SmartPlant 3D Piping Reference Data

Student Workbook

Process, Power & Marine

INTERGRAPH

Version 2009 SP1 **March 2009** **DSP3D-TP-100004A**

Copyright

Restricted Rights Legend

Intergraph Corporation
Huntsville, Alabama 35894-0001

Warranties and Liabilities

Trademarks

Table of Contents

Preface

This document is designed as an aid for students attending the SmartPlant 3D Reference Data class presented by Intergraph Corporation, and it's a supplement to the standard product documentation.

Objective

This document is designed to provide comprehensive information of what is in SmartPlant 3D Reference Data version 2009

Course description

Upon completing this course, you will be able to:

- Provide an overview of the SmartPlant 3D reference data. It describes general information about the catalog schema, terms, and the delivered piping reference data.

Course Reference Material

- SmartPlant 3D Reference Data Guide
- SmartPlant 3D Symbols Reference Data Guide
- Piping Reference Data Guide
- Catalog User's Guide
- SmartPlant Interpreting Human Piping Specifications

Questions or suggestions relating to this document should be directed to:

SmartPlant 3D Training Services

Lab 1: Piping Material Class

Objective

After completing this lab, you will be able to:

- Create a new Piping Material Class

  Note : This lab is intended as a basic introduction to spec creation. As such it is limited to straight pipe and few fittings (Example: 90 and 45 degree elbows, tees, etc). It is not intended as an example of a functional design spec.

Creating the Piping Specification CC150-1 Bulkload Worksheet

1. Open the Ten_Specs_SpecificationData.xls file located in <SP3D Installation >\ CatalogData\BulkLoad\DataFiles
2. Select the following worksheets while holding down the control key:
   a. PipingMaterialsClassData
   b. PipingCommodityFilter
   c. BendAngles
   d. PipeNominalDiameters
   e. StandardNotesData
3. Save the worksheets to a new Excel Workbook named “CC150-1.xls” in your own working directory.

Editing Piping Material Class Data

1. Open the PipingMaterialsClassData worksheet in the CC150-1.xls workbook.
2. Add the following data in the columns noted for the new piping specification.
   a. SpecName : CC150-1
   b. MaterialsOfConstructionClass : 31 (Reference AllCodeLists.xls, MaterialsOfConstructionClass sheet)
   c. MaterialsDescription: CL150, Carbon Steel, RFFE, .75" - 24" BE

d. FluidService : Process

e. DesignStandard : 40 (Reference AllCodeLists.xls, DesignStandard - ANSI-B31.3)

f. PipingSpecStatus : 5 (Reference AllCodelists.xls, PipingSpecStatus- Draft)

g. Comments: Training Specs

h. RevisionNumber : A

i. PipingNote1: 203

3. Save the workbook.

Editing Piping Diameter Data

1. Open the PipeNominalDiameters worksheet.
2. Add records for the new specification as shown below:

Head	SpecName	Npd	NpdUnitType
Start			
a	CC150-1	0.75	in
a		1	in
a		1.5	in
a		2	in
a		4	in
a		6	in
a		8	in
a		10	in
a		12	in
a		14	in
a		16	in
a		18	in
a		20	in
a		24	in

3. Save the workbook.

Editing Bend Angle Data

1. Open the BendAngles worksheet.
2. Add records for preferred bend angles for the new specification as shown below:

Head	SpecName	Npd	NpdUnitType	BendAngle
Start				
a	CC150-1	0.75	in	90deg
a		1	in	90deg
a		1.5	in	90deg
a		2	in	90deg
a		4	in	90deg
a		6	in	90deg
a		8	in	90deg
a		10	in	90deg
a		12	in	90deg
a		14	in	90deg
a		16	in	90deg
a		18	in	90deg
a		20	in	90deg
a		24	in	90deg
a	CC150-1	0.75	in	45deg
a		1	in	45deg
a		1.5	in	45deg
a		2	in	45deg
a		4	in	45deg
a		6	in	45deg
a		8	in	45deg
a		10	in	45deg
a		12	in	45deg
a		14	in	45deg
a		16	in	45deg
a		18	in	45deg
a		20	in	45deg
a		24	in	45deg

3. Save the workbook.

Creating Piping Material Class Records

1. Open the PipingCommodityFilter worksheet.

2. Add records for pipes, bends, size changes and tee as shown below:

Item	Size	Sched	Commodity Code	Description
Pipe	0.75” – 1.5”	S-XS	PAAZZBPZZABAABSAAZZUS	Pipe, plain ends, ASTM-A106-B, [401]
Pipe	2”-24”	S-STD	PAAZZBOZZABAABOAAZZUS	Pipe, [401], BE, ASTM-A53-B Type S
PipeBend (default)	0.75”- 1.5”	S-XS	PAAZZBPZZABAABSAAZZUS	Pipe, plain ends, ASTM-A106-B, [401] Bend Radius 3 D
45 Deg Elbow (Default)	2”-24”	S-STD	MBXZZBOZZAAEADCZZUS	45 deg LR elbow, [403], BE, ASTM-A234-WPB, ASME-B16.9
45 Deg Trimmable Elbow (Default)	2”-24”	S-STD	MBXZZBOZZAAEADCZZUS	45 deg LR elbow, [403], BE, ASTM-A234-WPB, ASME-B16.9
90 Deg Elbow (Default)	2”-24”	S-STD	MCMZZBOZZAAEADCZZUS	90 deg LR elbow, [403], BE, ASTM-A234-WPB, ASME-B16.9
90 Deg Trimmable Elbow (Default)	2”-24”	S-STD	MCMZZBOZZAAEADCZZUS	90 deg LR elbow, [403], BE, ASTM-A234-WPB, ASME-B16.9
Concentric Size Change	4”-24”	S-STD	MBCZZBOZZAAEADCZZUS	Concentric reducer, [414], BE, ASTM-A234-WPB, ASME-B16.9
Eccentric Size Change	4”-24”	S-STD	MBJZZBOZZAAEADCZZUS	Eccentric reducer, [414], BE, ASTM-A234-WPB, ASME-B16.9
Tee	2”-24”	S-STD	Tee01	Tee, [403], BE, ASTM-A234-WPB, ASME-B16.9

Head	SpecName	ShortCode	OptionCode	FirstSizeFrom	FirstSizeTo	FirstSizeUnits	SecondSizeFrom	SecondSizeTo	SecondSizeUnits	MultisizeOption	Comments	SelectionBasis	JacketedPipingBasis	MaximumTemperature	MinimumTemperature	EngineeringTag	CommodityCode	FabricationCategoryOverride	SupplyResponsibilityOverride	FirstSizeSchedule	SecondSizeSchedule	ReportableCommodityCode	QuantityOfReportableParts	AssociatedCommodityCode	BendRadiusMultiplier
Start																									
a	CC150-1																								
a		Piping	1	0.75	1.5	in						1					PAAZZBPZZABAABSAAZZUS			S-XS					
a		Piping	1	2	24	in						1					PAAZZBOZZABAABOAAZZUS			S-STD					
a		<45 Degree Direction Change	1	0.75	1.5	in						35													3
a		45 Degree Direction Change	1	0.75	1.5	in						35													3
a		45-90 Degree Direction Change	1	0.75	1.5	in						35													3
a		90 Degree Direction Change	1	0.75	1.5	in						35													3
a		<45 Degree Direction Change	1	2	24	in						70					MBXZZBOZZAAEADCZZUS			MATCH	MATCH				
a		45 Degree Direction Change	1	2	24	in						65					MBXZZBOZZAAEADCZZUS			MATCH	MATCH				
a		45-90 Degree Direction Change	1	2	24	in						70					MCMZZBOZZAAEADCZZUS			MATCH	MATCH				
a		90 Degree Direction Change	1	2	24	in						65					MCMZZBOZZAAEADCZZUS			MATCH	MATCH				
a		Concentric Size Change	1	4	4	in	2	2	in			1					MBCZZBOZZAAEADCZZUS			MATCH	MATCH				
a		Concentric Size Change	1	6	6	in	4	4	in			1					MBCZZBOZZAAEADCZZUS			MATCH	MATCH				
a		Concentric Size Change	1	8	8	in	4	6	in			1					MBCZZBOZZAAEADCZZUS			MATCH	MATCH				
a		Concentric Size Change	1	10	10	in	4	8	in			1					MBCZZBOZZAAEADCZZUS			MATCH	MATCH				
a		Concentric Size Change	1	12	12	in	6	10	in			1					MBCZZBOZZAAEADCZZUS			MATCH	MATCH				
a		Concentric Size Change	1	14	14	in	6	12	in			1					MBCZZBOZZAAEADCZZUS			MATCH	MATCH				
a		Concentric Size Change	1	16	16	in	8	14	in			1					MBCZZBOZZAAEADCZZUS			MATCH	MATCH				
a		Concentric Size Change	1	18	18	in	10	16	in			1					MBCZZBOZZAAEADCZZUS			MATCH	MATCH				
a		Concentric Size Change	1	20	20	in	12	18	in			1					MBCZZBOZZAAEADCZZUS			MATCH	MATCH				
a		Concentric Size Change	1	24	24	in	16	20	in			1					MBCZZBOZZAAEADCZZUS			MATCH	MATCH				
a		Eccentric Size Change	1	4	4	in	2	2	in			1					MBJZZBOZZAAEADCZZUS			MATCH	MATCH				
a		Eccentric Size Change	1	6	6	in	4	4	in			1					MBJZZBOZZAAEADCZZUS			MATCH	MATCH				
a		Eccentric Size Change	1	8	8	in	4	6	in			1					MBJZZBOZZAAEADCZZUS			MATCH	MATCH				
a		Eccentric Size Change	1	10	10	in	4	8	in			1					MBJZZBOZZAAEADCZZUS			MATCH	MATCH				
a		Eccentric Size Change	1	12	12	in	6	10	in			1					MBJZZBOZZAAEADCZZUS			MATCH	MATCH				
a		Eccentric Size Change	1	14	14	in	6	12	in			1					MBJZZBOZZAAEADCZZUS			MATCH	MATCH				
a		Eccentric Size Change	1	16	16	in	8	14	in			1					MBJZZBOZZAAEADCZZUS			MATCH	MATCH				
a		Eccentric Size Change	1	18	18	in	10	16	in			1					MBJZZBOZZAAEADCZZUS			MATCH	MATCH				
a		Eccentric Size Change	1	20	20	in	12	18	in			1					MBJZZBOZZAAEADCZZUS			MATCH	MATCH				
a		Eccentric Size Change	1	24	24	in	16	20	in			1					MBJZZBOZZAAEADCZZUS			MATCH	MATCH				
a		Tee	1	2	24	in						1					Tee01			MATCH	MATCH				

3. Save the worksheet.

4. Select Start => Programs => Intergraph SmartPlant3D => Database Tools => Bulkload Reference Data.

5. The Bulkload Utility form will appear.

6. Select the "Add" option under "Excel Files" and select CC150-1.xls

7. Under Bulkload Mode options, select the A/M/D bulkload mode and uncheck "Update Object Type Hierarchy and Catalog Views" option.

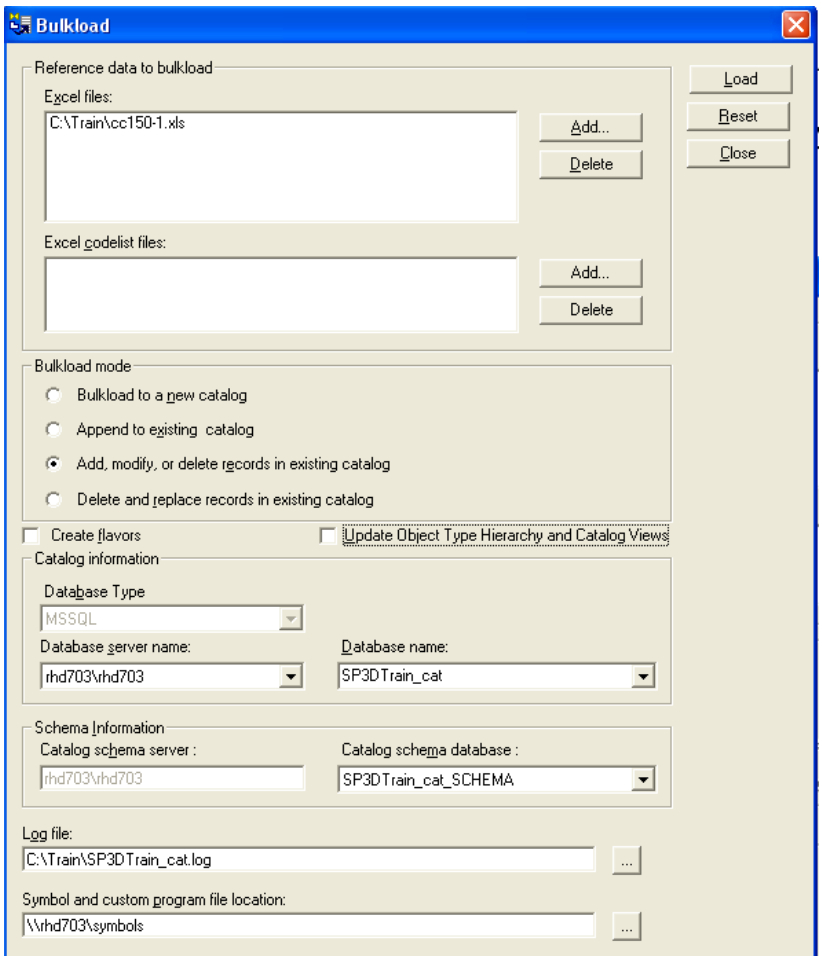
   Note: "Update Object Type Hierarchy and Catalog Views" option is provided that will allow the catalog administrator to choose when the Business Object Classification Hierarchy (BOC) and catalog views are updated.

8. Select an existing piping catalog. Find your catalog server name and database/schema names from the pull down menus. Obtain these names from the instructor.

Note : If the file is loaded into a new catalog, then additional data files will be required and the spec will be unusable until the required files are loaded into the database – this lab assumes that a functional catalog with existing specs and rules exists.

9. Enter a Log file name in your working directory.

10. Point the Symbol path to the symbols share for this class.



11. Select Load button to start the process.

12. Review the log file once the Bulkload process is complete.

Lab 2: Piping Specification Validation

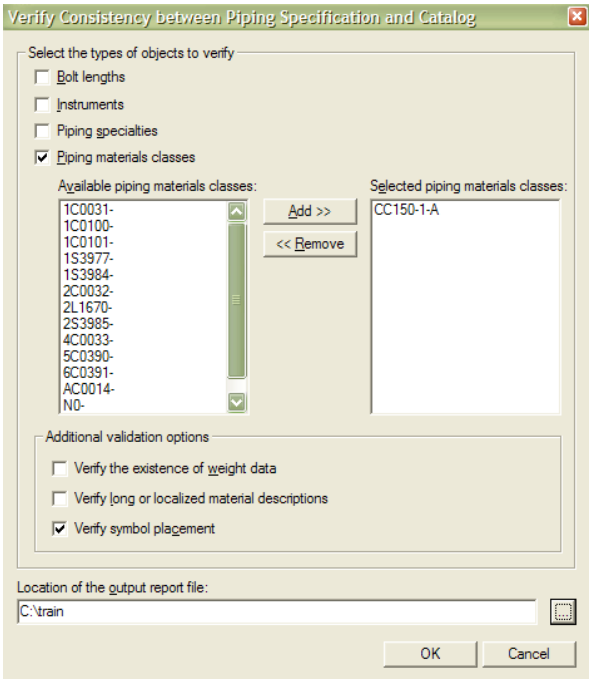
Objective

After completing this lab, you will be able to:

- Run the Verify Consistency between Piping Specification and Catalog tool
- Review and check for missing data in your piping specification

Database Verification/Consistency Checks

1. Open a session or create a new workspace and enter the Catalog task.
2. Select **Tools -> Verify Consistency Report**
3. The system displays the Verify Consistency between Piping Specification and Catalog form.
4. Select the "Piping materials classes" check box.
5. Select spec CC150-1 in the "Available piping material classes" picklist and select the "Add" option to move the spec into the "Selected piping material classes" side of the form.
6. Enable the Verify symbol placement option. Define an output location for the logfile. (Note: the filename is automatically generated by the system).



7. Accept the form for processing by selecting the "OK" button.

8. You can rename the generated report (Piping Material Class.xls) filename to CC150report.xls

9. Review the system generated spreadsheet once processing is complete. Go to the index sheet and select the following links:

   - Rules data undefined

   - Piping commodity undefined in piping commodity material control data

   - Summary of catalog parts

Go to Rules data undefined report. Review the missing specification rules.

INTERGRAPH

! A report of the rules for which data is undefined

Description Of The Error	Piping Materials	Revision Number	Rule Name
Rule data is missing	CC150-1	A	Branch Intersection rule
Rule data is missing	CC150-1	A	Pipe Takedown Parts Rule
Rule data is missing	CC150-1	A	Service Limits rule
Rule data is missing	CC150-1	A	Weld Clearance rule
WARNING : This is an optional rule. Data is missing in this rule. Please check if this rule is required.	CC150-1	A	Allowable Piping Materials Classes Rule
WARNING : This is an optional rule. Data is missing in this rule. Please check if this rule is required.	CC150-1	A	Corrosion Allowance rule
WARNING : This is an optional rule. Data is missing in this rule. Please check if this rule is required.	CC150-1	A	Default Change-of-Direction rule
WARNING : This is an optional rule. Data is missing in this rule. Please check if this rule is required.	CC150-1	A	Exterior Coating and Surface Treatment Rule
WARNING : This is an optional rule. Data is missing in this rule. Please check if this rule is required.	CC150-1	A	Field Fit Length rule
WARNING : This is an optional rule. Data is missing in this rule. Please check if this rule is required.	CC150-1	A	Field Lining Thickness rule
WARNING : This is an optional rule. Data is missing in this rule. Please check if this rule is required.	CC150-1	A	Flared Pipe rule
WARNING : This is an optional rule. Data is missing in this rule. Please check if this rule is required.	CC150-1	A	Inside Surface Treatment rule
WARNING : This is an optional rule. Data is missing in this rule. Please check if this rule is required.	CC150-1	A	Jacket Closure rule
WARNING : This is an optional rule. Data is missing in this rule. Please check if this rule is required.	CC150-1	A	Joint Quality Factor rule
WARNING : This is an optional rule. Data is missing in this rule. Please check if this rule is required.	CC150-1	A	Minimum Pipe Length rule
WARNING : This is an optional rule. Data is missing in this rule. Please check if this rule is required.	CC150-1	A	Minimum Pipe Length rule for purchase length
WARNING : This is an optional rule. Data is missing in this rule. Please check if this rule is required.	CC150-1	A	Permissible Pipe Bending Machine Rule
WARNING : This is an optional rule. Data is missing in this rule. Please check if this rule is required.	CC150-1	A	Permissible Taps rule
WARNING : This is an optional rule. Data is missing in this rule. Please check if this rule is required.	CC150-1	A	Pipe Bend Radius Multiplier Rule
WARNING : This is an optional rule. Data is missing in this rule. Please check if this rule is required.	CC150-1	A	Pipe Bending Elongation rule
WARNING : This is an optional rule. Data is missing in this rule. Please check if this rule is required.	CC150-1	A	Port Alignment rule
WARNING : This is an optional rule. Data is missing in this rule. Please check if this rule is required.	CC150-1	A	Root Gap Rule
WARNING : This is an optional rule. Data is missing in this rule. Please check if this rule is required.	CC150-1	A	Size Reduction rule
WARNING : This is an optional rule. Data is missing in this rule. Please check if this rule is required.	CC150-1	A	Swaged Jacket Pipe rule
WARNING : This is an optional rule. Data is missing in this rule. Please check if this rule is required.	CC150-1	A	Thickness Data rule
WARNING : This is an optional rule. Data is missing in this rule. Please check if this rule is required.	CC150-1	A	Weld Gap rule

Go to Piping commodity undefined in piping commodity material control data report. Note that tee commodity code is missing from the Piping Commodity Material Control Data sheet. This problem will be corrected in later labs.

SmartPlant

! Piping commodity is determined to be undefined in the piping commodity material control data

Description Of The Error	Piping Materials Class	Revision Number	Contractor Commodity Code	Primary Npd	Primary Npd Units	Secondary Npd	Secondary Npd Units	Multi-size Option
Piping commodity undefined in piping commodity material control data	CC150-1	A	Tee01	0		0		

Go to Summary of catalog parts report. This report displays a summary of the catalog parts required by your piping spec CC150-1.

INTERGRAPH

! Summary of the catalog parts required by each piping materials class

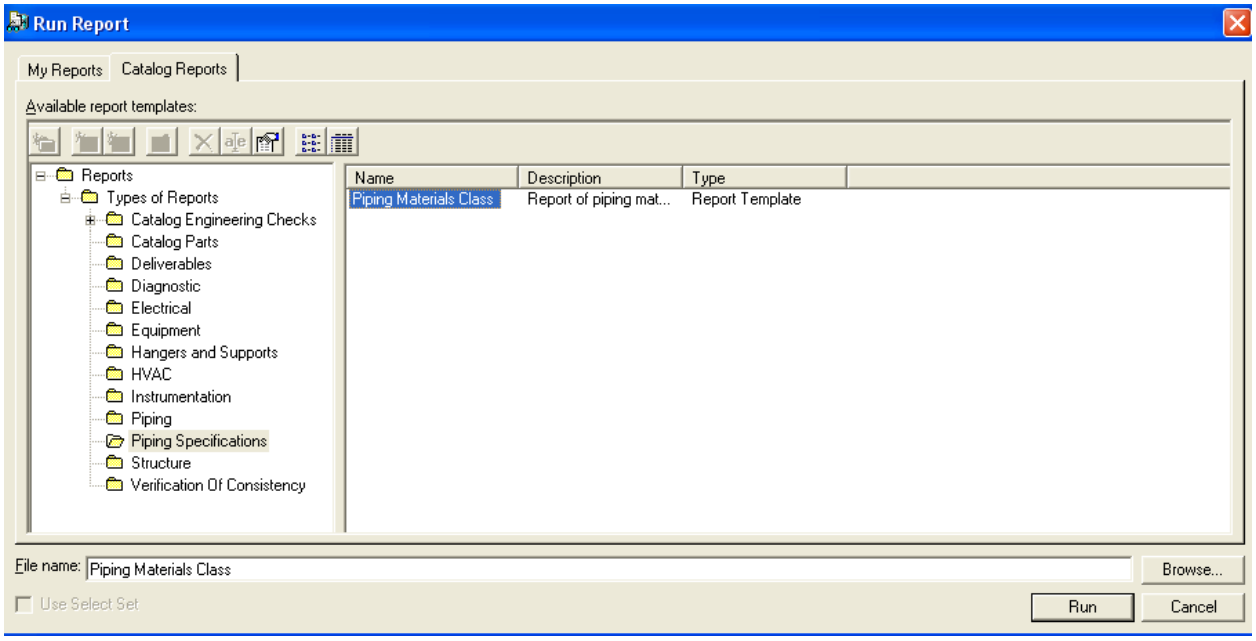
Piping Materials Class	Revision	Short Code	First	First Size	First	Second	Second	Second	First Size Schedule	Second Size Schedule	Commodity Option	Selection Basis	Contractor Commodity Code	Industry Commodity Code	Short Material Description
CC150-1	A	Concentric Size Change	4	4	in	2	2	in	MATCH	MATCH	Default	Default	MBCZZBOZZAAEADCZZUS	MBCZZBOZZAAEADCZZUS	Concentric reducer, [414], BE, ASTM-A234-WPB, ASME-B16.9
CC150-1	A	Concentric Size Change	6	6	in	4	4	in	MATCH	MATCH	Default	Default	MBCZZBOZZAAEADCZZUS	MBCZZBOZZAAEADCZZUS	Concentric reducer, [414], BE, ASTM-A234-WPB, ASME-B16.9
CC150-1	A	Concentric Size Change	8	8	in	4	6	in	MATCH	MATCH	Default	Default	MBCZZBOZZAAEADCZZUS	MBCZZBOZZAAEADCZZUS	Concentric reducer, [414], BE, ASTM-A234-WPB, ASME-B16.9
CC150-1	A	Concentric Size Change	8	8	in	4	6	in	MATCH	MATCH	Default	Default	MBCZZBOZZAAEADCZZUS	MBCZZBOZZAAEADCZZUS	Concentric reducer, [414], BE, ASTM-A234-WPB, ASME-B16.9
CC150-1	A	Concentric Size Change	10	10	in	4	8	in	MATCH	MATCH	Default	Default	MBCZZBOZZAAEADCZZUS	MBCZZBOZZAAEADCZZUS	Concentric reducer, [414], BE, ASTM-A234-WPB, ASME-B16.9
CC150-1	A	Concentric Size Change	10	10	in	4	8	in	MATCH	MATCH	Default	Default	MBCZZBOZZAAEADCZZUS	MBCZZBOZZAAEADCZZUS	Concentric reducer, [414], BE, ASTM-A234-WPB, ASME-B16.9
CC150-1	A	Concentric Size Change	10	10	in	4	8	in	MATCH	MATCH	Default	Default	MBCZZBOZZAAEADCZZUS	MBCZZBOZZAAEADCZZUS	Concentric reducer, [414], BE, ASTM-A234-WPB, ASME-B16.9
CC150-1	A	Concentric Size Change	12	12	in	6	10	in	MATCH	MATCH	Default	Default	MBCZZBOZZAAEADCZZUS	MBCZZBOZZAAEADCZZUS	Concentric reducer, [414], BE, ASTM-A234-WPB, ASME-B16.9
CC150-1	A	Concentric Size Change	12	12	in	6	10	in	MATCH	MATCH	Default	Default	MBCZZBOZZAAEADCZZUS	MBCZZBOZZAAEADCZZUS	Concentric reducer, [414], BE, ASTM-A234-WPB, ASME-B16.9
CC150-1	A	Concentric Size Change	12	12	in	6	10	in	MATCH	MATCH	Default	Default	MBCZZBOZZAAEADCZZUS	MBCZZBOZZAAEADCZZUS	Concentric reducer, [414], BE, ASTM-A234-WPB, ASME-B16.9
CC150-1	A	Concentric Size Change	14	14	in	6	12	in	MATCH	MATCH	Default	Default	MBCZZBOZZAAEADCZZUS	MBCZZBOZZAAEADCZZUS	Concentric reducer, [414], BE, ASTM-A234-WPB, ASME-B16.9
CC150-1	A	Concentric Size Change	14	14	in	6	12	in	MATCH	MATCH	Default	Default	MBCZZBOZZAAEADCZZUS	MBCZZBOZZAAEADCZZUS	Concentric reducer, [414], BE, ASTM-A234-WPB, ASME-B16.9
CC150-1	A	Concentric Size Change	14	14	in	6	12	in	MATCH	MATCH	Default	Default	MBCZZBOZZAAEADCZZUS	MBCZZBOZZAAEADCZZUS	Concentric reducer, [414], BE, ASTM-A234-WPB, ASME-B16.9
CC150-1	A	Concentric Size Change	14	14	in	6	12	in	MATCH	MATCH	Default	Default	MBCZZBOZZAAEADCZZUS	MBCZZBOZZAAEADCZZUS	Concentric reducer, [414], BE, ASTM-A234-WPB, ASME-B16.9
CC150-1	A	Concentric Size Change	16	16	in	8	14	in	MATCH	MATCH	Default	Default	MBCZZBOZZAAEADCZZUS	MBCZZBOZZAAEADCZZUS	Concentric reducer, [414], BE, ASTM-A234-WPB, ASME-B16.9
CC150-1	A	Concentric Size Change	16	16	in	8	14	in	MATCH	MATCH	Default	Default	MBCZZBOZZAAEADCZZUS	MBCZZBOZZAAEADCZZUS	Concentric reducer, [414], BE, ASTM-A234-WPB, ASME-B16.9
CC150-1	A	Piping	2	24	in				S-STD	Undefined	Default	Default	PAAZZBOZZABAABOAAZZ	PAAZZBOZZABAABOAAZZUS	Pipe, [401], BE, ASTM-A53-B Type S
CC150-1	A	Piping	2	24	in				S-STD	Undefined	Default	Default	PAAZZBOZZABAABOAAZZ	PAAZZBOZZABAABOAAZZUS	Pipe, [401], BE, ASTM-A53-B Type S
CC150-1	A	Piping	2	24	in				S-STD	Undefined	Default	Default	PAAZZBOZZABAABOAAZZ	PAAZZBOZZABAABOAAZZUS	Pipe, [401], BE, ASTM-A53-B Type S

10. Go back to the Catalog Task and select Tools -> Run Report.

11. Select Catalog Reports Tab.

12. Expand the report hierarchy and select Piping Specifications folder.

13. Select Piping Materials Class report.



14. Select Run button and key in the spec name CC150-1.

15. Hit Finish button to generate the report. Review the report.

Modeling Verification

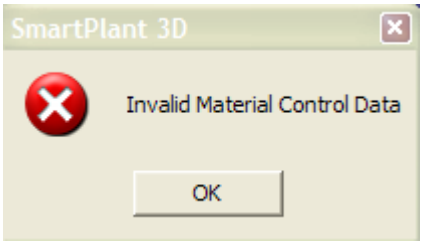
1. Enter the Systems and Specifications task.

2. Add the newly added spec to the plant hierarchy at any level you desire.

3. Enter the piping task.

4. Verify placement of spec components.

   Note: Use the insert component command to **place the Tee** component on a straight pipe. System displays an error message. Note the error message indicating that the material control data of the component is not defined in the catalog.



5. Exit the model.

Lab 3: Piping Commodity Part Data

Objective

After completing this lab, you will be able to:

- Define piping components associated with a particular piping material class.

Reminder : The Piping Commodity Filter rule is intended to provide the data that is required to select unique piping commodity codes from the part catalog.

