Folder Sele	ection						
Project:	EAP200			4			
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iModel Settings -							
Project Name:	APDemoProject	t					
iModel:	APiModel			× 2			
Custom AP2OPMap:							
			Publish	n Close			

With **DWG File Selection** option, the interface will change slightly and user can pick models (DWG files) from Explorer window to be published through Bridge:

$\blacksquare$ iModel Connector for AutoPLANT-v10.04.00.055 (Logged in as Adnan.Ulha $ imes$						
		Bentle Advancing Infrast	ey.			
AutoPLANT Settir	ngs					
<ul> <li>AutoPLAN</li> <li>DWG File S</li> <li>Folder Sele</li> </ul>	T Project Selection Selection ection	✓ Skip cross-drawing rela	tions			
Drawing:	6 Drawing(s) Selected					
- iModel Settings -						
Project Name:	APDemoProject					
iModel:	APiModel	~	>			
Custom AP2OPMap:						
		Publish C	lose			

With **Folder Selection** option, the interface will update accordingly and user will be able to select a folder through Browse button to publish all models present in that folder:

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AutoPLANT Settir	ngs	
<ul> <li>AutoPLAN</li> <li>DWG File S</li> <li>Folder Sele</li> </ul>	T Project Selection Selection ection	✓ Skip cross-drawing relations
Folder:	C:\ProjRoot001\EAP200\Eq	uip\Drawings
iModel Settings		
Project Name:	APDemoProject	
iModel:	APiModel	~ Z
Custom AP2OPMap:		
		Publish Close

The **iModel Settings** section contains **Project Name** and **iModel** fields. Both these fields will get populated when **AutoPLANT Project Selection** option is selected based on which CONNECT Project and iModel the selected AutoPLANT project is linked to.

**Project Name** and **iModel** fields are to be populated for other two options i.e., **DWG File Selection** and **Folder Selection** in order to point to where the models are to be published to.

## 2.2. Publishing AutoPLANT models through In-Session Workflow

User can publish to iModelHub / PlantSight right from inside of the drawing while working on it. Select **Import/Export > iModel Bridge** ribbon button would load iModel Connector for AutoPLANT with all setting automatically getting populated.



## 3. Importing AutoPLANT models in OpenPlant Modeler

Once AutoPLANT models have been published into iModelHub / PlantSight, it can be imported into OpenPlant Modeler.

- 1. To achieve this, first load OpenPlant Modeler in the WorkSet that was Setup with OpenPlant schema. *See step 3 from Migration Workflow*.
- 2. Once loaded, create a **New** file in this WorkSet.



3. After the new OpenPlant Modeler file is loaded, launch **Utilities > AutoPLANT Import** through the ribbon button.

File       Piping       Equipment       HVAC       Raceways       Structural       PlantSight       Collaboration       View       Annotate       Utilities       Membra       Annotate       Help         View       MUL Applications       © Solos Foil       © Solos Foil       © PlantSight       © Solos Foil       © PlantSight       © Committies       PlantSight       © Solos Foil       © PlantSight	II OpenPlant Mod	leler 🔹 🚾	🖬 🖬 🖪 🔦 -	• 🖈 📌 🚔 =			AP2OP_001.dgn [3D - V	8 DGN] - OpenPlant Model	er CONNECT Edition	Search Ribbon (F4)	۵ • 🕸 • ۹	>
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This will load AutoPLANT Import dialog.

L	AutoPLANT Import	×	
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1	Names		
<b></b>	EQPM01		
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⊡ s	STRM02		
⊠ s	STRM03		
✓ s	STRM04		
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			.:

The contents of this dialog are explained below:

Icon	Feature	Description
	Select All	Allows to select all models from the list
	Clear Selection	Deselects all selected models from the list
	Invert Selection	Reverses or swaps the model selection from the list
<b>1</b>	Load available AutoPLANT Model Names from iModel	Allows to list down all AutoPLANT models that have been published into iModelHub / PlantSight.

(H) on (H)	Import AutoPLANT Model	Starts the import process against the
VR V	from iModel	selected / All models from the list in the
		OpenPlant file.
		Note that if no model is selected from the
		list, this button remains as grayed out.
1	Upgrade imported	Converts the imported AutoPLANT
~	AutoPLANT data to OPM	components into OpenPlant components
	Components	
	Delete AutoPLANT data	Deletes all AutoPLANT instances in the
<u>^</u>	that has not be upgraded	DGN file
Filter AutoPLANT Models	Filter list	Filters list of loaded AutoPLANT Models in
		the dialog

- 4. The model list will already be loaded in the AutoPLANT Import dialog. If not, press **Load available AutoPLANT Model Names** button to load all models from the iTwin.
- 5. Next, **Select All** to select the models to be imported into OpenPlant Modeler file just created. Or

Make selection from the list manually through the checkboxes to import the selected set of models.

6. Next, press the **Import** button.

This will turn all selected set of models to green color showing that these models have been imported into the OpenPlant Modeler file.

Press Fit View buton to see the imported components in the file.



7. Now since components have been imported into the OpenPlant Modeler file, pressing **Upgrade imported components** button will convert these to OpenPlant Modeler components.

## 4. Configurations

A WorkSet has been specifically created for AutoPLANT-to-OpenPlant migration process for Out-of-thebox settings. Contact support for this WorkSet.

AutoPLANT iModel Bridge uses XML mapping file to map AutoPLANT components to OpenPlant ones. It's located at the bridge installation: **Assets/AP2OPMapping.xml**.

## 4.1. Mapping file structure

The mapping is an XML file with root element **<Mapping>**. There are following kinds of sub-elements:

- <APClass> element is the main entry for AutoPLANT to OpenPlant class mapping. It maps multiple AutoPLANT classes to one OpenPlant class. It contains attributes: name, OPname, APBase, PortCount, readMethod. Only name is main attribute.
  - **name** is a list of AutoPLANT classes separated by comma in following format: **Module:Class**.
  - **OPname** is OpenPlant class name. This attribute can be absent for base APM classes.
  - **APBase** is base APM class. Properties and attributes of this class are added to derived class.
  - **PortCount** is count of ports in component of APM class.
  - readMethod is name of method to used to move values from xdata of components to Physical component of represention of data.

Example below:

<APClass

name="Base:AT\_VALVE\_CNTL,Base:AT\_VALVE\_CNTL\_BFLY,Base:AT\_VALVE\_CNTL\_CHECK,Base:A T\_VALVE\_CNTL\_GLOBE,AT\_PVIC:AT\_VALVE\_BLNC789" OPname="CONTROL\_VALVE">

Sub-elements of <APClass> are <APProperty>.

- <APProperty> represents single property mapping. It contains two main attributes name, OPname and three optional attributes : ValueMap, ignore, "typeName".
  - **name** is a property name in AutoPLANT.
  - **OPname** is a property name in OpenPlant.
  - ValueMap is a name of <ValueMap> element located in the end of AP2OPMapping.xml. If ValueMap attribute is specified then property is transformed using corresponding map in \*\*

< ValueMap>\*\* element.

- typeName is a type of data. This attribute is nessessary to set if property is defined in base APClass, where "OPClass" is empty. By default it is "string". Example <APProperty name="GTYPE" typeName="double" OPname="ANGLE" />
- ignore is used to exclude moving AP property to OpenPlant. This can be used if base class has such property but it need not use this value in OpenPlant. Example : ignore="1"

Otherwise the property is not transformed and set to OpenPlant as is (only units transformations are applied).

- 3. **<ValueMap>** element represents one-to-one mapping for properties with attribute **ValueMap**. It contains **<ValueMapItem>** sub-elements.
- 4. **<ValueMapItem>** element is a property mapping entry. It represents how to transform the particular property value from AutoPLANT to OpenPlant.

In example below AutoPLANT property value "100LB" transforms into OpenPlant "CL100": <ValueMapItem OPname="CL100" APname="100LB" />

- 5. **<JointTypeMap>** element is a list of joint types with information about available end preparations and fasteners.
- <JointType> element is a sub-element of <JointTypeMap>. It defines the properties of the particular joint type. It contains 4 sub-elements:
  - **<JOINT\_NAME>** is a name of joint in OpenPlant.
  - **<END\_PREPARATION\_1>** is a list of available end preparations for one end.
  - **<END\_PREPARATION\_2>** is a list of available end preparations for another end.
  - **FASTENER>** is a list of fasteners for the joint.

## 4.2. Configuration Changes:

This section explains the sample configuration changes need for migration. Since users may have done customization in AutoPLANT for their project needs, this section will help in understanding the changes done in out of the box setup and accordingly further changes can be done as per actual project requirements. The basic objective is to have an OpenPlant WorkSet configured the exact same way as the project content looks like in AutoPLANT. So, if you were to create a new model in OpenPlant in this WorkSet the project nomenclature and definitions for tags and other project objects would look the same way as you would model in AutoPLANT.

The configuration updates done for AutoPLANT-to-OpenPlant migration for out of the box WorkSets are explained below, which will help user not only update their WorkSets accordingly but will also help them understand how to update their WorkSets for customized components.

This section explains these configuration changes done so far:

### 4.2.1. Generic Updates

1. Invoke Expression Editor within OPPA for the WorkSet where changes need to be incorporated.

		-		<b>4</b>	~			<b>i</b>	
Schema Editor	Associations	Expression Editor	Property Display	2D 3D	Standard Preferences	Value Maps	Joint Map	Component Creation	
	Settings								
▲ <u>ड</u> [+ C:\F ▲ 就									
🔺 🤞	▲ 🦾 APtoOP ^ 2D/3D Consistency Checker								
	OpenPlant Modeler     Copy Shared Properties								

2. Make the following changes to Equipment Tag Number:

Tag Number = this.DEVICE\_TYPE\_CODE & "-" & this.NUMBER Parser Regular Expression = (?<DEVICE\_TYPE\_CODE>[?\w]\*)-(?<NUMBER>.\*)|(?<NUMBER>.+)

Schema Configurat	ion [OpenPlant Modeler: APtoOP]	×
Schema Configurat	ion (OpenPlant Modeler: APtoOP)         i	
	Vinit     A Ean Dream Thrit     V     Use last valid value on failure  [Message Area]	~
	Help Do not Create a Backup Save Close	

- 3. Save changes
- 4. Make the following changes to Pipeline Tag Number:

Tag Number = this.NUMBER Parser Regular Expression = Nil( *Leave it blank*)

Schema Configurat	ion [	OpenPlant Modeler: APtoOP]		x
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: T	₽	A Pipe Flange Spacer	UNS.NOWDER	-
Schema Editor	Þ	😪 Pipe Flange Spade		*
	Þ	😪 Pipe Hose		
-16	₽	🕎 Pipe Hub		
Expression	₽	🔩 Pipe Joint		
Editor	Þ	🔩 Pipe Nozzle		{}
	₽	😪 Pipe Plug		<b>I</b>
	₽	😤 Pipe Reducer		<b>H</b>
	₽	😤 Pipe Return	IIF ( ) > < ≥ ≤ + − * / &	
	4	😪 Pipeline	{}System	
		Spool Prefix	{} Operators	
		Tag Number	{} Pipeline	
		🔷 Unit Name		
		Service Name		
		Service	Failure Value: PipingNetworkSystem	
		🔷 Unit	Parser Regular Expression:	
		Plant Area		
	₽	Riping Component	Is calculated value, default value only	
	к.	> >	Use last valid value on failure	
	ſM	essage Areal	·	
				~
		Help	Do not Create a Backup Save Clo	se

- 5. Save changes
- 6. Make the following changes to Fluid Regulator Tag Number:

Tag Number = this.DEVICE\_TYPE\_CODE & "-" & this.NUMBER Parser Regular Expression = (?<DEVICE\_TYPE\_CODE>[?\w]\*)-(?<NUMBER>.\*)|(?<NUMBER>.+)

Schema Configurati	ion [OpenPlant Modeler: APtoOP]	X
	👂 😪 Equipment 🔷	this.DEVICE_TYPE_CODE & "-" & this.NUMBER
	👂 🔩 Fan Power Unit	
Schema Editor	👂 🔩 Fastener	
<u>191</u>	Fire Hydrant	
	👂 😪 Fixed-length tray	Indow Snip
Expression Editor	👂 😪 Flame Arrestor	
	🕴 😪 Flexible Connector	
	👂 🔩 Floor Sweep	
	🔺 👍 Fluid Regulator	
	Tag Number	
	👂 🔩 Gasket	{} System     () Operators
	👂 🐴 Gauge	{}EC Methods
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	👂 😪 Hvac Axial Fan	Failure Value: Valve
	🕴 😪 Hvac Cleaning Elbow	Parser Regular Expression: (? <device_type_code>[?\w]*)-(?<number>.*))(?<number>.+)</number></number></device_type_code>
	👂 😪 HVAC Component	
	👂 😤 Hvac Conical Tee 🔍 🗸	is calculated value, default value only
	< >	✓ Use last valid value on failure
	[Message Area]	
	Help	Do not Create a Backup Save Close

7. Save changes

### 4.2.2. Introducing WELD\_GAP Custom Classe and Joint:

1. Invoke Schema Editor via OPPA and add WELD\_GAP as Domain class under Gasket in OP\_3D schema and save.

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2. Select 'No' on the following dialog which would pop-up after the creation of new class 'WELD\_GAP'.



3. Now invoke Joint Map from OPPA and add AP\_JOINT which should be a copy of BUTT\_WELD but must use WELD\_GAP as fastener

<b>(</b>	ADVANCED_GROOVE_JOINT	^ D4 85.	م	4
int Map	AP_XOINT	Joint Name	APJOINT	-
	AQUA_LINK_JOINT	Properties to Match	String[] Array	~
	AQUA_SOLVENT_JOINT AQUALINK MALEFEMALE JOINT	<ul> <li>List of Fasteners</li> </ul>	String[] Array	
	BUTT_WELD_JOINT	10	WELD_GAP	
	CLAMP_JOINT	<ul> <li>List 1 of Compatible End Preparations</li> </ul>	String() Array	
	CONPRESSION JOINT	101	BEVELED_END	
	FERRULE_JOINT	[7]	SUTT_WELD	
	FIELD_MECHANICAL_JOINT	[2]	PLAIN_END	
	FLANGE_JOINT	Ust 2 of Compatible End Preparations	String[] Array	
	FLEXIBLE_HOSE_JOINT	[0]	BEVELED_END	
	GROOVE_JOINT	[1]	BUTT_WELD	
	HVAC_FEMALE_JOINT	[2]	PLAIN_END	
	HVAC_FLANGE_JOINT	(3)	SUP_ON	
	HVAC MALE JOINT	14	SOCKET_WELD_MALE	
HVAC, MALEPEMALE, JOINT HVAC, PLAIN, JOINT INNOVATIVE, GROOVE, JOINT	HVAC_PLAIN_JOINT	Is Specification Driven		
	INNOVATIVE_GROOVE_JOINT	Assembly to Load for the Script		
	LAP_JOINT	Script Namespace		
	LUG_JOINT	Script Class Name		
	MECHANICAL, PORTORED, JOINT MECHANICAL, JOINT POS, GROOVE, JOINT POS, MALEFEMALE, JOINT PRESSIT, JOINT PUSH, ON, RESTRAINED, JOINT			

## 4.2.3. GETTING THREE\_PORTS\_GENERIC\_PIPING\_COMPONENTS into OPM

To do so, please follow these steps:

#### 4.2.3.1. Configurations Required at AP2OP Workset Level:

 Launch 'Bentley Class Editor' and Open 'OpenPlant\_3D.01.08.ecschema' the latest AP2OP Workset.

