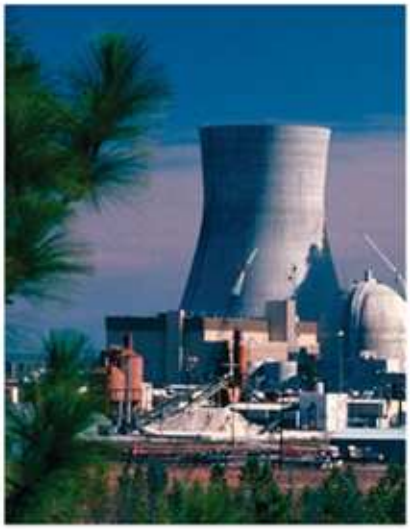
SmartPlant 3D Equipment Reference Data

Student Workbook

Process, Power & Marine


INTERGRAPH

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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 6.1

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 equipment reference data.

Course Reference Material

- SmartPlant 3D Reference Data Guide
- SmartPlant 3D Symbols Reference Data Guide
- Equipment and Furnishing Reference Data Guide

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

SmartPlant 3D Training Services

Lab 1: Creating a new Catalog Database

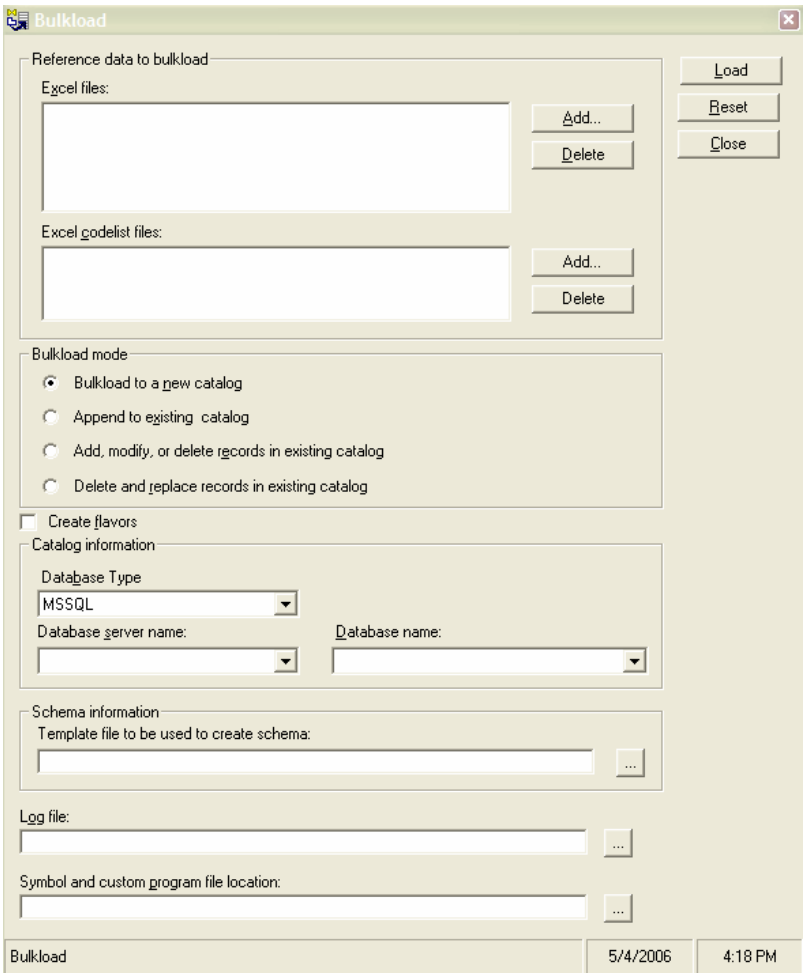
Objective

After completing this lab, you will be able to:

- Create a new catalog database using Bulkload Utility

Creating a new Catalog Database

1. Start the Bulkload application. Click on **Start-> Programs -> Intergraph SmartPlant 3D-> Database Tools> Bulkload Reference Data** to run the application.