Editing Piping Commodity (Part) Data

1. Open the Ten_Specs_CatalogData.xls file located in <SP3D Installation>\ CatalogData\BulkLoad\DataFiles and **save the following worksheets to a new workbook:**

   CustomInterfaces

   GUIDs

   Tee

2. Open the Tee worksheet.
3. Add records for the new commodity code Tee01 as shown below:

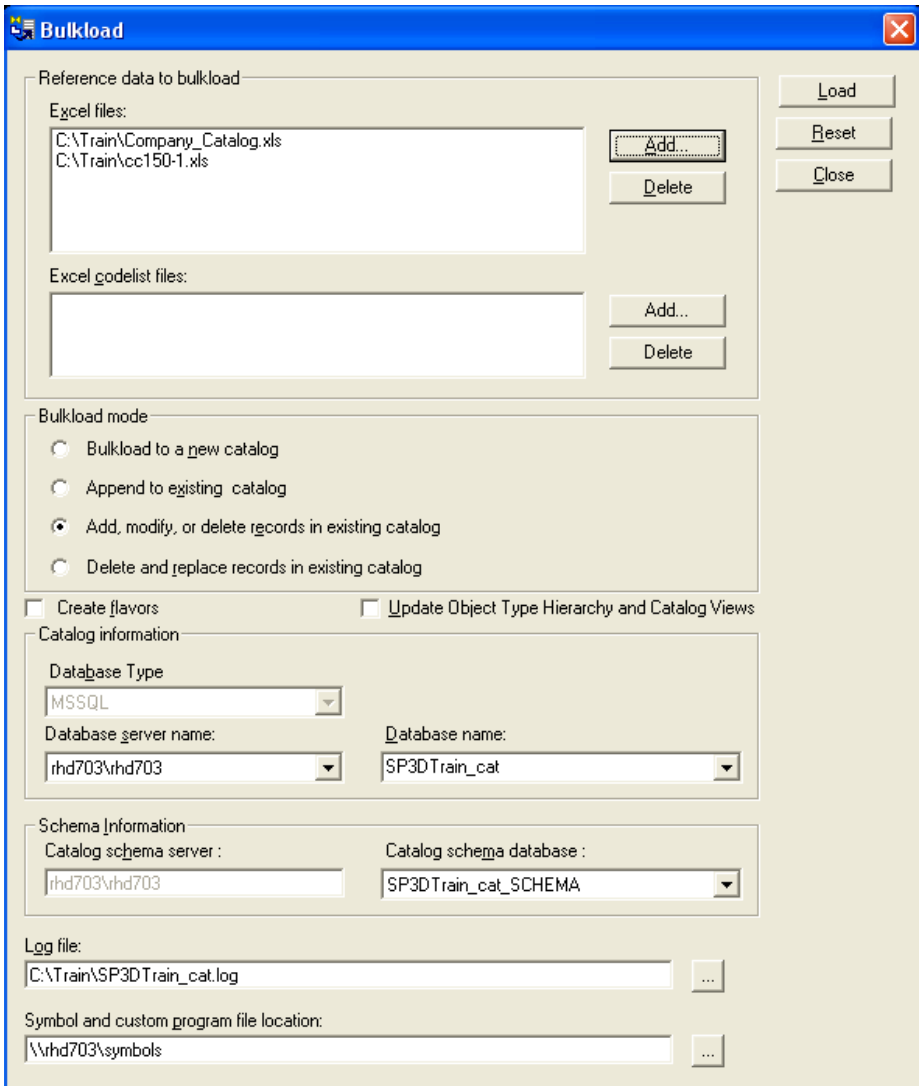
Head	IndustryCommodityCode	CommodityType	GeometryType	GraphicalRepresentationOrNot	SymbolDefinition	MaterialGrade	LiningMaterial	GeometricIndustryStandard	PipingPointBasis[1]	Id[1]	PressureRating[1]	EndPreparation[1]	EndStandard[1]	ScheduleThickness[1]	FlowDirection[1]	PipingPointBasis[2]	Id[2]	PressureRating[2]	EndPreparation[2]	EndStandard[2]	ScheduleThickness[2]	FlowDirection[2]	PipingPointBasis[3]	Id[3]	PressureRating[3]	EndPreparation[3]	EndStandard[3]	ScheduleThickness[3]	FlowDirection[3]	PipingNote 1	DryWeight	Npd[1]:Primary	NpdUnitType[1]	Npd[2]:Primary	NpdUnitType[2]	Npd[3]:Secondary	NpdUnitType[3]	FacetoCenter
Start																																						
a	Tee01	T	75		SP3DTee.CEqualTee	150		41	15			301	5	S-STD	3	15			301	5	S-STD	3	5			301	5	S-STD	3		3lbm	2	in	2	in	2	in	2.5in
a																														13lbm	4	in	4	in	4	in	4.125in
a																														29lbm	6	in	6	in	6	in	5.625in
a																														54lbm	8	in	8	in	8	in	7in
a																														88lbm	10	in	10	in	10	in	8.5in
a																														128lbm	12	in	12	in	12	in	10in
a																														176lbm	14	in	14	in	14	in	11in
a																														200lbm	16	in	16	in	16	in	12in
a																														318lbm	18	in	18	in	18	in	13.5in
a																														369lbm	20	in	20	in	20	in	15in
a																														560lbm	24	in	24	in	24	in	17in

4. Save the workbook as **Company_Catalog.xls**.
5. Open CC150-1.xls.
6. Open the Ten_Specs_SpecificationData.xls file located in <SP3D Installation >\ CatalogData\BulkLoad\DataFiles
7. Open the PipingCommodityMatlControlData worksheet

8. Save the sheet into the CC150-1.xls
9. Add the record for the new commodity code Tee01 as shown below:

Head		ContractorCommodityCode	FirstSizeFrom	FirstSizeTo	FirstSizeUnits	SecondSizeFrom	SecondSizeTo	SecondSizeUnits	MultisizeOption	IndustryCommodityCode	ClientCommodityCode	CIMSCommodityCode	ShortMaterialDescription	LocalizedShortMaterialDesc	LongMaterialDescription	Vendor	Manufacturer	FabricationType	SupplyResponsibility	ReportingType	QuantityOfReportableParts	GasketRequirements	BoltingRequirements	ClampRequirement	WeldingRequirement	LooseMaterialRequirements
Start																										
a	Tee01												Tee, [403], BE, ASTM-A234-WPB, ASME-B16.9					15	2	5		20	35		5	

10. Load the CC150-1.xls and Company_Catalog.xls into the Catalog using the Add/Modify and Delete Mode. Under Bulkload Mode options, uncheck "Update Object Type Hierarchy and Catalog Views" option.



11. Review the log file once the Bulkload process is complete.

12. Run the Verify Consistency between Piping Specification and Catalog command again.

13. Review the output report. Note that there is no entries in the *Piping commodity undefined in piping commodity material control data* and in the *Piping commodity undefined in piping commodity part data* reports.

14. Go to the Piping Task and place the Tee using the Insert component command.

Lab 4: Branch Insertion Rule

Objective

- After completing this lab, you will be able to create the branch insertion rule for the specified spec.

1. Open the Ten_Specs_SpecificationData.xls file located in <SP3D Installation >\ CatalogData\BulkLoad\DataFiles
2. Select PipeBranch worksheet. Move and copy this sheet into the CC150-1.xls in your working directory.
3. Add records to create the branch insertion rule for spec CC150-1 as shown below:

Header

Branch	0.75	1	1.5	2	4	6	8	10	12	14	16	18	20	24
0.75	RW	RW	RW	S	S	S	S	S	S	S	S	S	S	S
1		RW	RW	S	S	S	S	S	S	S	S	S	S	S
1.5			RW	S	S	S	S	S	S	S	S	S	S	S
2				T	W	W	W	W	W	W	W	W	W	W
4					T	W	W	W	W	W	W	W	W	W
6						T	W	W	W	W	W	W	W	W
8							T	W	W	W	W	W	W	W
10								T	W	W	W	W	W	W
12									T	W	W	W	W	W
14										T	W	W	W	W
16											T	W	W	W
18												T	W	W
20													T	W
24														T

Head	SpecName	HeaderSize	BranchSize	AngleLow	AngleHigh	HdrSizeNPDUnitType	BrSizeNPDUnitType	ShortCode	SecondaryShortCode	TertiaryShortCode
Start										
a	CC150-1									
a		0.75	0.75	89.5deg	90.5deg	in	in	Reinforcing Weld		
a		1	0.75	89.5deg	90.5deg	in	in	Reinforcing Weld		
a		1	1	89.5deg	90.5deg	in	in	Reinforcing Weld		
a		1.5	0.75	89.5deg	90.5deg	in	in	Reinforcing Weld		
a		1.5	1	89.5deg	90.5deg	in	in	Reinforcing Weld		
a		1.5	1.5	89.5deg	90.5deg	in	in	Reinforcing Weld		
a		2	1.5	89.5deg	90.5deg	in	in	Sockolet		
a		4	1.5	89.5deg	90.5deg	in	in	Sockolet		
a		6	1.5	89.5deg	90.5deg	in	in	Sockolet		
a		8	1.5	89.5deg	90.5deg	in	in	Sockolet		
a		10	1.5	89.5deg	90.5deg	in	in	Sockolet		
a		12	1.5	89.5deg	90.5deg	in	in	Sockolet		
a		14	1.5	89.5deg	90.5deg	in	in	Sockolet		
a		16	1.5	89.5deg	90.5deg	in	in	Sockolet		
a		18	1.5	89.5deg	90.5deg	in	in	Sockolet		
a		20	1.5	89.5deg	90.5deg	in	in	Sockolet		
a		24	1.5	89.5deg	90.5deg	in	in	Sockolet		
a		2	2	89.5deg	90.5deg	in	in	Tee		
a		4	4	89.5deg	90.5deg	in	in	Tee		
a		6	6	89.5deg	90.5deg	in	in	Tee		
a		8	8	89.5deg	90.5deg	in	in	Tee		
a		10	10	89.5deg	90.5deg	in	in	Tee		
a		12	12	89.5deg	90.5deg	in	in	Tee		
a		14	14	89.5deg	90.5deg	in	in	Tee		
a		16	16	89.5deg	90.5deg	in	in	Tee		
a		18	18	89.5deg	90.5deg	in	in	Tee		
a		20	20	89.5deg	90.5deg	in	in	Tee		
a		24	24	89.5deg	90.5deg	in	in	Tee		
a		4	2	89.5deg	90.5deg	in	in	Weldolet		
a		6	4	89.5deg	90.5deg	in	in	Weldolet		
a		8	6	89.5deg	90.5deg	in	in	Weldolet		
a		10	8	89.5deg	90.5deg	in	in	Weldolet		
a		12	10	89.5deg	90.5deg	in	in	Weldolet		
a		14	12	89.5deg	90.5deg	in	in	Weldolet		
a		16	14	89.5deg	90.5deg	in	in	Weldolet		
a		18	16	89.5deg	90.5deg	in	in	Weldolet		
a		20	18	89.5deg	90.5deg	in	in	Weldolet		
a		24	20	89.5deg	90.5deg	in	in	Weldolet		

4. Load the CC150-1.xls into the Catalog using the Add/Modify and Delete Mode.

5. Review the log file once the Bulkload process is complete.
6. Run the Verify Consistency between Piping Specification and Catalog command.
7. Review the output report. Go to *Branch fitting undefined in piping commodity filter* report.

Note that all the branch fitting specified by the branch table is determined to be undefined in the piping commodity filter.

SmartPlant

! Branch fitting specified by the branch intersection rule is determined to be undefined in the piping commodity filter

Description Of The Error	Piping Materials Class	Revision Number	Short Code	HeaderSize	Header Size NPD Unit Type	BranchSize	Branch Size NPD Unit Type
Branch fitting in pipebranch undefined in piping commodity filter	CC150-1		Reinforcing Weld	0.75	in	0.75	in
Branch fitting in pipebranch undefined in piping commodity filter	CC150-1		Reinforcing Weld	1	in	0.75	in
Branch fitting in pipebranch undefined in piping commodity filter	CC150-1		Reinforcing Weld	1	in	1	in
Branch fitting in pipebranch undefined in piping commodity filter	CC150-1		Reinforcing Weld	1.5	in	0.75	in
Branch fitting in pipebranch undefined in piping commodity filter	CC150-1		Reinforcing Weld	1.5	in	1	in
Branch fitting in pipebranch undefined in piping commodity filter	CC150-1		Reinforcing Weld	1.5	in	1.5	in
Branch fitting in pipebranch undefined in piping commodity filter	CC150-1		Sockolet	2	in	1.5	in
Branch fitting in pipebranch undefined in piping commodity filter	CC150-1		Sockolet	4	in	1.5	in
Branch fitting in pipebranch undefined in piping commodity filter	CC150-1		Weldolet	4	in	2	in
Branch fitting in pipebranch undefined in piping commodity filter	CC150-1		Sockolet	6	in	1.5	in
Branch fitting in pipebranch undefined in piping commodity filter	CC150-1		Weldolet	6	in	4	in
Branch fitting in pipebranch undefined in piping commodity filter	CC150-1		Sockolet	8	in	1.5	in
Branch fitting in pipebranch undefined in piping commodity filter	CC150-1		Weldolet	8	in	6	in
Branch fitting in pipebranch undefined in piping commodity filter	CC150-1		Sockolet	10	in	1.5	in
Branch fitting in pipebranch undefined in piping commodity filter	CC150-1		Weldolet	10	in	8	in
Branch fitting in pipebranch undefined in piping commodity filter	CC150-1		Sockolet	12	in	1.5	in
Branch fitting in pipebranch undefined in piping commodity filter	CC150-1		Weldolet	12	in	10	in
Branch fitting in pipebranch undefined in piping commodity filter	CC150-1		Sockolet	14	in	1.5	in
Branch fitting in pipebranch undefined in piping commodity filter	CC150-1		Weldolet	14	in	12	in
Branch fitting in pipebranch undefined in piping commodity filter	CC150-1		Sockolet	16	in	1.5	in
Branch fitting in pipebranch undefined in piping commodity filter	CC150-1		Weldolet	16	in	14	in
Branch fitting in pipebranch undefined in piping commodity filter	CC150-1		Sockolet	18	in	1.5	in
Branch fitting in pipebranch undefined in piping commodity filter	CC150-1		Weldolet	18	in	16	in
Branch fitting in pipebranch undefined in piping commodity filter	CC150-1		Sockolet	20	in	1.5	in
Branch fitting in pipebranch undefined in piping commodity filter	CC150-1		Weldolet	20	in	18	in
Branch fitting in pipebranch undefined in piping commodity filter	CC150-1		Sockolet	24	in	1.5	in
Branch fitting in pipebranch undefined in piping commodity filter	CC150-1		Weldolet	24	in	20	in

Now add the missing components in the piping commodity filter.

8. Go to the PipingCommodityFilter worksheet.
9. Add the record for the new commodities as shown below:

Item	Size	Commodity Code	Description
Sockolet	1.5”	MELAWDFZZAEYABQZZUM	Sockolet, SWE, 3000#, ASTM-A105
Weldolet	2”-20”	MEKZZBOZZAEYABQZZUM	Weldolet, [412], BE, CS, ASTM-A105 MSS SP-97
Reinforcing Weld	0.75”-1.5”		Reinforcing Weld CS, ASTM A53-B

SpecName	ShortCode	OptionCode	FirstSizeFrom	FirstSizeTo	FirstSizeUnits	SecondSizeFrom	SecondSizeTo	SecondSizeUnits	MultisizeOption	Comments	SelectionBasis	JacketedPipingBasis	MaximumTemperature	MinimumTemperature	EngineeringTag	CommodityCode	FabricationCategoryOverride	SupplyResponsibilityOverride	FirstSizeSchedule	SecondSizeSchedule
	Reinforcing Weld	1	0.75	1.5	in						25									
	Reinforcing Weld	1	1	1.5	in	0.75	1	in			25									
	Sockolet	1	2	24	in	0.75	1.5	in			1					MELAWDFZZAEYABQZZUM				
	Weldolet	1	4	24	in	2	20	in			1					MEKZZBOZZAEYABQZZUM			MATCH	MATCH

10. Save the CC150-1.xls
11. Load the information into the Catalog using the Add/Modify and Delete Mode.
12. Review the log file once the Bulkload process is complete.
13. Run the Verify Consistency between Piping Specification and Catalog command.
14. Review the output report. Go to the index sheet and select the following links:

    - Branch fitting undefined in piping commodity filter

Note that there is no entries in the *Branch fitting undefined in piping commodity filter* report.

- Piping commodity undefined in piping commodity material control data

- Piping commodity undefined in piping commodity part data

Note that there are no entries in the piping commodity material control data and piping commodity part data reports.

15. Go to the Piping Task and test the branch insertion rule using Route Pipe command to route a 4” header line and a 2” branch line.

Lab 5: Bolted Components and Valve Operators

Objective

- After completing this lab, you will be able to add, delete or modify existing piping specifications.
- Create new part class for flanges

Add records for flanges and valves in spec CC150-1 as shown below:

Item	Size	Commodity Code	Description
Flange (WN)	2" -24"	FWN001	Flange, CL150, RFFE/BE, A105, ASME-B16.5, WN
Flange (Default)	2"-24"	FSO001	Flange CL150, RFFE, A105, ASME-B16.5, SO
Gate Valve	2"-12"	GAT001	Gate Valve, CL150, RFFE, BB, OS&Y, ASTM-A216-WCB, trim 8, Crane 47

Adding Flanges

1. Open the Ten_Specs_CatalogData.xls file located in <SP3D Installation>\ CatalogData\BulkLoad\DataFiles and save the WeldNeckFlange worksheet to your Company_Catalog.xls

2. Open the WeldNeckFlange worksheet and edit as follows:

Head	IndustryCommodityCode	CommodityType	GeometryType	GraphicalRepresentationOrNot	SymbolDefinition	MaterialGrade	LiningMaterial	GeometricIndustryStandard	PartDataBasis	PipingPointBasis[1]	Id[1]	PressureRating[1]	EndPreparation[1]	EndStandard[1]	ScheduleThickness[1]	FlowDirection[1]	PipingPointBasis[2]	Id[2]	PressureRating[2]	EndPreparation[2]	EndStandard[2]	ScheduleThickness[2]	FlowDirection[2]	DryWeight	Npd[1]	NpdUnitType[1]	Npd[2]	NpdUnitType[2]	FacetoFace
Start																													
a	FWN001	FWN	15		SP3DWNFlange.CWNFlange	150		35	211	15		150	21	5		3	15			301	5	S-STD	3	6lbm	2	in	2	in	2.44in
a																								15lbm	4	in	4	in	2.94in
a																								24lbm	6	in	6	in	3.44in
a																								39lbm	8	in	8	in	3.94in
a																								52lbm	10	in	10	in	3.94in
a																								80lbm	12	in	12	in	4.44in
a																								102lbm	14	in	14	in	4.94in
a																								127lbm	16	in	16	in	4.94in
a																								140lbm	18	in	18	in	5.44in
a																								170lbm	20	in	20	in	5.6275in
a																								260lbm	24	in	24	in	5.94in

3. Make a copy of the WeldNeckFlange worksheet and rename it as SlipOnFlange.

4. Edit the SlipOnFlange sheet as follows:

Definition	PartClassType	SymbolDefinition	UserClassName	OccClassName	SymbolIcon	OA:InsulationThickness
a	PipeComponentClass		Slip on Flange	Slip on Flange	SymbolIcons\SP3DSliponFlange.gif	

Head	IndustryCommodityCode	CommodityType	GeometryType	GraphicalRepresentationOrNot	SymbolDefinition	MaterialGrade	GeometricIndustryStandard	PartDataBasis	PipingPointBasis[1]	Id[1]	PressureRating[1]	EndPreparation[1]	EndStandard[1]	ScheduleThickness[1]	FlowDirection[1]	PipingPointBasis[2]	Id[2]	PressureRating[2]	EndPreparation[2]	EndStandard[2]	ScheduleThickness[2]	FlowDirection[2]	Npd[1]	NpdUnitType[1]	Npd[2]	NpdUnitType[2]	FacetoFace
Start																											
a	FSO001	FSO	15		SP3DWNFlange.CWNFlange	150	35		15		150	21	5		3	15			591	5		3	2	in	2	in	1in
a																							4	in	4	in	1.31in
a																							6	in	6	in	1.56in
a																							8	in	8	in	1.75in
a																							10	in	10	in	1.94in
a																							12	in	12	in	2.19in
a																							14	in	14	in	2.25in
a																							16	in	16	in	2.5in
a																							18	in	18	in	2.69in
a																							20	in	20	in	2.88in
a																							24	in	24	in	3.25in

5. Save the workbook.

6. Open the CC150-1.xls file.

7. Open the PipingCommodityMatlControlData worksheet and add the following record:

   - The ContractorCommodityCode is FWN001.
   - The ShortMaterialDescription is Flange, *CL150, RFFE/BE, A105, ASME-B16.5, WN*
   - The ContractorCommodityCode is FSO001.
   - The ShortMaterialDescription is *Flange, CL150, RFFE/BE, A105, ASME-B16.5, SO*

   Note : Add the appropriate values in the Fabrication Type, Supply Responsibility, Reporting Type, Gasket Requirement, Bolting Requirement, and Welding Requirement columns. (Hint: Check the PipingCommodityMatlControlData spreadsheet for similar items, or Check the AllCodeLists.xls for appropriate values.)

Head	ContractorCommodityCode	FirstSizeFrom	FirstSizeTo	FirstSizeUnits	SecondSizeFrom	SecondSizeTo	SecondSizeUnits	MultisizeOption	IndustryCommodityCode	ClientCommodityCode	CIMSCommodityCode	ShortMaterialDescription	LocalizedShortMaterialDesc	LongMaterialDescription	Vendor	Manufacturer	FabricationType	SupplyResponsibility	ReportingType	QuantityOfReportableParts	GasketRequirements	BoltingRequirements	ClampRequirement	WeldingRequirement
Start																									
	Tee01											Tee, [403], BE, ASTM-A234-WPB, ASME-B16.9					15	2	5		20	35		5
a	FWN001											Flange, CL150, RFFE/BE, A105, ASME-B16.5, WN					15	2	5		5	5		5
a	FSO001											Flange, CL150, RFFE/BE, A105, ASME-B16.5, SO					15	2	5		5	5		5

8. Save the workbook.

Adding Gate Valves

1. Open the Ten_Specs_CatalogData.xls file located in <SP3D Installation>\ CatalogData\BulkLoad\DataFiles and save the GateValve worksheet to your Company_Catalog.xls

2. Go to the Gate Valve worksheet and edit as follows:

Head	IndustryCommodityCode	CommodityType	GeometryType	GraphicalRepresentationOrNot	SymbolDefinition	SymbolIcon	MaterialGrade	LiningMaterial	BendRadius	BendRadiusMultiplier	MirrorBehaviorOption	GeometricIndustryStandard	PartDataBasis	ValveManufacturer	ValveModelNumber	ValveTrim	FlangeFaceSurfaceFinish	SurfacePreparation	ManufacturingMethod	MiscRequisitionClassification
Start																				
a	GAT001	GAT	15		SP3DGateValve.CGateValve		252					40			440	35				
a																				
a																				
a																				
a																				
a																				

PipingPointBasis[1]	Id[1]	PressureRating[1]	EndPreparation[1]	EndStandard[1]	ScheduleThickness[1]	FlowDirection[1]	PipingPointBasis[2]	Id[2]	PressureRating[2]	EndPreparation[2]	EndStandard[2]	ScheduleThickness[2]	FlowDirection[2]	PipingNote1	DryWeight	Npd[1]	NpdUnitType[1]	Npd[2]	NpdUnitType[2]	FacetoFace
15		150	21	5		3	15		150	21	5		3		46lbm	2	in	2	in	7in
															110lbm	4	in	4	in	9in
															175lbm	6	in	6	in	10.5in
															310lbm	8	in	8	in	11.5in
															455lbm	10	in	10	in	13in
															650lbm	12	in	12	in	14in

3. Save the workbook.

4. Open the CC150-1.xls workbook.

5. Open the PipingCommodityMatlControlData worksheet

   - The ContractorCommodityCode is GAT001.

- The ShortMaterialDescription is Gate valve, *CL150, RFFE, BB, OS&Y, ASTM-A216-WCB, trim 8, Crane 47*

6. Note : Add the appropriate values in the Fabrication Type, Supply Responsibility, Reporting Type, Gasket Requirement, Bolting Requirement, and Welding Requirement columns of the part. (Hint : Check the PipingCommodityMatlControlData spreadsheet for similar items, or Check the AllCodeLists.xls for appropriate values.)

7. Add the valve operator data for the Gate Valve.

Head	ContractorCommodityCode	FirstSizeFrom	FirstSizeTo	FirstSizeUnits	SecondSizeFrom	SecondSizeTo	SecondSizeUnits	MultisizeOption	ShortMaterialDescription	Vendor	Manufacturer	FabricationType	SupplyResponsibility	ReportingType	QuantityOfReportableParts	GasketRequirements	BoltingRequirements	WeldingRequirement	MultiportValveOpReq	ValveOperatorType	ValveOperatorGeoIndStd	ValveOperatorCatalogPartNumber
Start																						
	Tee01								Tee, [403], BE, ASTM-A234-WPB, ASME-B16.9			15	2	5		20	35	5				
	FWN001								Flange, CL150, RFFE/BE, A105, ASME B16.5, WN			15	2	5		5	5	5				
	FSO001								Flange, CL150, RFFE/BE, A105, ASME B16.5, SO			15	2	5		5	5	5				
a	GAT001								Gate Valve, CL150, RFFE, BB, OS&Y, ASTM-A216-WCB, trim 8, Crane 47			7	10	5		5	5	50		3	1190	GAT001-BLT-150-3

8. Save the workbook.

Creating Piping Material Class Records.

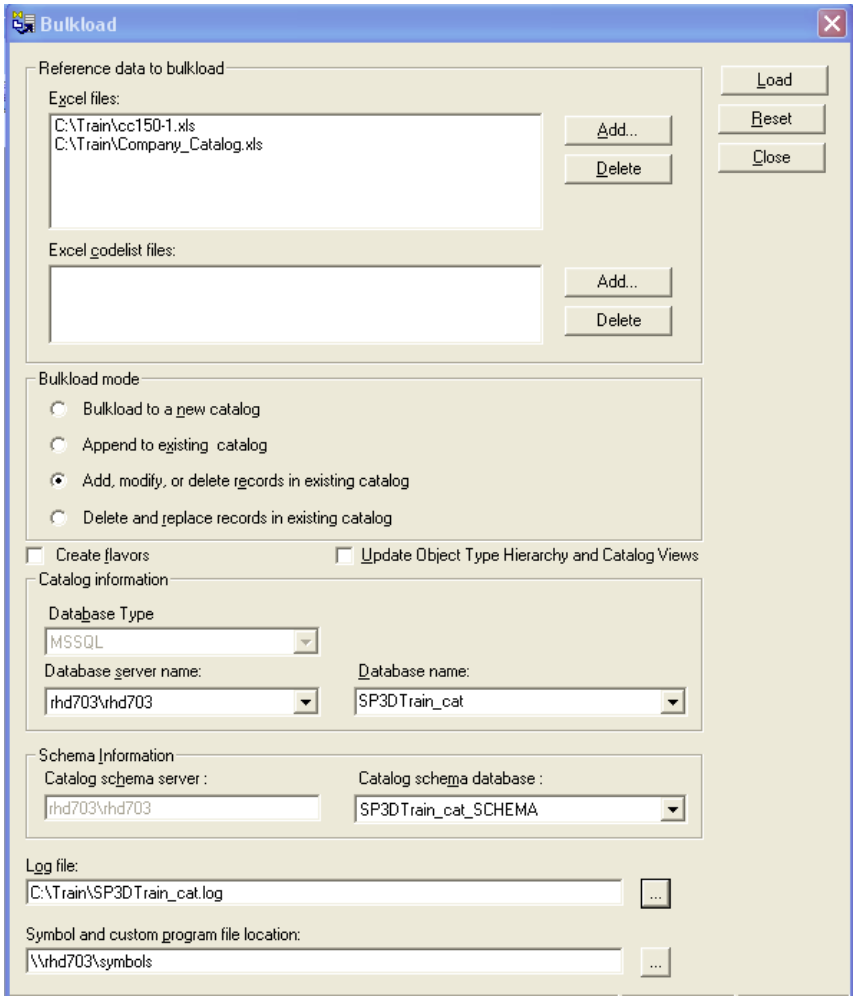
1. Go to the PipingCommodityFilter worksheet.

2. Add records for the flanges and gate valve.

Head	SpecName	ShortCode	OptionCode	FirstSizeFrom	FirstSizeTo	FirstSizeUnits	SecondSizeFrom	SecondSizeTo	SecondSizeUnits	MultisizeOption	Comments	SelectionBasis	FluidCode	JacketedPipingBasis	MaximumTemperature	MinimumTemperature	EngineeringTag	CommodityCode	FabricationCategoryOverride	SupplyResponsibilityOverride	FirstSizeSchedule	SecondSizeSchedule
a		Flange	1	2	24	in						5						FSO001				
a		Flange	171	2	24	in						5						FWN001				MATCH
a		Gate Valve	1	2	12	in						1						GAT001				

3. Save the file and exit.

4. Load the modified workbooks into the catalog database using the Bulkload Utility.



5. Review the log file once the Bulkload process is complete. Run the Verify Consistency between Piping Specification and Catalog command.

6. Review the output report. Go to the index sheet and select the following links:

   - Piping commodity undefined in piping commodity material control data

   - Piping commodity undefined in piping commodity part data

   - Summary of existing symbols

   - Summary of catalog parts

   - Valve operator undefined in valve operator part data

SmartPlant®

! Valve operator is determined to be undefined in the valve operator part data

Description Of The Error	Piping Materials Class	Revision Number	Valve Operator Number	Contractor Commodity Code
Valve operator undefined in valve operator part data	CC150-1	A	GAT001-BLT-150-3	GAT001

Note: the system reports that the valve operator is not defined in the part catalog.

- Valve operator undefined in piping commodity material control data

SmartPlant

! Valve operator is determined to be undefined in the valve operator material control data

Description Of The Error	Piping Materials Class	Revision Number	Valve Operator Number	Contractor Commodity Code
Valve operator undefined in valve operator material control data	CC150-1	A	GAT001-BLT-150-3	GAT001

Note: the system reports that valve operator is not defined in the valve operator material control data

- Insertion of the part failed

SmartPlant

Description Of The Error	Piping Materials Class	Revision Number	Industry Commodity Code	Short Code	Primary Size	Primary Size Units	Secondary Size	Secondary Size Units	Multi-size option	First Size Schedule	Second Size Schedule	Option Code
Placement of Symbol Failed. Please refer the log file	CC150-1	A	GAT001	Gate Valve	2	in						1
Placement of Symbol Failed. Please refer the log file C:\Train\SymbolPlacementError Log.log	CC150-1	A	GAT001	Gate Valve	4	in						1
Placement of Symbol Failed. Please refer the log file C:\Train\SymbolPlacementError Log.log	CC150-1	A	GAT001	Gate Valve	6	in						1
Placement of Symbol Failed. Please refer the log file C:\Train\SymbolPlacementError Log.log	CC150-1	A	GAT001	Gate Valve	8	in						1
Placement of Symbol Failed. Please refer the log file C:\Train\SymbolPlacementError Log.log	CC150-1	A	GAT001	Gate Valve	10	in						1
Placement of Symbol Failed. Please refer the log file C:\Train\SymbolPlacementError Log.log	CC150-1	A	GAT001	Gate Valve	12	in						1

Note: The system reports that the system fails to construct the gate valve GAT001 symbol for all sizes.

Adding valve operator data

7. Open the Ten_Specs_CatalogData.xls file located in <SP3D Installation>\ CatalogData\BulkLoad\DataFiles and save the Operator3 worksheet to your Company_Catalog.xls.

8. Go to the Operator3 worksheet.

9. Add the valve operator data GAT001-BLT-150-3 as shown below:

Definition	PartClassType	SymbolDefinition	SymbolIcon										
	ValveOperatorClass		SymbolIcons\SP3DOP3.gif										
CommodityPart													
Head	ValveOperatorNumber	ValveSize	ValveSizeUnits	SymbolDefinition	MirrorBehaviorOption	DimensionalBasis	ValveOperatorIsRotatable	DryWeight	DryCogX	DryCogY	DryCogZ	OperatorHeight	OperatorDiameter
Start													
a	GAT001-BLT-150-3	2	in	SP3DOP3.COP3			5					17.813in	10in
a		4	in									28.188in	13.75in
a		6	in									35.375in	15.5in
a		8	in									45in	19.5in
a		10	in									52.5in	19.5in
a		12	in									61.125in	20in

10. Save the workbook.
11. Open CC150-1.xls.
12. Open the Ten_Specs_SpecificationData.xls file located in <SP3D Installation >\ CatalogData\BulkLoad\DataFiles
13. Open the ValveOperatorMatlControlData worksheet
14. Add the valve operator data GAT001-BLT-150-3 as shown below:

Head	OperatorPartNumber	ShortMatlDescription	LocalizedShortMaterialDescription	LongMaterialDescription	Vendor	Manufacturer	ValveOperatorType	ReportableCommodityCode	QuantityOfReportableParts	AltReportableCommodityCode	QuantityOfAltReportableParts	HyperlinkToElectronicVendor	HyperlinkToElectronicManuals
Start													
a	GAT001-BLT-150-3	Handwheel					3						

15. Save the sheet into the CC150-1.xls

16. Save the file and exit.
17. Load the modified workbooks into the database using the Bulkload Utility.
18. Review the log file once the Bulkload process is complete. Run the Verify Consistency between Piping Specification and Catalog command.

Review the output report. Go to the index sheet and select the following links:

- Piping commodity undefined in piping commodity material control data

- Piping commodity undefined in piping commodity part data

- Summary of existing symbols

- Summary of catalog parts

- Valve operator undefined in valve operator part data

- Valve operator undefined in piping commodity material control data

- Insertion of the part failed

Lab 6: Connection Components

Objective

- After completing this lab, you will be able to define bolt and gasket data to an existing piping specification.