Can be found at this link C:\ProgramData\Bentley\OpenPlant CONNECT Edition\Configuration\WorkSpaces\OpenPlantExample\WorkSets\......\Metric\Standards\Open Plant\Schemas

- Load all Reference schemas from this location: C:\ProgramData\Bentley\OpenPlant CONNECT Edition\Configuration\WorkSpaces\OpenPlantExample\Standards\OpenPlant\Schemas
- 3. Right Click on 'OpenPlant 3D' schema and select 'Supplement Schema.'

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<ul> <li>Location: OpenPlant_3D.01.08</li> <li>Collapse</li> <li>Paste</li> <li>Custom Attributes</li> <li>Add Class</li> <li>Add Relationship Class</li> <li>Add New Supplemental Schema</li> <li>Supplement Schema</li> <li>Close Schema</li> <li>Save Schema</li> <li>Close Schema</li> <li>Save As</li> <li>Add Units</li> <li>Remove Units</li> <li>Add New Mapping</li> <li>Open Existing Mapping</li> <li>Save Mapping</li> <li>Close Manping</li> </ul>		
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Add New Mapping Open Existing Mapping Save Mapping		
Add Class From Dictionary		
Add Relationship From Dictionary		

- 4. Add following two Supplemental schemas:
  - Supplemental\_Information\_3DComponent
  - Supplemental Modeling

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		Open	Cancel		

Use the same Reference schemas as used in Step:2 and press OK.

- 5. Expand the 'Classes' and follow the hierarchy as shown below, to find 'Generic Piping Component'.
- 6. Right Click on 'Generic Piping Components' and select 'Add Derived Classes.'
- 7. Specify its 'Name' and 'Display Label' as 'GENERIC\_PIPING\_COMPONENT\_TWO\_PORT'
- 8. Go to the Parent Class 'Generic Piping Component' and Right click to copy 'Component Port Information' as a 'Custom Attributes'.



9. Paste this custom attribute into the newly created derived class 'Generic Piping Component Two\_Ports'

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Piping and Instrument Component	nt	Description	OpenPlant_3D.01.08		
🕕 🔶 Instrument		IsStruct	False		
Piping Component		IsCustomAttributeClass	False		
Access Plate		IsDomainClass	True		
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Pipe Hose	Remove Class		Paste		
Pipe Joint	Add Derived Relationshi	ip Class	GEN COMP		
Pipe Nozzle 	Add Mapping				
	raa mapping				

- 10. Now 'Remove' this custom attribute '**Component Port Information** from the Right click menu of the parent class.
- 11. Again, Right Click on 'Generic Piping Components' and select 'Add Derived Classes' to add another child class.
- 12. Specify its 'Name' and 'Display Label' as 'GENERIC\_PIPING\_COMPONENT\_THREE\_PORT'.
- 13. Paste the previously copied 'Component Port Information' custom attribute into this newly created derived class 'GENERIC\_PIPING\_COMPONENT\_THREE\_PORT'

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📄 🔶 Pipe Flange			Deste	
Pipe Hose	Remove Class		Paste	
Pipe Joint	Add Derived Relations	hip Class	cal_catalogue_class_map	
Pipe Nozzle			GEN_COMP	
Pipe Plug	Add Mapping			
Pipe Reducer	Copy Mapping			
m. v ripe neulm	Copy Mapping			

14. Add the Port No. as **3** and add its name as **'BRANCH\_PORT'** as shown below. **Note:** It will not be visible in real time once you add it, to see port 3 switch to some other class and revert.

	Component	Ports	Information	(from	GENERIC_PIPING	G_COMPONE
	No. of Ports		3			
~	Port Type					
	Port Type[0]		MAIN_PORT			
	Port Type[1]		RUN_PORT			
	Port Type[2]		BRANCH_POR	r		
	Port EC Class Nar	me				

- 15. Save these changes to schemas and close the 'Bentley Class Editor'.
- 16. Now create a new **i-model** on i-model hub and provision it using this updated workset.

### 4.2.3.2. Configurations Required as AP2OPMapping.xml:

1. Go to the machine where APIMB is installed (if not the same) and navigate to this path: C:\Program Files\Bentley\APiModelBridge\Assets

And open 'AP2OPMapping.xml' file in Notepad

- Search for the following keyword: generic\_piping, until you can find the mapping for 'Generic\_Piping\_Component'.
- 3. Copy this 'APClass' including all its 'APProperties' and paste it right below.
- 4. Rename the older 'Generic\_Piping\_Component' to GENERIC\_PIPING\_COMPONENT\_TWO\_PORT'.
- 5. Rename the pasted 'Generic\_Piping\_Component' to GENERIC\_PIPING\_COMPONENT\_THREE\_PORT'
- Remove all AP Classes from GENERIC\_PIPING\_COMPONENT\_THREE\_PORT' and add following:

<APClass

name="Base:AT\_INLINETRAP,Base:AT\_WYESWTRAP,Base:AT\_RETTRAP,Base:AT\_WYET RAP,Base:AT\_VALVE\_RELCHANGEOVER"

OPname="GENERIC\_PIPING\_COMPONENT\_THREE\_PORT"

- 7. Save this file at some other location and replace it with the original one.
- 8. Now publish the docs containing 'Three ports Generic Piping components.
- 9. Verify on I-model hub preview that the mappings have been updated.
- 10. Go through the Import and upgrade process inside OPM and notice that now 'Three ports generic piping components are not being missed out.

## 4.2.4. Getting 'Pipe Nozzle' as Custom Component inside the OPM

#### 4.2.4.1. Configurations Required as AP2OP Workset Level:

Please follow following steps to get 'Pipe Nozzle' as a custom component after running the Upgrade process.

 Launch 'Bentley Class Editor' and Open 'OpenPlant\_3D.01.08.ecschema' the latest AP2OP Workset. Can be found at this link C:\ProgramData\Bentley\OpenPlant CONNECT Edition\Configuration\WorkSpaces\OpenPlantExample\WorkSets\AP to OP OPPA33 Metric\Standards\OpenPlant\Schemas

2. Load all Reference schemas from this location:

C:\ProgramData\Bentley\OpenPlant CONNECT Edition\Configuration\WorkSpaces\OpenPlantExample\Standards\OpenPlant\Schemas

3. Right Click on 'OpenPlant 3D' schema and select 'Supplement Schema.'

	<ul> <li>Location: OpenPlant_3D.01.08</li> </ul>		
)- 🚺 Ope	nPlant_3D	OpenPlant_3D	.01.08
÷-	Collapse	Name DisplayLabel NameSpacePrefix	OpenPlant_31 OpenPlant_31 op 3d
C	Paste	Description VersionMajor	1
	Custom Attributes	VersionMinor	0
	Add Class		
	Add Relationship Class		
	Add New Supplemental Schema		
	Supplement Schema		
	Save Schema		
	Close Schema		
	Save As		
	Add Units		
	Remove Units		
	Add New Mapping		
	Open Existing Mapping		
	Save Mapping		
	Close Mapping		
	Add Class From Dictionary		
	Add Palationship From Dictionany		

- 4. Add following two Supplemental schemas:
  - Supplemental\_Information\_3DComponent
  - Supplemental Modeling

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- 5. Use the same Reference schemas as used in **Step:2** and press **OK**.
- 6. Expand the 'Openplant3D-Supplemented' schema and navigate to find the 'Pipe Nozzle' Class
- Copy following 'Creation Attributes' from 'GENERIC\_PIPING\_COMPONENT' and 'Component Port Information' from 'GENERIC\_PIPING\_COMPONENT \_TWO\_PORT' and paste them inside the 'Pipe Nozzle' class.
  - Creation Attribute
  - Component Port Information

C 24 Deles Comment			
En gripping Component	IsCustomAttributeClass	False	
Access Hate	IsDomainClass	True	
Bellows	> BaseClasses		
T Fire Hydrant			
Flame Arrestor	Associated Item c	lass list po	inter (inherited from PIPING_COMPONENT)
Flow Element	Associated Itom Class Name	ASSOCIATE	D ITEM LIST FOR DIRING COMPONENT
Flow Meter	Associated iterii class ivalle	ASSOCIATE	
🕀 🔩 Fluid Regulator	Accoriated Ribbon	Tab (inho	arited from DIDING COMPONENT in OpenPlant 2D Supplemental Modeling 01.08)
🕀 🔩 Gauge	ASSociated Ribboli		inted from FIFING_COMPONENT in OpenFiant_5D_5dpplemental_Modeling.01.05)
Ceneric Branch	Tab Group Name	openplantmo	deler.piping.main,Personal.Piping
*g Generic Offset	Associated Task I	Panes (inh	erited from PIPING_COMPONENT in OpenPlant_3D_Supplemental_Modeling.01.08)
🕀 🍫 Generic Piping Component	> Task Pane Labels		
	Component Ports	Informatio	n (from PIPE NOZZLE in OpenPlant 3D Supplemental Information 3DComponent.0
	1. (2.)		
	No. of Ports	2	
±. ♦ d Olet	> Port Type	_	
i + • • • • • • • • • • • • • • • • • •	Port EC Class Name		
Pipe Adapter		//	
Pipe Bend	Creation Attribute	(from PI	re_NOZZEE in OpenPlant_3D_Supplemental_Modeling.01.08)
Pipe Branch	Assembly Name		
Pipe Bushing	Class Name	IsGraphical	
Pipe Cap	Namespace		
Pipe Clamp	Placement tool		
Pipe Coupling	Handler Type		
Pipe Elbow	Diagram Cell Name		
Pipe End	Cell Library		
Pipe Bange			
Pipe Hose	Global Id Specifica	ation (inhe	rited from PLANT_BASE_OBJECT in OpenPlant.01.08)
+ 🔶 Pipe Hub	Property Name	GUID	
Pipe Joint	L risperty ridine	4015	
Pipe Nozzie	StandardValues		

- 8. Now save these changes and close the 'Bentley Class Editor'.
- 9. Try to publish doc containing 'Pipe Nozzle' and verify that if is appears as a custom component inside OPM or not?

# 4.2.5. Fixing 'TEE Strainer', 'Basket Strainer' and 'Duplex Strainer' by AP2OP Schema customization

#### 4.2.5.1. TEE Strainer

- 1. Go to AP2OP workset location (in my case" C:\ProgramData\Bentley\OpenPlant CONNECT Edition\Configuration\WorkSpaces\AP\_OP\_59\_Workspace\WorkSets\Metric\Standards\Open Plant\Modeler"
- 2. Open 'Modeler.cfg' file in Notepad.
- 3. Search for 'OPM\_AP2OP\_ALWAYS\_TREAT\_AS\_CUSTOM\_COMPONENT'
- 4. Add class 'T\_STRAINER' in the list, by separating with a semi-colon (;).

#### 4.2.5.2. BASKET Strainer

- 1. Go to AP2OP workset location (in my case" C:\ProgramData\Bentley\OpenPlant CONNECT Edition\Configuration\WorkSpaces\AP\_OP\_59\_Workspace\WorkSets\Metric\Standards\OpenP lant\Modeler"
- 2. Open 'Modeler.cfg' file in Notepad.
- 3. Search for 'OPM\_AP2OP\_ROTATE\_COMPS\_DATA'
- 4. Add this 'BASKET\_STRAINER|0|-90' in the list in the following way:

OPM\_AP2OP\_ROTATE\_COMPS\_DATA=PIPE\_WYE|0|-180;**BASKET\_STRAINER|0|-90**;STRAINER|0|-180

#### 4.2.5.3. Duplex Strainer

Please follow following steps to get 'Duplex Strainer' after running the Upgrade process.

 Launch 'Bentley Class Editor' and Open 'OpenPlant\_3D.01.08. ecschema' the latest AP2OP Workset.

> Can be found at this link C:\ProgramData\Bentley\OpenPlant CONNECT Edition\Configuration\WorkSpaces\OpenPlantExample\WorkSets\ AP\_OP\_59\_Workspace\WorkSets Metric\Standards\OpenPlant\Schemas

2. Load all Reference schemas from this location:

C:\ProgramData\Bentley\OpenPlant CONNECT

Edition\Configuration\WorkSpaces\OpenPlantExample\Standards\OpenPlant\Schemas

3. Right Click on 'OpenPlant 3D' schema and select 'Supplement Schema.'

	3 10 10 10 10 10		
	▶		
- 🦓 Ope	nPlant_3D	OpenPlant_3D.	01.08
⊕- <b>⊆</b> ⊕- <b>⊆</b>	Collapse	Name DisplayLabel Name Space Prefix	OpenPlant_3E OpenPlant_3E op3d
	Paste	Description VersionMajor	1
	Custom Attributes	VersionMinor	8
	Add Class		
	Add Relationship Class		
	Add New Supplemental Schema		
	Supplement Schema		
	Save Schema		
	Close Schema		
	Save As		
	Add Units		
	Remove Units		
	Add New Mapping		
	Open Existing Mapping		
	Save Mapping		
	Close Mapping		
	Add Class From Dictionary		
	Add Relationship From Dictionary		

- 4. Add following two Supplemental schema:
  - Supplemental\_Information\_3DComponent
  - Supplemental Modeling



- 5. Use the same Reference schemas as used in **Step:2** and press **OPEN**.
- 6. Navigate to the 'Strainer' parent class and expand it.
- 7. Click on 'Duplex Strainer' and change its ports from 3 to 2.
- 8. Remove the 'Branch port' from the element drop-down

So, in this way schema configuration of 'Duplex Strainer's is done, which makes it import inside OPM successful.

## 4.2.6. Getting all types of Supports from APM to OPM by AP2OP schema configuration

Presently all supports from APM are wrongly mapped generally to the 'Parent Class' of supports due to which it cannot be imported.