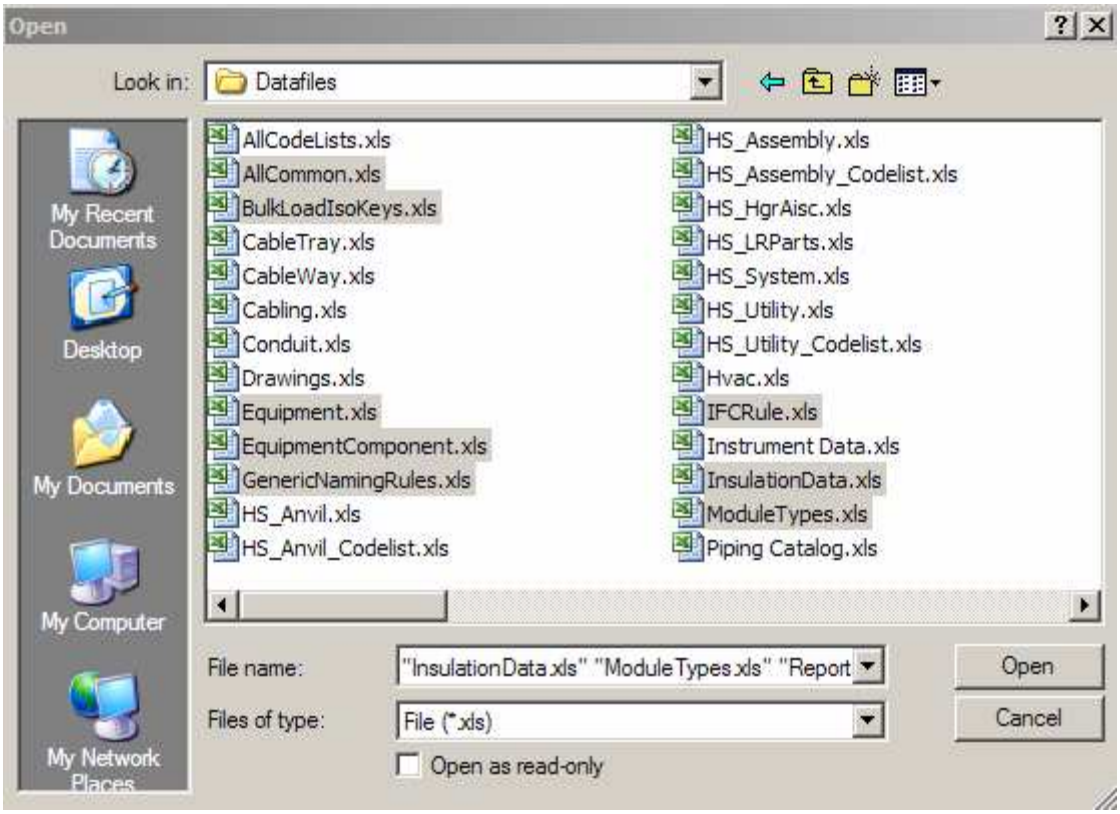
2. In the **Bulkload Excel Files**, click **Browse** ... to access the **Open** dialog box. Navigate to the following directory.

   [Install Product]\CatalogData\BulkLoad\DataFiles

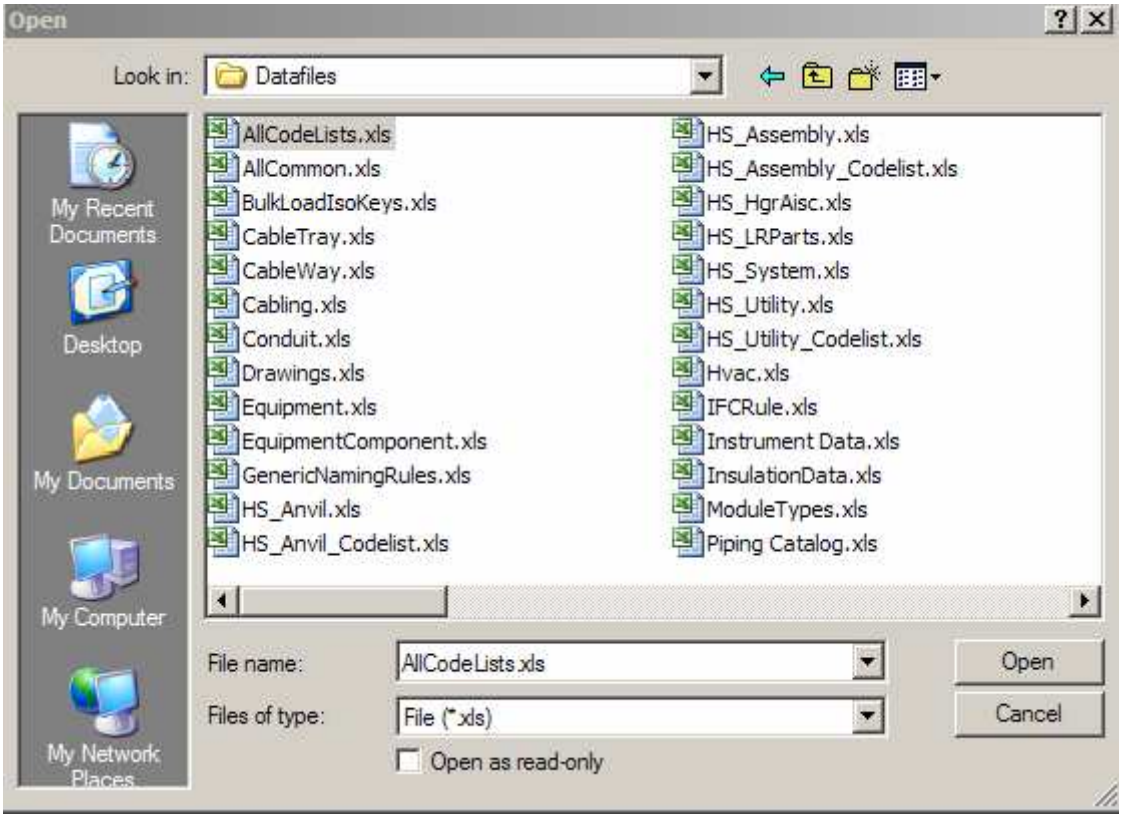
3. We are only selecting the common workbooks to create this catalog. Select **AllCommon.xls, GenericNamningRules.xls, Reports.xls, ModuleTypes.xls, BulkLoadIsoKeys.xls, Drawings.xls, IFCRule.xls, InsulationData.xls, Equipment.xls, EquipmentComponent.xls, Shapes.xls, Standard Nozzle Data.xls and SpaceMgmt.xls**