Creating Gasket Records.

1. Open the Ten_Specs_SpecificationData.xls file located in <SP3DInstalled_Location>\ CatalogData\BulkLoad\DataFiles

2. Select GasketSelection Filter and BoltSelectionFilter sheets. Move and copy these sheets into the CC150-1.xls

3. Go to the GasketSelectionFilter worksheet and add the following records:

Head	SpecName	NominalDiameterFrom	NominalDiameterTo	NpdUnitType	GasketOption	MaximumTemperature	MinimumTemperature	EndPreparation	PressureRating	EndStandard	AlternateEndPreparation	AlternatePressureRating	AlternateEndStandard	FluidCode	ScheduleThickness	ContractorCommodityCode	Priority	RingNumber	FabricationCategoryOverride	SupplyResponsibilityOverride	Comments	QuantityOfAltReportableParts	AltReportableCommodityCode	QuantityOfReportableParts	ReportableCommodityCode	PipingNote1
Start																										
a	CC150-1	2	24	in	1			21	150	5						GMAHACABXBEPUS			7	10						
a	CC150-1	2	24	in	1			21	150	5	121	150	5			GMAHACABXBEPUS			7	10						

Creating Bolt Records.

1. Go to the BoltSelectionFilter worksheet and add the following records:

Head	SpecName	NominalDiameterFrom	NominalDiameterTo	NpdUnitType	BoltOption	MaximumTemperature	EndPreparation	PressureRating	EndStandard	AlternateEndPreparation	AlternatePressureRating	AlternateEndStandard	ContractorCommodityCode	Priority	BoltExtensionOption	FabricationCategoryOverride	SupplyResponsibilityOverride	Comments	PipingNote1	LubricationRequirements
Start																				
a	CC150-1	2	24	in	1		21	150	5				BAZZZZZZAAYBEUZZUS		1	7	10			
a	CC150-1	2	24	in	1		21	150	5	121	150	5	BAZZZZZZAAYBEUZZUS		1	7	10			

2. Save the file and load the CC150-1.xls using the Bulkload Utility. Review the log file.
3. Run the Verify Consistency between Piping Specification and Catalog command.
4. Review the output report. Go to the index sheet and select the following links:
    - Bolt for bolted joint undefined in bolt selection filter data
    - Bolts undefined in piping commodity material control data
    - Bolts undefined in bolt part data
    - Summary of bolt parts
    - Gasket for bolted joint undefined in gasket selection filter data
    - Gaskets undefined in piping commodity material control data
    - Gaskets undefined in gasket part data
    - Summary of gasket parts
5. Enter SmartPlant 3D and attempt to place a flange or flanged valve on the existing lines from the prior lab.

Lab 7: PipeTakedown Parts Rule

Objective

- After completing this lab, you will be able to create the pipe takedown parts rule for the specified spec.

1. Open the Ten_Specs_SpecificationData.xls file located in <SP3D Installation >\ CatalogData\BulkLoad\DataFiles
2. Select PipeTakedownParts worksheet. Move and copy this sheet into the CC150-1.xls
3. Add records to create the pipe takedown parts rule for spec CC150-1 as shown below:
    - Place a Union when NPD is 0.75”
    - Place a Coupling when NPD is between 1” – 1.75”
    - Place default flanges when NPD is between 2” – 24”

Head	SpecName	TakeDownShortCode	WeldShortCode	IsPairRequired	Npd	NpdUnitType	IsWeld
Start							
a	CC150-1	Union	Butt Weld	0	0.75	in	1
a		Coupling	Butt Weld	0	1	in	1
a		Coupling	Butt Weld	0	1.5	in	1
a		Flange	Butt Weld	1	2	in	1
a		Flange	Butt Weld	1	4	in	1
a		Flange	Butt Weld	1	6	in	1
a		Flange	Butt Weld	1	8	in	1
a		Flange	Butt Weld	1	10	in	1
a		Flange	Butt Weld	1	12	in	1
a		Flange	Butt Weld	1	14	in	1
a		Flange	Butt Weld	1	16	in	1
a		Flange	Butt Weld	1	18	in	1
a		Flange	Butt Weld	1	20	in	1
a		Flange	Butt Weld	1	24	in	1

4. Go to the PipingCommodityFilter worksheet.
5. Add the record for the new commodities as shown below:

Item	Size	Commodity Code	Description
Union	0.75” – 0.75”	MAXAWBVZZADRABQZZUS	Union, CL3000, SWE, ASTM-A105, MSS-SP-83
Coupling	1” – 1.5”	MAKAWBVZZAAGABQZZUS	Coupling, CL3000, SWE, ASTM-A105, ASME-B16.11

Head	SpecName	ShortCode	OptionCode	FirstSizeFrom	FirstSizeTo	FirstSizeUnits	SecondSizeFrom	SecondSizeTo	SecondSizeUnits	MultisizeOption	Comments	SelectionBasis	FluidCode	JacketedPipingBasis	MaximumTemperature	MinimumTemperature	EngineeringTag	CommodityCode	FabricationCategoryOverride	SupplyResponsibilityOverride	FirstSizeSchedule	SecondSizeSchedule
a		Coupling	1	1	1.5	in						1						MAKAWBVZZAAGABQZZUS				
a		Union	1	0.75	0.75	in						1						MAXAWBVZZADRABQZZUS				

6. Save the sheet into the CC150-1.xls
7. Load the information into the Catalog using the Add/Modify and Delete Mode.
8. Review the log file once the Bulkload process is complete.
9. Run the Verify Consistency between Piping Specification and Catalog command.
10. Review the output report. Go to the index sheet and select the following links:

    - Piping commodity undefined in piping commodity material control data

    - Piping commodity undefined in piping commodity part data

    - Summary of existing symbols

    - Summary of catalog parts

11. Go to the Piping Task and test the pipe takedown parts rule.

Lab 8: Permissible Taps Rule

Objective

- After completing this lab, you will be able to create the permissible taps rule for the specified spec.

1. Open the Ten_Specs_SpecificationData.xls file located in <SP3D Installation>\ CatalogData\BulkLoad\DataFiles
2. Select PermissibleTaps worksheet. Move and copy this sheet into the CC150-1.xls
3. Add records to create the permissible taps rule for spec CC150-1 as shown below:

   - Set the default tap for a 1” NPD
   - Place a 3000# socket weld tap when NPD is between 0.75” – 4”
   - Place a hole circular end tap when NPD is between 6” – 24”

Head	SpecName	PermissibleTapNumber	IsPreferredTap
Start			
a	CC150-1	Tap-004	FALSE
a		Tap-006	TRUE
a		Tap-010	FALSE
a		Tap-012	FALSE
a		Tap-018	FALSE
a		Tap-021	FALSE
a		Tap-022	FALSE
a		Tap-023	FALSE
a		Tap-024	FALSE
a		Tap-025	FALSE
a		Tap-026	FALSE
a		Tap-027	FALSE
a		Tap-028	FALSE
a		Tap-029	FALSE

   Note: The Permissible TapNumbers are defined in TapProperties rule.

4. Save the sheet into the CC150-1.xls
5. Load the information into the Catalog using the Add/Modify and Delete Mode.
6. Review the log file once the Bulkload process is complete.
7. Run the Verify Consistency between Piping Specification and Catalog command.
8. Review the output report. Go to the index sheet and select the following link:

- Rules data undefined
- Tap undefined in tap properties data

9. Go to the Piping Task and test the permissible taps rule.

Lab 9: Model/Catalog Synchronization

Objective

- After completing this lab, you will be able to modify the piping specification/catalog and synchronize the catalog with the model data.

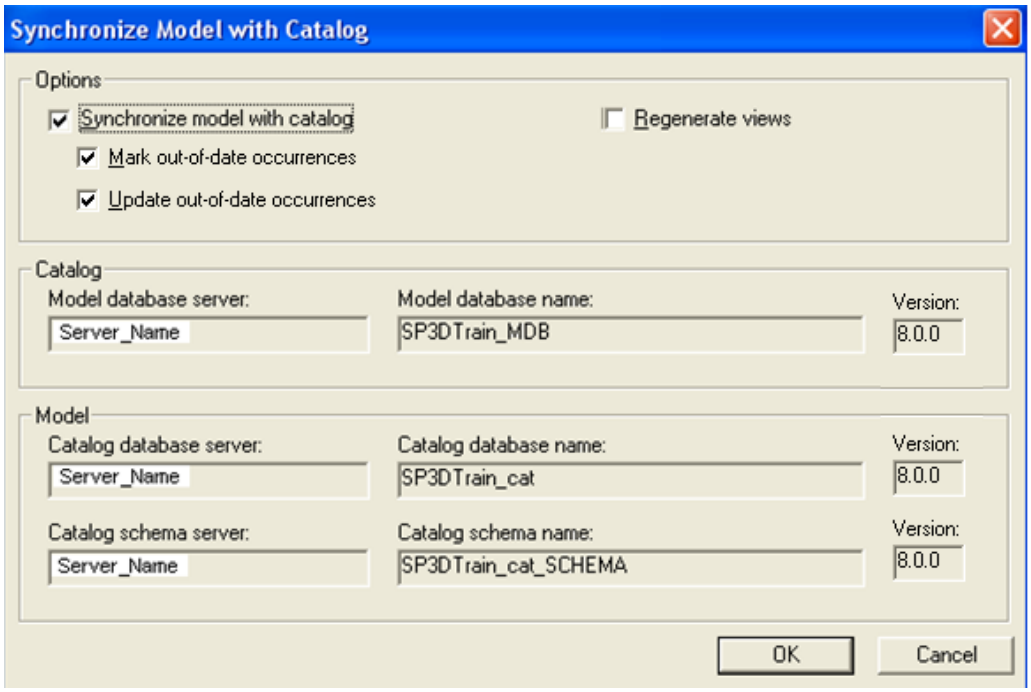
Component Modeling

1. Route items in the model that include the following items:
2. Large bore pipe and fittings (NPD = 4")
3. Small Bore pipe and fittings (NPD = 2")
4. At least one flanged component
5. At least three standard tees on the 2" pipeline: at the end of a pipe, somewhere along the pipe and between two fittings.
6. Open the Company_Catalog.xls
7. Open the Tee worksheet and edit the FacetoCenter dimension for the 2" Tee as follows:

   FacetoCenter = 6in

Head	IndustryCommodityCode	CommodityType	GeometryType	GraphicalRepresentationOrNot	SymbolDefinition	MaterialGrade	LiningMaterial	MirrorBehaviorOption	GeometricIndustryStandard	PartDataBasis	PipingPointBasis[1]	Id[1]	PressureRating[1]	EndPreparation[1]	EndStandard[1]	ScheduleThickness[1]	FlowDirection[1]	PipingPointBasis[2]	Id[2]	PressureRating[2]	EndPreparation[2]	EndStandard[2]	ScheduleThickness[2]	FlowDirection[2]	PipingPointBasis[3]	Id[3]	PressureRating[3]	EndPreparation[3]	EndStandard[3]	ScheduleThickness[3]	FlowDirection[3]	PipingNote1	DryWeight	Npd[1];Primary	NpdUnitType[1]	Npd[2];Primary	NpdUnitType[2]	Npd[3];Secondary	NpdUnitType[3]	FacetoCenter
Start																																								
M	Tee01	T	75		SP3DTee.CEqualTee	264			39		15			301	5	S-STD	3	15			301	5	S-STD	3	15				301	5	S-STD	3		3lbm	2	in	2	in	2	in	6in
	Tee01	T	75		SP3DTee.CEqualTee	264			39		15			301	5	S-STD	3	15			301	5	S-STD	3	15				301	5	S-STD	3		13lbm	4	in	4	in	4	in	4.125in

8. Note : Make sure to mark all rows modified in the spreadsheet with an "M", and use the "Add, Modify, or Delete" Bulkload option.
9. Load the changes into the database using the Bulkload Utility. Review the log file.
10. Open Project Management Tool
11. Select the Model and go to Tool -> Synchronize Model with Catalog command. Do not need to re-generate the views in the model.



12. Select OK to start the process.

13. Enter SmartPlant 3D and go to Piping task. Use F5 to update graphics if using a session file to enter the model.

14. Review the TO DO LIST dialog box.

15. Hit the Update button in the TO DO LIST to update any out of date entries in the list or move features to accommodate the changes.

Lab 10: Reportable Piping Commodity

Objective

- After completing this lab, you will be able to add a lap joint flange represents the primary piping commodity, and the stub end represents the reportable piping commodity for reporting purposes. It is not necessary that the stub end be modeled.

1. Add records for lap joint flange in spec CC150-1 as shown below:

Item	Option	Size	Commodity Code	Description
Flange	189	4" -8"	FLSL-01	Flange, CL150, RFFE/BE, ASTM-A105, ASME-B16.5, FLSL
		4"-8"	StubEnd-01	Stub End, ASME-B16.9, bevel end, Schedule bore to match

2. Open the Ten_Specs_CatalogData.xls file located in <SP3D Installation>\ CatalogData\BulkLoad\DataFiles and save the LapJointFlange and StubEnd worksheets to your Company_Catalog.xls

3. Edit the LapJointFlange sheet as follows:

Head	IndustryCommodityCode	CommodityType	GeometryType	GraphicalRepresentationOrNot	SymbolDefinition	MaterialGrade	LiningMaterial	MirrorBehaviorOption	GeometricIndustryStandard	PartDataBasis	PipingPointBasis[1]	Id[1]	PressureRating[1]	EndPreparation[1]	EndStandard[1]	ScheduleThickness[1]	FlowDirection[1]	PipingPointBasis[2]	Id[2]	PressureRating[2]	EndPreparation[2]	EndStandard[2]	ScheduleThickness[2]	FlowDirection[2]	PipingNote1	DryWeight	Npd[1]	NpdUnitType[1]	Npd[2]	NpdUnitType[2]	StubLength	LapThickness
Start																																
a	FLSL-01	FSSE	15			150			39		15		150	71	5		3	15			301	5	S-STD	3			4	in	4	in	6in	0.169in
a																											6	in	6	in	6in	0.194in
a																											8	in	8	in	6in	0.218in

4. Go to StubEnd sheet.

5. Edit the StubEnd sheet as follows:

Head	IndustryCommodityCode	CommodityType	GeometryType	GraphicalRepresentationOrNot	SymbolDefinition	MaterialGrade	LiningMaterial	MirrorBehaviorOption	GeometricIndustryStandard	PartDataBasis	PipingPointBasis[1]	Id[1]	PressureRating[1]	EndPreparation[1]	EndStandard[1]	ScheduleThickness[1]	FlowDirection[1]	PipingPointBasis[2]	Id[2]	PressureRating[2]	EndPreparation[2]	EndStandard[2]	ScheduleThickness[2]	FlowDirection[2]	PipingNote1	DryWeight	Npd[1]	NpdUnitType[1]	Npd[2]	NpdUnitType[2]
Start																														
a	StubEnd-01	STBNDL	15			150			39		15		150	71	5		3	15			301	5	S-STD	3			4	in	4	in
a																											6	in	6	in
a																											8	in	8	in

6. Save the file and exit.

7. Open the CC150-1.xls spreadsheet.

8. Open the PipingCommodityMatlControlData worksheet

   - The ContractorCommodityCode is FLSL-01.
   - The ShortMaterialDescription is Flange, CL150, RFFE/BE, A105, ASME-B16.5, FLSL
   - The ContractorCommodityCode is StubEnd-01.
   - The ShortMaterialDescription is Stub End, ASME-B16.9, bevel end, Schedule bore to match

   Note : Add the appropriate values in the Fabrication Type, Supply Responsibility, Reporting Type, Gasket Requirement, Bolting Requirement, and Welding Requirement columns of the part. (Hint : Check the AllCodeLists.xls spreadsheet for similar codelist items.)

Head	ContractorCommodityCode	FirstSizeFrom	FirstSizeTo	FirstSizeUnits	SecondSizeFrom	SecondSizeTo	SecondSizeUnits	MultisizeOption	IndustryCommodityCode	ClientCommodityCode	CIMSCommodityCode	ShortMaterialDescription	LocalizedShortMaterialDesc	LongMaterialDescription	Vendor	Manufacturer	FabricationType	SupplyResponsibility	ReportingType	QuantityOfReportableParts	GasketRequirements	BoltingRequirements	ClampRequirement	WeldingRequirement	LooseMaterialRequirements	MultiportValveOpReq	ValveOperatorType	ValveOperatorGeoIndStd	ValveOperatorCatalogPartNumber
Start																													
	Tee01											Tee, [403], BE, ASTM-A234-WPB, ASME-B16.9					15	2	5		20	35		5						
	FWN001											Flange, CL150, RFFE/BE, A105, ASME-B16.5, WN					15	2	5		5	5		5						
	FSO001											Flange, CL150, RFFE/BE, A105, ASME-B16.5, SO					15	2	5		5	5		5						
	GAT001											Gate valve, CL150, RFFE, BB, OS&Y, ASTM-A216-WCB, trim 8, Crane 47					7	10	5		5	5		50				3	1190	GAT001-BLT-150-3
a	FLSL-01											Flange, CL150, RFFE/BE, A105, ASME-B16.5, FLSL					15	2	5		5	5		5						
a	StubEnd-01											Stub End, ASME-B16.9, bevel end, Schedule bore to match					15	2	5		5	5		5						

Creating Piping Material Class Record

9. Open the PipingCommodityFilter worksheet.

10. Add records for the lap joint flange and the Stub End.

Head	SpecName	ShortCode	OptionCode	FirstSizeFrom	FirstSizeTo	FirstSizeUnits	SecondSizeFrom	SecondSizeTo	SecondSizeUnits	MultisizeOption	Comments	SelectionBasis	FluidCode	JacketedPipingBasis	MaximumTemperature	MinimumTemperature	EngineeringTag	CommodityCode	FabricationCategoryOverride	SupplyResponsibilityOverride	FirstSizeSchedule	SecondSizeSchedule	ReportableCommodityCode	QuantityOfReportableParts
a		Flange	183	4	8	in						5						FLSL-01				MATCH	StubEnd-01	1

11. Save the file and load both workbooks using the Bulkload Utility.

12. Review the log file once the Bulkload process is complete.

13. Run the Verify Consistency between Piping Specification and Catalog command again.

14. Review the output report. Go to the index sheet and select the following links:

- Piping commodity undefined in piping commodity material control data
- Piping commodity undefined in piping commodity part data
- Summary of existing symbols
- Summary of catalog parts
- Bolt for bolted joint undefined in bolt selection filter data
- Bolts undefined in piping commodity material control data
- Bolts undefined in bolt part data
- Summary of bolt parts
- Gasket for bolted joint undefined in gasket selection filter data
- Gaskets undefined in piping commodity material control data
- Gaskets undefined in gasket part data
- Summary of gasket parts

Note: the report shows missing bolts and gaskets.

Creating Gasket Records.

15. Open the GasketSelectionFilter worksheet and add the following records:

Head	SpecName	NominalDiameterFrom	NominalDiameterTo	NpdUnitType	GasketOption	MaximumTemperature	MinimumTemperature	EndPreparation	PressureRating	EndStandard	AlternateEndPreparation	AlternatePressureRating	AlternateEndStandard	FluidCode	ScheduleThickness	ContractorCommodityCode	Priority	RingNumber	FabricationCategoryOverride	SupplyResponsibilityOverride	Comments
Start																					
	CC150-1	2	24	in	1			21	150	5						GMAHACABXBEPUS			7	10	
	CC150-1	2	24	in	1			21	150	5	121	150	5			GMAHACABXBEPUS			7	10	
a	CC150-1	2	24	in	1			71	150	5						GMAHACABXBEPUS			7	10	
a	CC150-1	2	24	in	1			21	150	5	71	150	5			GMAHACABXBEPUS			7	10	

Note: The plant option is setup to use the gasket selection based on both bolted end is required.

Creating Bolt Records.

16. Open the BoltSelectionFilter worksheet and add the following records:

Head	SpecName	NominalDiameterFrom	NominalDiameterTo	NpdUnitType	BoltOption	MaximumTemperature	EndPreparation	PressureRating	EndStandard	AlternateEndPreparation	AlternatePressureRating	AlternateEndStandard	ContractorCommodityCode	Priority	BoltExtensionOption	FabricationCategoryOverride	SupplyResponsibilityOverride	Comments	PipingNote1	LubricationRequirements
Start																				
	CC150-1	2	24	in	1		21	150	5				BAZZZZZZAAYBEUZZUS		1	7	10			
	CC150-1	2	24	in	1		21	150	5	121	150	5	BAZZZZZZAAYBEUZZUS		1	7	10			
a	CC150-1	2	24	in	1		71	150	5				BAZZZZZZAAYBEUZZUS		1	7	10			
a	CC150-1	2	24	in	1		21	150	5	71	150	5	BAZZZZZZAAYBEUZZUS		1	7	10			

17. Save the file and load the workbook using the Bulkload Utility.

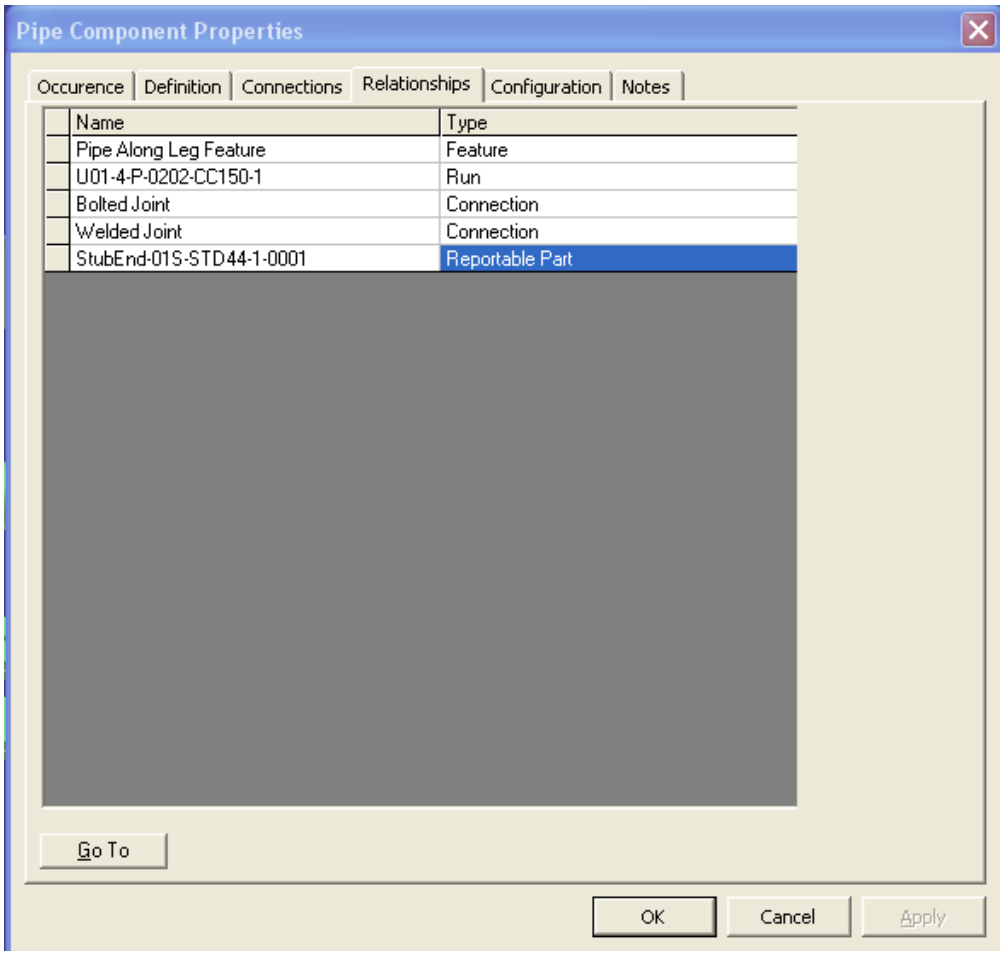
18. Review the log file once the Bulkload process is complete.

19. Run the Verify Consistency between Piping Specification and Catalog command again.

20. Review the output report.

21. Go to the Piping Task and place the lap joint flange.

22. Review the properties page.



Lab 11: Substitution Cap Screw Commodity Code

Objective

- After completing this lab, you will be able to add a lug-type wafer butterfly valve, where the valve body has threaded holes that are drilled to a manufacturer-specific depth for cap screws.

1. Add records for lug-type wafer butterfly valve in spec CC150-1 as shown below:

Item	Size	Commodity Code	Cap Screws	Description
Butterfly Valve	4” –8”	BFYHP-01	Partial cap screw substitution for threaded holes	Butterfly valve, CL150, RFTBE, Standard Lugged Pattern, ASTM-A216-WCB

2. Open the Ten_Specs_CatalogData.xls file located in <SP3D Installation>\ CatalogData\BulkLoad\DataFiles and save the ButterflyValve worksheet to your Company_Catalog.xls

3. Edit the ButterflyValve sheet as follows:

Head	IndustryCommodityCode	CommodityType	GeometryType	GraphicalRepresentationOrNot	SymbolDefinition	MaterialGrade	LiningMaterial	MirrorBehaviorOption	GeometricIndustryStandard	PartDataBasis	PipingPointBasis[1]	Id[1]	PressureRating[1]	EndPreparation[1]	EndStandard[1]	ScheduleThickness[1]	FlowDirection[1]	PipingPointBasis[2]	Id[2]	PressureRating[2]	EndPreparation[2]	EndStandard[2]	ScheduleThickness[2]	FlowDirection[2]	PipingNote1	DryWeight	Npd[1]	NpdUnitType[1]	Npd[2]	NpdUnitType[2]	FacetoFace
Start																															
a	BFYHP-01	BFYHP	15		SP3DButterflyValveSym.CButterflyValveS	252			4200		15		150	211	5		3	15		150	211	5		3			4	in	4	in	2.125in
a																											6	in	6	in	2.25in
a																											8	in	8	in	2.5in

4. Save the file and exit.

5. Open the CC150-1.xls spreadsheet.

6. Open the PipingCommodityMatlControlData worksheet

   - The Contractor Commodity Code is BFYHP-01.

   - The ShortMaterialDescription is Butterfly valve, CL150, RFTBE, Standard Lugged Pattern, ASTM-A216-WCB

Note : Add the appropriate values in the Fabrication Type, Supply Responsibility, Reporting Type, Gasket Requirement, Bolting Requirement, and Welding Requirement columns of the part. (Hint : Check the AllCodeLists.xls spreadsheet for similar codelist items.)

Head	ContractorCommodityCode	FirstSizeFrom	FirstSizeTo	FirstSizeUnits	SecondSizeFrom	SecondSizeTo	SecondSizeUnits	MultisizeOption	IndustryCommodityCode	ClientCommodityCode	CIMISCommodityCode	ShortMaterialDescription	Vendor	Manufacturer	FabricationType	SupplyResponsibility	ReportingType	QuantityOfReportableParts	GasketRequirements	BoltingRequirements	WeldingRequirement
Start																					
a	BFYHP-01											Butterfly Valve, CL150, RFTBE, Standard Lugged Pattern, ASTM-A216-WCB			7	10	5		5	20	50

7. Add the valve operator data and the cap screws for the butterfly valve.

SubstCapScrewsQuantity	SubstCapScrewCntrCommodityCode	SubstCapScrewDiameter	TappedHoleDepth	MultiportValveOpReq	ValveOperatorType	ValveOperatorGeoIndStd	ValveOperatorCatalogPartNumber	ReportableCommodityCode
4	BCZZZZZZAAYBEUZZUS				17	2035	BFYHP-Bolted-150-17	

8. Save the spreadsheet.

Creating Piping Material Class Records.

9. Open the PipingCommodityFilter worksheet.

10. Add records for the butterfly valve.

Head	SpecName	ShortCode	OptionCode	FirstSizeFrom	FirstSizeTo	FirstSizeUnits	SecondSizeFrom	SecondSizeTo	SecondSizeUnits	MultisizeOption	Comments	SelectionBasis	JacketedPipingBasis	MaximumTemperature	MinimumTemperature	EngineeringTag	CommodityCode	FabricationCategoryOverride	SupplyResponsibilityOverride	FirstSizeSchedule	SecondSizeSchedule
a		Butterfly Valve	1	4	8	in						1					BFYHP-01				

Creating Gasket Records.

11. Open the GasketSelectionFilter worksheet and add the following records:

Head	SpecName	NominalDiameterFrom	NominalDiameterTo	NpdUnitType	GasketOption	MaximumTemperature	MinimumTemperature	EndPreparation	PressureRating	EndStandard	AlternateEndPreparation	AlternatePressureRating	AlternateEndStandard	FluidCode	ScheduleThickness	ContractorCommodityCode	Priority	RingNumber	FabricationCategoryOverride	SupplyResponsibilityOverride	Comments
Start																					
	CC150-1	2	24	in	1			21	150	5						GMAHACABXBEPUS			7	10	
	CC150-1	2	24	in	1			21	150	5	121	150	5			GMAHACABXBEPUS			7	10	
	CC150-1	2	24	in	1			71	150	5						GMAHACABXBEPUS			7	10	
	CC150-1	2	24	in	1			21	150	5	71	150	5			GMAHACABXBEPUS			7	10	
a	CC150-1	4	8	in	1			21	150	5	211	150	5			GMAHACABXBEPUS			7	10	
a	CC150-1	4	8	in	1			71	150	5	211	150	5			GMAHACABXBEPUS			7	10	

Creating Bolt Records.

12. Open the BoltSelectionFilter worksheet and add the following records:

Head	SpecName	NominalDiameterFrom	NominalDiameterTo	NpdUnitType	BoltOption	MaximumTemperature	EndPreparation	PressureRating	EndStandard	AlternateEndPreparation	AlternatePressureRating	AlternateEndStandard	ContractorCommodityCode	Priority	BoltExtensionOption	FabricationCategoryOverride	SupplyResponsibilityOverride	Comments	PipingNote1	LubricationRequirements
Start																				
	CC150-1	2	24	in	1		21	150	5				BAZZZZZZAAYBEUZZUS		1	7	10			
	CC150-1	2	24	in	1		21	150	5	121	150	5	BAZZZZZZAAYBEUZZUS		1	7	10			
	CC150-1	2	24	in	1		71	150	5				BAZZZZZZAAYBEUZZUS		1	7	10			
	CC150-1	2	24	in	1		21	150	5	71	150	5	BAZZZZZZAAYBEUZZUS		1	7	10			
a	CC150-1	4	8	in	1		21	150	5	211	150	5	BAZZZZZZAAYBEUZZUS		1	7	10			
a	CC150-1	4	8	in	1		71	150	5	211	150	5	BAZZZZZZAAYBEUZZUS		1	7	10			

13. Save the file and load both workbooks using the Bulkload Utility.

14. Review the log file once the Bulkload process is complete.

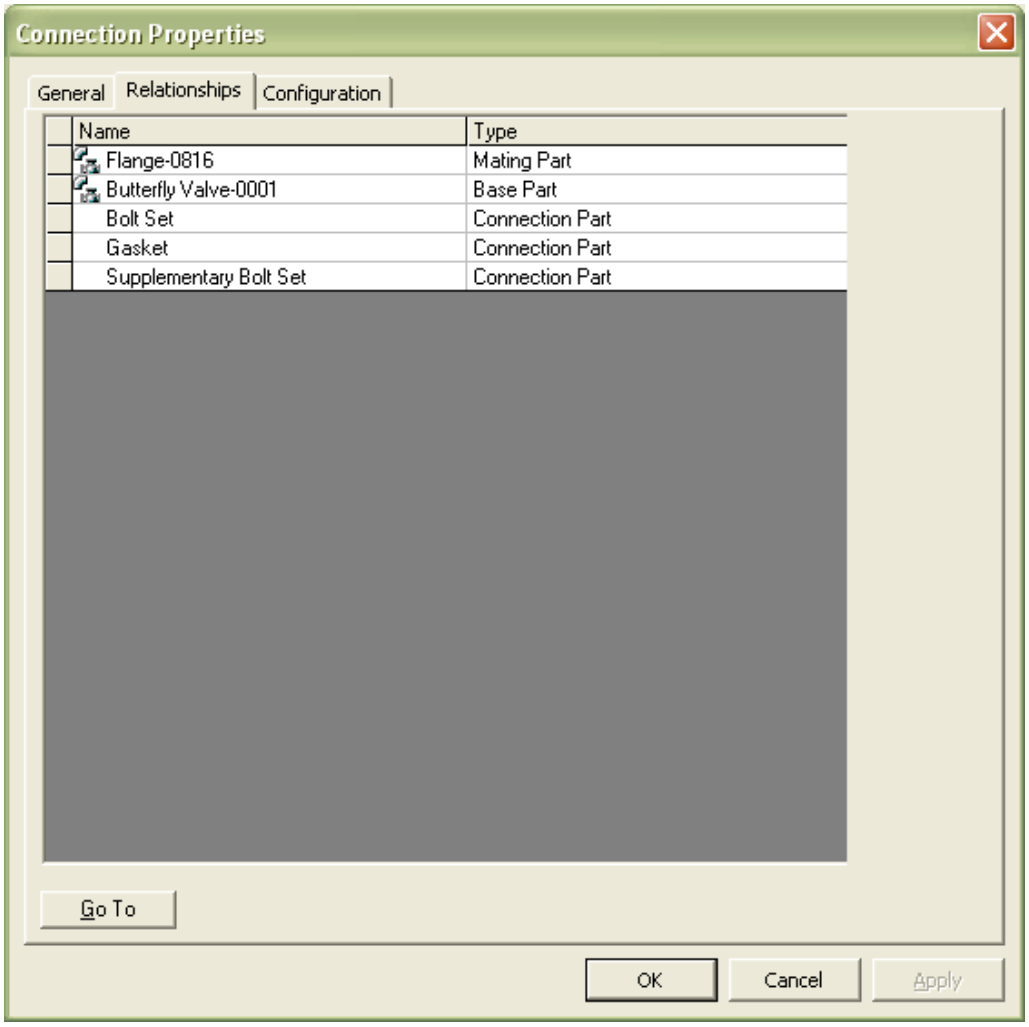
15. Run the Verify Consistency between Piping Specification and Catalog command.