So, for the present situation a solution of creating new Child 'Generic' class within their main 'parent class' is suggested. Please follow the following steps to add the 'Generic' classes:

## 4.2.6.1. Configuration Required at 'AP2OP Workset Level:

#### 4.2.6.1.1. GENERIC\_PIPE\_ANCHOR

1. Add a new derived class under the parent 'PIPE\_ANCHOR' named 'GENERIC\_PIPE\_ANCHOR'



2. Copy the 'Creation Attribute' from 'GENERIC\_PIPING\_COMPONENT' and paste it into this class.

Anned Item	Class Properties Re	lationships						
	CENERIC D	IDING COMPONENT						
Equipment	GENERIC_F							
HVAC Component	Name	GENERIC_PIPIN	E_COMPONENT					
	DisplayLabel						_	
H Nozzle	Schema	Copy Custom Attrib	utes					×
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🕀 🔶 Instrument	IsStruct	Applied Custom Attributes	1			1		
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	Assembly Name							
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🗄 🌿 Fluid Regulator	Placement tool							
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🕀 😭 Pipe Elbow		Copied Custom Attributes : 0				Copy	San	
	Associated	•		_			_	

3. Notice that a new child class has been created with 'Creation Attribute' as 'IsGraphical'

#### 4.2.6.1.2. GENERIC\_MISC\_SUPPORT

- Add a new derived class under the parent 'MISC\_SUPPORT' named 'GENERIC\_MISC\_SUPPORT'
- 2. Copy the 'Creation Attribute' from 'GENERIC\_PIPE\_ANCHOR' and paste it into this class.
- 3. Notice that a new child class has been created with 'Creation Attribute' as 'IsGraphical'

#### 4.2.6.1.3. GENERIC\_SHOES

- 1. Add a new derived class under the parent 'SHOES' named 'GENERIC\_SHOES'
- 2. Copy the 'Creation Attribute' from 'GENERIC\_PIPE\_ANCHOR' and paste it into this class.
- 3. Notice that a new child class has been created with 'Creation Attribute' as 'IsGraphical'

#### 4.2.6.1.4. GENERIC\_PIPE\_HANGER

- 1. Add a new derived class under the parent 'PIPE\_HANGER' named 'GENERIC\_PIPE\_HANGER'
- 2. Copy the 'Creation Attribute' from 'GENERIC\_PIPE\_ANCHOR' and paste it into this class.
- 3. Notice that a new child class has been created with 'Creation Attribute' as 'IsGraphical'

#### 4.2.6.1.5. GENERIC\_PIPE\_BASE\_SUPPORT

- 1. Add a new derived class under the parent 'PIPE\_BASE\_SUPPORT' named 'GENERIC\_PIPE\_BASE\_SUPPORT'
- 2. Copy the 'Creation Attribute' from 'GENERIC\_PIPE\_ANCHOR' and paste it into this class.
- 3. Notice that a new child class has been created with 'Creation Attribute' as 'IsGraphical'

#### 4.2.6.1.6. GENERIC\_PIPE\_GUIDE

- 1. Add a new derived class under the parent 'PIPE\_GUIDE' named 'GENERIC\_PIPE\_GUIDE'
- 2. Copy the 'Creation Attribute' from 'GENERIC\_PIPE\_ANCHOR' and paste it into this class.
- 3. Notice that a new child class has been created with 'Creation Attribute' as 'IsGraphical'

#### 4.2.6.1.7. GENERIC\_ELBOW\_SUPPORT

- 1. Add a new derived class under the parent 'ELBOW SUPPORT' named 'GENERIC\_ELBOW\_SUPPORT'
- 2. Copy the 'Creation Attribute' from 'GENERIC\_PIPE\_ANCHOR' and paste it into this class.
- 3. Notice that a new child class has been created with 'Creation Attribute' as 'IsGraphical'

#### 4.2.6.2. Configurations Required in AP2OPMapping.xml file:

[This is by-default part of the iModel Connector for AutoPLANT build and user is not required to manually do this. However, mentioning here for record]

As most of the supports which are getting failed to import are actually mapped to the parent classes. So, it is required to rename their OPname mapping to 'generic' ones.

Please follow these steps:

#### 4.2.6.2.1. Renaming Following OPname:

#### 4.2.6.2.1.1. PIPE\_HANGER' to 'GENERIC\_PIPE\_HANGER':

- 1. Search for 'PIPE\_HANGER' inside AP2OPMapping.xml.
- 2. Rename the mapping with OPname from 'PIPE\_HANGER' to 'GENERIC\_PIPE\_HANGER'

#### 4.2.6.2.1.2. PIPE\_ANCHOR' to 'GENERIC\_PIPE\_ANCHOR':

- 1. Search for 'PIPE\_ANCHOR' inside AP2OPMapping.xml.
- 2. Rename the mapping with OPname from 'PIPE\_ANCHOR' to 'GENERIC\_PIPE\_ANCHOR'

#### 4.2.6.2.1.3. 'PIPE\_BASE\_SUPPORT' to 'GENERIC\_PIPE\_BASE\_SUPPORT':

- 1. Search for 'PIPE\_BASE\_SUPPORT' inside AP2OPMapping.xml.
- 2. Rename the mapping with OPname from PIPE\_BASE\_SUPPORT' to 'GENERIC\_PIPE\_BASE\_SUPPORT'

#### 4.2.6.2.1.4. 'SHOES' to 'GENERIC\_SHOES':

- 1. Search for 'SHOES inside AP2OPMapping.xml.
- 2. Rename the mapping with OPname from 'SHOES to 'GENERIC\_SHOES'

#### 4.2.6.2.1.5. 'PIPE\_GUIDE' to 'GENERIC\_PIPE\_GUIDE':

- 1. Search for 'PIPE\_GUIDE' inside AP2OPMapping.xml.
- 2. Rename the mapping with OPname from 'PIPE\_GUIDE' to 'GENERIC\_PIPE\_GUIDE'

#### 4.2.6.2.1.6. 'MISC\_SUPPORT to 'GENERIC\_MISC SUPPORT':

- 1. Search for 'MISC\_SUPPORT inside AP2OPMapping.xml.
- 2. Rename the mapping with OPname from 'MISC\_SUPPORT to 'GENERIC\_MISC SUPPORT'

#### 4.2.6.2.2. Reconfiguration required for specific APClass

Although from the previous step of renaming class to 'Generic' ones has solved most of the supports but some of them are still need reconfiguration.

Please follow these steps to correct mapping for these specific supports:

#### 4.2.6.2.2.1. AT\_SUPPORT\_GBOLT --- U Bolt Guide

- Find AT\_SUPPORT\_GBOLT inside the AP2OPMapping.xml and notice that this support is listed under 'Ubolt Anchor' – NOT OK
- 2. Erase its entry from 'Ubolt Anchor'
- 3. Copy and paste the whole 'Ubolt Anchor' mapping including its APProperties.
- 4. Delete all entries of APClass names from the copied class.
- 5. Rename the OPname to 'UBOLT\_GUIDE'.

6. And paste just one APClass name as 'Base:AT\_SUPPORT\_GBOLT'.

#### 4.2.6.2.2.2. AT\_SUPPORT\_STEEL ---GENERIC\_MISC\_SUPPORT

- Find AT\_SUPPORT\_STEEL inside the AP2OPMapping.xml and notice that this support is listed under 'SUPPORT' – NOT OK.
- 2. Erase its entry from 'SUPPORT'.
- 3. Search for 'GENERIC\_MISC\_SUPPORT'.
- 4. And paste 'Base:AT\_SUPPORT\_STEEL' inside its APClass name.

#### 4.2.6.2.2.3. AT\_SUPPORT\_UABOXES --- GENERIC\_PIPE\_ANCHOR'

- Find AT\_SUPPORT\_UABOXES inside the AP2OPMapping.xml and notice that this support is listed under 'DIRECTIONAL PIPE ANCHOR' – NOT OK.
- 2. Erase its entry from 'DIRECTIONAL PIPE ANCHOR'.
- 3. Search for 'GENERIC\_PIPE\_ANCHOR'.
- 4. And paste 'Base:AT\_SUPPORT\_UABOXES' inside its APClass name.

#### 4.2.6.2.2.4. AT\_SUPPORT\_UGBOXES --- GENERIC\_PIPE\_GUIDE

- Find AT\_SUPPORT\_UGBOXES inside the AP2OPMapping.xml and notice that this support is listed under 'DIRECTIONAL PIPE GUIDE' – NOT OK.
- 2. Erase its entry from 'DIRECTIONAL PIPE GUIDE'.
- 3. Search for 'GENERIC\_PIPE\_GUIDE'.
- 4. And paste 'Base:AT\_SUPPORT\_UABOXES' inside its APClass name.

#### 4.2.6.2.2.5. AT\_SUPPORT\_GENHANGER -----GENERIC\_PIPE\_HANGER':

- Find 'AT\_SUPPORT\_GENHANGER' inside the AP2OPMapping.xml and notice that this support is listed under 'ROD HANGER' – NOT OK.
- 2. Erase its entry from 'ROD HANGER'.
- 3. Search for 'GENERIC\_ HANGER'.
- 4. And paste 'Base: AT\_SUPPORT\_GENHANGER inside its APClass name.
#### 4.2.6.2.2.6. AT\_SUPPORT\_SHOEPADSLOP --- 'GENERIC\_SHOES':

- Find 'AT\_SUPPORT\_SHOEPADSLOP inside the AP2OPMapping.xml and notice that this support is listed under 'TEE SHOE' – NOT OK.
- 2. Erase its entry from 'TEE SHOE'.
- 3. Search for 'GENERIC\_SHOES'.
- 4. And paste 'Base: AT\_SUPPORT\_SHOEPADSLOP inside its APClass name

#### 4.2.6.2.2.7. AT\_SUPPORT\_ELBOWLUG --GENERIC\_ELBOW\_SUPPORT

- Find 'AT\_SUPPORT\_ELBOWLUG-- 'inside the AP2OPMapping.xml and notice that this support is listed under 'GENERIC PIPE\_HANGER'- NOT OK.
- 2. Erase its entry from 'GENERIC PIPE\_HANGER'.
- 3. Copy and paste the whole 'GENERIC PIPE\_HANGER' mapping including its APProperties.
- 4. Delete all entries of APClass names from the copied class.
- 5. Rename the OPname to 'GENERIC\_ELBOW\_SUPPORT'.
- 6. And paste just one APClass name as 'Base:AT\_SUPPORT\_ELBOWLUG'.

So, in this way schema configuration for supports is done, which makes them import inside OPM successful.

## 4.2.7. Fixing 'Inline Steam Trap', 'Generic Offset', 'Steam Trap and 'Drip Pan Elbow' by AP2OP Schema customization

#### 4.2.7.1. Configurations Required in AP2OP Workset:

Please follow following steps to incorporate **GENERIC\_OFFSET**, **STEAM\_TRAP**, **TEE\_TRAP** and **DRIP\_PAN\_ELBOW** after running the Upgrade process.

- 1. Launch 'Bentley Class Editor' and Open **'OpenPlant\_3D.01.08.ecschema'** the latest AP2OP Work set.
- Load all Reference schemas from this location: C:\ProgramData\Bentley\OpenPlant CONNECT Edition\Configuration\WorkSpaces\OpenPlantExample\Standards\OpenPlant\Schemas
- 3. Right Click on 'OpenPlant 3D' schema and select 'Supplement Schema.'

- 4. Add following two Supplemental schema:
  - Supplemental\_Information\_3DComponent
  - Supplemental Modeling
- 5. Use the same Reference schemas as used in **Step:2** and press **OK**.
- 6. Expand the 'Openplant3D-Supplemented' schema and navigate to find
  - 1. GENERIC\_OFFSET
  - 2. **STEAM\_TRAP**
- Copy the 'Creation Attribute' from OPM Class 'GENERIC\_PIPING\_COMPONENT' and 'Component Port information' from 'GENERIC\_PIPING\_COMPONENT\_TWO\_PORT' and paste them inside the 'GENERIC\_OFFSET' and 'STEAM\_TRAP' classes.
- 8. Copy the 'Component Port information' from 'GENERIC\_PIPING\_COMPONENT\_TWO\_PORT' and paste it into '**TEE\_TRAP'** class.
- 9. Change the 'Component Port Information' for '**TEE\_TRAP'** to '3' and add 'BRANCH\_PORT' (as it contains 3 Ports inside AP environment)
- 10. Navigate to '**DRIP\_PAN\_ELBOW'** inside 'PIPE\_ELBOW' parent class and change its 'Creation attribute' to 'IsGraphical' by coping it from OPM Class 'GENERIC\_PIPING\_COMPONENT'.
- 10. Now Save these changes and close the 'Bentley Class Editor'.
- 11. Try to publish doc containing 'GENERIC\_OFFSET, STEAM\_TRAP, TEE\_TRAP and DRIP\_PAN\_ELBOW' and verify that if these components appear as a custom component inside OPM

## 4.2.7.2. Configurations Required in AP2OPMapping.xml file:

#### 4.2.7.2.1. AT\_INLINETRAP --- GENERIC\_PIPING\_COMPONENT\_THREE\_PORT

- 1. Find 'AT\_INLINETRAP' inside the AP2OPMapping.xml.
- 2. Erase its present entry from any other OP class (if exist).
- 3. Search for 'GENERIC\_PIPING\_COMPONENT\_THREE\_PORT'.
- 4. And paste 'Base:AT\_INLINETRAP' inside its APClass name.

# 4.2.8. Fixing 'Valve-TopWorks' by AP2OP Schema customization

#### 4.2.8.1. Conclusions

While some topworks classes are similar, most are not.

We map compatible classes (with special steps in the AP Connector to convert properties, because some calculations are required), or keep APM graphics if no OPM draw script is available. Extra EC classes are created if needed.

Also some valve operators in APM allow another topwork on them: like a chain on a gear operator. EC relationship class VALVE\_OPERATING\_DEVICE\_HAS\_VALVE\_OPERATING\_DEVICE was created for that (with support in AP Connector). Some modifications from OPM are required to support it.

We list existing APM and OPM topworks classes with notes. Found or possible issues are highlighted in red.

APM topworks are from the Base module. APM vs OPM classes comparison was mostly name then graphics based.

Important difference is about specs: OPM has TOPWORKS table in the specs, but APM just uses parameters from the dialog in the script.

Name (as in	APM	Notes	EC class name	Ok?
placement	equivalent			
tool)				
HAND WHEEL	Handwheel		HAND_WHEEL	+
VALVE	Wrench		VALVE_WRENCH	+
WRENCH	Operator			
BAR HANDLE	Bar Handle		BAR_HANDLE	-
	Operator			
CUBE	Cube		CUBE_OPERATOR	f
OPERATOR	Operator			
CONE	Cone		CONE_OPERATOR	+
OPERATOR	Operator			
SEAL CAP	Seal Cap		SEAL_CAP_OPERATOR	+
OPERATOR	-			
DIAPHRAGM	Diaphragm	Has picture of	DIAPHRAGM_OPERATOR	-
OPERATOR	Operator	<b>Cylinder Operator</b>	_	
		in the placement		
		tool! (OPM		
		10.9.0.59)		
GEAR BOX	Gear		GEARBOX_OPERATOR	^
OPERATOR	Operator			
PHEUMATIC	Pneumatic	Misspelled in the	PNEUMATIC_VALVE_ACTUATOR	+
VALVE	Actuator	placement tool.		
ACTUATOR				
ELECTRIC	Electric		ELECTRIC_VALVE_ACTUATOR	-
VALVE	Actuator			
ACTUATOR				
DIAPHRAGM	Diaphragm-	Wrong graphics!	DIAPHRAGM_GEAR_OPERATOR	-
GEAR	Gear	(OPM 10.9.0.59)		
OPERATOR	Operator			
Bar Handle	_	Missing picture in	T_HY_BAR_HANDLE	0
		the placement		
		tool! (OPM		
		10.9.0.59)		

## 4.2.8.2. OPM placeable topworks

Cylinder Operator	Cylinder Operator	Has picture of DIAPHRAGM OPERATOR in the placement tool! (OPM 10.9.0.59)	CYLINDER_OPERATOR	-
CHAIN	Chain		CHAIN_OPERATOR	-
OPERATOR	Operator (I)			
Motor	—		MOTOR_OPERATED_VALVE_ACTUATOR	0
Operated				
Valve				
Actuator				

For some reason Relief Operator is not in the placement menu. OPM draw script is present. Its EC class is RELIEF\_OPERATOR.