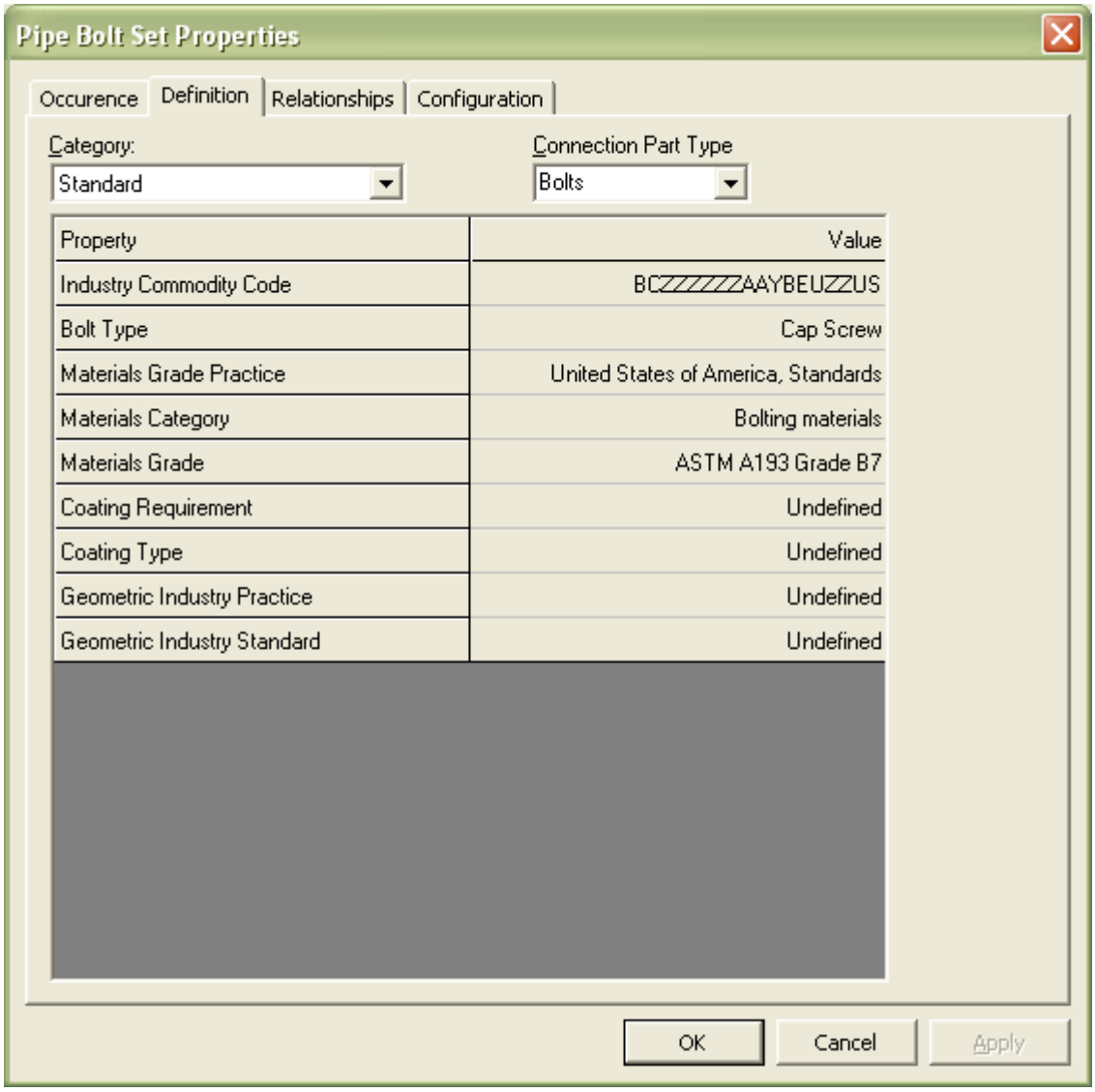
16. Review the output report. Go to the index sheet and select the following links:

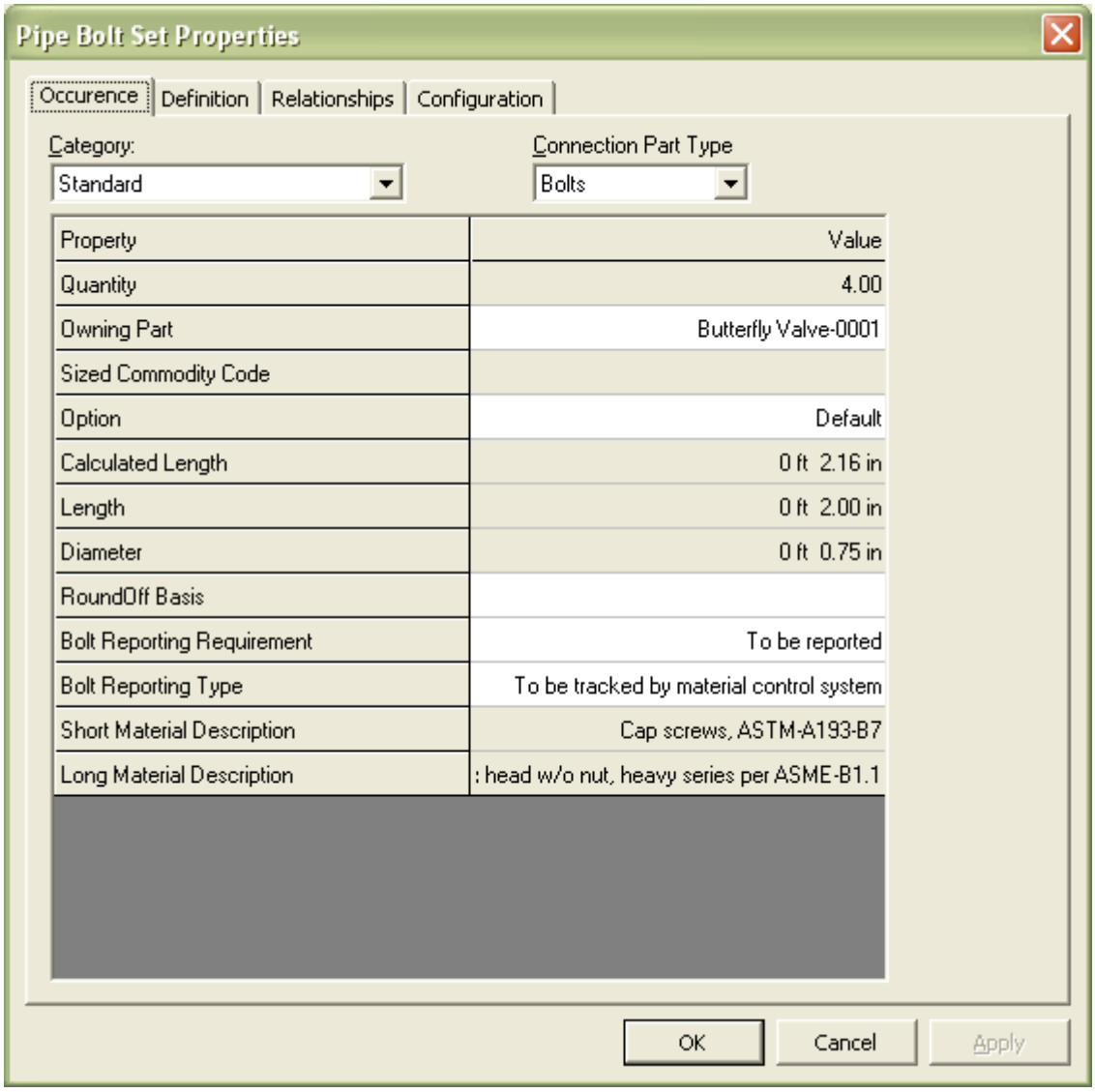
    - Piping commodity undefined in piping commodity material control data
    - Piping commodity undefined in piping commodity part data
    - Summary of existing symbols
    - Summary of catalog parts
    - Bolt for bolted joint undefined in bolt selection filter data
    - Bolts undefined in piping commodity material control data
    - Bolts undefined in bolt part data
    - Summary of bolt parts
    - Gasket for bolted joint undefined in gasket selection filter data
    - Gaskets undefined in piping commodity material control data
    - Gaskets undefined in gasket part data
    - Summary of gasket parts

17. Go to the Piping Task and place the butterfly valve.

18. Review the properties page. "Go To" the properties of the "Supplementary Bolt Set" connection part and verify the cap screws.




Pipe Bolt Set Properties
Occurence
Definition
Relationships
Configuration
Category:
Standard
Connection Part Type
Bolts
Property
Value
Industry Commodity Code
BCZZZZZZZAAYBEUZZUS
Bolt Type
Cap Screw
Materials Grade Practice
United States of America, Standards
Materials Category
Bolting materials
Materials Grade
ASTM A193 Grade B7
Coating Requirement
Undefined
Coating Type
Undefined
Geometric Industry Practice
Undefined
Geometric Industry Standard
Undefined
OK
Cancel
Apply


Pipe Bolt Set Properties
Occurence
Definition
Relationships
Configuration
Category:
Standard
Connection Part Type
Bolts
Property
Value
Quantity
4.00
Owning Part
Butterfly Valve-0001
Sized Commodity Code
Option
Default
Calculated Length
0 ft 2.16 in
Length
0 ft 2.00 in
Diameter
0 ft 0.75 in
RoundOff Basis
Bolt Reporting Requirement
To be reported
Bolt Reporting Type
To be tracked by material control system
Short Material Description
Cap screws, ASTM-A193-B7
Long Material Description
: head w/o nut, heavy series per ASME-B1.1
OK
Cancel
Apply

Lab 12: Engineered/Stock Instruments

Objective:

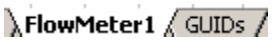
After completing this lab, you will be able to:

- Add/Modify Engineered/Stock Instrument.

Create a stock flowmeter (part number: Flow-001) with a tag number F-001. Stock items represent those piping items that are purchased from a manufacturer's catalog, where no real engineering is required other than selecting the correct size, material, etc.

Create an engineered item Flow Meter called F-002.
Both flowmeters will use the symbol called SP3DCoriolisFlowMeterTy1.CCFMeterTy1.
The symbol can be found in [Install Product]\Programming\ExampleCode\Symbols\Piping

1. Open the Instrument Data.xls Excel Workbook.
2. Copy the worksheet ANG as FlowMeter1



3. Locate printable document SmartPlant 3D Symbols Reference Data Guide (or open the symbol program) and find out the inputs required to construct the symbol SP3DCoriolisFlowMeterTy1.
4. Define insulation thickness as **occurrence attributes (oa)**. The part definition for this instrument will look as follows:

Definition	*PartClassType*	*SymbolDefinition*	*UserClassName*	*OccClassName*	*SymbolIcon*	*OA:InsulationThickness*
a	*InstrumentsClass*	*SP3DCoriolisFlowMeterTy1.CCFMeterTy1*	Flow Meter1	Flow Meter1	*SymbolIcons\FlowMeter1.gif*	

4. Add the two instruments with the following data:
   Make sure the Geometry Type is 15 (Linear, full size) and Commodity Type is 5402 (Flow Controller).
   Material Grade: 150
   Make sure to delete any attributes used by the ANG.

   Flowmeter 1:

Industry Commodity Code: Flow-001
Geometric Industry Standard: 5275

Port data:

NPD: 4 in

Rating: 150
EndPrep: 21
End Standard: 5
Flow Direction: 3

Dimension data:
FacetoFace: 12 in
FlowDiameter: 5 in
InstrumentHeight: 18 in
InstrumentDiameter: 4 in
InstrumentWidth: 6 in
InstrumentWidth1: 8 in

Flowmeter 2:
Industry Commodity Code: F-002
Geometric Industry Standard: 5275

Port data:

NPD: 4 in

Rating: 150
EndPrep: 21
End Standard: 5
Flow Direction: 3

Dimension data:
FacetoFace: 12 in
FlowDiameter: 5 in
InstrumentHeight: 24 in
InstrumentDiameter: 4 in
InstrumentWidth: 6 in
InstrumentWidth1: 8 in

Note: Make sure you **add the Requisition Type attribute** values.

Head	IndustryCommodityCode	CommodityType	GeometryType	GraphicalRepresentationOrNot	SymbolDefinition	MaterialGrade	LiningMaterial	BendAngle	BendRadius	GeometricIndustryStandard	BendRadiusMultiplier	DryCogX	DryCogY	DryCogZ	WaterWeight	WaterCogX	WaterCogY	WaterCogZ	VolumetricCapacity	SurfaceArea	RequisitionType
Start																					
a	Flow-001	5402	15			150				5275		0	0	0		0	0	0			5
a	F-002	5402	15			150				5275		0	0	0		0	0	0			10

PipingPointBasis[1]	Id[1]	PressureRating[1]	EndPreparation[1]	EndStandard[1]	ScheduleThickness[1]	FlowDirection[1]	PipingPointBasis[2]	Id[2]	PressureRating[2]	EndPreparation[2]	EndStandard[2]	ScheduleThickness[2]	FlowDirection[2]	DryWeight	Npd[1]	NpdUnitType[1]	Npd[2]	NpdUnitType[2]	FacetoFace	FlowDiameter	InstrumentHeight	InstrumentDiameter	InstrumentWidth	InstrumentWidth1
		150	21	5		3			150	21	5		3		4	in	4	in	12in	5in	18in	4in	6in	8in
		150	21	5		3			150	21	5		3		4	in	4	in	12in	5in	24in	4in	6in	8in

5. Go to the InstrumentClassData sheet and add the following data:

Head	TagNumber	GenericTagNumber	SpecName	FirstSizeFrom	FirstSizeTo	FirstSizeUnits	SecondSizeFrom	SecondSizeTo	SecondSizeUnits	MultiSizeOption	RequisitionType	ContractorCommodityCode	InstrumentType	GeometryType	FirstSizeSchedule	SecondSizeSchedule	PartDataBasis	IsGraphicalRepresentation	MaximumTemperature	MaterialGrade	LiningMaterial	CorrosionAllowance	ShortMaterialDescription	LocalizedShortMaterialDesc	LongMaterialDescription	Vendor	Manufacturer	FabricationType	SupplyResponsibility	ReportingType	GasketRequirements	BoltingRequirements	ClampRequirement	WeldingRequirement	LooseMaterialRequirements
Start																																			
a	F-001			4	4	in					5	Flow-001	5402	15																						
a		F-002									10		5402	15								Custom instr					7	2	5	5	5		50		

6. Go to the Piping Commodity Material Control Data sheet and add the following data for the stock instrument.

Head	ContractorCommodityCode	FirstSizeFrom	FirstSizeTo	FirstSizeUnits	SecondSizeFrom	SecondSizeTo	SecondSizeUnits	MultisizeOption	IndustryCommodityCode	ClientCommodityCode	ShortMaterialDescription	LocalizedShortMaterialDesc	LongMaterialDescription	Vendor	Manufacturer	FabricationType	SupplyResponsibility	ReportingType	ReportableCommodityCode	QuantityOfReportableParts	GasketRequirements	BoltingRequirements	ClampRequirement	WeldingRequirement	LooseMaterialRequirements
Start																									
a	Flow-001										Stock Instr					7	2	5			5	5		50	

7. Create the FlowMeter1.gif file and place it under \\<MachineName>\Symbols\SymbolIcons. You can use the picture for SP3DCoriolisFlowMeterTy1 in the SmartPlant 3D Symbols Reference Data Guide printable guide for illustration details.

   Note: You can use Microsoft Paint to create the FlowMeter1.gif

8. Save the changes to a new workbook and use the Bulkload Utility to load the new class. Remember to add the letter A to all new rows in all sheets modified.

   Note: For faster processing, copy the worksheets that were modified above to a new workbook: Instrument.xls. The system will require at least the following worksheets for this and next lab:

   a. FlowMeter1

   b. PipingCommodityMaterialControlData

   c. InstrumentClassData

   d. CustomInterfaces

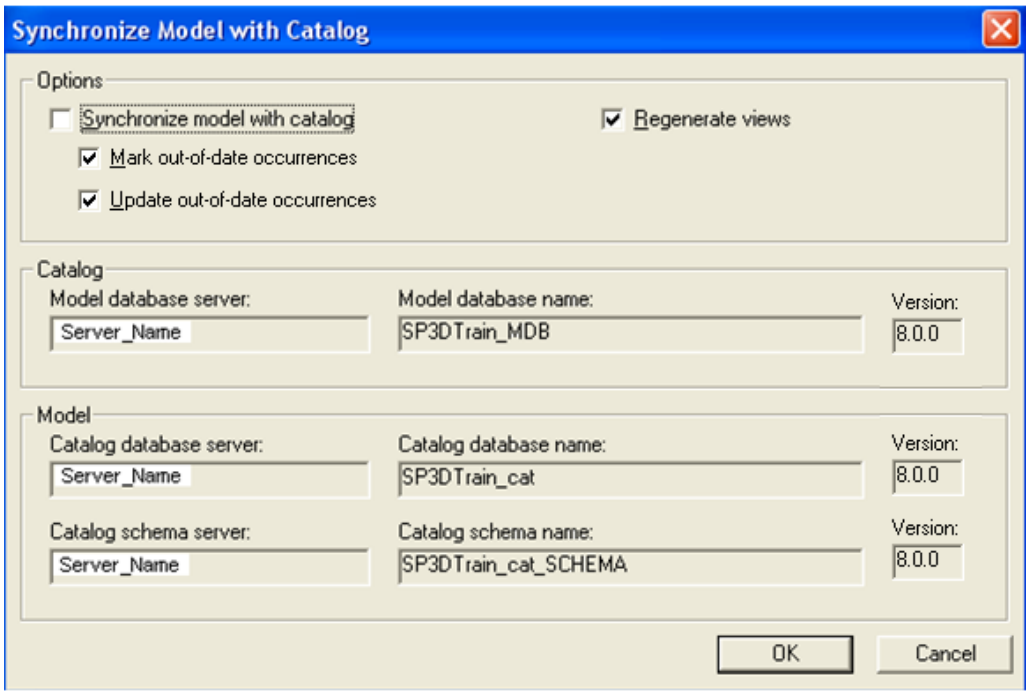
   e. GUIDs

10. Once the bulkload process is complete, review the log file. Run the Project Management Task. Select the Model in the hierarchy.

11. Select Tools -> Synchronize Model with the Catalog.

12. Uncheck the Synchronize Model with the Catalog option.

    Note: You just need to update the views in the model.



13. Hit "OK" Button.

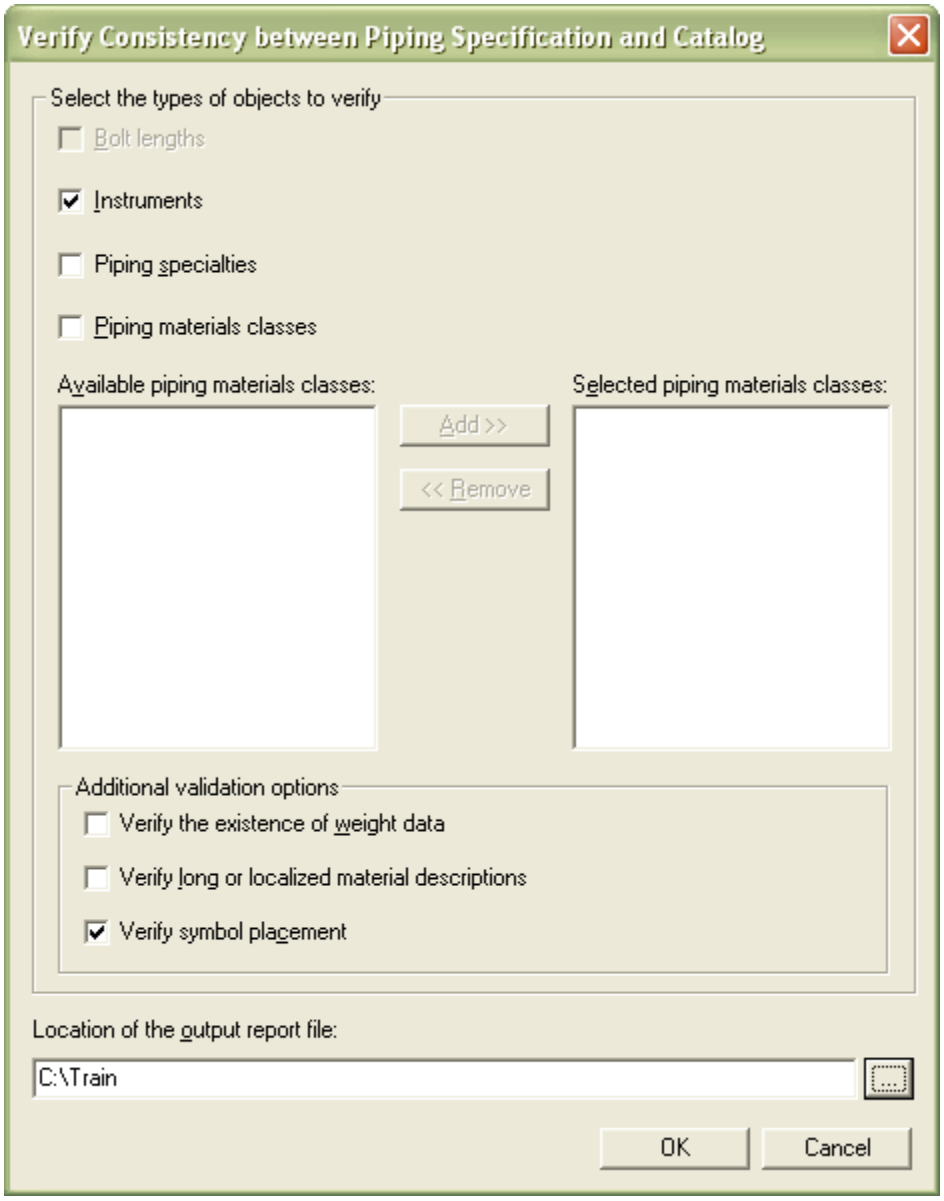
14. Once the process is complete. Right click on the model and select regenerate the report database.

15. Hit "OK" Button.

16. Run the Verify Consistency Report command for Instruments

- In the Verify Consistency between Piping Specification and Catalog form, select the "Instruments" check box.

- Enable the Verify symbol placement option. Define an output location for the logfile.



17. Review the system generated workbook once processing is complete. Go to the index sheet and select the following links:

    - Report of custom instrument symbols
    - Summary of catalog parts for custom instruments
    - Report of stock instrument symbols
    - Summary of catalog parts for stock instruments

18. Go to the Piping Task and place both instruments.

Lab 13: Custom Instrument

Objective

After completing this lab, you will be able to:

- Add a Custom Instrument

Create a Custom-engineered flow controller called F-101.
This flow controller will use the symbol called SP3DCICoriolisFlowMeterTy1.CCICFMetTy1.
The symbol can be found in [Install Product]\Programming\ExampleCode\Symbols\Piping

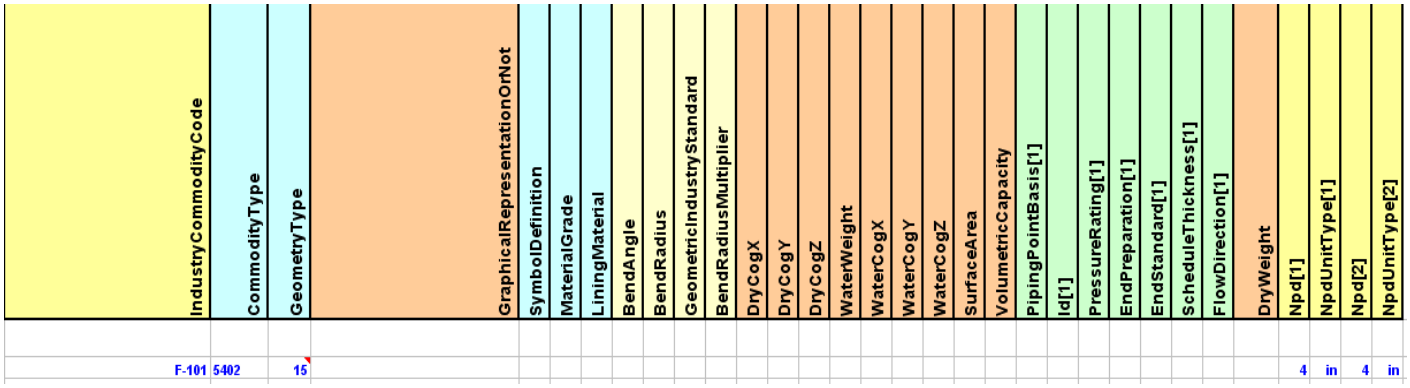
1. Open the ***On-the-fly Instruments.xls*** Excel Workbook. The workbook can be found in [Install Product]\CatalogData\BulkLoad\Datafiles
2. Select IPDA1 sheet, copy it as FlowController into the Instrument.xls workbook from the previous lab.
3. Open the SmartPlant 3D Symbols Reference Data Guide printable guide and find out the inputs required to construct the symbol SP3DCICoriolisFlowMeterTy1.CCICFMetTy1
4. Define all inputs that create the body of the instrument as occurrence attributes.
5. The Part definition for this instrument will look as follows:

Definition	PartClassType	SymbolDefinition	UserClassName	OccClassName	SymbolIcon
	InstrumentsClass	SP3DCICoriolisFlowMeterTy1.CCICFMetTy1	Flow Controller	Flow Controller	SymbolIcons\FlowController.gif

The occurrence attributes are:

oa:FacetoFace	oa:FlowDiameter	oa:InstrumentHeight	oa:InstrumentDiameter	oa:InstrumentWidth	oa:InstrumentWidth1	oa:InsulationThickness	OA:Npd	OA:NpdUnitType	OA:EndPreparation	OA:ScheduleThickness	OA:EndStandard	OA:PressureRating	OA:FlowDirection	OA:Id1	OA:PortIndex1	OA:Npd1	OA:NpdUnitType1	OA:EndPreparation1	OA:ScheduleThickness1	OA:EndStandard1	OA:PressureRating1	OA:FlowDirection1	OA:Id2	OA:PortIndex2	OA:Npd2	OA:NpdUnitType2	OA:EndPreparation2	OA:ScheduleThickness2	OA:EndStandard2	OA:PressureRating2	OA:FlowDirection2

6. Add the part with the following data:



IndustryCommodityCode	CommodityType	GeometryType	GraphicalRepresentationOrNot	SymbolDefinition	MaterialGrade	LiningMaterial	BendAngle	BendRadius	GeometricIndustryStandard	BendRadiusMultiplier	DryCogX	DryCogY	DryCogZ	WaterWeight	WaterCogX	WaterCogY	WaterCogZ	SurfaceArea	VolumetricCapacity	PipingPointBasis[1]	Id[1]	PressureRating[1]	EndPreparation[1]	EndStandard[1]	ScheduleThickness[1]	FlowDirection[1]	DryWeight	Npd[1]	NpdUnitType[1]	Npd[2]	NpdUnitType[2]
F-101	5402	15																										4	in	4	in

7. Again, open the ***On-the-fly Instruments.xls*** Excel Workbook.
8. Select R-ClassNodeDescribes sheet and save it to the Instrument.xls (if not already done in Lab 12).
9. Go to the R-ClassNodeDescribes sheet in Instrument.xls and add the following data:

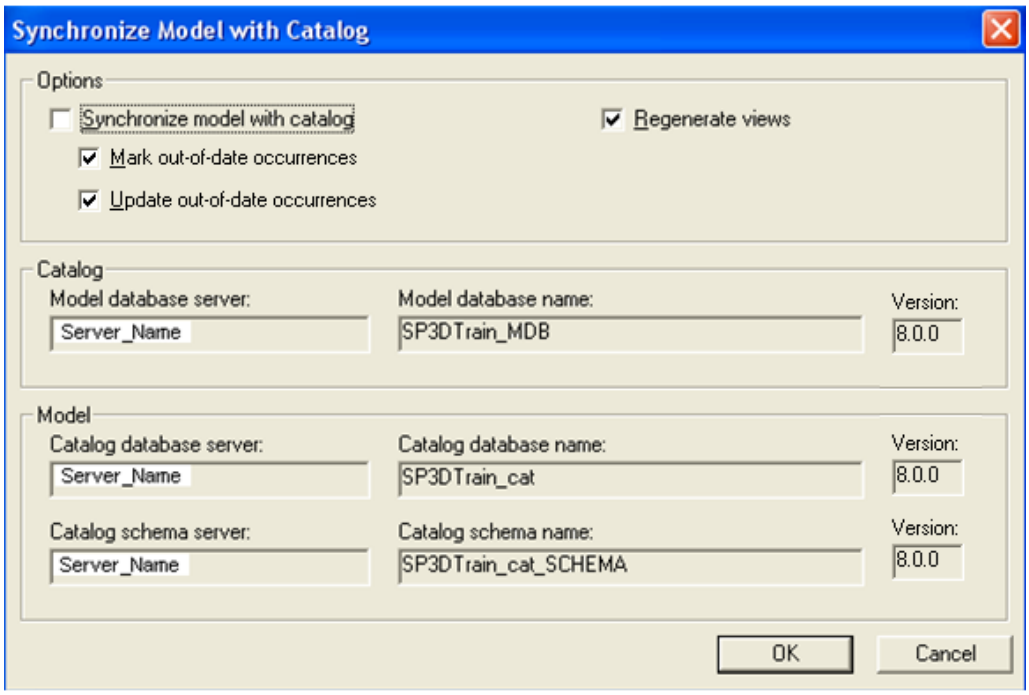
RelationSource	*RelationDestination*
CustomInstruments	**FlowController**

10. Create the FlowController.gif file and place it under \\<MachineName>\Symbols\SymbolIcons. A figure to go by of the symbol SP3DCICoriolisFlowMeterTy1 can be found in the SmartPlant 3D Symbols Reference Data Guide printable guide.