## 4.2.8.3. APM placeable topworks

Name (as in	OPM	Notes	AP class name	Ok?
placement	equivalent			
tool)				
Cone	CONE		AT_TOPWORKS_CONE	+
Operator	OPERATOR			
Cube	CUBE		AT_TOPWORKS_CUBE	f
Operator	OPERATOR			
Cylinder	Cylinder		AT_TOPWORKS_CYLINDER	-
Operator	Operator			
Seal Cap	SEAL CAP		AT_TOPWORKS_SEALCAP	+
	OPERATOR			
Handwheel	HAND	One extra parameter	AT_TOPWORKS_HANDWHEEL	+
	WHEEL	in APM.		
Handwheel	—		AT_TOPWORKS_HWHEELRISING	-
(Rising				
Stem)				
Wrench	VALVE	Somewhat different	AT_TOPWORKS_BALLLEVER	+
Operator	WRENCH	graphics!		
Bar Handle	BAR HANDLE		AT_TOPWORKS_BHANDLE	-
Operator				
Gear	GEAR BOX	OPM class has more	AT_TOPWORKS_GEAROPERATOR,	۸
Operator	OPERATOR	parameters.	ROTOCHAINCHECK=0	
Diaphragm	DIAPHRAGM	One extra parameter	AT_TOPWORKS_DIAPHRAGMSPRING	-
Operator	OPERATOR	in APM.		
Diaphragm-	DIAPHRAGM	ОРМ	AT_TOPWORKS_DIAGEAR	-
Gear	GEAR	graphics/placement		
Operator	OPERATOR	tool do not look		
		right.		
Relief	Relief	Not in the placement	AT_TOPWORKS_RELIEF	+
Operator	Operator	tool. OPM draw		
		script is present.		1

Chain	CHAIN	Name is the same as	AT_TOPWORKS_CHAIN	-
Operator (I)	OPERATOR	Chain Operator (II).		
Rotork	—		AT_TOPWORKS_ROTORKACTUATOR	-
Actuator				
Diaphragm	—		AT_TOPWORKS_DIAPHRAGM	-
Actuator				
Roto Chain	—	Topwork on topwork!	AT_TOPWORKS_ROTOCHAIN_GEAROP,	-
Links On		(On Gear Operator.)	or part of	
Gear		Or part of Gear	AT_TOPWORKS_GEAROPERATOR with	
Operator		Operator.	ROTOCHAINCHECK=1	
Chain	-	Name is the same as	AT_TOPWORKS_CHAINROTO	-
Operator (II)		Chain Operator (I).		
Chain	—	Topwork on topwork!	AT_TOPWORKS_CHAIN_LINK	-
Operator		(On Chain Operator		
Links		(II).)		
Electric	ELECTRIC		AT_TOPWORKS_ELECT	-
Actuator	VALVE			
	ACTUATOR			
Pneumatic	PHEUMATIC		AT_TOPWORKS_PNEUM	+
Actuator	VALVE			
	ACTUATOR			
Pneumatic	-		AT_TOPWORKS_G	+
Spring				
Return				
Actuator				
G20xx-SR	-		AT_TOPWORKS_G20xx	-
Actuator				
Spring	—		AT_TOPWORKS_G_M11	-
Return				
Actuator				
c/w Manual				
Overdrive				
G20xx-SR-	-		AT_TOPWORKS_G_SR_M1	-
M11				
Actuator				
c/w Manual				
Overdrive				
Diaphragm	-	APM graphics may be	AT_TOPWORKS_DIAPHANDWHEEL	-
and		a bit wrong.		
Handwheel				
Actuator				
Bayonet	-		AT_TOPWORKS_BAYONET	-
Actuator				

"Ok?": "+" means ok, "f" means flipped graphics, "^" means almost correct, "0" means not applicable, "-"means missing or wrong.

## 4.2.8.4. Required work

- 1. Configure in OPM project: flip Cube operator.
- 2. Create EC classes with IsGraphical creation attribute OR map to some suitable classes with : Handwheel (Rising stem), Rotork actuator, Diaphragm actuator, Roto chain links on gear operator, Chain operator (II), Chain operator links, G20xx-SR actuator, Spring return actuator c/w manual overdrive, G20xx-SR-M11 actuator c/w manual overdrive, Diaphragm and handwheel actuator, Bayonet actuator.

Note 1: both "Pneumatic Spring Return Actuator" and "Pneumatic Actuator" are mapped to "Pheumatic valve actuator", and while that class has OPM draw script, APM graphics are kept. Note 2: RELIEF\_OPERATOR, PNEUMATIC\_VALVE\_ACTUATOR and VALVE\_WRENCH are configured to keep APM graphics (in Modeler.cfg).

3. Fix mapping: Cylinder operator, Bar handle operator, Diaphragm operator, Diaphragm-Gear operator, Chain operator (I), Electric actuator.

## 4.2.8.5. Work done

- 1. Appending "CUBE\_OPERATOR|2|-180" to OPM\_AP2OP\_ROTATE\_COMPS\_DATA setting seems to work.
- 2. Class by class:
  - a. Added ELECTRIC\_VALVE\_ACTUATOR to OPM\_AP2OP\_ALWAYS\_TREAT\_AS\_CUSTOM\_COMPONENT list of exceptions.
  - b. Changed mapping of "G20xx-SR Actuator", "Spring Return Actuator c/w Manual Overdrive" and "G20xx-SR-M11 Actuator c/w Manual Overdrive" from "Gear operator" to PNEUMATIC\_VALVE\_ACTUATOR (they seem to be pneumatic).
  - c. Created new classes for "Bayonet actuator" and "Diaphragm and handwheel operator". Just BAYONET\_ACTUATOR and DIAPHRAGM\_AND\_HANDWHEEL\_ACTUATOR, VALVE\_ACTUATOR descendants.
- 3. Class by class:
  - a. Cylinder operator in OPM lacks C and D parameters from APM. Fixed mapping, ignoring extra parameters. Note that APM graphics are closer to diaphragm operator, so graphics are configured to be kept.
  - b. Bar handle operator in OPM has more parameters than in APM. Fixed mapping, ignoring extra parameters. Graphics are kept too.

## 4.2.9. Fixes for Piping 'Base' module components getting 'missed' or give 'wrong graphics' due to incorrect mappings.

## 4.2.9.1. Fixing 'Fire Hydrant':

- Launch 'Bentley Class Editor' and Open 'OpenPlant\_3D.01.08.ecschema' the latest AP2OP Workset.
   Can be found at this link
   C:\ProgramData\Bentley\OpenPlant CONNECT
   Edition\Configuration\WorkSpaces\OpenPlantExample\WorkSets\......\Metric\Standards\Open Plant\Schemas
- Load all Reference schemas from this location:
   C:\ProgramData\Bentley\OpenPlant CONNECT
   Edition\Configuration\WorkSpaces\OpenPlantExample\Standards\OpenPlant\Schemas
- 3. Right Click on 'OpenPlant 3D' schema and select 'Supplement Schema.'

<b>~</b> *			
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	Add Relationship Class		
	Add New Supplemental Schema		
	Supplement Schema		
	Save Schema		
	Close Schema		
	Save As		
	Add Units Remove Units		
	Add New Mapping		
	Open Existing Mapping		
	Save Mapping		
	Add Class From Dictionary		
	Add Relationship From Dictionary		

- 4. Add following two Supplemental schemas:
  - Supplemental\_Information\_3DComponent
  - Supplemental Modeling

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OneDrive		OpenPlant_3D_Supplemental_Mapping_PSDS.01.08.ecschema	2/15/2021 11:31 AN
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- 5. Expand the 'Classes' and follow the hierarchy, to find 'Fire Hydrant'.
- 6. Go to the class 'Generic Piping Component' and Right click to copy 'Creation Attribute' as a 'Custom Attributes'.



- 7. Paste this custom attribute into the 'Fire Hydrant' class.
- 8. Now copy the 'Component Port Information' from GENERIC\_PIPING\_COMPONENT\_TWO\_PORT.
- 9. Paste it into the 'Fire\_hydrant' class.
- 10. Edit the No.of Ports from 2 to 1.
- 11. Delete the 'Run\_Port' from 'Port Type'.
- 12. As a result, we can now incorporate Fire Hydrants into the OP world.

#### 4.2.9.2. Fixing 'Pressure\_Relief\_Valve':

 Launch 'Bentley Class Editor' and Open 'OpenPlant\_3D.01.08.ecschema' the latest AP2OP Workset.

Can be found at this link

C:\ProgramData\Bentley\OpenPlant CONNECT

Edition\Configuration\WorkSpaces\OpenPlantExample\WorkSets\......\Metric\Standards\Open Plant\Schemas

2. Load all Reference schemas from this location:

C:\ProgramData\Bentley\OpenPlant CONNECT

Edition\Configuration\WorkSpaces\OpenPlantExample\Standards\OpenPlant\Schemas

3. Right Click on 'OpenPlant 3D' schema and select 'Supplement Schema.'

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	Add Relationship Class		
	Add New Supplemental Schema		
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	Open Existing Mapping		
	Save Mapping		
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	Add Class From Dictionary		
	Add Relationship From Dictionary		

- 4. Add following two Supplemental schemas:
  - Supplemental\_Information\_3DComponent
  - Supplemental Modeling

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Videos		OpenPlant_3D_Supplemental_Mapping_PDS.01.08.ecschema	2/15/2021 11:31 AN
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		Open	Cancel

- 5. Search for the class 'Presssure\_Relief\_Valve'.
- 6. Navigate to it.
- 7. Edit the No.of Ports from **2** to **1**.
- 8. Delete the 'Run\_Port' from 'Port Type'.
- 9. Go to the class 'Generic Piping Component' and Right click to copy 'Creation Attribute' as a 'Custom Attributes'.

OpenPlant_3D [Supplemented] - Bentley Class Editor CO	NNECT Edition
File Edit View Database Mapping Tools Help	
<u> **</u> **	
◆ ► Location: S:OpenPlant_3D.01.08\Generic Piping Component	
Device	Class Properties Relationships
tequipment tequipment tequipment	GENERIC_PIPING_COMPONEN
HVAC Component	Name GENERIC_PIF
	DisplayLabel Generic Piping
	Schema OpenPlant_3D
	Isstnuct False
Piping Component	IsCustom AttributeClass False
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Fire Hydrant	BaseClasses op 3d:PIPING_
- Arrestor	Associated Item class list poin
Row Meter	Associated Item Class Name ASSOCIATED
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	Add/Remove
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Remove Class	Paste
Add Derived Relations	hip Class EC Class
Add Mapping	cID Specification (inherite
	erty GUID
	Class As Custom Compo
🕀 🐨 🐨 Paste Mapping	

- 10. Paste this custom attribute into the 'Presssure\_Relief\_Valve' class.
- 11. As a result, we can now incorporate **Presssure\_Relief\_Valve** into the OP world.

## 4.2.9.3. Fixing 'WELDOFLANGE' and 'Welding\_Boss':

 Launch 'Bentley Class Editor' and Open 'OpenPlant\_3D.01.08.ecschema' the latest AP2OP Workset.

Can be found at this link

C:\ProgramData\Bentley\OpenPlant CONNECT

Edition\Configuration\WorkSpaces\OpenPlantExample\WorkSets\......\Metric\Standards\Open Plant\Schemas

- Load all Reference schemas from this location:
   C:\ProgramData\Bentley\OpenPlant CONNECT
   Edition\Configuration\WorkSpaces\OpenPlantExample\Standards\OpenPlant\Schemas
- 3. Right Click on 'OpenPlant 3D' schema and select 'Supplement Schema.'

<b>~</b> * %			
<b>&lt;</b>	← Location: OpenPlant_3D.01.08		
- 👸 Open	Plant 3D	OpenPlant_3	0.01.08
₫- <b>С</b> ₫- <b>С</b>	Collapse	Name DisplayLabel Name Space Prefix	OpenPlant_3D OpenPlant_3D op3d
	Paste	Version Major	1
	Custom Attributes	VersionMinor	8
	Add Class		
	Add Relationship Class		
	Add New Supplemental Schema		
	Supplement Schema		
	Save Schema		
	Close Schema		
	Save As		
	Add Units		
	Remove Units		
	Add New Mapping		
	Open Existing Mapping		
	Save Mapping		
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	Add Class From Dictionary		

- 4. Add following two Supplemental schemas:
  - Supplemental\_Information\_3DComponent
  - Supplemental Modeling

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		Open	Cancel

- 5. Expand the 'Classes' and follow the hierarchy, to find 'Welding Boss' and 'Weldoflange'.
- 6. Go to the class 'Generic Piping Component' and Right click to copy 'Creation Attribute' as a 'Custom Attributes'.



- 7. Paste this custom attribute into both 'Welding Boss' and 'Weldoflange' classes.
- 8. As a result, we can now incorporate 'Welding Boss' and 'Weldoflange' into the OP world.

4.2.9.4. Fixing 'Pipe\_Elbow\_Street':

1. Launch 'Bentley Class Editor' and Open 'OpenPlant\_3D.01.08.ecschema' the latest AP2OP Workset.

Can be found at this link C:\ProgramData\Bentley\OpenPlant CONNECT Edition\Configuration\WorkSpaces\OpenPlantExample\WorkSets\......\Metric\Standards\Open Plant\Schemas

Load all Reference schemas from this location:
 C:\ProgramData\Bentley\OpenPlant CONNECT
 Edition\Configuration\WorkSpaces\OpenPlantExample\Standards\OpenPlant\Schemas

3. Right Click on 'OpenPlant 3D' schema and select 'Supplement Schema.'

5 ™& ▲ ►			
Open	Plant a)	OpenPlant_3D	0.01.08
÷-	Collapse	Name DisplayLabel NameSpacePrefix	OpenPlant_31 OpenPlant_31 op3d
	Paste	Description VersionMajor	1
1	Custom Attributes  Add Class Add Relationship Class Add New Supplemental Schema Supplement Schema Save Schema Close Schema Save As	VersionMinor	8
	Add Units Remove Units		
	Add New Mapping Open Existing Mapping Save Mapping Close Mapping		
	Add Class From Dictionary Add Relationship From Dictionary		

- 4. Add following two Supplemental schemas:
  - Supplemental\_Information\_3DComponent
  - Supplemental Modeling

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- Kitasic		OpenPlant_3D_Supplemental_Isometrics_Isoextractor.01.08.ecschema	2/15/2021 11:31 AN
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- 5. Expand the 'Classes' and follow the hierarchy, to find 'Pipe\_Elbow\_Street'.
- 6. Go to the class 'PIPE\_ELBOW\_45\_DEGREE\_STREET' and Right click to copy 'Component Port Information' as a 'Custom Attributes'.



- 9. Paste this custom attribute into parent class 'Pipe Elbow Street'.
- 10. As a result, we can now incorporate 'Pipe Elbow Street' into the OP world.

## 4.2.9.5. Fixing 'Pipe End':

1. Launch 'Bentley Class Editor' and Open **'OpenPlant\_3D.01.08.ecschema'** the latest AP2OP Workset.

Can be found at this link C:\ProgramData\Bentley\OpenPlant CONNECT Edition\Configuration\WorkSpaces\OpenPlantExample\WorkSets\......\Metric\Standards\Open Plant\Schemas

Load all Reference schemas from this location:
 C:\ProgramData\Bentley\OpenPlant CONNECT
 Edition\Configuration\WorkSpaces\OpenPlantExample\Standards\OpenPlant\Schemas

3. Right Click on 'OpenPlant 3D' schema and select 'Supplement Schema.'

5 ™& ▲ ►			
Open	Plant a)	OpenPlant_3D	0.01.08
÷-	Collapse	Name DisplayLabel NameSpacePrefix	OpenPlant_31 OpenPlant_31 op3d
	Paste	Description VersionMajor	1
1	Custom Attributes  Add Class Add Relationship Class Add New Supplemental Schema Supplement Schema Save Schema Close Schema Save As	VersionMinor	8
	Add Units Remove Units		
	Add New Mapping Open Existing Mapping Save Mapping Close Mapping		
	Add Class From Dictionary Add Relationship From Dictionary		

- 4. Add following two Supplemental schemas:
  - Supplemental\_Information\_3DComponent
  - Supplemental Modeling

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- 5. Expand the 'Classes' and follow the hierarchy, to find 'Pipe\_End'.
- 6. Now copy the 'Component Port Information' from GENERIC\_PIPING\_COMPONENT\_TWO\_PORT.
- 7. Paste it into the 'Pipe\_End' class.
- 8. Edit the No.of Ports from **2** to **1**.
- 9. Delete the 'Run\_Port' from 'Port Type'.
- 10. Go to the class 'Generic Piping Component' and Right click to copy 'Creation Attribute' as a 'Custom Attributes'.

OpenPlant_3D [Supplemented] - Bentley Class Editor CONNECT Editio	on		
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15 15 <b>4</b> 5 <b>4</b> 5 16 16 14 14 15			
Location: S:OpenPlant_3D.01.08\Generic Piping Component			
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- 11. Paste this custom attribute into parent class 'Pipe\_End'.
- 12. As a result, we can now incorporate '**Pipe\_End'** into the OP world.

## 4.2.10. Incorporating 'Concentric\_Swage' as a Custom Component.

1. Launch 'Bentley Class Editor' and Open **'OpenPlant\_3D.01.08.ecschema'** the latest AP2OP Workset.

Can be found at this link

C:\ProgramData\Bentley\OpenPlant CONNECT

Edition\Configuration\WorkSpaces\OpenPlantExample\WorkSets\......\Metric\Standards\Open Plant\Schemas

Load all Reference schemas from this location:
 C:\ProgramData\Bentley\OpenPlant CONNECT
 Edition\Configuration\WorkSpaces\OpenPlantExample\Standards\OpenPlant\Schemas

3. Right Click on 'OpenPlant 3D' schema and select 'Supplement Schema.'

	► ► Location: OpenPlant_3D.01.08		
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	Paste	Description Version Major	1
	Custom Attributes  Add Class Add Relationship Class	Version Minor	8
	Add New Supplemental Schema		
	Supplement Schema		
	Save Schema		
	Close Schema Save As		
	Add Units Remove Units		
	Add New Mapping Open Existing Mapping Save Mapping Close Mapping		
	Add Class From Dictionary Add Relationship From Dictionary		

- 4. Add following two Supplemental schemas:
  - Supplemental\_Information\_3DComponent
  - Supplemental Modeling

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- 5. Search for 'CONCENTRIC\_SWAGE' class and select it.
- 6. Go to the class 'Generic Piping Component' and Right click to copy 'Creation Attribute' as a 'Custom Attributes'.

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Piping and Instrument Component	0	Description		
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- 7. Paste this 'Creation Attribute' into the 'CONCENTRIC\_SWAGE'.
- 8. Now copy the 'Component Port Information' from GENERIC\_PIPING\_COMPONENT\_TWO\_PORT.
- 9. Paste this attribute to 'CONCENTRIC\_SWAGE' class also.
- 10. As a result, we can now incorporate 'CONCENTRIC\_SWAGE' into the OP world.

## 4.2.11. Incorporating 'LATROLET\_90\_DEGREES' as a Custom Component

 Launch 'Bentley Class Editor' and Open 'OpenPlant\_3D.01.08.ecschema' the latest AP2OP Workset.

Can be found at this link C:\ProgramData\Bentley\OpenPlant CONNECT Edition\Configuration\WorkSpaces\OpenPlantExample\WorkSets\......\Metric\Standards\Open Plant\Schemas  Load all Reference schemas from this location: C:\ProgramData\Bentley\OpenPlant CONNECT Edition\Configuration\WorkSpaces\OpenPlantExample\Standards\OpenPlant\Schemas

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	Custom Attributes		
	Add New Supplemental Schema Supplement Schema		
	Save Schema		
	Close Schema Save As		
	Add Units Remove Units		
	Add New Mapping Open Existing Mapping Save Mapping Close Mapping		
	Add Class From Dictionary Add Relationship From Dictionary		

3. Right Click on 'OpenPlant 3D' schema and select 'Supplement Schema.'

- 4. Add following two Supplemental schemas:
  - Supplemental\_Information\_3DComponent
  - Supplemental Modeling

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Schemas		OpenPlant_3D_Supplemental_Mapping_OpenPlantBIS.01.08.ecschema	2/15/2021 11:31 AN
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- 5. Search for 'LATROLET' class and select it.
- 6. Right Click on 'LATROLET' and select 'Add Derived Classes.'
- 7. Specify its 'Name' and 'Display Label' as 'LATROLET\_90\_DEGREES'
- 8. Go to the class 'Generic Piping Component' and Right click to copy 'Creation Attribute' as a 'Custom Attributes'.

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		Dis	playLabel	Generic Piping
	nstrument Component	Sch	nema	OpenPlant_3D
. Anstrume	ent	Des	scription	Falso
📄 🔶 Piping C	Component	IsC	ustomAttributeClass	False
	ess Plate	IsD	omainClass	True
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	Paste Mapping			

9. Paste this 'Creation Attribute' into the newly created 'LATROLET\_90\_DEGREES' class.

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Latrolet	Creation Attribute	e (from LATROLET_90_DE
Nipolet	Assembly Name	
Saddle	Class Name	IsGraphical
Sockolet	Namespace	
Sweepolet	Placement tool	
Threadolet	Handler Type	
Welding Boss	Diagram Cell Name	
Weldoflange	Cell Library	
Weldolet		

10. As a result, we can now incorporate 'LATROLET\_90\_DEGREES' into the OP world.

## 4.2.12. Incorporating 'TAP-TAP' End-Conditions for 'TAP\_JOINT'

1. Launch 'Bentley Class Editor' and Open **'OpenPlant\_3D.01.08.ecschema'** the latest AP2OP Workset.

Can be found at this link C:\ProgramData\Bentley\OpenPlant CONNECT Edition\Configuration\WorkSpaces\OpenPlantExample\WorkSets\......\Metric\Standards\Open Plant\Schemas

- Load all Reference schemas from this location:
   C:\ProgramData\Bentley\OpenPlant CONNECT
   Edition\Configuration\WorkSpaces\OpenPlantExample\Standards\OpenPlant\Schemas
- 3. Right Click on 'OpenPlant 3D' schema and select 'Supplement Schema.'

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- 4. Add following two Supplemental schemas:
  - Supplemental\_Information\_3DComponent
  - Supplemental Modeling

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5. Under the 'Plant Base Object' click on 'Joint'



6. Expand the 'Joint Type' from 'OpenPlant\_Physical\_JointType\_Map'.

	Ор	enPlant_Physica	l_JointType_Map
/	Joir	nt Type	
	>	Joint Type[0]	
	>	Joint Type[1]	
	>	Joint Type[2]	
	>	Joint Type[3]	
	>	Joint Type[4]	
	>	Joint Type[5]	
	>	Joint Type[6]	
	>	Joint Type[7]	
	>	Joint Type[8]	
	>	Joint Type[9]	
	>	Joint Type[10]	

- 7. Please look for the 'TAP\_JOINT' (can be found at [8] position).
- 8. Expand the 'End Preparation 2' and add 'TAP' (as a new End Condition 2) as shown below.

✓ Joint Type[41]	
Joint Name 1	TAP_JOINT
<ul> <li>End Preparation 1</li> </ul>	
End Preparation 1	TAP
<ul> <li>End Preparation 2</li> </ul>	
End Preparation 2	BUTT_WELD
End Preparation 2	SOCKET_WELD_FEMALE
End Preparation 1	THREADED_FEMALE
End Preparation 2	BEVELED_END
End Preparation 1	THREADED_MALE
End Preparation 2	PLAIN_END
End Preparation 2	TAP

9. As a result, we can now incorporate 'TAP-TAP' End Conditions for 'Tap\_Joint'

## 4.2.13. Incorporating 'Straightway Y Check Valve' and 'Relief Change Over Valve APM'

- Launch 'Bentley Class Editor' and Open 'OpenPlant\_3D.01.08.ecschema' the latest AP2OP Workset.
   Can be found at this link
   C:\ProgramData\Bentley\OpenPlant CONNECT
   Edition\Configuration\WorkSpaces\OpenPlantExample\WorkSets\......\Metric\Standards\Open Plant\Schemas
- Load all Reference schemas from this location: C:\ProgramData\Bentley\OpenPlant CONNECT Edition\Configuration\WorkSpaces\OpenPlantExample\Standards\OpenPlant\Schemas

3. Right Click on 'OpenPlant 3D' schema and select 'Supplement Schema.'

<u>१</u> 8 % ▲ ►			
	<ul> <li>Location: OpenPlant_30.01.08</li> <li>Expand</li> <li>Collapse</li> <li>Paste</li> <li>Custom Attributes</li> <li>Add Class</li> <li>Add Relationship Class</li> <li>Add Relationship Class</li> <li>Add New Supplemental Schema</li> <li>Supplement Schema</li> <li>Save Schema</li> <li>Close Schema</li> <li>Save As</li> <li>Add Units</li> <li>Remove Units</li> <li>Add New Mapping</li> <li>Open Existing Mapping</li> <li>Save Mapping</li> <li>Close From Dictionary</li> <li>Add Relationship From Dictionary</li> </ul>	OpenPlant_3D. Name DisplayLabel NameSpacePrefix Description VersionMajor VersionMinor	01.08 OpenPlant_3C op3d 1 8

- 4. Add following two Supplemental schemas:
  - Supplemental\_Information\_3DComponent
  - Supplemental Modeling

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5. Navigate to 'Plant Base Object > Named Item > Device > Piping and instrument Component > Piping Component > Fluid Regulator > One Way Flow Regulator > Check Valve.



- 6. Right Click on 'Check Valve' and select 'Add Derived Classes.'
- 7. Specify its 'Name' and 'Display Label' as 'VALVE\_YCHECK' and "Straightway Y Check Valve" respectively.
- 8. Similarly Navigate to 'Plant Base Object > Named Item > Device > Piping and instrument Component > Piping Component > Valve > Multi Way Valve > Three Way Valve.



- 9. Right Click on 'Three Way Valve' and select 'Add Derived Classes.'
- 10. Specify its 'Name' and 'Display Label' as 'CHANGE\_OVER\_VALVE\_AP' and "Relief Change Over Valve APM" respectively.
- 11. Go to the class 'Generic Piping Component' and Right click to copy 'Creation Attribute' as a 'Custom Attributes'.

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Flow Meter		Associated Item Class	Name ASSOCIATED
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- 12. Paste this 'Creation Attribute' into the newly created classes 'VALVE\_YCHECK' and 'CHANGE\_OVER\_VALVE\_AP'
- 13. As a result, we can now incorporate 'Straightway Y Check Valve' and 'Relief Change Over Valve APM' into the OP world.

## 4.2.14. Incorporating 'THREADED\_WELD\_JOINT'

 Launch 'Bentley Class Editor' and Open 'OpenPlant\_3D.01.08.ecschema' the latest AP2OP Workset.

Can be found at this link C:\ProgramData\Bentley\OpenPlant CONNECT Edition\Configuration\WorkSpaces\OpenPlantExample\WorkSets\......\Metric\Standards\Open Plant\Schemas

Load all Reference schemas from this location:
 C:\ProgramData\Bentley\OpenPlant CONNECT
 Edition\Configuration\WorkSpaces\OpenPlantExample\Standards\OpenPlant\Schemas
3. Right Click on 'OpenPlant 3D' schema and select 'Supplement Schema.'

	► ► Location: OpenPlant_3D.01.08		
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- 4. Add following two Supplemental schemas:
  - Supplemental\_Information\_3DComponent
  - Supplemental Modeling

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- 5. Navigate to 'Plant Base Object > Joint' and expand the 'OpenPlant\_Physical\_JointType\_Map'.
- 6. Right Click on 'Joint Type' and select 'Add element' to add a new joint.
- 7. Scroll down and notice that a new empty Joint has been created. (If it does not appear, please refresh or click on any other node)



8. Please Fill the information of 'THREADED\_WELD\_JOINT' as shown below:

ſ	v	Joir	nt Type[42]	
			Joint Name	THREADED_WELD_JOINT
		v	End Preparation 1	
			End Preparation	THREADED_FEMALE
		v	End Preparation 2	
			End Preparation 2	THREADED_MALE
			End Preparation 2	PLAIN_END
			End Preparation 2	BUTT_WELD
			Match Property	
		$\mathbf{v}$	Fastener	
			Fastener[0]	WELD
			Is Fastener Spec Driv	True
			Script Assembly Name	
			Script Class Name	
			Script Namespace	

- 9. Save all the changes.
- 10. As a result, we can have now incorporated 'THREADED\_WELD\_JOINT' into the OP world.

### 4.2.15. Incorporating 'CLAMP\_GASKET' and 'CLAMP\_BOLT':

 Launch 'Bentley Class Editor' and Open 'OpenPlant\_3D.01.08.ecschema' the latest AP2OP Workset.

Can be found at this link C:\ProgramData\Bentley\OpenPlant CONNECT Edition\Configuration\WorkSpaces\OpenPlantExample\WorkSets\......\Metric\Standards\Open Plant\Schemas

- Load all Reference schemas from this location: C:\ProgramData\Bentley\OpenPlant CONNECT Edition\Configuration\WorkSpaces\OpenPlantExample\Standards\OpenPlant\Schemas
- 3. Right Click on 'OpenPlant 3D' schema and select 'Supplement Schema.'

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- 4. Add following two Supplemental schemas:
  - Supplemental\_Information\_3DComponent
  - Supplemental Modeling

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Use the same Reference schemas as used in Step:2 and press OK.

- Navigate to 'Plant Base Object > Named Item > Device > Piping and instrument Component > Seal >Gasket.
- 6. Right Click on 'Gasket' and select 'Add Derived Classes'.
- 7. Specify its 'Name' and 'Display Label' as 'CLAMP\_GASKET' and "CLAMP\_GASKET" respectively.
- 8. Navigate to 'Plant Base Object > Named Item > Device > Fastener > Bolt
- 9. Right Click on 'Bolt' and select 'Add Derived Classes'.
- 10. Specify its 'Name' and 'Display Label' as 'CLAMP\_BOLT' and "CLAMP\_BOLT" respectively.
- 11. Go to the class 'Generic Piping Component' and Right click to copy 'Creation Attribute' as a 'Custom Attributes'.



12. Paste this 'Creation Attribute' into the newly created classes 'CLAMP\_GASKET' and 'CLAMP\_BOLT'.



#### 13. As a result, we can now incorporate 'CLAMP\_GASKET' and 'CLAMP\_BOLT' into the OP world.

## 4.2.16. Introducing 'UPDATE\_GRAPHICS' property inside 'Fastener' and 'Seal' classes:

- Launch 'Bentley Class Editor' and Open 'OpenPlant\_3D.01.08.ecschema' the latest AP2OP Workset.
   Can be found at this link
   C:\ProgramData\Bentley\OpenPlant CONNECT
   Edition\Configuration\WorkSpaces\OpenPlantExample\WorkSets\......\Metric\Standards\Open Plant\Schemas
- 2. Load all Reference schemas from this location:

C:\ProgramData\Bentley\OpenPlant CONNECT

Edition\Configuration\WorkSpaces\OpenPlantExample\Standards\OpenPlant\Schemas

3. Right Click on 'OpenPlant 3D' schema and select 'Supplement Schema.'

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- 4. Add following two Supplemental schemas:
  - Supplemental\_Information\_3DComponent
  - Supplemental Modeling

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Use the same Reference schemas as used in Step:2 and press OK.