    Note: You can use Microsoft Paint to create the FlowController.gif

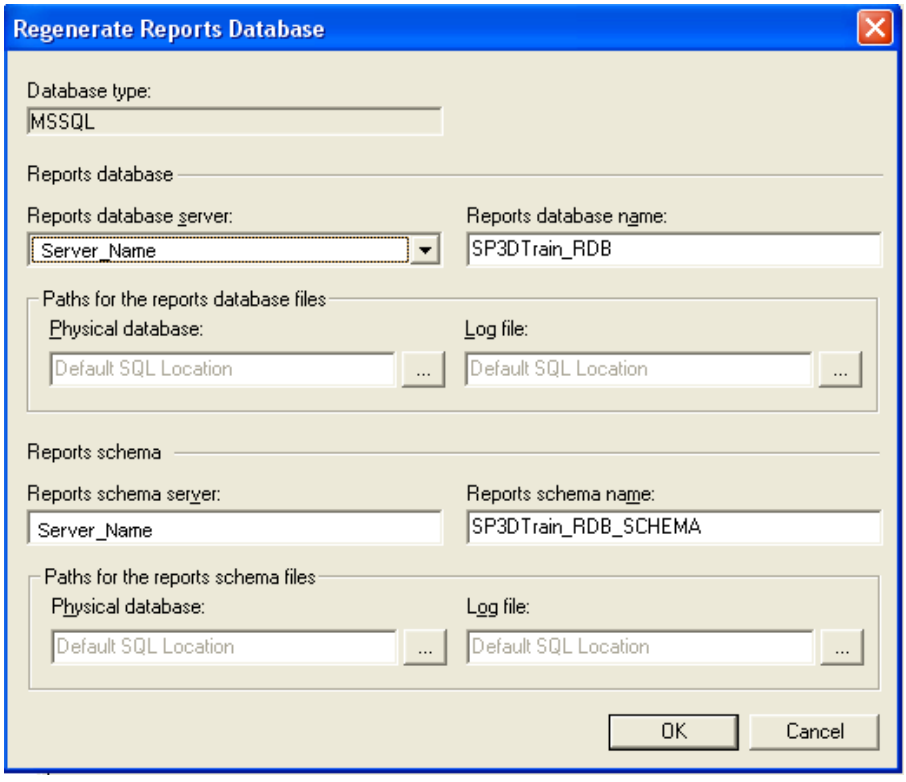
11. Load the information into the Catalog using the Append Mode.
12. Run the Project Management Task. Select the Model in the hierarchy.
13. Select Tools -> Synchronize Model with the Catalog.
14. Uncheck the Synchronize Model with the Catalog option.

    Note: You just need to update the views in the model.



15. Hit "OK" Button.

16. Once the process is complete. Right click on the model and select regenerate the report database.



17. Hit "OK" Button.
18. Go to the Piping Task and place the F-101 custom instrument.

Lab 14: Piping Commodity Procurement Data (Optional)

Objective

After completing this lab, you will be able to:

- Use the Piping Commodity Procurement Data to determine the *Size-Dependent Client Commodity Code* on the basis of the *Contractor Commodity Code* from the piping commodity filter

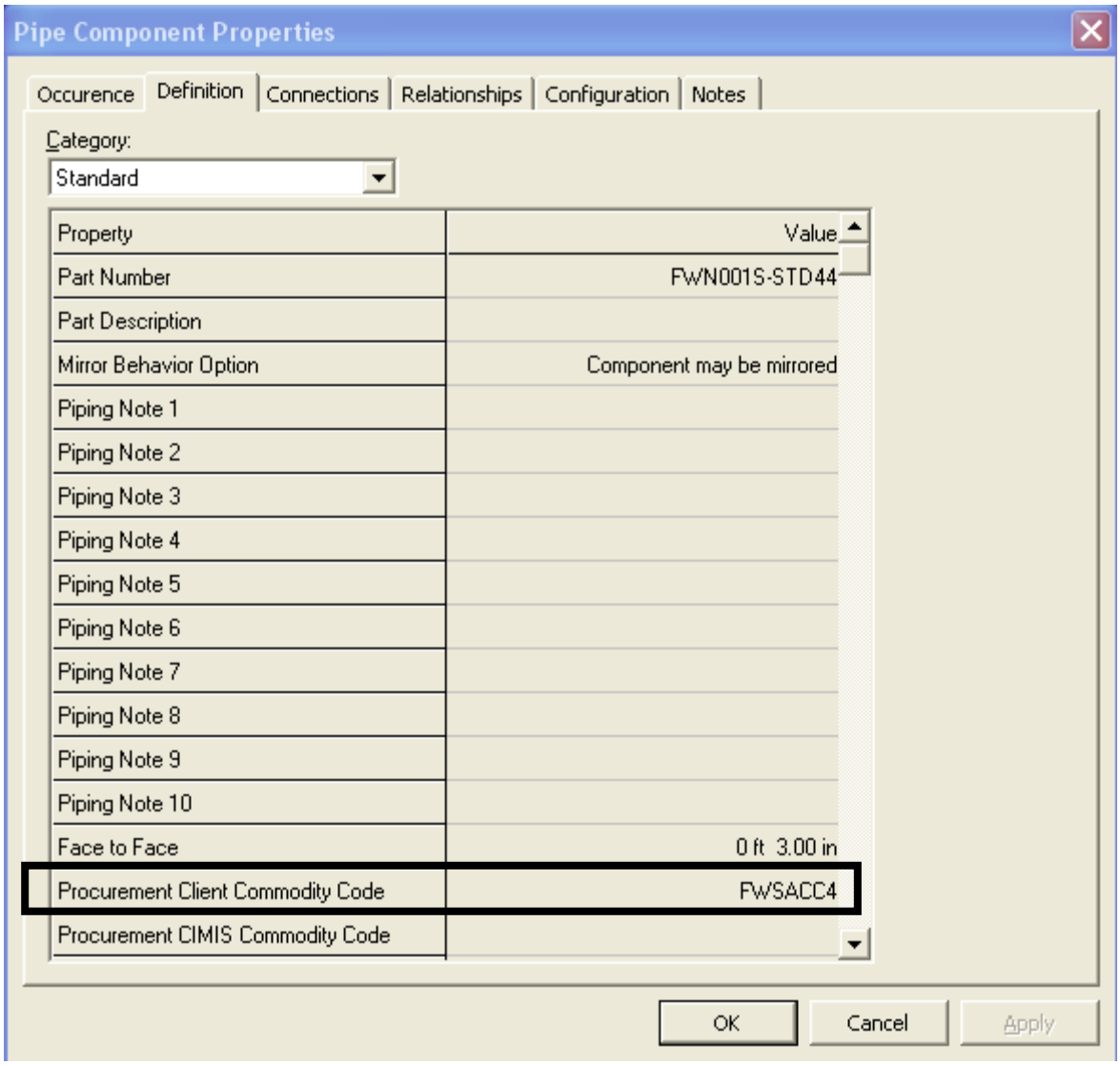
1. Open the Ten_Specs_SpecificationData.xls workbook located in <SP3D Installation>\ CatalogData\BulkLoad\DataFiles.
2. Go to the DefaultProjectOptions sheet.
3. Save the sheet into the CC150-1.xls
4. Change the PipingCmdtyProcurementDataOpt option to 10.
5. Save the workbook.

	IndustryCommodityCodeOption	OletBranchOwnershipOption	StudBoltLengthRoundOffOption	StudBoltLengthRoundOffValue	MachBoltLengthRoundOffOption	MachBoltLengthRoundOffValue	CapScrewLengthRoundOffOption	CapScrewLengthRoundOffValue	CapScrewEngagementGap	NutCreationOption	WasherCreationOption	PipingCommodityOverrideOption	PipeBendRadiusMultiplierOption	MinimumPlateFlangeThickness	DensityOfWater	PipeBendRadiusByUserOption	BoltLengthCalculationOption	NonRadlTangtlBranchODMultplier	NonRadlOffsetBranchODMultplier	PipingCmdtyCtlgPartNoBasisOpt	PipingCmdtyProcurementDataOpt	BoltDiameterEquivalenceOption
Head																						
Start																						
m	10	5	15	0.25in	15	0.25in	15	0.25in	0.25in	5	5	5	5	0.5in	1000Kg/m^3	5	5	0.5	0.375	5	10	5

6. Open the Piping Commodity Procurement Data.xls workbook located in <SP3D Installation>\ CatalogData\ BulkLoad\SampleDataFiles
7. Go to the PipingCommodityProcurementData sheet and add the following records:

Head	CommodityCode	FirstSize	FirstSizeUnits	SecondSize	SecondSizeUnits	MultisizeOption	FirstSizeSchedule	SecondSizeSchedule	ClientCommodityCode	CIMISCommodityCode	VendorPartNumber	ManufacturerPartNumber	UnitCost	RequisitionNumber	InstallationManHours	MaintenanceManHours
Start																
a	FSO001	2	in	2	in				FSACC2							
a	FSO001	4	in	4	in				FSACC4							
a	FSO001	6	in	6	in				FSACC6							
a	FSO001	8	in	8	in				FSACC8							
a	FSO001	10	in	10	in				FSACC10							
a	FSO001	12	in	12	in				FSACC12							
a	FSO001	14	in	14	in				FSACC14							
a	FSO001	16	in	16	in				FSACC16							
a	FSO001	18	in	18	in				FSACC18							
a	FSO001	20	in	20	in				FSACC20							
a	FSO001	24	in	24	in				FSACC24							
a	FWN001	2	in	2	in			S-STD	FWSACC2							
a	FWN001	4	in	4	in			S-STD	FWSACC4							
a	FWN001	6	in	6	in			S-STD	FWSACC6							
a	FWN001	8	in	8	in			S-STD	FWSACC8							
a	FWN001	10	in	10	in			S-STD	FWSACC10							
a	FWN001	12	in	12	in			S-STD	FWSACC12							
a	FWN001	14	in	14	in			S-STD	FWSACC14							
a	FWN001	16	in	16	in			S-STD	FWSACC16							
a	FWN001	18	in	18	in			S-STD	FWSACC18							
a	FWN001	20	in	20	in			S-STD	FWSACC20							
a	FWN001	24	in	24	in			S-STD	FWSACC24							
a	GAT001	2	in	2	in				GTSACC2							
a	GAT001	4	in	4	in				GTSACC4							
a	GAT001	6	in	6	in				GTSACC6							
a	GAT001	8	in	8	in				GTSACC8							
a	GAT001	10	in	10	in				GTSACC10							
a	GAT001	12	in	12	in				GTSACC12							
End																

8. Save the sheet into the CC150-1.xls
9. Load the information into the Catalog using the Add/Modify/Delete Mode.
10. Open your session and go to the Piping Task.
11. Select the weld neck flange and open the properties page. Verify the client commodity code is displayed in the properties page.


Pipe Component Properties
Occurence
Definition
Connections
Relationships
Configuration
Notes
Category:
Standard
Property
Value
Part Number
FWN001S-STD44
Part Description
Mirror Behavior Option
Component may be mirrored
Piping Note 1
Piping Note 2
Piping Note 3
Piping Note 4
Piping Note 5
Piping Note 6
Piping Note 7
Piping Note 8
Piping Note 9
Piping Note 10
Face to Face
0 ft 3.00 in
Procurement Client Commodity Code
FWSACC4
Procurement CIMIS Commodity Code
OK
Cancel
Apply

Lab 15: Component Insulation Exclusion Rule (Optional)

Objective

After completing this lab, you will be able to:

Use the Component Insulation Exclusion rule to define piping components that should not have insulation although they exist on insulated pipeline.

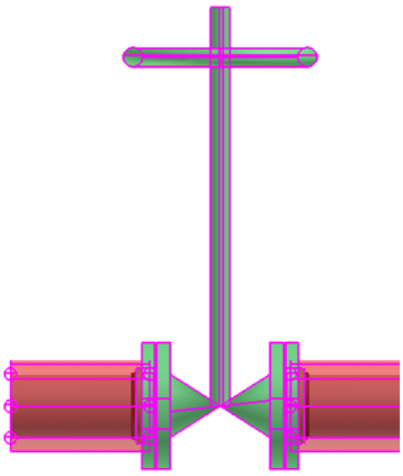
1. Open the ComponentInsulationExclusion.xls workbook located in <SP3D Installation>\ CatalogData\BulkLoad\SampleDataFiles.
2. Save the sheet into the CC150-1.xls
3. Go to the ComponentInsulationExclusion sheet and add the following record:

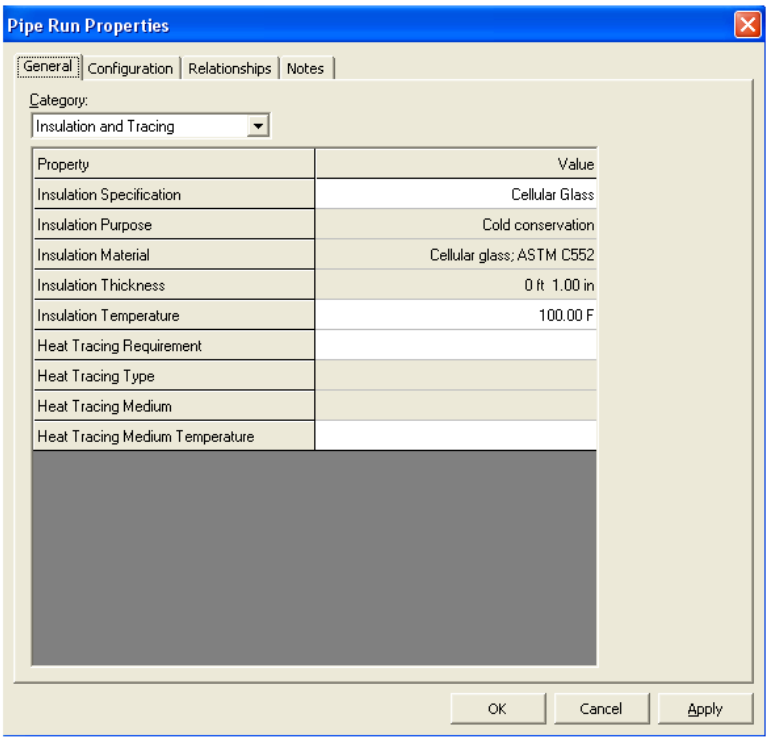
Head	PipingCommodityType	FirstSizeFrom	FirstSizeTo	FirstSizeUnits	SecondSizeFrom	SecondSizeTo	SecondSizeUnits	MultisizeOption	HeatTracingMedium	InsulationPurpose	InsulationTemperatureFrom	InsulationTemperatureTo
!												
Start												
a	5	2	12	in							50F	200F
End												

4. Load the information into the Catalog using the Add/Modify/Delete Mode.
5. Open your session and go to the Piping Task.
6. Create a new insulated piperun using the following data:

Specification:	CC150-1
Nominal Diameter:	4”
Insulation Specification:	Cellular Glass
Insulation Purpose:	Cold conservation
Insulation Temperature:	100 F

Place the gate valve along the pipe. Turn on the Insulation Aspect. Verify the gate valve is not insulated on this insulated piperun.




Pipe Run Properties
General
Configuration
Relationships
Notes
Category:
Insulation and Tracing
Property
Value
Insulation Specification
Cellular Glass
Insulation Purpose
Cold conservation
Insulation Material
Cellular glass; ASTM C552
Insulation Thickness
0 ft 1.00 in
Insulation Temperature
100.00 F
Heat Tracing Requirement
Heat Tracing Type
Heat Tracing Medium
Heat Tracing Medium Temperature
OK
Cancel
Apply

Lab 16: Create/Modify Spec in Catalog Task (Optional)

Objective

After completing this lab, you will be able to:

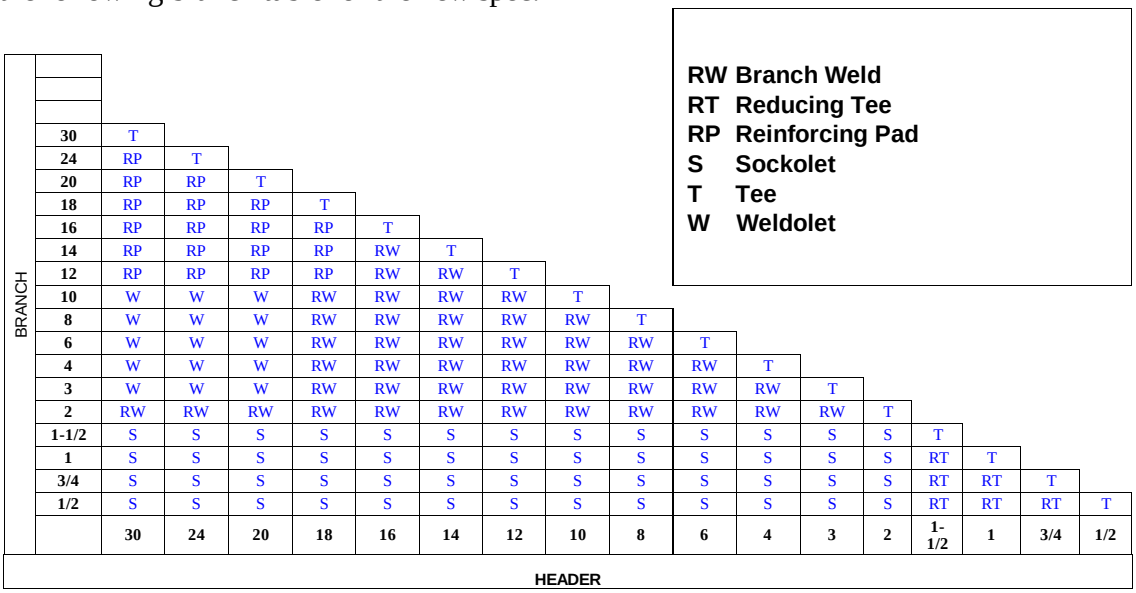
- "Copy and Paste" a piping spec in the Catalog Task to create a brand new specification
- Modify piping spec data directly in the catalog database through the interface
- Edit/Create spec's Rules
- Edit/Create Branch Table in paper spec format
- Create and modify code list values through the Catalog Task

Using the Catalog Task only, start creation of a new piping spec "CC150-1C": 150#, RF, Carbon Steel, design std ANSI-B31.3, service: Utilities; Corrosion Allowance of 0.063, -20 to 800 degF, cement lined.
Use the following temperature-pressure chart:

TEMP F	100	200	300	400	500	600	700	800
Psig	285	260	230	200	170	140	110	80

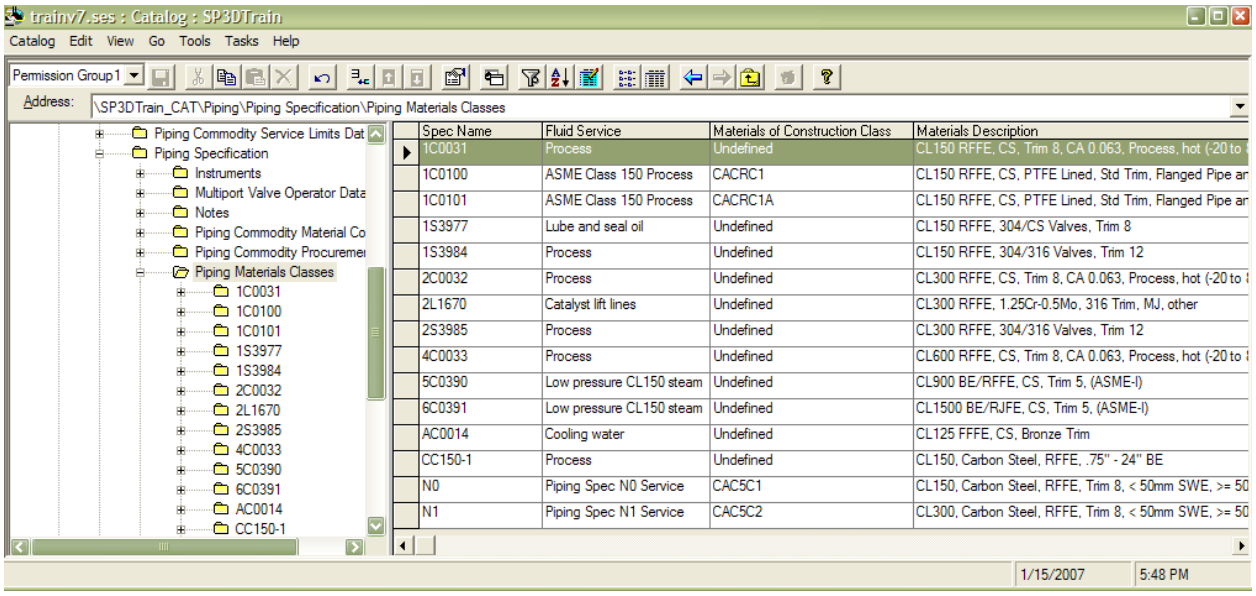
Using the Catalog Task verify that cement lining is an available option and add Kynar lining as an additional lining option to the select list.

Use the following branch table for the new spec:

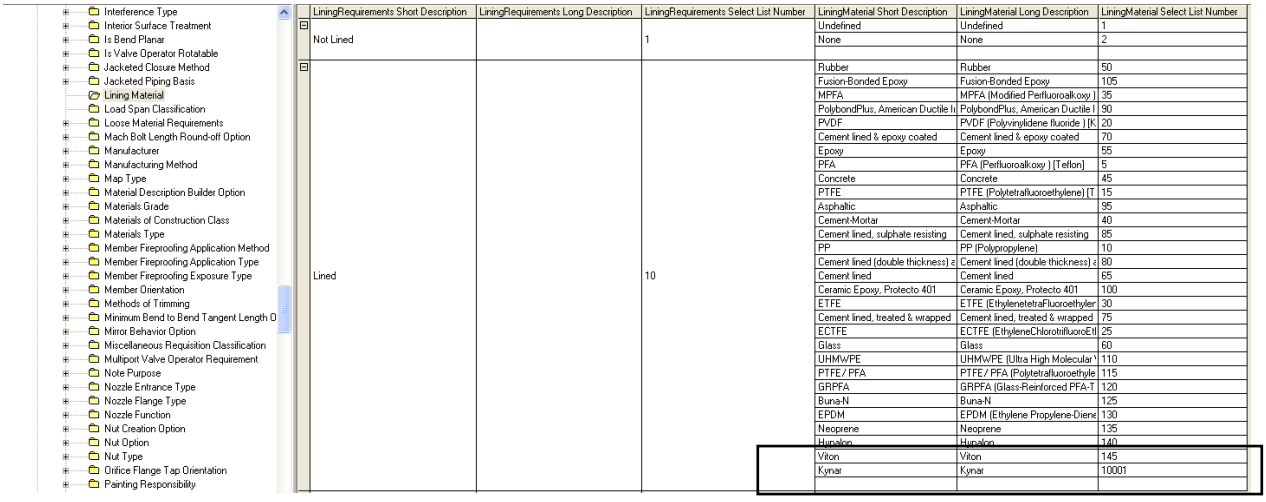


BRANCH \ HEADER	30	24	20	18	16	14	12	10	8	6	4	3	2	1-1/2	1	3/4	1/2
30	T																
24	RP	T															
20	RP	RP	T														
18	RP	RP	RP	T													
16	RP	RP	RP	RP	T												
14	RP	RP	RP	RP	RW	T											
12	RP	RP	RP	RP	RW	RW	T										
10	W	W	W	RW	RW	RW	RW	T									
8	W	W	W	RW	RW	RW	RW	RW	T								
6	W	W	W	RW	RW	RW	RW	RW	RW	T							
4	W	W	W	RW	RW	RW	RW	RW	RW	RW	T						
3	W	W	W	RW	RW	RW	RW	RW	RW	RW	RW	T					
2	RW	RW	RW	RW	RW	RW	RW	RW	RW	RW	RW	RW	T				
1-1/2	S	S	S	S	S	S	S	S	S	S	S	S	S	T			
1	S	S	S	S	S	S	S	S	S	S	S	S	S	RT	T		
3/4	S	S	S	S	S	S	S	S	S	S	S	S	S	RT	RT	T	
1/2	S	S	S	S	S	S	S	S	S	S	S	S	S	RT	RT	RT	T

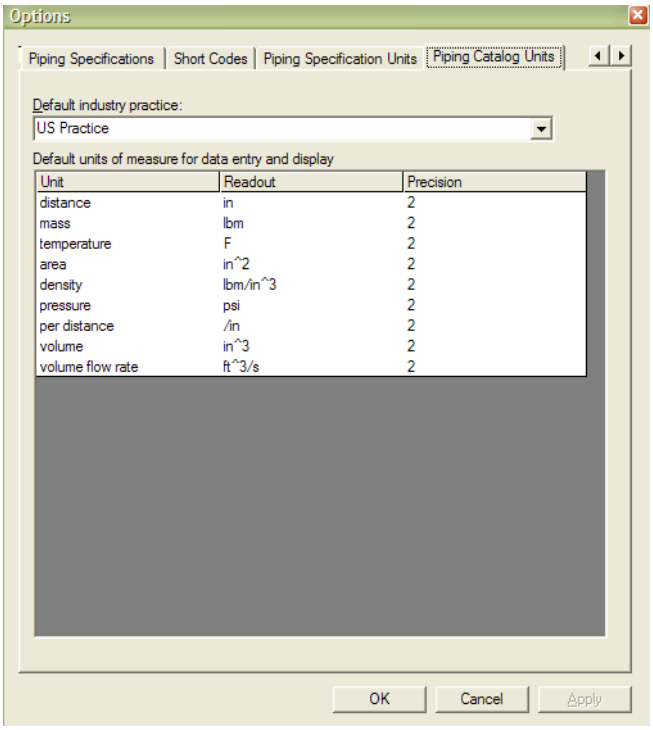
1. Open the Catalog Task to …Piping Specification>Piping Materials Classes
2. Select a spec in the catalog tree view, e.g. CC150-1 or 1C0031.
3. Use Edit>Copy or the Copy ribbon bar button
4. Use Edit>Paste or the Paste ribbon bar button. When prompted, enter the new spec name: "CC150-1C"



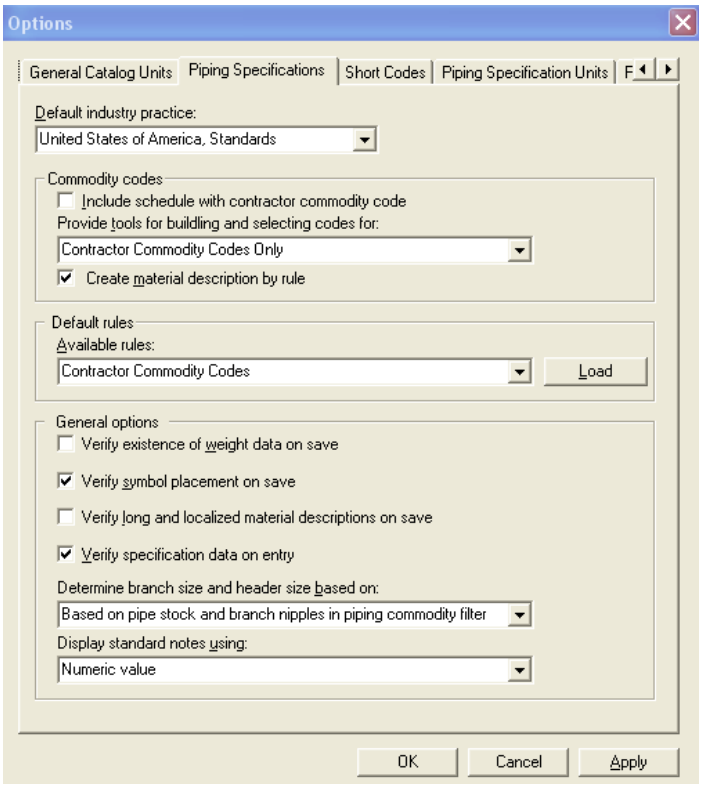
5. Open the Catalog Task to Select Lists>Lining Material
6. Verify that "Cement Lined" is available in the short description column
7. Modify the Select List to include "Kynar" as an option in the short description column



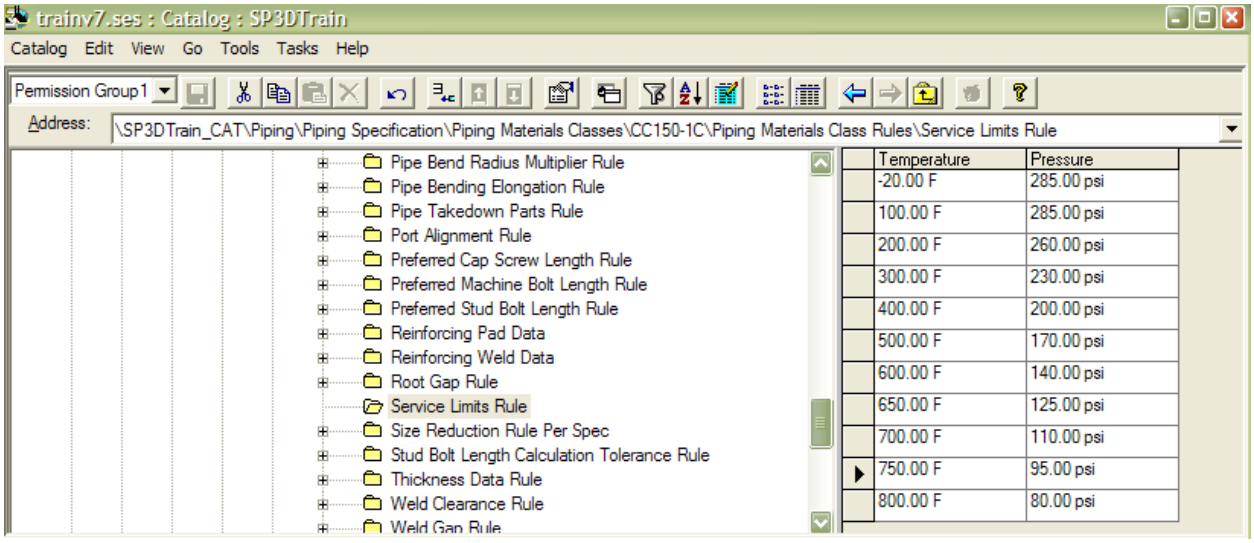
8. Return to …Piping Specification>Piping Materials Classes and edit the pasted spec name and spec properties in the grid view to match spec requirements
9. Select Tools>Options and set <u>all</u> "Units" tabs to display pressure ("force per area") to Psi



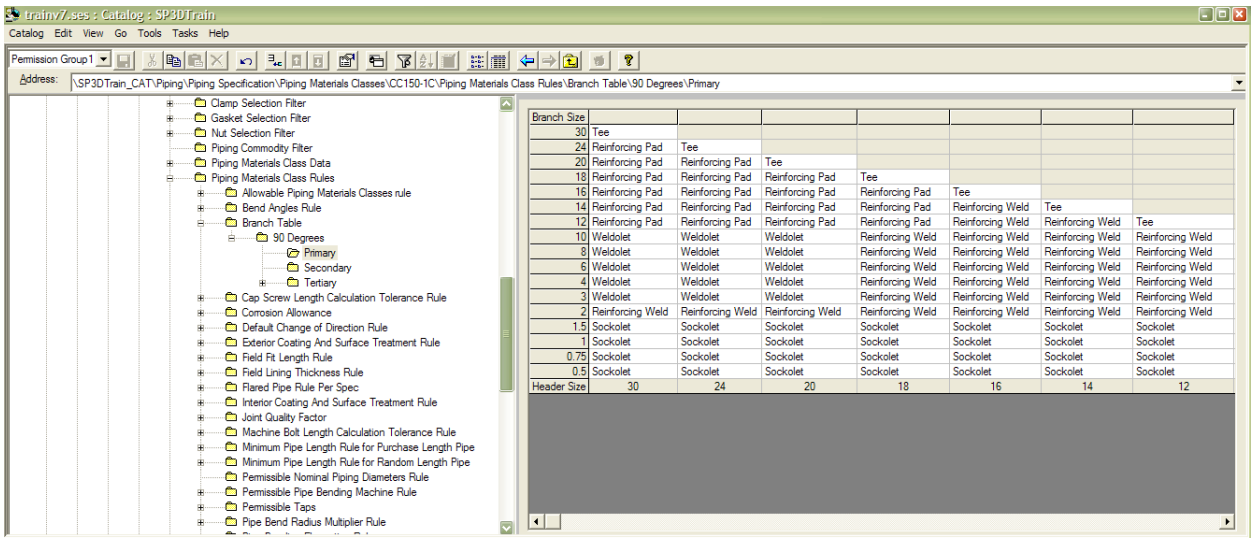
Go to Piping Specifications Tab and set the followings:



10. Navigate to Piping>Piping Specification>Piping Materials Classes> CC150-1C>Piping Materials Class Rules>Service Limits Rule and set the temperature and pressure limits rule to their proper values for this spec as provided above.