- Navigate to 'Plant Base Object > Named Item > Device > Piping and instrument Component > Piping Component
- 6. Copy the 'Update\_Graphics' property from the 'Property' tab.

Location: S:OpenPlant_3D.01.08\Piping Componen	it						
Nozzle Type Map	^	Class	Properties	Relationsh	nips		
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- 7. Paste this property to the 'Fastener' and 'Seal' class.
- 8. Finally, we are now able to use 'Update\_graphics' property inside all of the Derived class from 'Fastener' and 'Seal'

## 4.2.17. Some Corrections required inside the 'Modeler.cfg' file:

1. Launch the 'Modeler.cfg' file from the following location:

#### C:\ProgramData\Bentley\OpenPlant CONNECT

Edition\Configuration\WorkSpaces\OpenPlantExample\WorkSets\AP2OP Base Metric\Standards\OpenPlant\Modeler

- 2. Find 'OPM\_AP2OP\_ALWAYS\_TREAT\_AS\_CUSTOM\_COMPONENT' inside this file.
- 3. Add 'MITERED\_PIPE' like:

#### SUPPORT;MITERED\_PIPE;INSTRUMENT;T\_STRAINER;

4. Introduce a new variable inside the 'Modeler.cfg' file as

'OPM\_AP2OP\_POST\_UPGRADE\_KEYINS = mechaddin deleteemptylines PIPING\_NETWORK\_SYSTEM'

5. Remove the following variable from 'Modeler.cfg' file:

OPM\_AP2OP\_DISABLE\_CROSS\_MODEL\_RELS=1

### 4.2.18. Fixing 'PIPE\_ELBOW' Ports information:

 Launch 'Bentley Class Editor' and Open 'OpenPlant\_3D.01.08.ecschema' the latest AP2OP Workset.
 Can be found at this link
 C:\ProgramData\Bentley\OpenPlant CONNECT
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Edition\Configuration\WorkSpaces\OpenPlantExample\WorkSets\......\Metric\Standards\Open Plant\Schemas

- Load all Reference schemas from this location:
   C:\ProgramData\Bentley\OpenPlant CONNECT
   Edition\Configuration\WorkSpaces\OpenPlantExample\Standards\OpenPlant\Schemas
- 3. Right Click on 'OpenPlant 3D' schema and select 'Supplement Schema.'

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	Save Mapping		
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	Add Relationship From Dictionary		

- 4. Add following two Supplemental schemas:
  - Supplemental\_Information\_3DComponent
  - Supplemental Modeling

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Use the same Reference schemas as used in Step:2 and press OK.

- 5. Search for the class 'PIPE\_ELBOW'.
- 6. Update the Port information to 2 –Ports.
- 7. Please make sure that the Two –Port types are present,
  - MAIN\_PORT
  - RUN\_PORT

E Pipe Clamp	Tab Group Name openplantmodeler.piping.main,Personal.Piping	
	Associated Task Panes (inherited from PIPING_COMPONENT in Op	penPlant_3
Generic Bend	> Task Pane Labels	
Jacketed Elbow	Component Ports Information (from PIPE_ELBOW in OpenPlant_3	D_Supplem
Pipe Elbow 11.25 Degree	No. of Ports 2	
Pipe Elbow 22.5 Degree	Port Type Port Type Port Type	
Pipe Elbow 30 Degree	Port Type[1] RUN_PORT	
	Port EC Class Name	
Pipe Elbow 5 Degree	Creation Attribute (from PIPE_ELBOW in OpenPlant_3D_Supplement	ntal_Model

8. Save the changes to Bentley Class Editor.

## 4.2.19. Fixing 'PIPE\_FLANGE\_SPADE' Creation Attribute:

 Launch 'Bentley Class Editor' and Open 'OpenPlant\_3D.01.08.ecschema' the latest AP2OP Workset.

Can be found at this link

C:\ProgramData\Bentley\OpenPlant CONNECT

Edition\Configuration\WorkSpaces\OpenPlantExample\WorkSets\......\Metric\Standards\Open Plant\Schemas

 Load all Reference schemas from this location: C:\ProgramData\Bentley\OpenPlant CONNECT Edition\Configuration\WorkSpaces\OpenPlantExample\Standards\OpenPlant\Schemas

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	Add Class From Dictionary Add Relationship From Dictionary		

3. Right Click on 'OpenPlant 3D' schema and select 'Supplement Schema.'

- 4. Add following two Supplemental schemas:
  - Supplemental\_Information\_3DComponent
  - Supplemental Modeling

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Use the same Reference schemas as used in **Step:2** and press **OK**.

- 5. Search for the class 'PIPE\_FLANGE\_SPADE' and select it
- 6. Go to the class 'Generic Piping Component' and Right click to copy 'Creation Attribute' as a 'Custom Attributes'.



7. Paste this 'Creation Attribute' into the 'PIPE\_FLANGE\_SPADE' class.

Pipe Reducer	Creation Attribute (from PIPE_FLANGE_SPADE in OpenPlant_3D_Supplemental_Modeling.01.08)
Pulsation Damper	Assembly Name
⊕	Class Name IsGraphical
- 🕂 Spacer	Namespace
	Placement tool
	Handler Type
Pipe Flange Spade	Diagram Cell Name
	Cell Library

9. Save the changes to Bentley Class Editor.

### 4.2.20. Fixing 'JOINT\_GAP' BUG: 598573:

 Launch 'Bentley Class Editor' and Open 'OpenPlant\_3D.01.08.ecschema' the latest AP2OP Workset.
 Can be found at this link C:\ProgramData\Bentley\OpenPlant CONNECT Edition\Configuration\WorkSpaces\OpenPlantExample\WorkSets\......\Metric\Standards\Open Plant\Schemas

- Load all Reference schemas from this location: C:\ProgramData\Bentley\OpenPlant CONNECT Edition\Configuration\WorkSpaces\OpenPlantExample\Standards\OpenPlant\Schemas
- 3. Right Click on 'OpenPlant 3D' schema and select 'Supplement Schema.'

V			
	► ► Location: OpenPlant_3D.01.08		
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	Add Class		
	Add Relationship Class		
	Add New Supplemental Schema		
	Supplement Schema		
	Save Schema		
	Close Schema		
	Save As		
	Add Units		
	Remove Units		
	Add New Mapping		
	Open Existing Mapping		
	Save Mapping		
	Close Mapping		
	Add Class From Dictionary		
	Add Relationship From Dictionary		

- 4. Add the following two Supplemental schemas:
  - Supplemental\_Information\_3DComponent
  - Supplemental Modeling

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Use the same Reference schemas as used in Step:2 and press OK

- 5. Search for the 'Gasket' Class
- 6. Right Click on 'Gasket' class and select 'Add Derived Class'.
- 7. Name this newly created class as 'JOINT\_GAP'.
- 8. Save the changes on Bentley Class Editor.
- 9. Launch OPPA and navigate to the recently opened AP2OP Base Workset.
- 10. Navigate to the 'Joint Map' option inside the 'Settings' tab.
- 11. Create a new joint named 'AP\_JOINT\_GAP' with details as follows:

	^ E	↓ ¤≡: ¤≡:		Q
nt Map AP_JOINT		Joint Name	AP JOINT GAP	A
AP_JOINT_GAP		Properties to Match	String I Array	
AQUA_LINK_JOINT			string[] Anay	
AQUA_SOLVENT_JOINT		List of Fasteners	String[] Array	
AQUALINK_MALEFEMALE_JOINI		[0]	JOINT_GAP	
CLAMP JOINT	-	List 1 of Compatible End Preperations	String[] Array	
COMPRESSION_JOINT		[0]	BEVELED_END	
COUPLED_JOINT		[1]	BUTT_WELD	
FERRULE_JOINT		[2]	PLAIN END	
FIELD_MECHANICAL_JOINT		List 2 of Compatible End Preparations	String D Array	
FLANGE_GROOVE_JOINT	-	List 2 of compatible end Preperations	Stringtj Array	
FLEXIBLE HOSE JOINT		[0]	BEVELED_END	
GROOVE_JOINT		[1]	BUTT_WELD	
HUB_JOINT		[2]	PLAIN_END	
HVAC_FEMALE_JOINT		[3]	SLIP_ON	
HVAC_FLANGE_JOINT		[4]	SOCKET_WELD_MALE	
HVAC_MALE_JOINT		Is Specification Driven		
HVAC_PLAIN_JOINT				
INNOVATIVE_GROOVE_JOINT		Carlot Namanana		
INNOVATIVE_MALEFEMALE_JOINT		Script Namespace		
MECHANICAL ANCHORED JOINT				
MECHANICAL_COUPLED_JOINT				
Help		Do not C	reate a Backup Save	Close

12. Save the changes in OPPA

13. Now we have successfully incorporated 'JOINT\_GAP' inside the AP2OP workflow.

# 4.2.21. Incorporating 'Equipment' from APM inside the AP2OP Schemas

 Launch 'Bentley Class Editor' and Open 'OpenPlant\_3D.01.08.ecschema' the latest AP2OP Workset.

Can be found at this link C:\ProgramData\Bentley\OpenPlant CONNECT Edition\Configuration\WorkSpaces\OpenPlantExample\WorkSets\......\Metric\Standards\Open Plant\Schemas

- Load all Reference schemes from this location: C:\ProgramData\Bentley\OpenPlant CONNECT Edition\Configuration\WorkSpaces\OpenPlantExample\Standards\OpenPlant\Schemas
- 3. Right Click on 'OpenPlant 3D' schema and select 'Supplement Schema.'

	► Location: OpenPlant_3D.01.08		
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	Add Class		
	Add Relationship Class		
	Add New Supplemental Schema		
	Supplement Schema		
	Save Schema		
	Close Schema		
	Save As		
	Add Units		
	Remove Units		
	Add New Mapping		
	Open Existing Mapping		
	Save Mapping		
	Close Manning		
	Add Class From Dictionary		
	Add Relationship From Dictionary		

- 4. Add the following two Supplemental schemas:
  - Supplemental\_Information\_3DComponent
  - Supplemental Modeling

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Use the same Reference schemas as used in Step:2 and press OK

5. To incorporate diverse varieties of Equipment from APM, we need to add new classes for them inside the AP2OP Schema.

Classes can be added by selecting 'Add Derived Class' from the right click context menu of the parent class

Parent Class	Derived Class	Description	Display - Label
			AP Equipment
EQUIPMENT	APEQPPRIM	AutoPLANT equipment primitives	Primitives
		AutoPLANT equipment primitives -	
APEQPPRIM	APEQPPRIM_CYL	cylinders	Cylinders
		AutoPLANT equipment primitives -	
APEQPPRIM	APEQPPRIM_CON	cones	Cones
		AutoPLANT equipment primitives -	Rectangular
APEQPPRIM	APEQPPRIM_RECT	rectangular solid	Solids
			AP Associative
EQUIPMENT	APASSOCPRIM	AutoPLANT assosiative primitives	Primitives
			AP Spec
EQUIPMENT	APSPECREAC	AutoPLANT assosiative primitives	Reactors
	APASSOCPRIM_CY	AutoPLANT assosiative primitives -	
APASSOCPRIM	L	cylinders	Cylinders
	APASSOCPRIM_CO	AutoPLANT assosiative primitives -	
APASSOCPRIM	N	cones	Cones

	APASSOCPRIM_HE	AutoPLANT assosiative primitives -	
APASSOCPRIM	AD	heads	Heads
EQUIPMENT	APSTRUCT	AutoPLANT structures	AP Structures
		AutoPLANT structures - Transition	AP Transition
EQUIPMENT	APTRANSCMP	Components	Components
		AutoPLANT structures - Material	Material
EQUIPMENT	APMATHANDLING	Handling	Handling
			AP
		AutoPLANT structures -	Underground
EQUIPMENT	APUNDEGREQP	Undeground Equipment	Equipment
APSTRUCT	APLADDERS	AutoPLANT structures - Ladders	Ladders
		AutoPLANT structures -	Rectangular
APSTRUCT	APRECTPLATF	Rectangular Platform	Platform
APSTRUCT	APDAVIT	AutoPLANT structures - davits	Davits
		AutoPLANT structures - radial	
APDAVIT	APRADDAVIT	davits	Radial Davits

6. Then Add Sub Classes inside the following previously derived classes:

Parent Class	Derived Class	Description	Display - Label
APASSOCPRIM_CYL	PRRELCYL_AP	Attached Axial Cylinder	Attached Axial Cylinder
APASSOCPRIM_CYL	PRRADCYL_AP	Attached Radial Cylinder	Attached Radial Cylinder
APASSOCPRIM_CYL	PRTANCYL_AP	Attached Tangential Cylinder	Attached Tangential Cylinder
APASSOCPRIM_CYL	PRRELBDYFLNG_AP	Body Flange	Body Flange
APASSOCPRIM_CYL	RELHORCYL_AP	Attached Horizontal Cylinder	Attached Horizontal Cylinder
APASSOCPRIM_CYL	RELVERCYL_AP	Attached Vertical Cylinder	Attached Vertical Cylinder
APASSOCPRIM_CYL	PROTHCYL_AP	Attached Skewed Cylinder	Attached Skewed Cylinder
APASSOCPRIM_CON	PRRELCON_AP	Attached Axial Cone	Attached Axial Cone
APASSOCPRIM_CON	ASSOCOFFCONE_AP	Attached OffsetAxial Cone	Attached OffsetAxial Cone
APASSOCPRIM_CON	PRRELTORICON_AP	Attached Axial Tori- Conical	Attached Axial Tori-Conical
APASSOCPRIM_CON	PRRADCON_AP	Attached Radial Cone	Attached Radial Cone
APASSOCPRIM	PRSPHERE_AP	Sphere	Sphere
APASSOCPRIM	RECTEQ_AP	Associative Rectangle	Associative Rectangle