11. Open the Piping Commodity Filter node for the new piping specification, review the component data copied from the original spec.
12. If needed, define the branch components in the Piping Commodity Filter required by the branch table provided.
13. To enter the branch table preferred branching items, open the node at Piping>Piping Specification>Piping Materials Classes> CC150-1C ->Piping Materials Class Rules>Branch Table
14. To generate a simplified paper-spec style view of the branch table do as follows:
    a. With the Branch Table node selected, use Actions>Add Range
    b. Enter the range values for existing data: From 89.5 To 90.5
    c. Provide a name for the range of values, e.g. “90 Degrees”
    d. Select the branch priority level: “Primary” and OK the form
    e. Fill the branch table per the table in the instructions above



15. Once all desired fittings and components are defined, run Tools>Verify Consistency to check for errors.

    In practice, make sure that a good backup of the Catalog is made after a new spec is defined.

Lab 17: New Class Command (Optional)

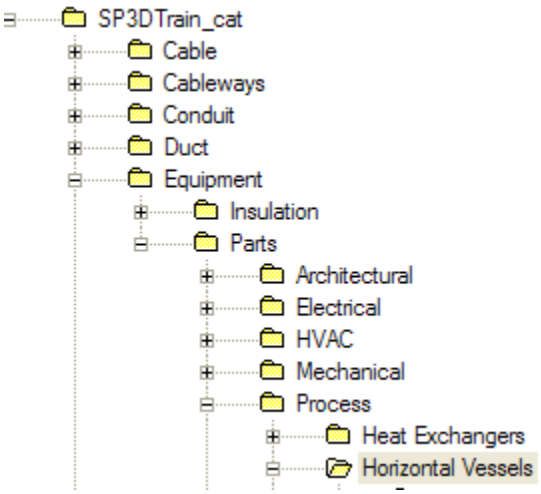
Objective

After completing this lab, you will be able to:

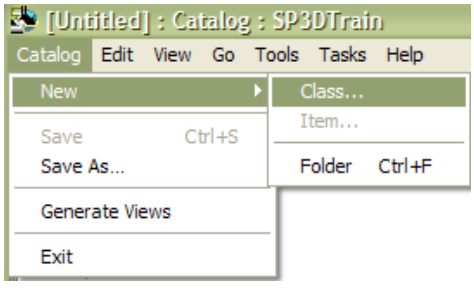
- Create a Smart Equipment Class using User Interface

In this lab, you will create Smart Equipment class using the New Class Command.

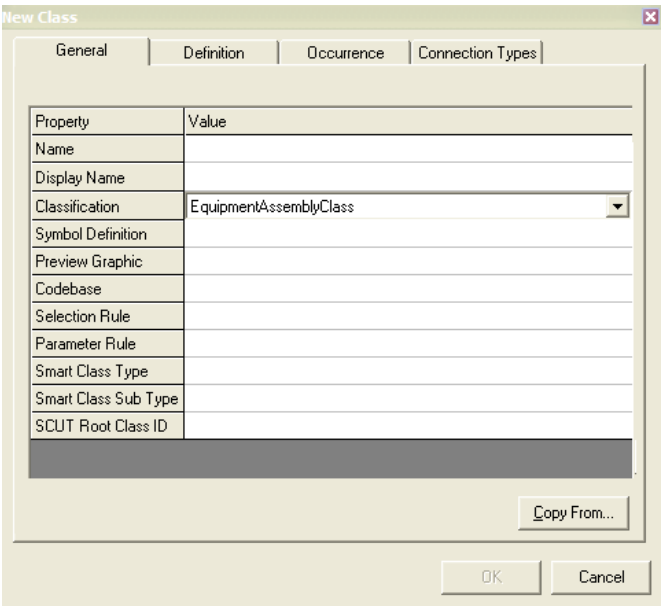
1. Start SP3D application and connect to the Training Plant using the "All" Filter.
2. Enter the Catalog Task.
3. Make sure the Active Permission Group is set to *Permission Group 1*
4. Expand the Catalog Hierarchy *"\SP3DTrain_cat\Equipment\Parts\Process\Horizontal Vessels"*



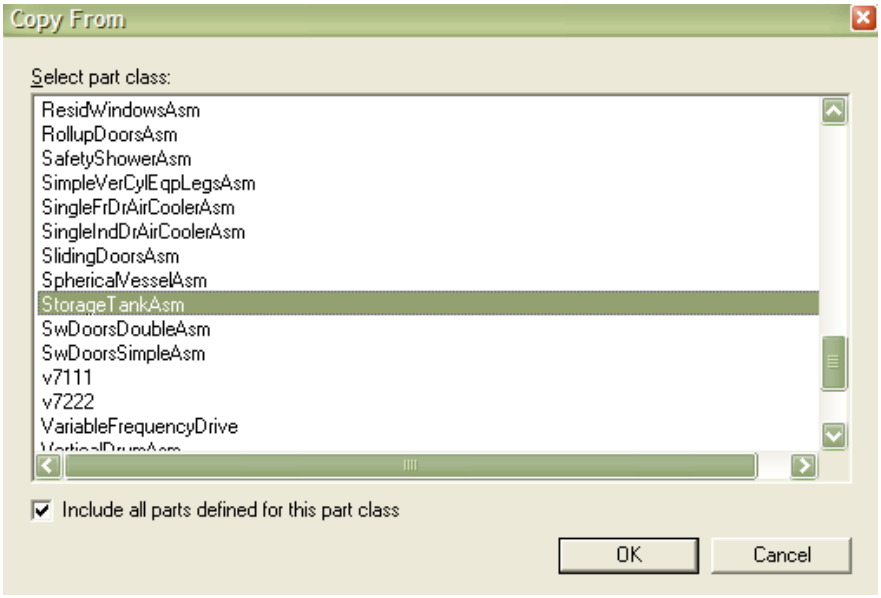
5. Select the Catalog -> New Class to create a Class.



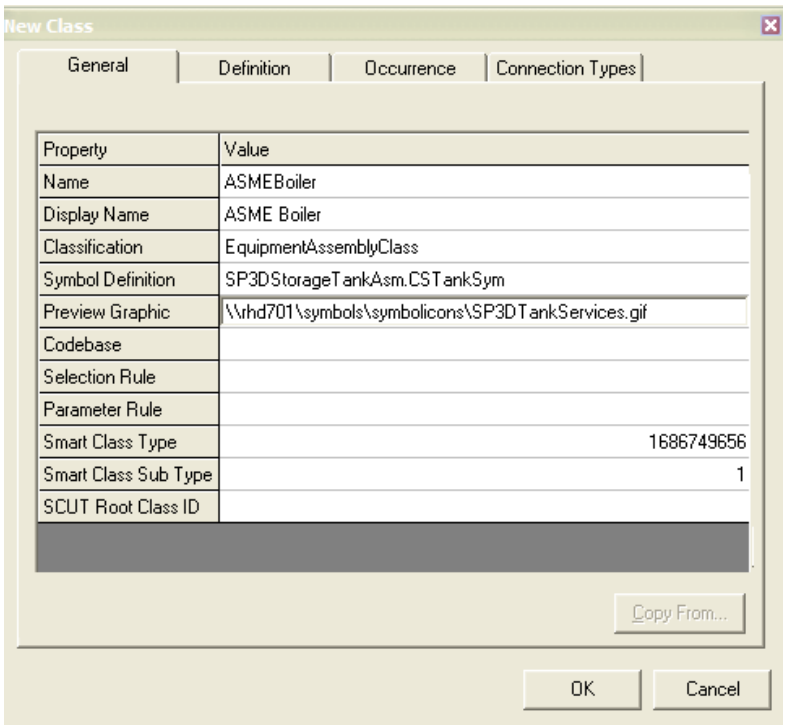
6. Make sure EquipmentAssemblyClass is defined in the Classification field.



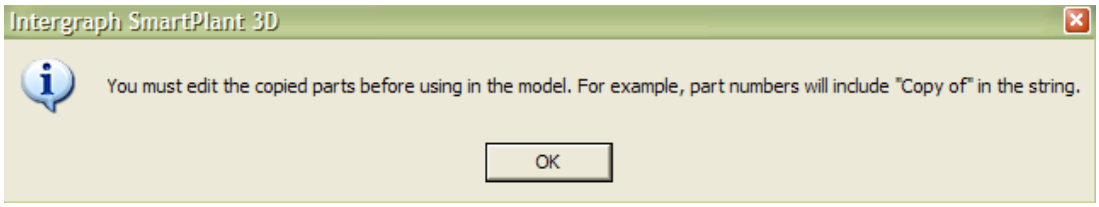
7. Select "Copy From" Button to open the Copy From dialog box.
8. Check the "Include all parts defined for this part class".
9. Select StorageTankAsm from the list.



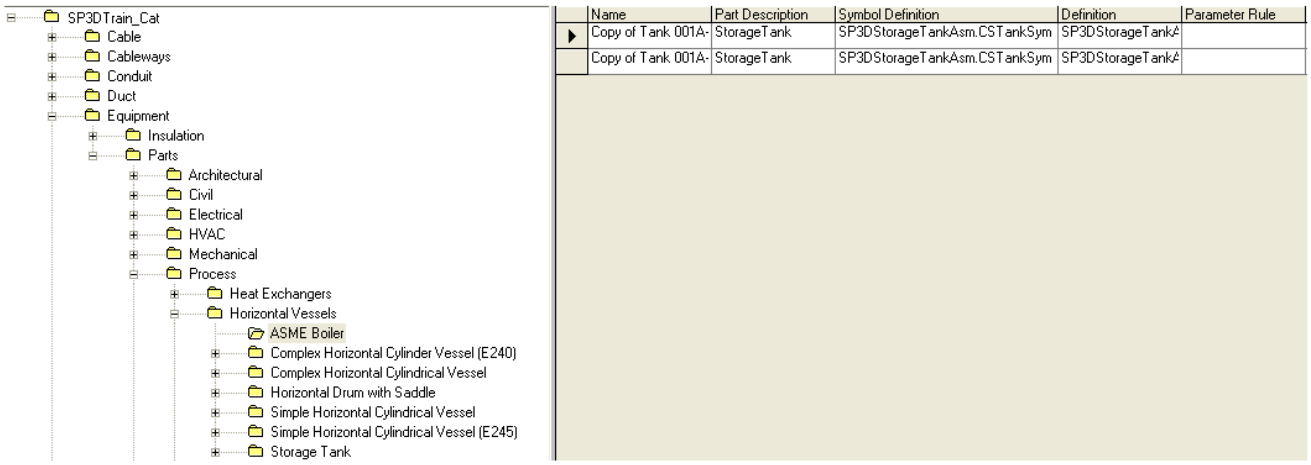
10. Click "OK" button to return to the New Class dialog box.
11. Rename the Name and the Display Name as ASMEBoiler and ASME Boiler.
12. Keyin the symbol share path where the symbol icon is located on your machine.



13. Click "OK" button. Read the prompt and click "OK" button again to close the message dialog box.



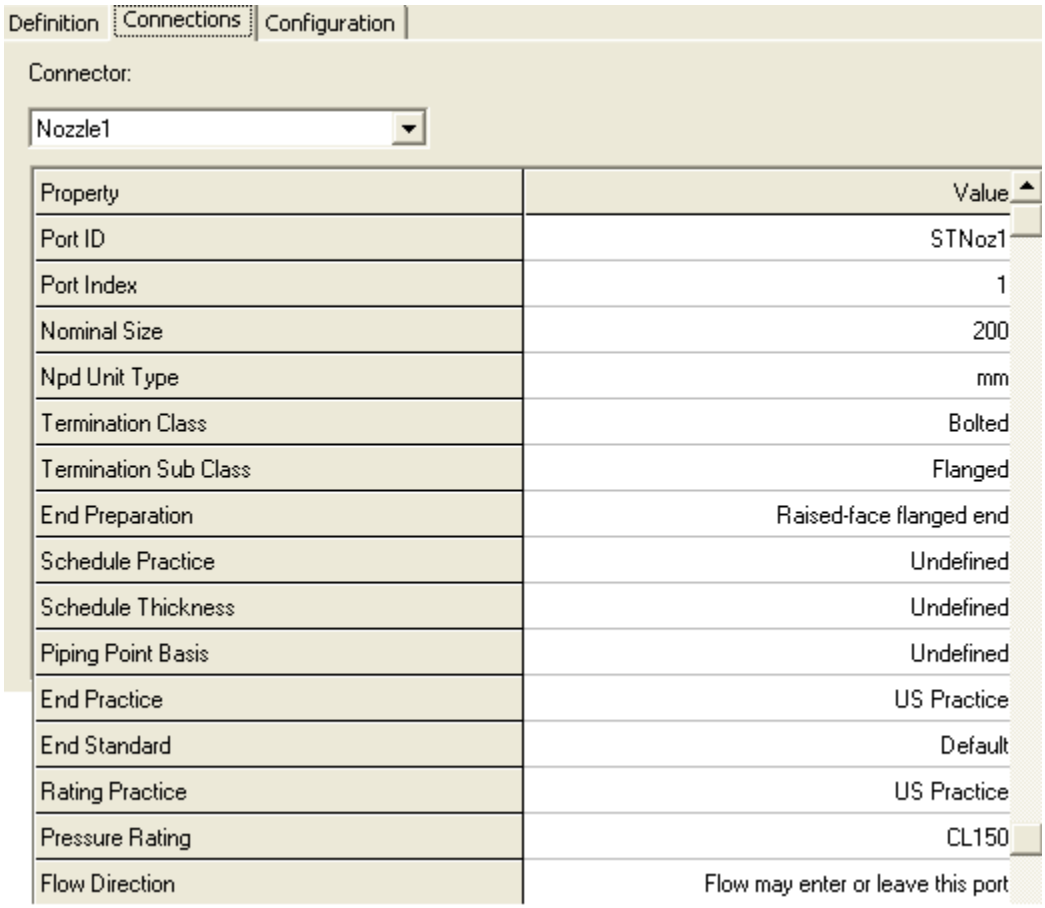
The system returns to the Catalog task. Notice the two new parts.



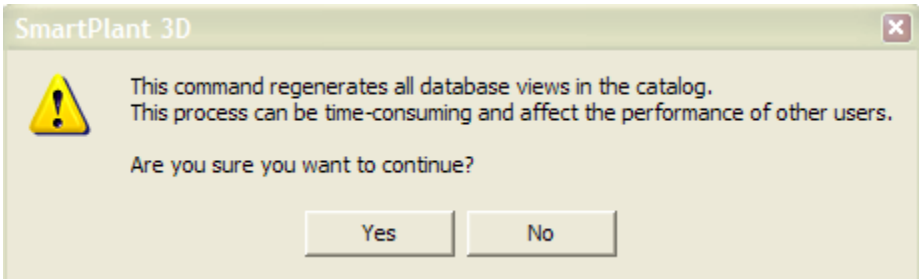
14. Rename the name of the two parts as follows:

	Name	Part Description	Symbol Definition	Definition	Parameter Rule	Equipment Classification 0
▶	Boiler-001	StorageTank	SP3DStorageTankAsm.CSTankSym	SP3DStorageTankA		Process Equipment
	Boiler-002	StorageTank	SP3DStorageTankAsm.CSTankSym	SP3DStorageTankA		Process Equipment

15. Select Boiler-001 to open its properties page. Make sure the pipe port data for pipe nozzle 1 and pipe nozzle 2 are correct. Repeat this step for Boiler-002.



16. Select Catalog -> Generate Views. This step will generate the views in the Catalog database.



17. Click "No" button. You are not going to regenerate the view at this time. (If you are working in a production catalog, you need to create the views in the catalog database)

18. Exit the SP3D application.

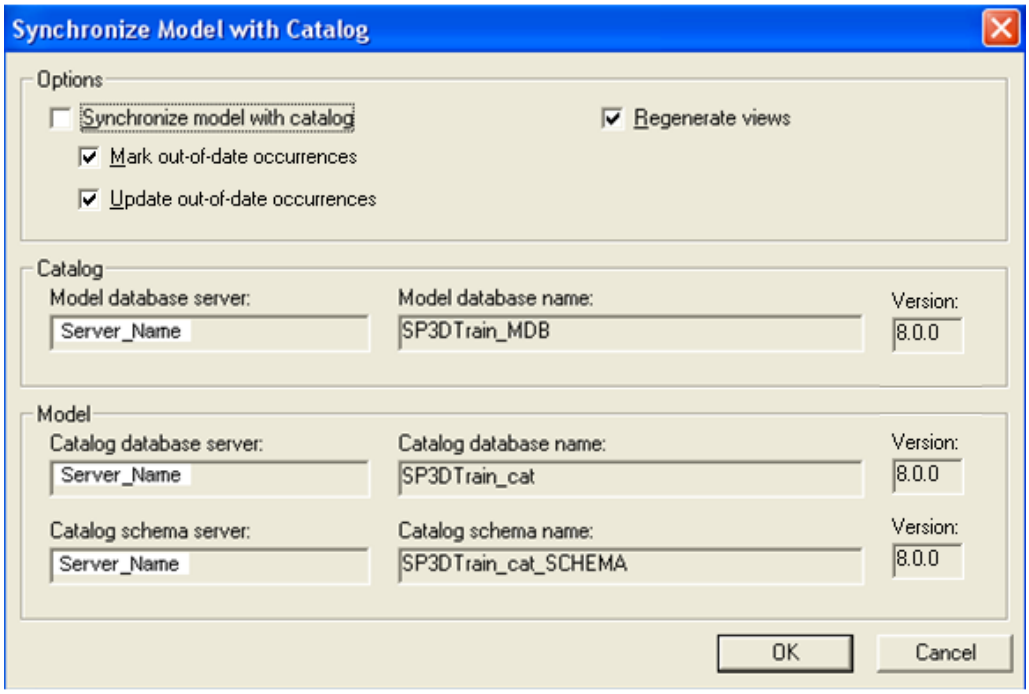
    Skip step 18 through 23 if you are not working in a production catalog.

19. Go to Project Management Task.

20. Select Tools -> Synchronize Model with the Catalog.

21. Uncheck the Synchronize Model with the Catalog option.

    Note: You just need to update the views in the model.

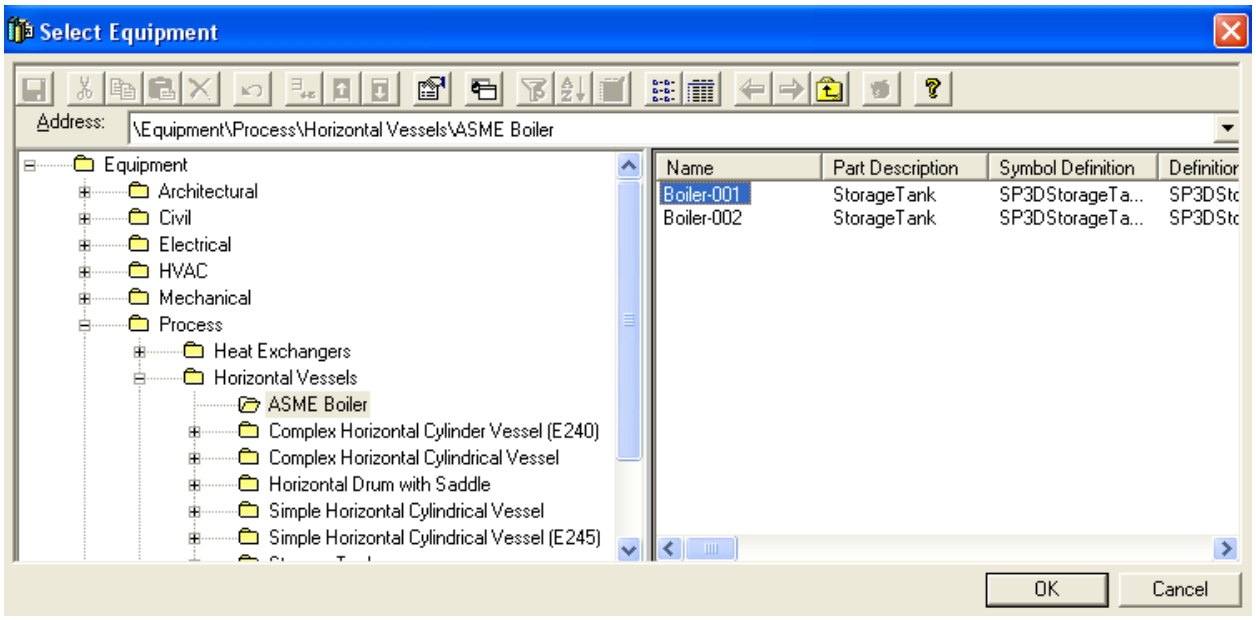


21. Click “OK” Button.

22. Once the process is complete. Right click on the model and select regenerate the report database.

23. Click “OK” Button.

24. Go to the Equipment Task and place the Boiler-001.


Select Equipment
Address:
\Equipment\Process\Horizontal Vessels\ASME Boiler
Equipment
Architectural
Civil
Electrical
HVAC
Mechanical
Process
Heat Exchangers
Horizontal Vessels
ASME Boiler
Complex Horizontal Cylinder Vessel (E240)
Complex Horizontal Cylindrical Vessel
Horizontal Drum with Saddle
Simple Horizontal Cylindrical Vessel
Simple Horizontal Cylindrical Vessel (E245)
Name
Part Description
Symbol Definition
Definitior
Boiler-001
StorageTank
SP3DStorageTa...
SP3DStc
Boiler-002
StorageTank
SP3DStorageTa...
SP3DStc
OK
Cancel

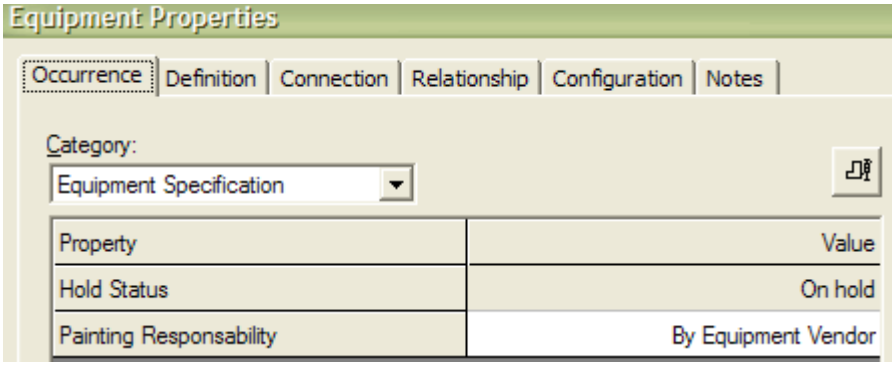
Lab 18: Creating Custom Interfaces using User Interface (UI) - (Optional)

Objective

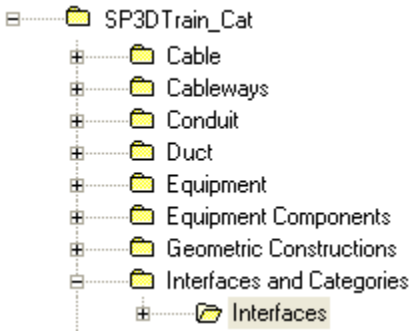
After completing this lab, you will be able to:

- Add User Interfaces using the User Interface

In this lab, you will add a new custom interface and two attributes for a smart equipment class called Horizontal Boiler. Use the Custom Interfaces User Interface to define the attributes name with associated data type, unit type and code list table namespace as shown below:



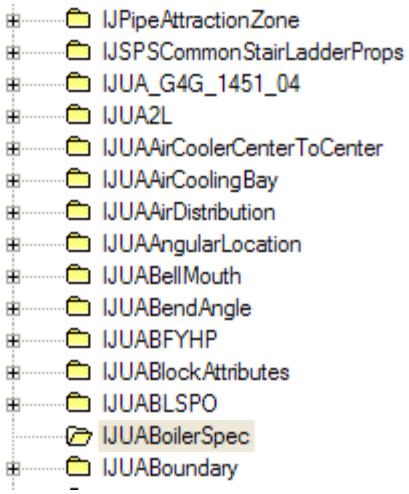
1. Enter the Catalog Task.
2. Make sure the Active Permission Group is set to *Permission Group 1*
3. Expand the Catalog Hierarchy ”\SP3DTrain_cat\Interfaces and Categories\Interfaces”



4. Go to the ribbon bar and select the Insert Row command .
5. Create a new interface called IJUABoilerSpec where the two properties will be display under Equipment Specification category as shown below:

	IJUABoilerSpec	IJUABoilerSpec		Equipment Specification

6. Select Catalog -> Save to save the row or select Save icon .
7. Go back to the interfaces hierarchy and select the IJUABoilerSpec

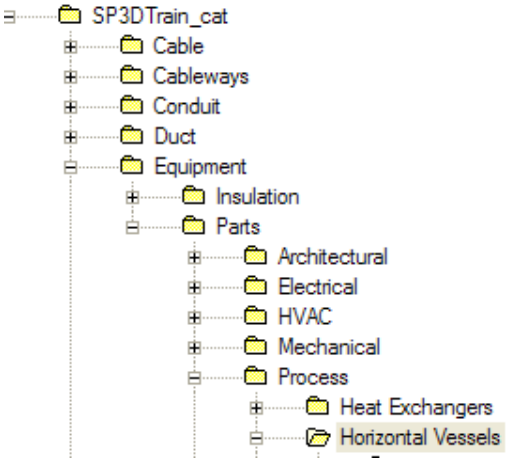


8. Go to the ribbon bar and select the Insert Row command .
9. Add the following entries:

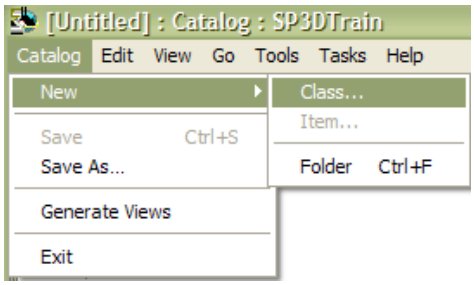
Name	User Name	Type	Units Type	Primary Units	Select List Table Name	On Property page	Is Value Required	Read Only	Description	Parent Select List Property
HoldStatus	Hold Status	Long			Hold Status	True	True	True		
PaintRes	Painting Responsability	Long			PaintingResponsibility	True	True	False		

Note: Select Catalog -> Save or Select Save icon to save each row.

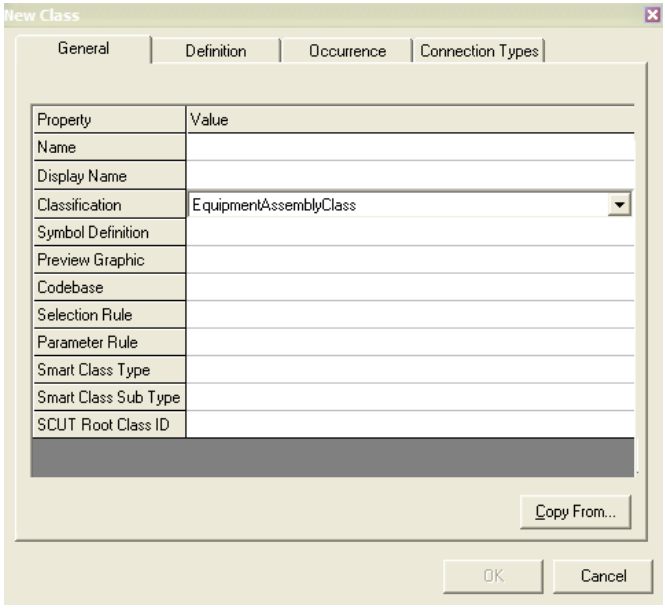
10. Go back to "\SP3DTrain_cat\Equipment\Parts\Process\Horizontal Vessels" folder.



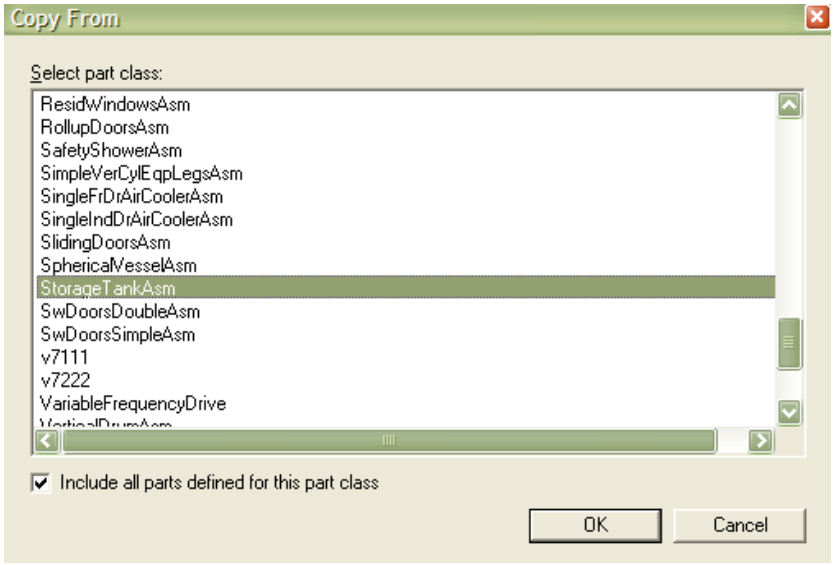
11. Select the Catalog -> New Class to create a Class.



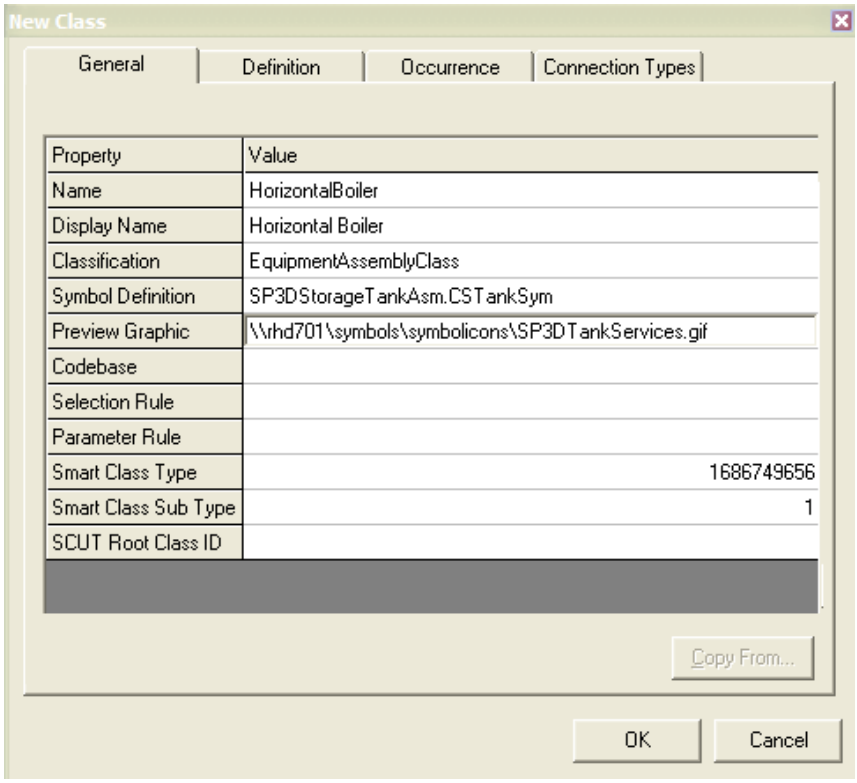
12. Make sure EquipmentAssemblyClass is defined in the Classification field.



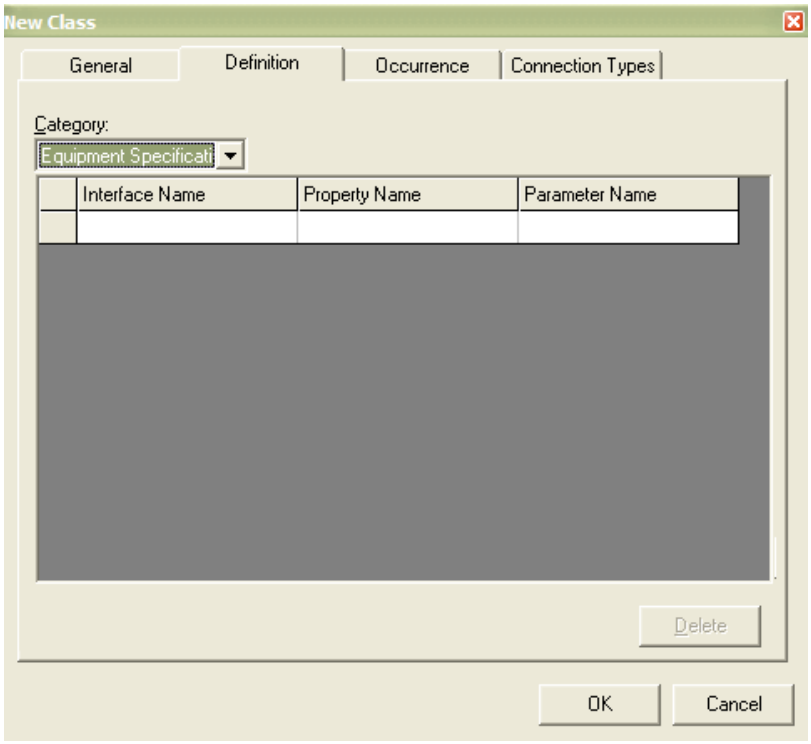
13. Select "Copy From" Button to open the Copy From dialog box.
14. Check the Include all parts defined for this part class.
15. Select StorageTankAsm from the list.



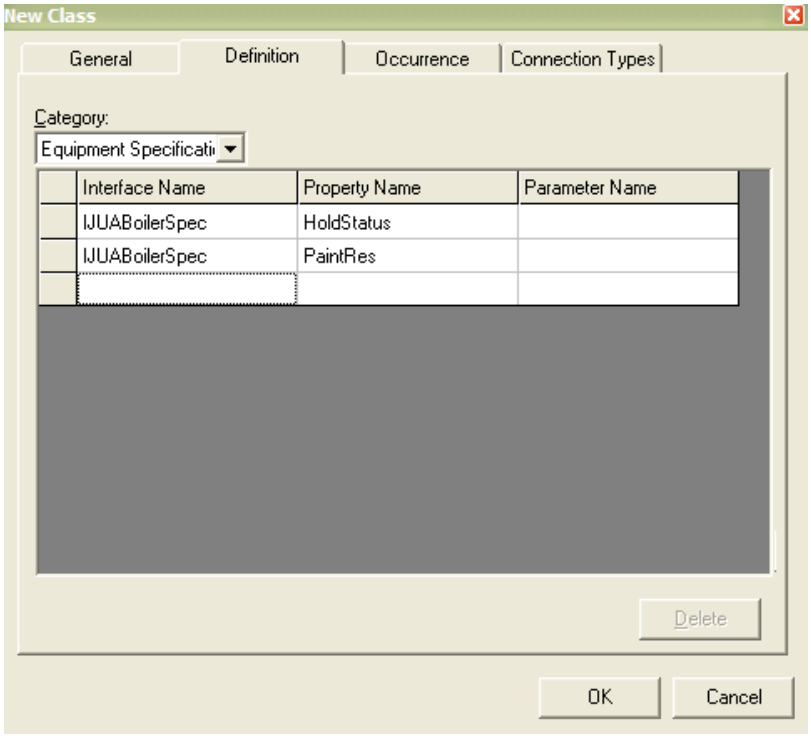
16. Click "OK" button to return to the New Class dialog box.
17. Rename the Name and the Display Name as HorizontalBoiler and Horizontal Boiler.
18. Keyin the symbol share path where the symbol icon is located on your machine.



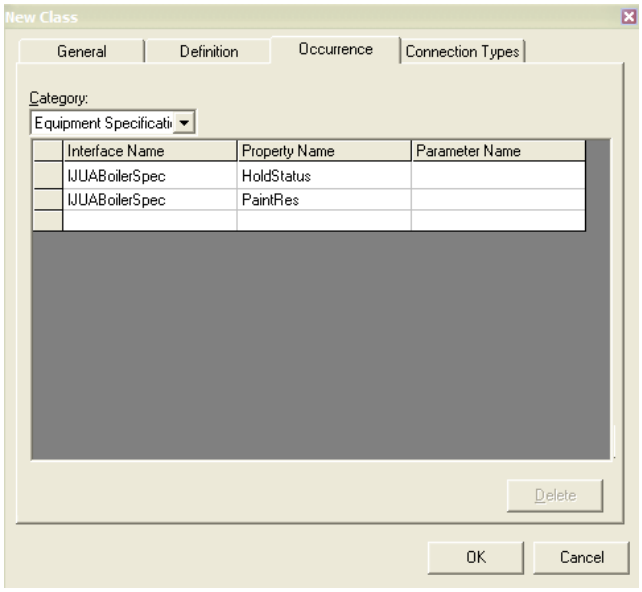
19. Select the Definition tab and Select Equipment Specification Category.



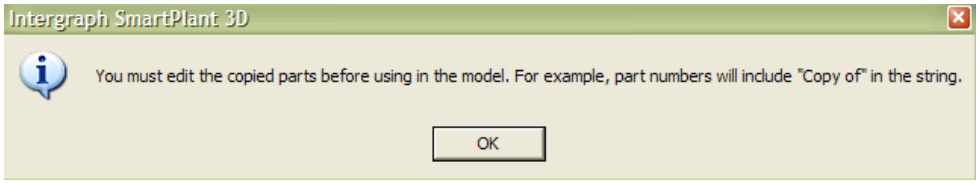
20. Add IJUABoilerSpec interface as shown below:



21. Select the Occurrence tab and Select Equipment Specification Category.
22. Add IJUABoilerSpec interface as shown below:



23. Click "OK" button. Read the prompt and Click "OK" button again to close the message dialog box.



24. The system returns to the Catalog task. Notice the two new parts.

	Name	Part Description	Symbol Definition	Definition	Parameter Rule	Equipment Classification 0	Equipment Classification 1
▶	Copy of Tank 001A-	StorageTank	SP3DStorageTankA	SP3DStorageTankA		Process Equipment	Process Vessel
	Copy of Tank 001A_	StorageTank	SP3DStorageTankA	SP3DStorageTankA		Process Equipment	Process Vessel

25. Rename the name of the two parts as follows:

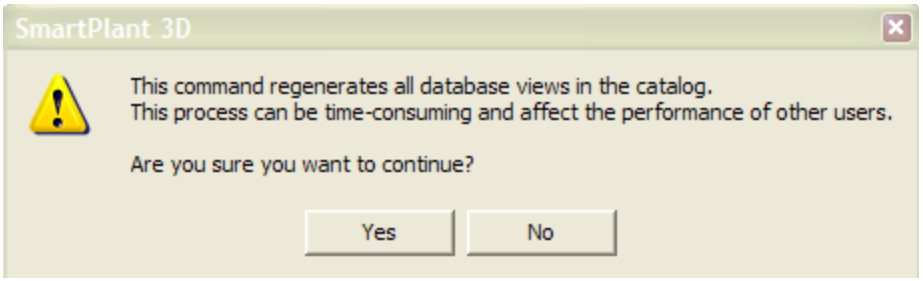
	Name	Part Description	Symbol Definition	Definition	Parameter Rule	Equipment Classification 0	Equipment Classification 1
▶	HBoiler-001	StorageTank	SP3DStorageTankA	SP3DStorageTankA		Process Equipment	Process Vessel
	HBoiler-002	StorageTank	SP3DStorageTankA	SP3DStorageTankA		Process Equipment	Process Vessel

26. Scroll to the left and set the Hold Status and Painting Responsibility values as shown below:

Hold Status	Painting Responsability
On hold	Equipment Vendor
Not on hold	Owner

27. Select HBoiler-001 to open its properties page. Make sure the pipe port data for pipe nozzle 1 and pipe nozzle 2 are correct. Repeat this step for HBoiler-002.

28. Select Catalog -> Generate Views. This step will generate the views in the Catalog database.



29. Hit "No" button. You are not going to regenerate the view at this time. (If you are working in a production catalog, you need to create the views in the catalog database)

30. Exit the SP3D application.

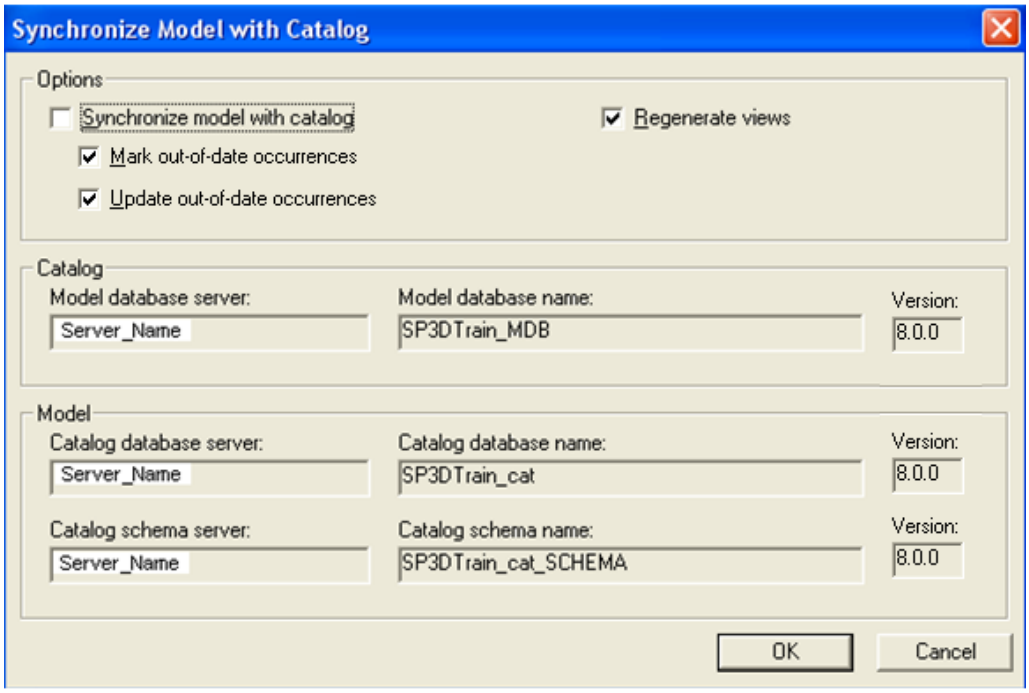
    Skip step 30 through 35 if you are not working in a production catalog.

30. Go to Project Management Task.

31. Select Tools -> Synchronize Model with the Catalog.

32. Uncheck the Synchronize Model with the Catalog option.

    Note: You just need to update the views in the model.

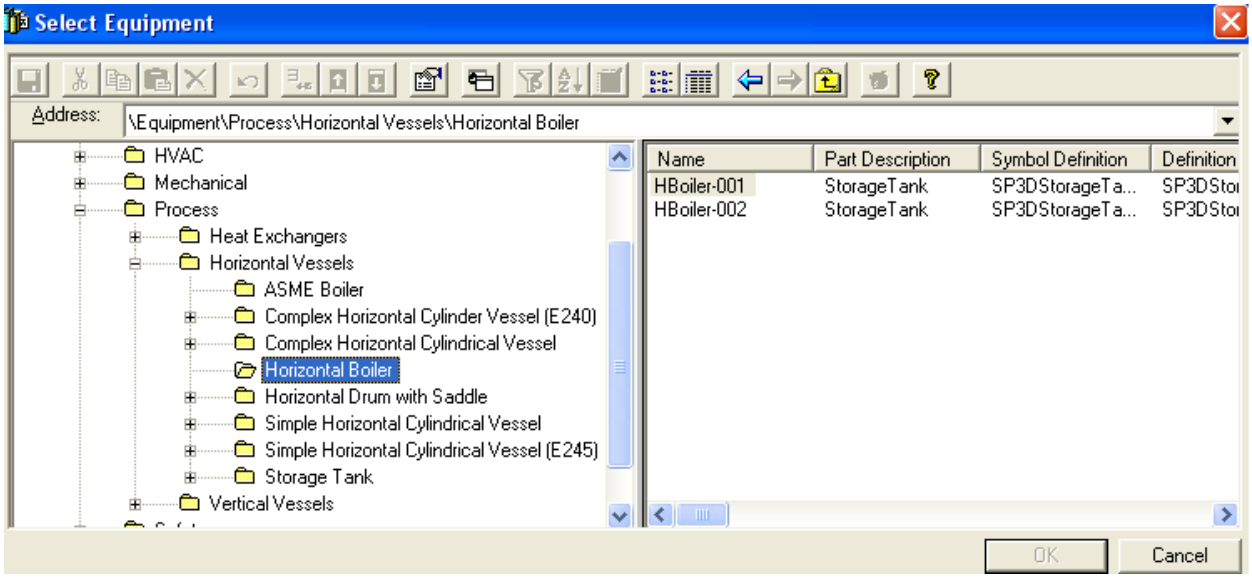


33. Click "OK" Button.

34. Once the process is complete. Right click on the model and select regenerate the report database.

35. Click “OK” Button.

36. Go to the Equipment Task and place the HBoiler-001.



Lab 19: Commodity Code Builder (Optional)

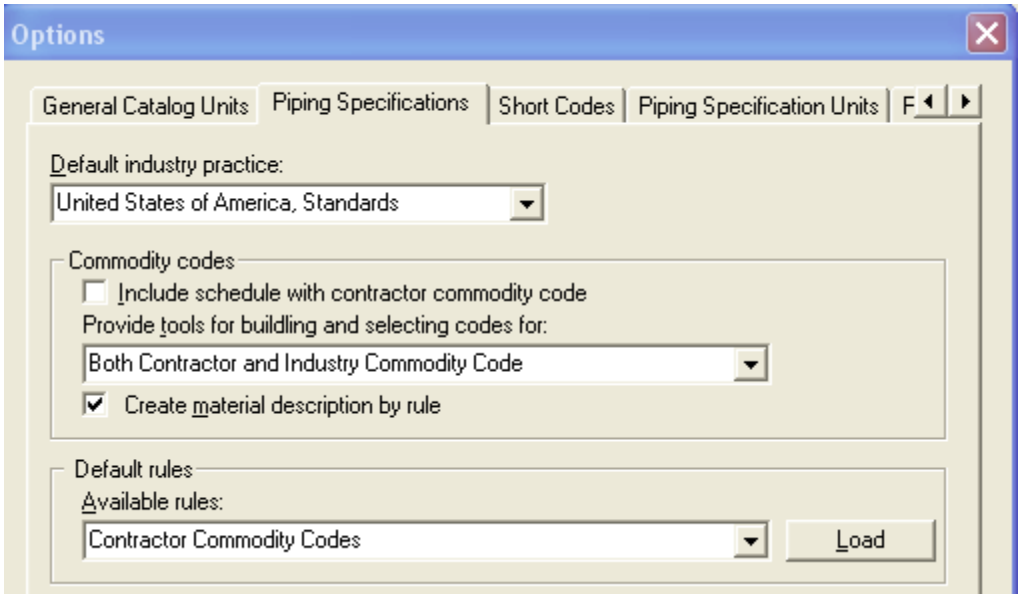
Objectives

After completing this lab, you will be able to:

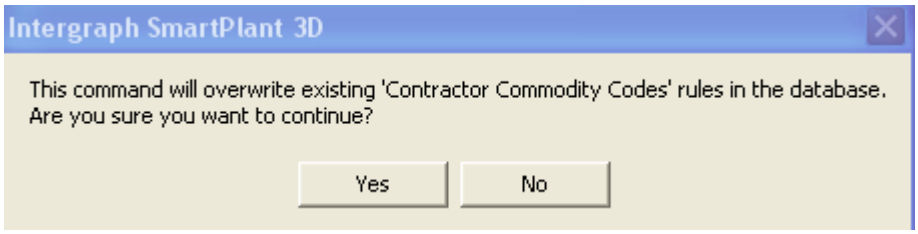
- Create a Piping Component Class using the User Interface
- Use the commodity code builder to create the commodity code
- Add a part using the User Interface

In this lab, you will create a new piping component class using the New Class Command. Once the class is created, then you use the commodity code builder to create the commodity code for the new part in this new class.

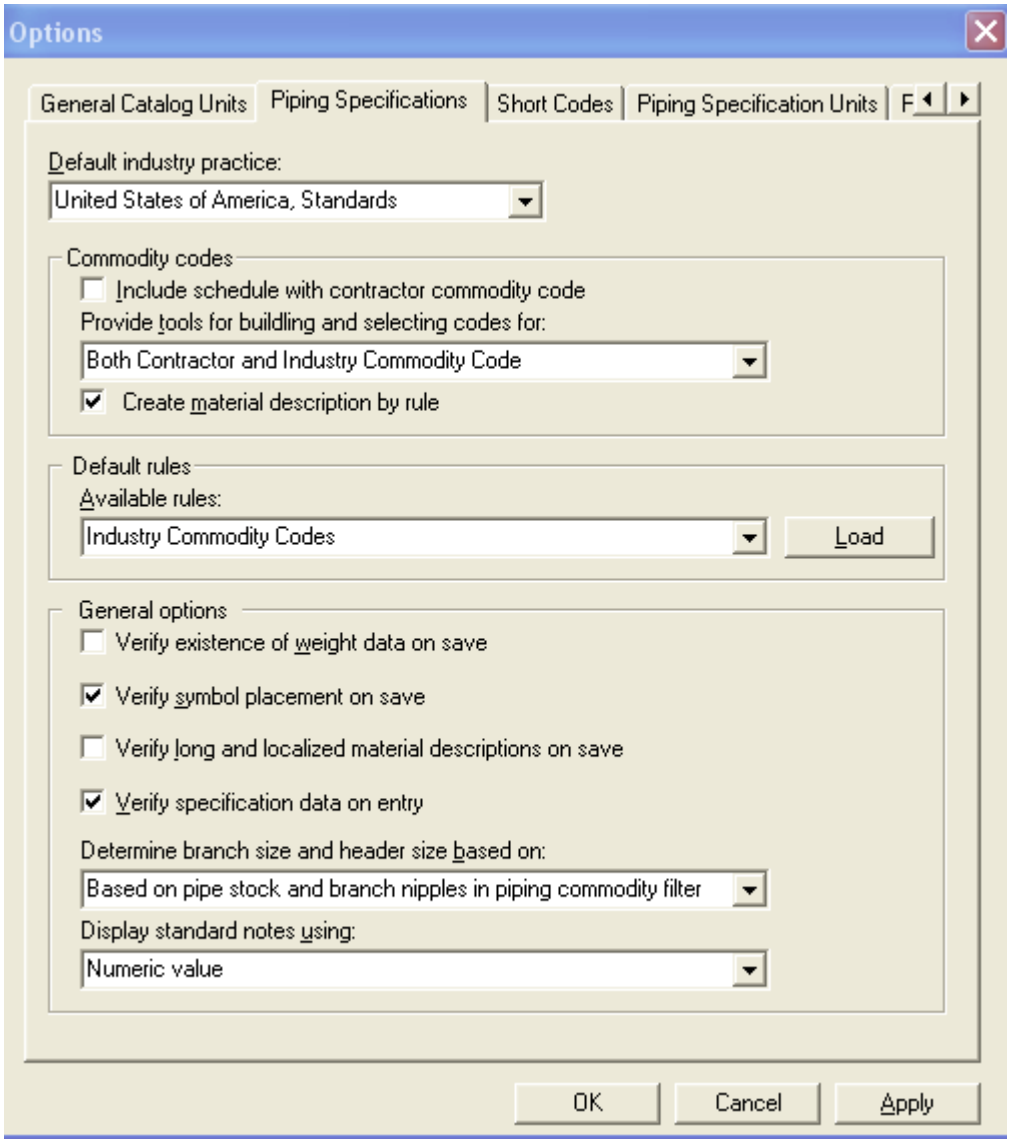
1. Start SP3D Application and connect to the Training Plant using the "All" Filter.
2. Enter the Catalog Task.
3. Make sure the Active Permission Group is set to *Permission Group 1*
4. Go Tools > Options in the Catalog task and select the Piping Specifications tab.
5. Make sure "United States of America, Standards" is set as the default industry practice.
6. Enable the commodity code builder option by selecting Contractor Commodity code and Industry Commodity Code.
7. Make sure the Create material description by rule option is checked.



8. Click "Load" button to load the Contractor Commodity Codes rule.

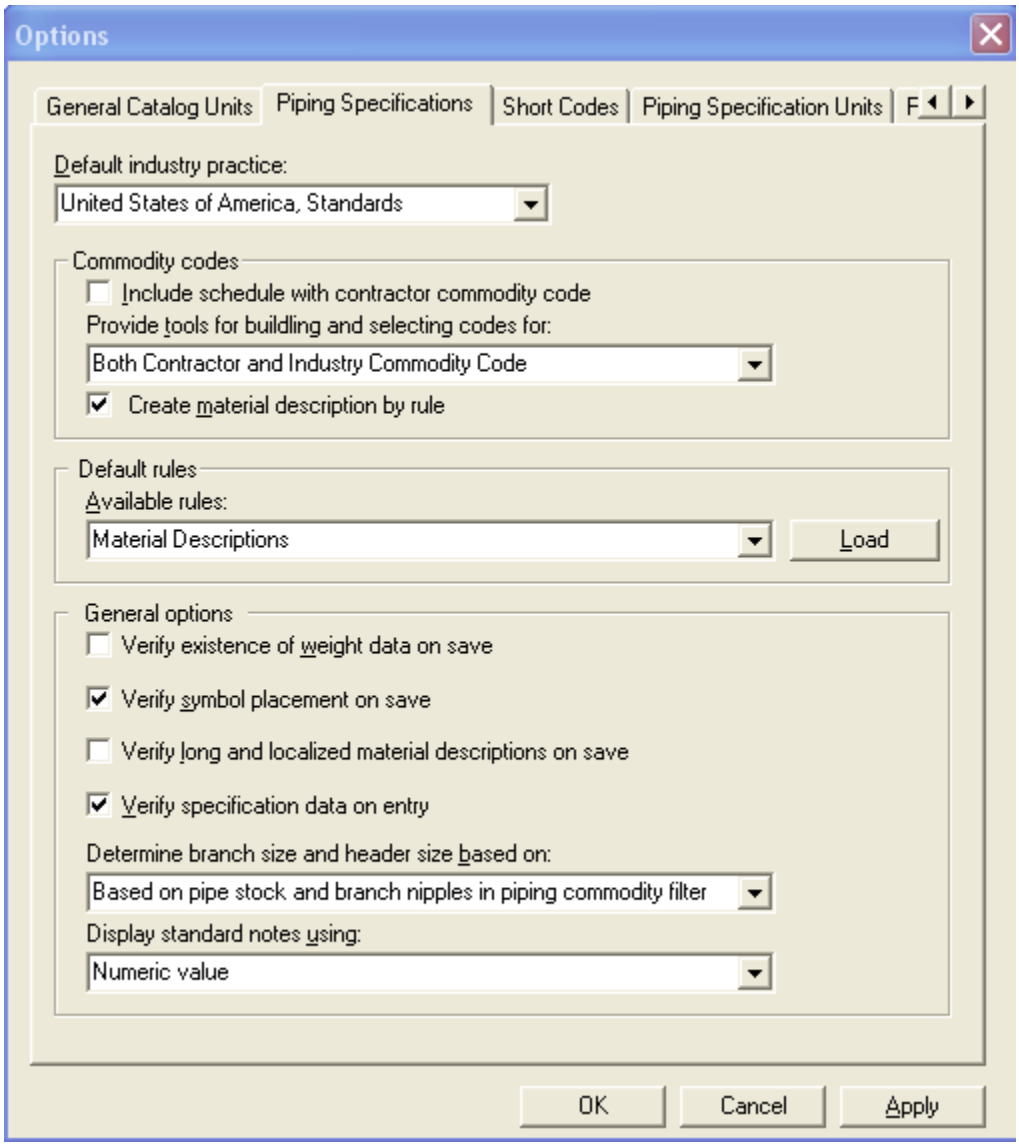


9. Click "Yes" button. Select the Industry Commodity Codes in the Available rules.

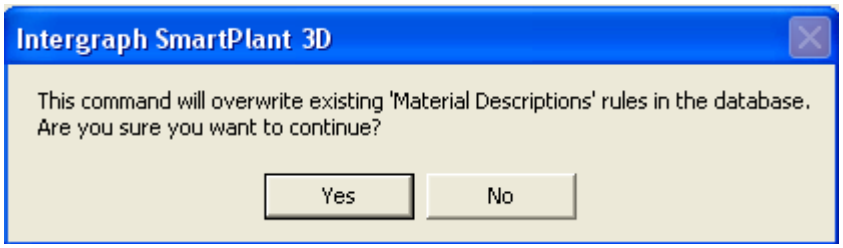


10. Click "Load" button.

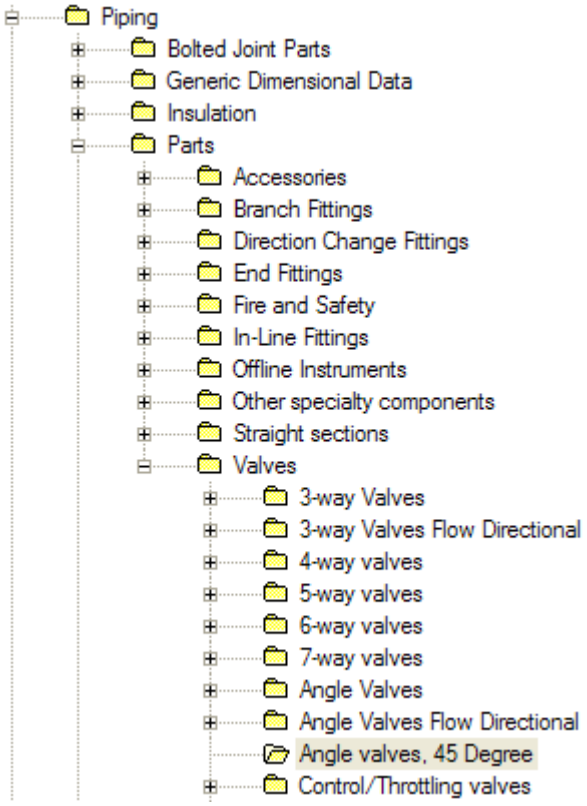
11. Click "Yes" button. Select the material description rule in the Available Rules.



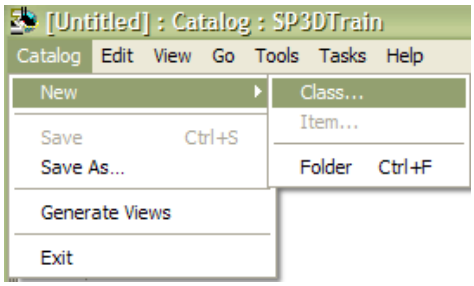
12. Click "Load" button to load the material description rule.



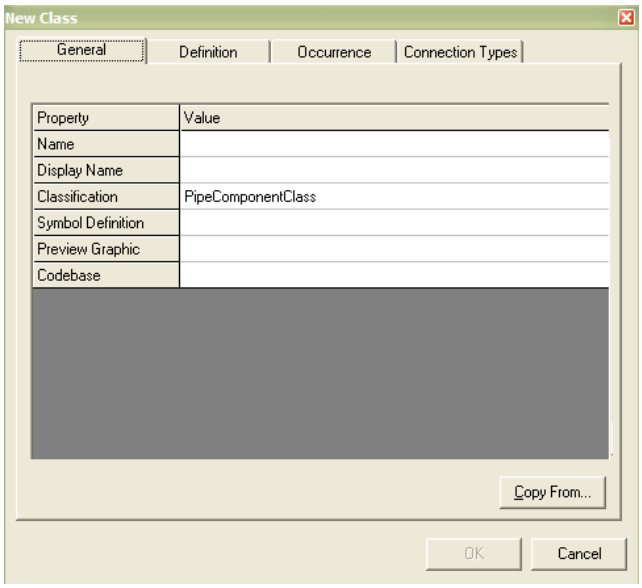
13. Click "Yes" button.
14. Expand the Catalog Hierarchy "\SP3DTrain_cat\Piping\Parts\Valves\Angle valves, 45 Degree"



15. Select the Catalog -> New Class to create a Class.



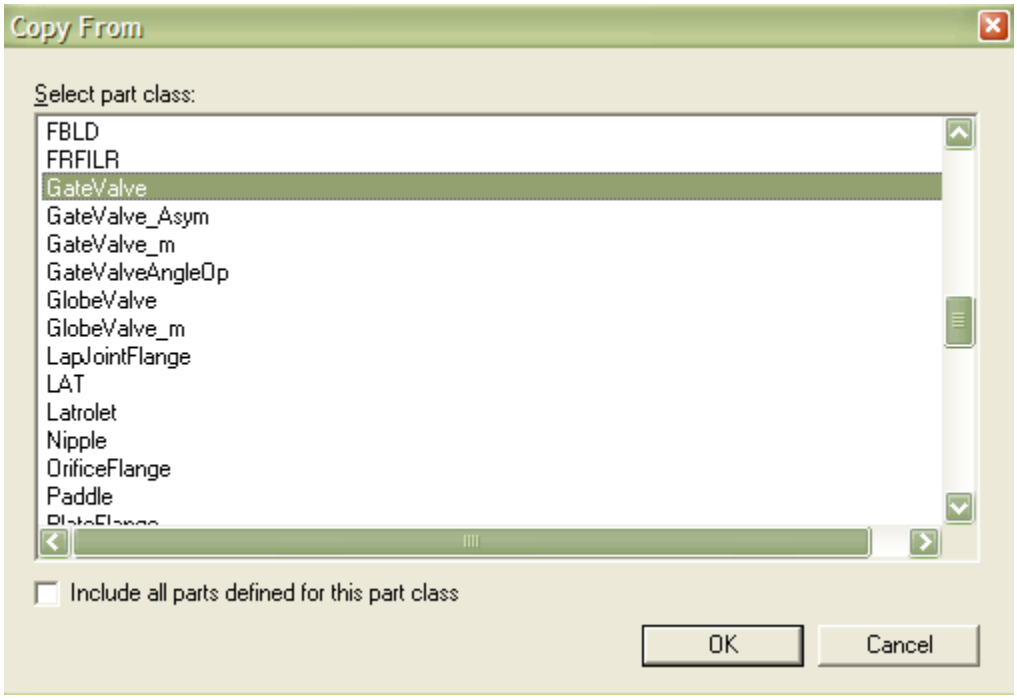
16. Make sure PipingComponentClass is defined in the Classification field.



17. Select "Copy From" Button to open the Copy From dialog box.

18. Select GateValve from the list.

    Note: We are only copy the Gate valve schema.