		Hemi-Spherical	Hemi-Spherical
APASSOCPRIM_HEAD	PRRELHEMIHD_AP	Head	Head
		Semi-Elliptical (2:1)	Semi-Elliptical (2:1)
APASSOCPRIM_HEAD	PRRELASMEHD_AP	Head	Head
APASSOCPRIM_HEAD	PRRELELHD_AP	Elliptical Head	Elliptical Head
APASSOCPRIM_HEAD	PRRELNUKLHD_AP	Tori-Spherical Head	Tori-Spherical Head
APASSOCPRIM_HEAD	PRRELTCONEHD_AP	Tori-Conical Head	Tori-Conical Head
	PRRELASMEFDHD_A	ASME Flanged and	ASME Flanged and
APASSOCPRIM_HEAD	Р	Dished Head	Dished Head
		Associated	Associated
APASSOCPRIM	ASSOCOCT_AP	Octagonal Solid	Octagonal Solid
		Associated	Associated
APASSOCPRIM	ASSOCHEX_AP	Hexagonal Solid	Hexagonal Solid
		Associated	Associated
APASSOCPRIM	ASSOCTRI_AP	Triangular Solid	Triangular Solid
		Associated Pyramid	Associated Pyramid
APASSOCPRIM		Solid	Solid
APEQPPRIM_CYL	PRHORCYL_AP	Horizontal Cylinder	Horizontal Cylinder
APEQPPRIM_CYL	PRVERCYL_AP	Vertical Cylinder	Vertical Cylinder
		Cylinder other	Charmed Calineder
		orientation	Skewed Cylinder
APEQPPRIM_CON	PRHORCON_AP	Horizontal Cone	Horizontal Cone
APEQPPRIM_CON	PRVERCON_AP	Vertical Cone	Vertical Cone
		Offset Horizontal	Offset Horizontal
	PRHSETCONE_AP	Cone	Cone Offeet Vertical
		Offect Vertical Cone	Cono
	PROFFSETCONE_AP	Horizontal	Horizontal
	PRHORRECT AP	Rectangle	Rectangle
	PRVERBECT AP	Vertical Rectangle	Vertical Rectangle
		Equipment Sphere	Equipment Sphere
		Octagonal Solid	Octagonal Solid
		Hovagonal Solid	Hovagonal Solid
		Dentegenel Celid	
		Prinangular Solid	Prinangular Solid
APEQPPRIM	PRPTRSUL_AP	Pyramid Solid	Pyramid Solid
		Air Cooled Heat	Air Cooled Heat
HEAT_EXCHANGER			
PLATE_TYPE_HEAT_EXCHANGER	PLIEXCH_AP	Plate Exchanger	Plate Exchanger
		Exchanger	Exchanger
DOUBL_FIFE_REAT_EACHANGER		Vertical Un Heat	Vertical Un Heat
HEAT EXCHANGER	EXVERTUP AP	Fxchanger	Fxchanger
		Exercises	Vertical Down Heat
HEAT EXCHANGER			
	EXVERTDN AP	Vertical Down	Exchanger

		Horizontal Breech	Horizontal Breech
HEAT_EXCHANGER	EXBRCHLCK_AP	Lock Exchanger	Lock Exchanger
		Louvered Fin Fan	
		Air-Cooler	
COOLER	LFINFAN_AP	Exchanger	Louvered
		Ladder On	On Rectangular
APLADDERS	STRLDDRREC_AP	Rectangular Shapes	Shapes
HEATING_AND_COOLING_FACILIT IES	HEATCYL_AP	Cylindrical Heater	Cylindrical Heater
HEATING_AND_COOLING_FACILIT IES	ΗΕΑΤΒΟΧ_ΑΡ	Box Heater	Boxed Heater
	CASCADEMAGNET_		
APMATHANDLING	AP	Cascade Magnet	Cascade Magnet
	BUCKETELEVATOR_		
APMATHANDLING	AP	Bucket Elevator	Bucket Elevator
	FLIGHTCONVEYOR_		
APMATHANDLING	AP	Flight Conveyor	Flight Conveyor
		Horizontal Split-	Horizontal Split-
SKID_PUMP	PMP_HSC_AP	case Pump	case Pump
		Horizontal Split	Horizontal Split
		Case with Gear	Case with Gear
SKID_PUMP	PMP_HSCG_AP	Pump	Pump
CENTRIFUGAL_PUMP	TURBINE_C_AP	Turbine Centrifugal Pump	Turbine Centrifugal Pump
		Turbine Split Case	Turbine Split Case
CENTRIFUGAL_PUMP	TURBINE_S_AP	Pump	Pump
PUMP	PMPCAN_AP	Can Pump	Can Pump
			Vertical Inline
VINLINE_PUMP	PMPVIN_AP	Vertical Inline Pump	Pump
		Simplex Sump	Simplex Sump
PUMP	PMPSSUMP_AP	Pump	Pump
		AP Centrifugal	AP Centrifugal
CENTRIFUGAL_PUMP	PMPWASTM_AP	Pump	Pump
PUMP	PMPPROP_AP	Propeller Pump	Propeller Pump
PUMP	PMPMIX_AP	Mixed Flow Pump	Mixed Flow Pump
PUMP	PUMPHOSE_AP	Hose Pump	Hose Pump
PUMP	PUMPCHMMET_AP	Metering Pump	Metering Pump
		Spec Centrifugal	Spec Centrifugal
CENTRIFUGAL_PUMP	PMPSPC_AP	Pump	Pump
		Waukesha C-Series	Waukesha C-Series
CENTRIFUGAL_PUMP	WPUMPC_AP	Centrifugal Pump	Centrifugal Pump
		Waukesha Pump	Waukesha Pump
CENTRIFUGAL_PUMP	WPUMP200_AP	200 Series	200 Series
		Vertical Mixed Flow and Axial Flow	
VERTICAL_PUMP	PUMPVMF_AP	Pump (VMF/VAF)	VMF Pump

		Vertical mounted	Vertical mounted
VERTICAL_PUMP	VMOTORPUMP_AP motor pump		motor pump
SKID PUMP	HMOTORPUMP AP	Horizontal mounted motor pump	Horizontal mounted motor pump
APSPECREAC	RA45REACTOR AP	RA Series Reactor	RA Series Reactor
	RT14RFACTOR AP	RT Series Reactor	RT Series Reactor
STORAGE_TANK	STGTNKSF_AP	Storage Tank with a Sloped Foundation	Storage Tank with a Sloped Foundation
STORAGE_TANK	STGTNKRF_AP	Storage Tank with a Ring Foundation	Storage Tank with a Ring Foundation
STORAGE_TANK	STGTNKOF_AP	Storage Tank with an Octagonal Foundation	Storage Tank with an Octagonal Foundation
APTRANSCMP	PRRELRND2RND_AP	Round To Round Transition	Round To Round Transition
APTRANSCMP	PRRELSQ2RND_AP	Square To Round Transition	Square To Round Transition
APTRANSCMP	PRRELSQ2SQ_AP	Square To Square Transition	Square To Square Transition
APDAVIT	DAVITEQAX_AP	Axial Davit	Axial Davit
APRADDAVIT	DAVITEQRAS_AP	Radial Davit (Standard)	Radial Davit (Standard)
APRADDAVIT	DAVITEQRAP_AP	Radial Davit (Projection)	Radial Davit (Projection)
APRADDAVIT	DAVITNZRA_AP	Radial Davit on Nozzle	Radial Davit On Nozzle
		Vertical Vessel	Vertical Vessel
APSTRUCT	VERTDOOR_AP	Manway Door	Manway Door
APSTRUCT	PRRELBDYRING_AP	Body Ring	Body Ring
APUNDEGREQP	POSTINDCTR_AP	Post Indicator	Post Indicator
APUNDEGREQP	HYDRNT_AP	Water Hydrant	Water Hydrant
APUNDEGREQP	HYDMNTR_AP	Water Hydrant w/ Monitor	Water Hydrant w/ Monitor
APUNDEGREQP	ELEVMNTR_AP	Elevated Monitor	Elevated Monitor
APSPECREAC	HORIZREACTOR_AP	Horizontal Reactor	Horizontal Reactor
HORIZONTAL_VESSEL	HORZVAP_AP	Vapor Column On Horizontal Vessel	Vapor Column On Horizontal Vessel
HORIZONTAL_VESSEL	HORZBOOT_AP	Boot on Horizontal Vessel	Boot on Horizontal Vessel
HORIZONTAL_VESSEL	HORIZCLIPS_AP	Horizontal Vessel Clips	Horizontal Vessel Clips
VERTICAL_VESSEL	VERTLEG_AP	Vertical Vessel Legs	Vertical Vessel Legs
VERTICAL_VESSEL	VERTANGLELEG_AP	Vertical Vessel Angle Legs	Vertical Vessel Angle Legs

			Vertical Vessel
VERTICAL_VESSEL	VERTCLIPS_AP	Vertical Vessel Clips	Clips
VERTICAL_VESSEL	VERTLUG_AP	Vertical Vessel Lugs	Vertical Vessel Lugs
		Ladder On	Ladder On
APLADDERS	STRLDDRH_AP	Horizontal Vessel	Horizontal Vessel
		Ladder On Vertical	Ladder On Vertical
APLADDERS	STRLDDRV_AP	Vessel	Vessel
		Spiral Ladder On	Spiral Ladder On
APLADDERS	STRLDDRS_AP	Vertical Vessel	Vertical Vessel
		Rectangular	Rectangular
		Platform On	Platform On
APRECTPLATF	STRPLTRH_AP	Horizontal Vessel	Horizontal Vessel
		Circular Platform	Circular Platform
APSTRUCT	STRPLTC_AP	On Vertical Vessel	On Vertical Vessel
		Rectangular	Rectangular
		Platform On	Platform On
APRECTPLATF	STRPLTRV_AP	Vertical Vessel	Vertical Vessel
		Vertical Industrial	
		Submersible Pump	
VERTICAL_PUMP	PUMPVIS_AP	(VIS)	VIS Pump
		Vertical Inline	Vertical Inline
VERTICAL_PUMP	PUMPVIT_AP	Turbine Pump	Turbine Pump
		Vertical Marine	
VERTICAL_PUMP	PUMPVMP_AP	Pump (VMP)	VMP Pump
		Vertical Industrial	
		Can Type Pump	
VERTICAL_PUMP	PUMPVIC_AP	(VIC)	VIC Pump

7. In the end the Equipment would look like this:



8. Go to the class 'Generic Piping Component' and right click to copy 'Creation Attribute' as a 'Custom Attributes'.

OpenPlant_3D [Supplemented] - Bentley Class Editor CONNECT Edition	ו
File Edit View Database Mapping Tools Help	
品 🗁 🖬 🖨 📋 🔹 🛤 🖼 👂	
✓ ► Location: S:OpenPlant_3D.01.08\Generic Piping Component	
	Class Properties Relationships
tupment transferrer	GENERIC_PIPING_COMPONEN
HVAC Component	Name GENERIC_PIP
E Cop	DisplayLabel Generic Piping
Nozzle	Schema OpenPlant_3D
Piping and instrument Component	Description
	IsStruct False
Access Plate	IsCustomAttributeClass False
Bellows	IsDomainClass Inue
- Pire Hydrant	Baseclasses op 30: PIPING_
- Arrestor	Associated Item class list poir
	Associated Item Class Name ASSOCIATED
tille Art Regulator	Associated Ribbon Tab (inher
Generic Branch	Tab Group Name openplantmod
Generic Instrument	
Generic Offset	Associated Task Panes (inne
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₽- <sup>4</sup> ¢ Paste	Name IsGraphical
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Base Classes	der Type
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Derived Classes	Library
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Add Derived Class	Copy
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1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	
E Copy Mapping	erty GUID
Copy Mapping	etty GUID Class As Custom Compo

9. Paste this 'Creation Attribute' to the following classes one by one.

Class name	Display-Label
PRRELCYL_AP	Attached Axial Cylinder
PRRADCYL_AP	Attached Radial Cylinder
PRTANCYL_AP	Attached Tangential Cylinder
PRRELBDYFLNG_AP	Body Flange
RELHORCYL_AP	Attached Horizontal Cylinder
RELVERCYL_AP	Attached Vertical Cylinder
PRRELCON_AP	Attached Axial Cone
ASSOCOFFCONE_AP	Attached OffsetAxial Cone
PRRELTORICON_AP	Attached Axial Tori-Conical
PRRADCON_AP	Attached Radial Cone
PRSPHERE_AP	Sphere
RECTEQ_AP	Associative Rectangle
PRRELHEMIHD_AP	Hemi-Spherical Head
PRRELASMEHD_AP	Semi-Elliptical (2:1) Head
PRRELELHD_AP	Elliptical Head
PRRELNUKLHD_AP	Tori-Spherical Head

PRRELTCONEHD_AP	Tori-Conical Head
PRRELASMEFDHD_AP	ASME Flanged and Dished Head
ASSOCOCT_AP	Associated Octogonal Solid
ASSOCHEX_AP	Associated Hexagonal Solid
ASSOCTRI_AP	Associated Triangular Solid
ASSOCPYR_AP	Associated Pyramid Solid
PRHORCYL_AP	Horizontal Cylinder
PRVERCYL_AP	Vertical Cylinder
PRHORCON_AP	Horizontal Cone
PRVERCON_AP	Vertical Cone
PRHSETCONE_AP	Offset Horizontal Cone
PROFFSETCONE_AP	Offset Vertical Cone
PRHORRECT_AP	Horizontal Rectangle
PRVERRECT_AP	Vertical Rectangle
PRSPHEREE_AP	Equipment Sphere
PROCTSOL_AP	Octogonal Solid
PRHEXSOL_AP	Hexagonal Solid
PRPENTSOL_AP	Pentagonal Solid
PRTRISOL_AP	Triangular Solid
PRPYRSOL_AP	Pyramid Solid
FINFAN_AP	Louvered Air Cooled Heat Exchanger
EXDBLPIP_AP	Double Pipe Exchanger
EXVERTUP_AP	Vertical Up Heat Exchanger
EXVERTDN_AP	Vertical Down Heat Exchanger
EXSURFCOND_AP	Surface Condenser
EXBRCHLCK_AP	Horizontal Breech Lock Exchanger
LFINFAN_AP	Louvered Air Cooled Heat Exchanger
STRLDDRREC_AP	Ladder On Rectangular Shapes
HEATCYL_AP	Cylindrical Heater
HEATBOX_AP	Box Heater
CASCADEMAGNET_AP	Cascade Magnet
BUCKETELEVATOR_AP	Bucket Elevator
FLIGHTCONVEYOR_AP	Flight Conveyor
PMP_HSC_AP	Horizontal Split-case Pump
PMP_HSCG_AP	Horizontal Split Case with Gear Pump
TURBINE_C_AP	Turbine Centrifugal Pump
TURBINE_S_AP	Turbine Split Case Pump
PMPCAN_AP	Can Pump
PMPVIN_AP	Vertical Inline Pump
PMPSSUMP_AP	Simplex Sump Pump
PMPWASTM_AP	Centrifugal Pump
PMPPROP_AP	Propeller Pump
PMPMIX_AP	Mixed Flow Pump

PUMPHOSE_AP	Hose Pump
PUMPCHMMET_AP	Metering Pump
PMPSPC_AP	Spec Horizontal Pump
WPUMPC_AP	Waukesha C-Series Centrifugal Pump
WPUMP200_AP	Waukesha Pump 200 Series
PUMPVMF_AP	Vertical Mixed Flow and Axial Flow Pump (VMF/VAF)
VMOTORPUMP_AP	Vertical Reciprocating Multiplex Pump
HMOTORPUMP_AP	Horizontal Reciprocating Multiplex Pump
RA45REACTOR_AP	RA Series Reactor
RT14REACTOR_AP	RT Series Reactor
STGTNKSF_AP	Storage Tank with a Sloped Foundation
STGTNKRF_AP	Storage Tank with a Ring Foundation
STGTNKOF_AP	Storage Tank with an Octogonal Foundation
PRRELRND2RND_AP	Round To Round Transition
PRRELSQ2RND_AP	Square To Round Transition
PRRELSQ2SQ_AP	Square To Square Transition
DAVITEQAX_AP	Axial Davit
DAVITEQRAS_AP	Radial Davit (Standard)
DAVITEQRAP_AP	Radial Davit (Projection)
DAVITNZRA_AP	Radial Davit on Nozzle
VERTDOOR_AP	Vertical Vessel Manway Door
PRRELBDYRING_AP	Body Ring
POSTINDCTR_AP	Post Indicator
HYDRNT_AP	Water Hydrant
HYDMNTR_AP	Water Hydrant w/ Monitor
ELEVMNTR_AP	Elevated Monitor
HORIZREACTOR_AP	Horizontal Reactor
HORZVAP_AP	Vapor Column On Horizontal Vessel
HORZBOOT_AP	HORZBOOT_AP
HORIZCLIPS_AP	Horizontal Vessel Clips
VERTLEG_AP	Vertical Vessel Legs
VERTANGLELEG_AP	Vertical Vessel Legs
VERTCLIPS_AP	Vertical Vessel Clips
VERTLUG_AP	Vertical Vessel Lugs
STRLDDRH_AP	Ladder On Horizontal Vessel
STRLDDRV_AP	Ladder On Vertical Vessel
STRLDDRS_AP	Ladder On Vertical Vessel
STRPLTRH_AP	Rectangular Platform On Horizontal Vessel
STRPLTC_AP	Circular Platform On Vertical Vessel
STRPLTRV_AP	Rectangular Platform On Vertical Vessel
PUMPVIS_AP	Vertical Industrial Submersible Pump (VIS)
PUMPVIT_AP	Vertical Inline Turbine Pump
PUMPVMP_AP	Vertical Marine Pump (VMP)