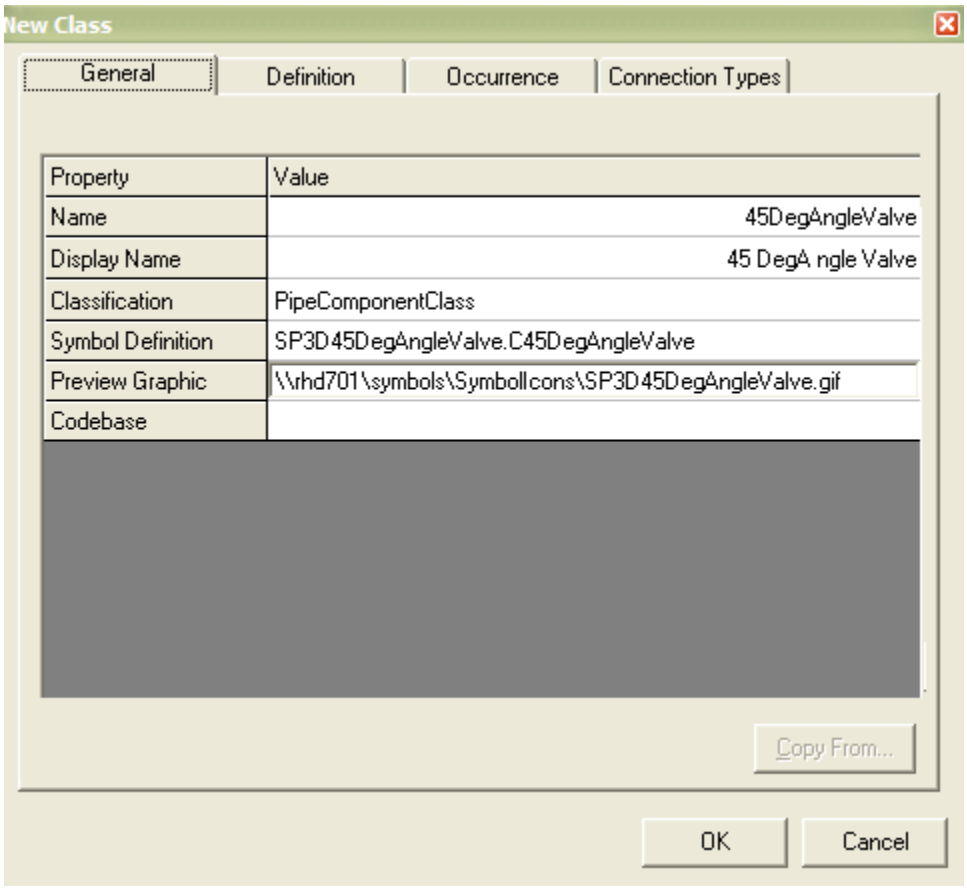


19. Click "OK" button to return to the New Class dialog box.

20. Rename the Name and the Display Name as 45DegAngleValve and 45DegAngleValve.

21. Keyin the appropriate symbol definition as SP3D45DegAngleValve.C45DegAngleValve.

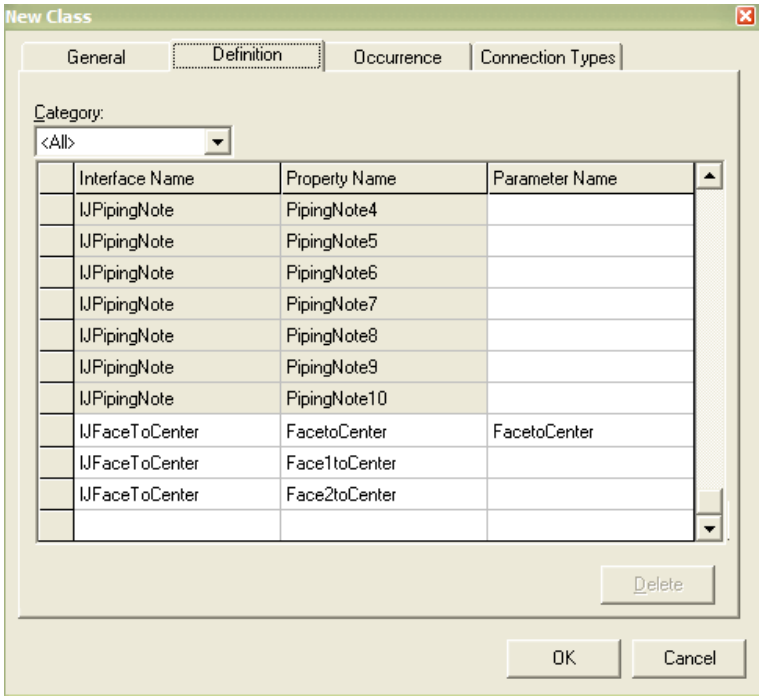
22. Keyin the symbol share path where the symbol icon is located on your machine.



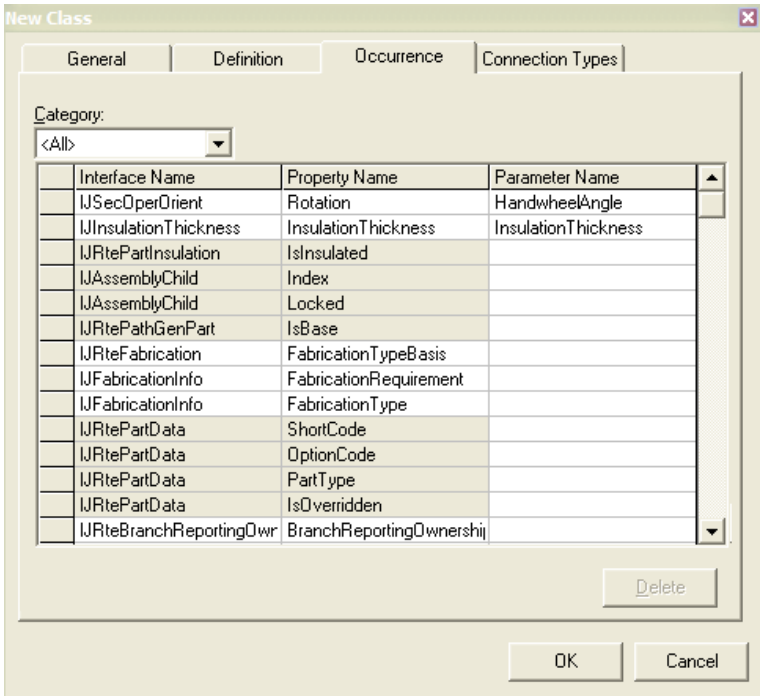
23. Go to the Definition Tab and delete FacetoFace value from the Parameter Name.

Interface Name	Property Name	Parameter Name
IJFaceToFace	FacetoFace	

24. Insert IJFacetoCenter to the list and keyin the FacetoCenter value in the Parameter Name.

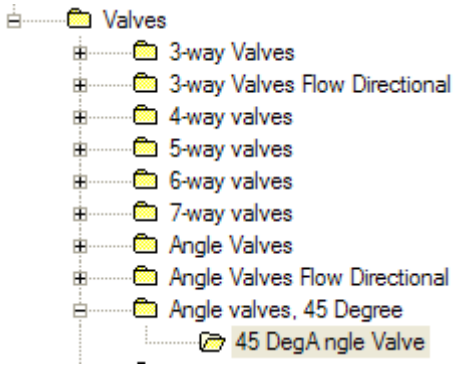


25. Go the Occurrence tab and make sure the IJSecOperOrient and IJInsulationThickness are defined in this tab.



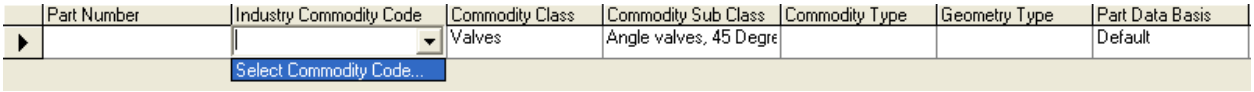
26. Click “OK” button.

    The system returns to the Catalog task. Notice the new part class.

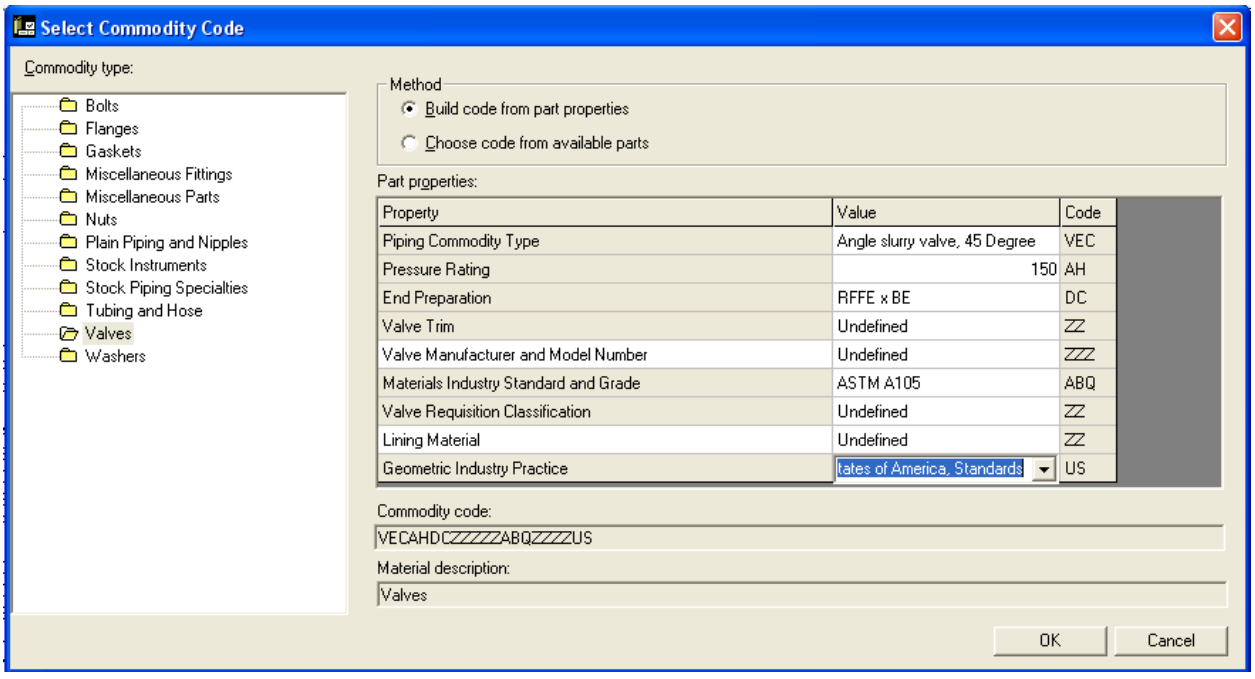


27. Go to the ribbon bar and select the Insert Row command  .

28. Go to the Industry Commodity Code and select "Select Commodity Code".



29. Build the commodity code as shown below:



30. Click "OK" button. Fill in the appropriate part data as shown below:

Industry Commodity Code	Commodity Class	Commodity Sub Class	Commodity Type	Geometry Type	Part Data Basis
VECAHDCZZZZZZABQZZZZZ	Valves	Angle valves, 45 Degree	Angle slurry valve, 45o	Elbow, fixed angle (including angle valves)	Default

Display Prog ID	Materials Practice	Materials Category	Materials Grade	Lining Requirements	Lining Material	Valve Manufacturer Industry Practice
SP3D45DegAngleV	United States of Amer	Carbon Steels	ASTM A105	Not Lined	Undefined	

Valve Manufacturer	Valve Model Number	Valve Trim Practice	Valve Trim	Flange Face Surface Finish	Surface Preparation	Manufacturing Method

Miscellaneous Requisition Classification	Miscellaneous Requisition Component Type	Vendor Part Number	Manufacturer Part Number	Mirror Behavior Option
Default state for valves	Valves			May be mirrored

Piping Point Basis 1	Id 1	Rating Practice 1	Pressure Rating 1	Termination Class 1	Termination Sub Class 1	End Preparation 1	End Practice 1	End Standard 1
Dual Flow	0(null) Undefined	United States of Ame	150	Bolted	Flanged	RFFE	United States of Am	Default

Schedule Practice 1	Schedule Thickness 1	Flow Direction 1	Piping Point Basis 2	Id 2	Rating Practice 2	Pressure Rating 2	Termination Class 2	Termination Sub Class 2
Undefined	Undefined	Bi-directional	Dual Flow	0(null) Undefined	United States of Ame	150	Bolted	Flanged

End Preparation 2	End Practice 2	End Standard 2	Schedule Practice 2	Schedule Thickness 2	Flow Direction 2	Npd 1	Npd Unit Type 1	NPD 2	Npd Unit Type 2
RFFE	United States of Am	Default	Undefined	Undefined	Bi-directional	4	in	4	in

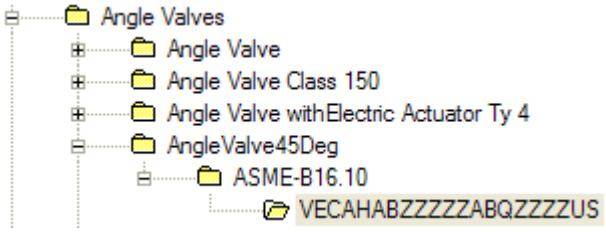
Geometric Industry Practice	Geometric Industry Standard	Bend Radius	Bend Radius Multiplier	Volumetric Capacity	Surface Area	Requisition Type	Minimum Pipe Length
Undefined	Undefined	0 ft 0.00 in	0	<undefined>	<undefined>		0 ft 0.00 in

Maximum Pipe Length	Dry Weight	Dry Cog X	Dry Cog Y	Dry Cog Z	Water Weight	Water Cog X	Water Cog Y	Water Cog Z
0 ft 0.00 in	<undefined>	<undefined>	<undefined>	<undefined>	<undefined>	<undefined>	<undefined>	<undefined>

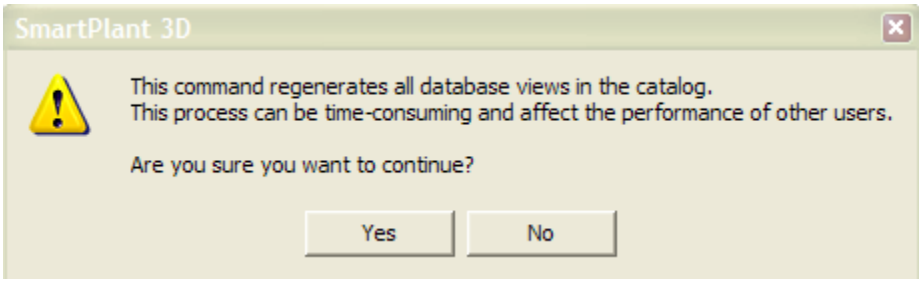
FormDefinition	Face to Center	Face 1 to Center	Face 2 to Center	Face to Face
	0 ft 6.00 in			

31. Select Catalog -> Save to save the row *or Select Save icon*  .

    Note: The system returns to the Catalog task. Notice the new part.



32. Select Catalog -> Generate Views. This step will generate the views in the Catalog database.



33. Click "No" button. You are not going to regenerate the view at this time. (If you are working in a production catalog, you need to create the views in the catalog database)

34. Exit the SP3D application.

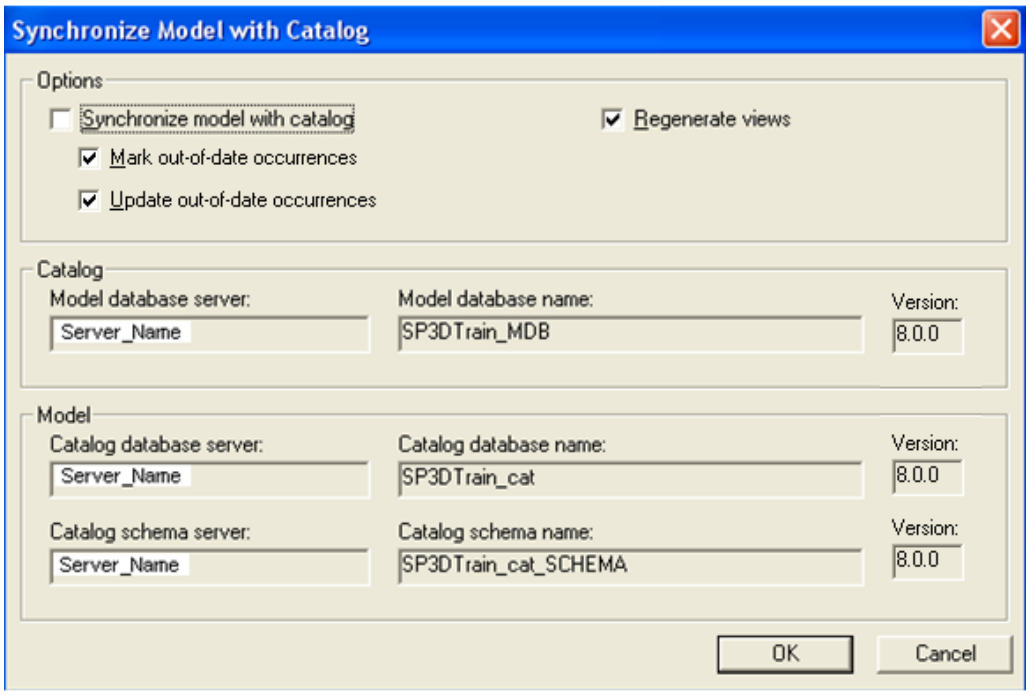
35. Go to Project Management Task.

36. Skip step 37 through 41 if you are not working in a production catalog.

37. Select Tools -> Synchronize Model with the Catalog.

38. Uncheck the Synchronize Model with the Catalog option.

    Note: You just need to update the views in the model.



39. Click “OK” Button.

40. Once the process is complete. Right click on the model and select regenerate the report database.

41. Click “OK” Button.

Lab 20: Piping Commodity Material Control Data (UI) -(Optional)

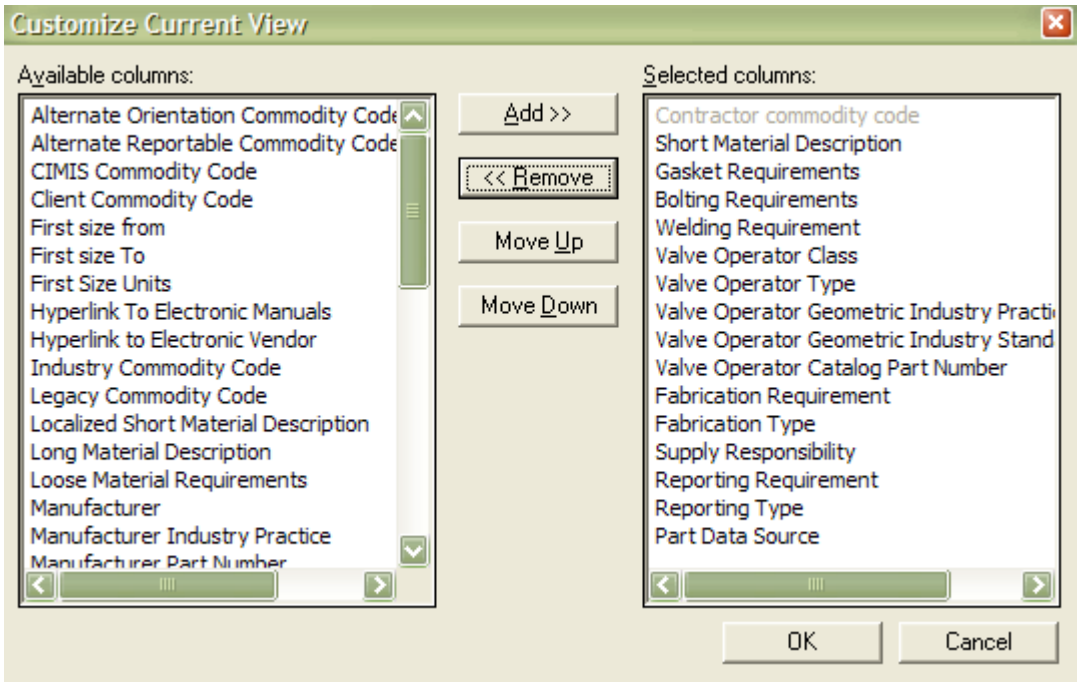
Objective

After completing this lab, you will be able to:

- Create a record in the Piping Commodity Material Control Data using User Interface

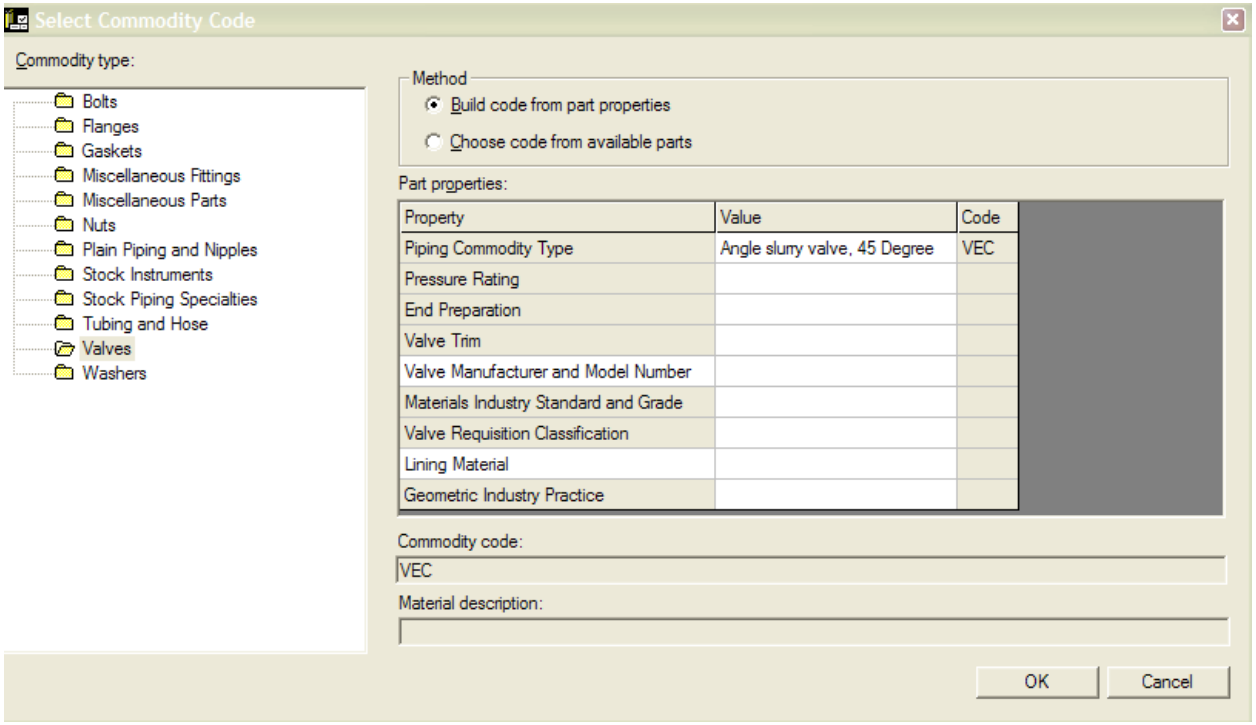
In this lab, you will create a record for the new part in the Piping Commodity Material Control Data using the user interface.

1. Go to Catalog Task.
2. Make sure the Active Permission Group is set to *Permission Group 1*
3. Expand the Catalog Hierarchy "\SP3DTrain_cat\Piping\Piping Specification\Piping Commodity Material Control Data"
4. Use Customize the Current View Command to remove the First size from, First size to and First size Units columns.

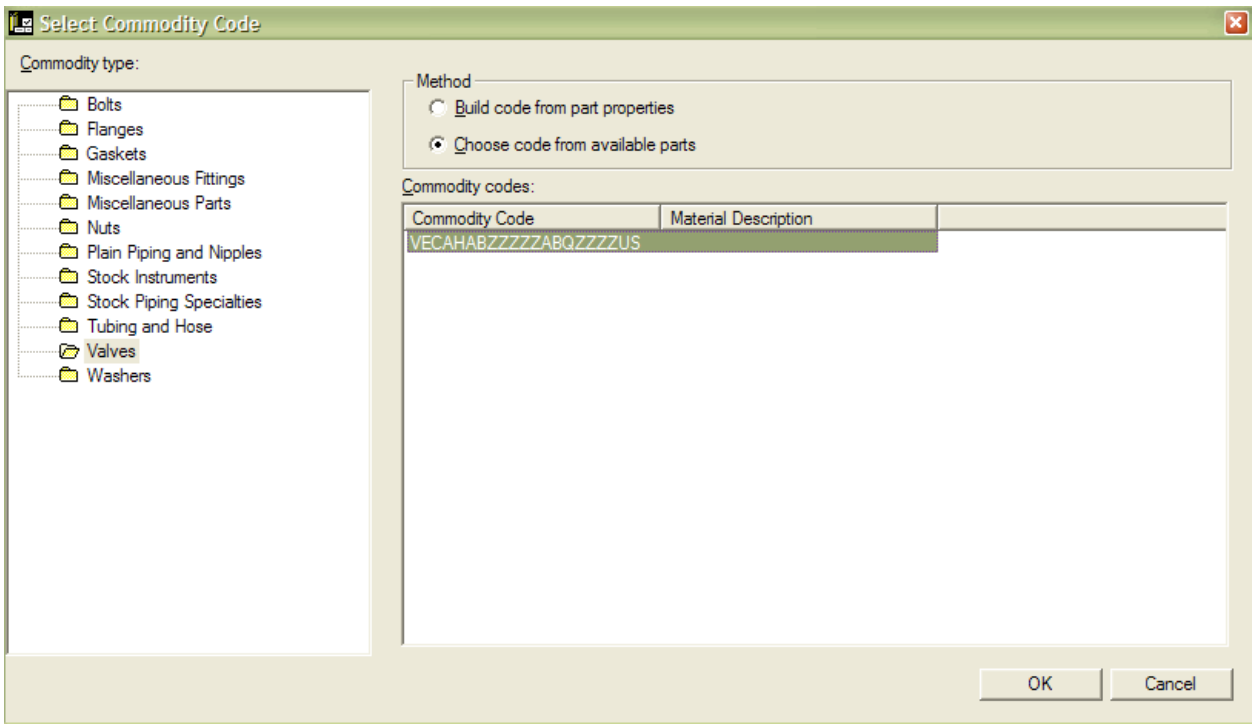


5. Select Insert Row Command .
6. Go to the Industry Commodity Code and select "Select Commodity Code".

7. Select Valve in the Commodity Type tree. Pick the Angle slurry valve, 45 Degree in Piping Commodity Type field.



8. Check "Choose code from available parts" and Pick the item from the list.



9. Click “OK” button. Fill in the appropriate part data as shown below:

Contractor commodity code	Short Material Description	Fabrication Requirement	Fabrication Type	Supply Responsibility	Reporting Requirement	Reporting Type
VECAHDCZZZZZZABQZZZZZU	Valves	By fabricator	SF	Undefined	To be reported	Included in Material Control System

Gasket Requirements	Bolting Requirements	Welding Requirement	Substitution Cap Screws Quantity	Substitution Cap Screw Contractor Commodity Code
Gasket required	Bolting required	No welds required	0	

Valve Operator Class	Valve Operator Type	Valve Operator Geometric Industry Practice	Valve Operator Geometric Industry Standard	Valve Operator Catalog Part Number
Manual Operators	Handwheel	United States of America, Standards	ASME-B16.10	GAT-Bolted-150-3

10. Select Catalog -> Save to save the row *or Select Save icon*  .

Lab 21: Piping Commodity Filter (UI) - (Optional)

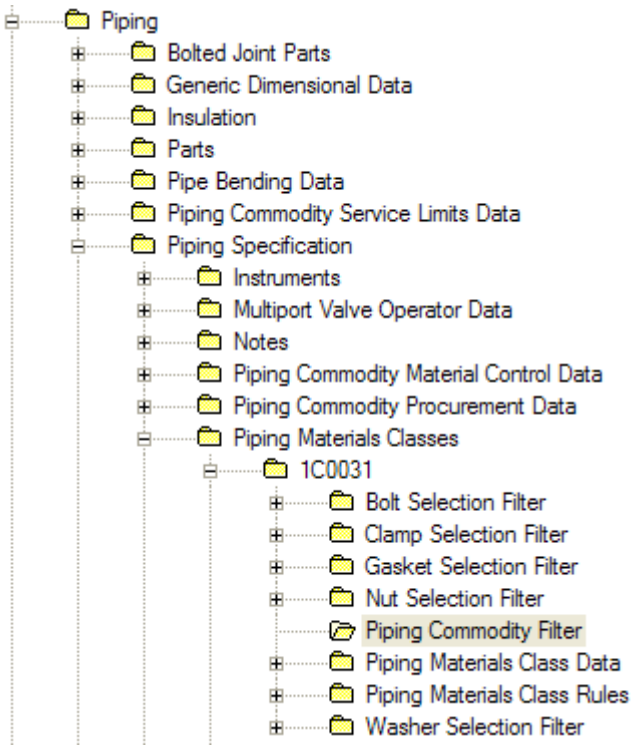
Objective

After completing this lab, you will be able to:

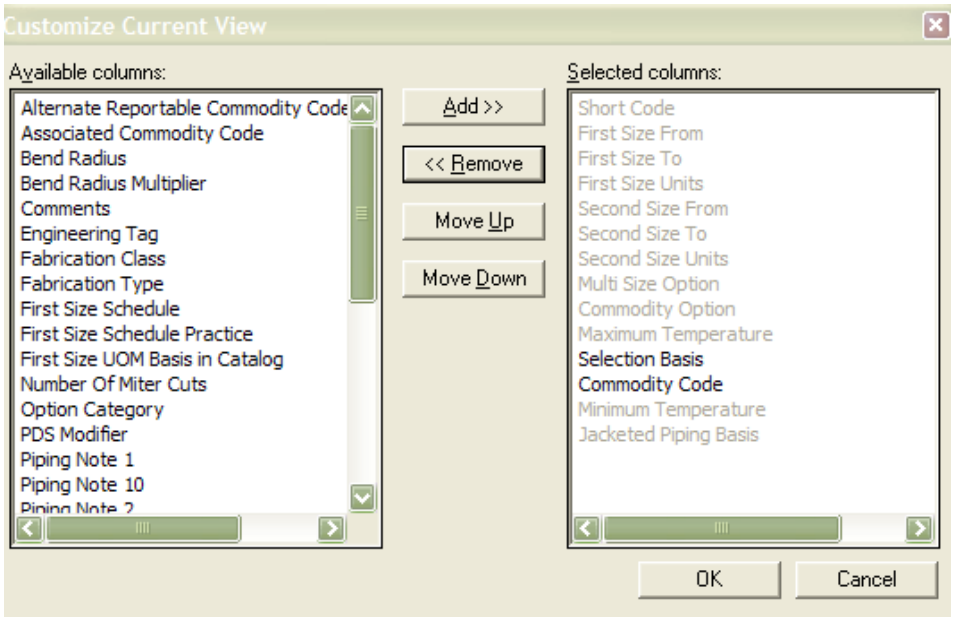
- Create a record in the Piping Commodity Filter using User Interface

In this lab, you will create a record in the Piping Commodity Filter using the user interface so that you can place the new part.

1. Go to Catalog Task.
2. Make sure the Active Permission Group is set to *Permission Group 1*
3. Expand the Catalog Hierarchy \SP3DTrain_cat\Piping\Piping Specification\Piping Materials Classes\1C0031\Piping Commodity Filter"



4. Use Customize the Current View Command to remove the columns as shown below:



5. Click "OK" Button.

6. Fill in the appropriate data as shown below:

	Short Code	First Size From	First Size To	First Size Units	Second Size From	Second Size To	Second Size Units	Multi Size Option
▶	Angle Hose Valve	4	4	in	<undefined>	<undefined>		

Commodity Option	Maximum	Selection Basis	Commodity Code
Default	<undefined>	Default	VECAHABZZZZZABQZZZZUS

7. Select Catalog -> Save to save the row *or Select Save icon* .

8. Go to the Piping Task and place the Angle Valve.