PUMPVIC_AP	Vertical Industrial Can Type Pump (VIC)
PROTHCYL_AP	Attached Skewed Cylinder
PLTEXCH_AP	Plate Exchanger

- 10. Now copy the 'Component Port Information' from GENERIC\_PIPING\_COMPONENT\_TWO\_PORT.
- 11. Paste it into the following classes:
  - a. PUMPVIC\_AP with display Label="Vertical Industrial Can Type Pummp (VIC)"
  - b. PUMPVIS\_AP with display Label="Vertical Industrial Submersible Pump (VIS)"
  - c. PUMPVIT\_AP with display Label="Vertical Inline Turbine Pump"
  - d. PUMPVMP\_AP with display Label="Vertical Marine Pump (VMP)"
- 12. Edit the No.of Ports from **2** to **1**.
- 13. Delete the 'Run\_Port' from 'Port Type'.
- 14. Navigate to the 'Plate Exchanger'.
- 15. Create 8 Ports, in the following order:

Heat Exchanger	Component Port	s Information	(from PLTEXCH_AP
庄 🔶 Cooler	No. of Ports	8	
🗄 প Double pipe heat exchanger	Y Port Type		
Horizontal Breech Lock Exchanger	Port Type[0]	NP1	
🕀 🔩 Indirect Contact Heat Exchanger	Port Type[1]	NP2	
Plate-type Heat Exchanger	Port Type[2]	NP3	
Par. Plate-type Heat Exchanger	Port Type[3]	NP4	
Plate Exchanger	Port Type[4]	NP5	
Reboiler	Port Type[5]	NP6	
Surface Condenser	Port Type[6]	NP7	
	Port Type[7]	NP8	
Vertical Up Heat Exchanger	Port EC Class Name		

16. As a result, we can now incorporate all Equipment from AP world into the OP world.

# 4.2.22. Solving the Hyphen (-) issue for Equipments by configuring AP2OP Schemas

- 1. Launch OPPA and Navigate to the latest AP2OP Workset.
- 2. From the Drop-down select the 'OpenPLANT Modeler'
- 3. Then within the 'Settings' tab, select 'Expression Editor' as shown in the below image:

-	OpenPlant Project Administrator CONNECT Edition	_ • ×
Configuration Settings Tools CONNECT S	rvices	<b>13 - 9 1 2 - 0 - 1</b>
Schema Expression Editor Display 2D 30 Preferences Val	Le Maps Joint Map Component	
C:\ProgramData\Bentley\OpenPlant CONNEC  C:\ProgramData\Bentley\OpenPlant CONNEC  C::::::::::::::::::::::::::::::::	20/2D Consistency Checker     Copy Shared Properties     Display related classes in consistency checker tree     Include SpecID in Query     Use Offine 2D/3D with CONNECTED Mode     Auto-Fitting Elbow Types     Auto-Fitting Trim Stock Angles     Auto-Fitting Trim Stock Angles     Auto-Fitting Trim Stock Angles     Supported Angle Tolerance     Supported Angle     Supported Angle     Supported Angle     Auto-Fitting Generic Component     Max Angle for Mitered Elbows	
()	Min Angle for Mitered Elbows Alignment Tolerance [OPM_ALIGNMENT_TOLERANCE] Angular tolerance in Degrees between the mating por components is considered disconnected	30

- 4. Navigate to the 'Equipment' Class and select the 'Tag Number'.
- 5. Enter the following values in the empty field as shown in the image below:

IIF(this.DEVICE\_TYPE\_CODE = "", this.NUMBER, this.DEVICE\_TYPE\_CODE & amp; "-" & amp; this.NUMBER)

Schema Configuratio	on [OpenPlant Mo			_ = ×	
	😵 Chiller 🔷	this DEVICE_TYPE_	CODE = -, this.individer, DE & "-" & this NUMBER)	4	
Schema Editor	😵 Cross Body Registers		bed datasitomberty		
	猞 Double Wall To Single \			×	
- <b>1</b> 2	😵 Drum Louvers				
Expression	徐 Dual Inlet Variable Air \			<b>~</b>	
Editor	😵 Elbow Silencers			{}	ORK_SYST
	😵 Equipment			U	
	Component Name				
	Tag Number				
	Service				
	🔷 Unit	System			
	🔷 AREA	{}EC Methods			
	徐 Fan Power Unit	<pre>{}Equipment</pre>			
	😵 Fastener				
	😤 Fire Hydrant 🛛 🗸				
	< >	Failure Value:	Equipment		
	[Message Area]				
				^	
			Do pot Crosto o Rackup		
	Help		Save	Close	
		Angular tolerance	in Degrees between the mating ports, any c	onnection with greater and	gle betwe

- 6. Save the changes.
- 7. Navigate to the 'Fluid Regulator' Class and select the 'Tag Number'.
- 8. Enter the following values in the empty field as shown in the image below:

IIF(this.DEVICE\_TYPE\_CODE = "", this.NUMBER, this.DEVICE\_TYPE\_CODE & "-" & this.NUMBER)

Schema Configurat		
Schema Configurat Schema Editor Expression Editor	tion [OpenPlant Mo	IETWORK_SYST
	III:       ()       ><       ≥       +       -         P       Gasket       ()       ><       ≥       +       -         P       Gasket       ()       ()       ><       ≤       +       -         P       Gasket       ()       ()       >       <       ≥        +       -         P       Gasket       ()       Operators       ()       E       ()       Fluid Regulator       ()         P       Generic Offset       ()       Fluid Regulator       () <th></th>	
	C Failure Value: Valve	
	[Message Area]	
	Help Do not Create a Backup Save Close	
	Angular tolerance in Degrees between the mating ports, any connection with greate the components is considered disconnected	er angle betwee

- 9. Save the changes.
- 10. Navigate to the 'Nozzle' Class and select the 'Equipment\_tag'.
- 11. Enter the following values in the empty field as shown in the image below:

this.GetRelatedInstance("EQUIPMENT\_HAS\_NOZZLE:1:EQUIPMENT\_TAG, NAME").NAME Unable to validate related class specifier from string 'EQUIPMENT\_HAS\_NOZZLE:1:EQUIPMENT\_TAG'.

Schema Configuration	ı [OpenPlant Mo			– 🗆 X	
Schema Congurator	Hvac Standard Rect Hvac System Inline Pipe Compon Instrument Instrument Valve Instrument Valve Instrument Valve Intelligent Line Iso Sheet Iso Sheet Iso Jacket Jumpover Iso Jacket Jumpover Component Na Tao Number Iso Namber Iso Na	this.GetRelatedInstan ("EQUIPMENT_HAS_N NAME").NAME Unable to validate rel 'EQUIPMENT_HAS_NC EQUIPMENT_HAS_NC UPPENT_HAS_NC ↓ System ↓ Operators ↓ EC Methods ↓ Nozzle	CE IOZZLE:1:EQUIPMENT_TAG, ated class specifier from string DZZLE:1:EQUIPMENT_TAG'		NETWORK_SYST
ļ	Equipment Tag     Unit	Failure Value:	Fauipment		
[	Message Area]		i edadaren	^	
	Help		Do not Create a Backup Save	Close	
		Angular tolerance the components is	in Degrees between the mating ports, any conn s considered disconnected	ection with grea	ater angle betwee

- 12. Save the changes.
- 13. Navigate to the 'Support' Class and select the 'Tag Name'.

14. Enter the following values in the empty field as shown in the image below:

IIF(this.DEVICE\_TYPE\_CODE = "", this.NUMBER, this.DEVICE\_TYPE\_CODE & "-" & this.NUMBER)

Schema Configuration [OpenPlant Mo 🗖 🗙								
Schema Editor	Round Supply Dif     Seal     Segment	IIF(this.DEVICE_TYPE_CODE = "", this.NUMBER, this.DEVICE_TYPE_CODE & "-" & this.NUMBER)						
Expression Editor	<ul> <li>Side Wall Register</li> <li>Single Body Regis</li> <li>Single Inlet Variat:</li> <li>Spectacle Blind</li> <li>SquareThroat Tee</li> <li>Steam Humidifier</li> <li>Steam Trap</li> <li>Steam Trap</li> <li>Strainer</li> <li>Tag Number</li> <li>Designer</li> <li>Swage</li> </ul>	IF()><≥≤+-*						
	[Message Area]	Anore value: Device						
	Help	Do not Create a Backup Save Close						

- 15. Save the changes.
- 16. In this way the hypen issue would be fixed.

# 4.2.23. Incorporating 'ELBOWPIPET' from APM inside the AP2OP Schemas

 Launch 'Bentley Class Editor' and Open 'OpenPlant\_3D.01.08.ecschema' the latest AP2OP Workset.
 Can be found at this link

C:\ProgramData\Bentley\OpenPlant CONNECT

Edition\Configuration\WorkSpaces\OpenPlantExample\WorkSets\......\Metric\Standards\Open Plant\Schemas

- Load all Reference schemes from this location: C:\ProgramData\Bentley\OpenPlant CONNECT Edition\Configuration\WorkSpaces\OpenPlantExample\Standards\OpenPlant\Schemas
- 3. Right Click on 'OpenPlant 3D' schema and select 'Supplement Schema.'

~ ~	3 40 48 LO LO   *** *0 *0		
	► Location: OpenPlant_3D.01.08		
- 🦓 Ope	nPlant 3D	OpenPlant_3D.	01.08
	Collapse	Name DisplayLabel NameSpacePrefix	OpenPlant_30 OpenPlant_30 op3d
	Paste	Description VersionMajor	1
	Custom Attributes	VersionMinor	8
	Add Class		
	Add Relationship Class		
	Add New Supplemental Schema		
	Supplement Schema		
	Save Schema		
	Close Schema		
	Save As		
	Add Units		
	Remove Units		
	Add New Mapping		
	Open Existing Mapping		
	Save Mapping		
	Close Mapping		
	Add Class From Dictionary		
	Add Relationship From Dictionary		

- 4. Add the following two Supplemental schemas:
  - Supplemental\_Information\_3DComponent
  - Supplemental Modeling

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$\leftarrow \rightarrow \land \uparrow$	1 Schemas									
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Schomac		OpenPlant_3D_Supplemental_Isometrics_Isoextractor.01.08.ecschema	2/15/2021 11:31 AN							
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Schemas		OpenPlant_3D_Supplemental_Mapping_OpenPlantBIS.01.08.ecschema	2/15/2021 11:31 AN							
Videos	Videos OpenPlant_3D_Supplemental_Mapping_PDS.01.08.ecschema									
OneDrive		OpenPlant_3D_Supplemental_Mapping_PSDS.01.08.ecschema	2/15/2021 11:31 AN							
		OpenPlant_3D_Supplemental_Mapping_SPMM.01.08.ecschema	2/15/2021 11:31 AN							
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		Open	Cancel							

- 5. Navigate to the 'Elbolet' class via Search.
- 6. Create a new Derived Class by selecting 'Add Derived Class' from the right click context menu of the parent class 'Elbolet'.
- 7. Give the name 'ELBOWPIPET", description "elbow pipet" and display\_Label "Elbow pipet".
- 8. So finally we have incorporated 'ElbowPipet' class inside the AP2OP Schemas

# 4.2.24. Introducing 'TAP\_JOINT\_OLET\_WELD' for Olet Connection:

- 1. Launch OPPA and Navigate to the latest AP2OP Workset.
- 2. From the Drop-down select the 'OpenPLANT Modeler'
- 3. Then within the 'Settings' tab, select 'Joint\_Map'.
- 4. Create a new Joint named 'TAP\_JOINT\_OLET\_WELD'
- 5. Enter Fasteners, End preparation 1 and End preparation 2 values as shown in the image below.

Schema Configurati	on [OpenPlant Modeler: APOP]			-	∎ ×
-#-	HVAC_FEMALE_JOINT HVAC_FLANGE_JOINT	^ E	↓ 0 <u>≣</u> . □≣:		s +
Joint Map	HVAC_MALE_JOINT	1	Joint Name	TAP_JOINT_OLET_WELD	1
	HVAC_MALEFEMALE_JOINT		Properties to Match	String[] Array	
	INNOVATIVE GROOVE JOINT		List of Fasteners	String[] Array	
	INNOVATIVE_MALEFEMALE_JOINT		[0]	PIPING_FASTNER_OLET_WELD	× 1
	LAP_JOINT		List 1 of Compatible End Preperations S	String[] Array	
	MECHANICAL ANCHORED JOINT		[0]	ТАР	
	MECHANICAL_COUPLED_JOINT		List 2 of Compatible End Preperations	String Array	
	MECHANICAL_JOINT		101	BUTT WELD	
	PGS_GROOVE_JOINT		 	SOCKET WELD FEMALE	
	PRESSFIT_JOINT		[2]		
	PUSH_ON_JOINT		[2]		
	PUSH_ON_RESTRAINED_JOINT		[3]		
	RADIUS MALEFEMALE JOINT		[4]		
	RESTRAINED_MECHANICAL_JOINT		[5]	PLAIN_END	
	SHOULDER_JOINT		[6]	ТАР	
	SHOULDERED_GROOVE_JOINT		Is Specification Driven		
	SWEAT_JOINT		Assembly to Load for the Script		
	TAP_JOINT		Crint Namesnace		/
	TAP_JOINT_OLET_WELD TAP_JOINT_WITHOUT_FASTENERS THREADED_JOINT THREADED_WELD_JOINT	Ĵ			
	Help		Do not C	reate a Backup Save C	llose
	Angular tolerance disconnected	in Degr	ees between the mating ports, any conne	ection with greater angle between the com	ponents is co

- 6. Save the changes.
- 7. So after following these basic steps, we have introduced a new joint for Olet Connection named 'TAP\_JOINT\_OLET\_WELD'

### 4.2.25. Fixing the 'Gasket' issue while generating isometrics:

1. Launch the 'Modeler.cfg' file from the following location:

C:\ProgramData\Bentley\OpenPlant CONNECT Edition\Configuration\WorkSpaces\OpenPlantExample\WorkSets\AP2OP Base Metric\Standards\OpenPlant\Modeler

 Introduce a new variable in the bottom of the file as 'OPM\_AP2OP\_UPGRADE\_CALC\_GASKET\_ORIGIN=1'