   workbook files for loading into the Catalog Database.

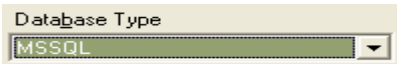
   Tip You can select more than one workbook to bulkload. Hold **Ctrl** key and click each workbook in the **Open** dialog box.



4. Click **OK button** to accept.
5. In the **Bulkload Excel CodeList File field**, click **Browse** ... to access the **Open** dialog box and select **AllCodeList** workbook file for loading into the Catalog Database.

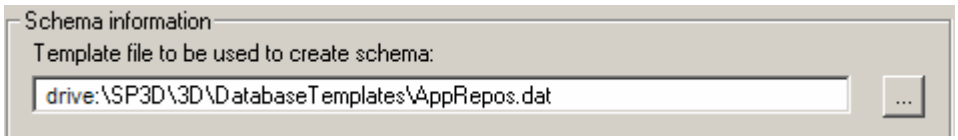


6. In the **Database Server Name** box, select the name of the server where the Catalog Database and schema will be located.

7. Select the appropriate Database Vendor. 

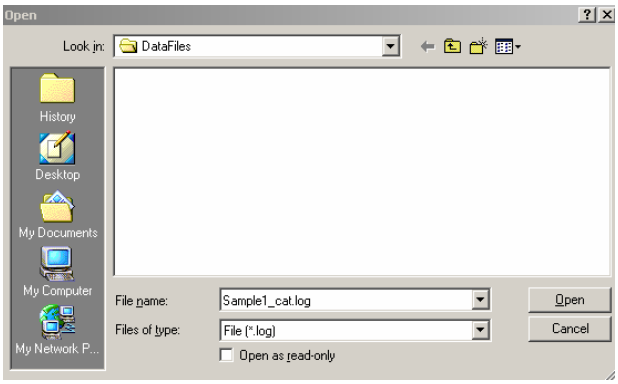
8. To create a new database, keyin **Sample1_Cat** in the **Database Name** box**.**

9. Under **Schema information section**, select the Application Repository database delivered in the product. Select AppRepos.dat for SQL Server or Select APPREPOS.DMP for Oracle.



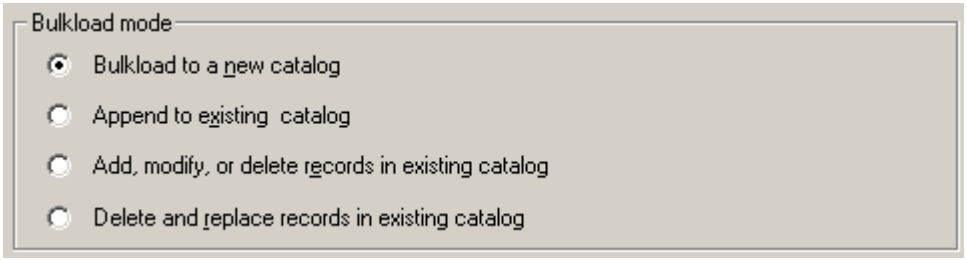
10. In the **Log File** box, click **Browse** ... to specify the name and location of the log file.

Tip The default location for the log file is \CatalogData\Bulkload\Database\DataFiles, but you can change this location.



11. Click **Open** to accept.
12. In the **Symbol and custom program file location,** type the symbol share location.

13. Click **OK button** to accept form.
14. Verify that Bulkload Mode is set to: Bulkload to a new catalog



15. Click **Load button** to start process
16. Open the log file to check for any errors during the bulkloading process.
17. Click **Quit button** to exit.

Lab 2: Catalog Hierarchy

Objective

After completing this lab, you will be able to:

- Add/Modify Module Type Hierarchy

Module Hierarchy

In this lab, you will add two new module classes called TransformerType1 and PipeRackType1 into the Module Type catalog hierarchy. To create the classification folders as shown below, you must edit the ModuleType Excel workbook, which contain three sheets that control the hierarchy: **ClassNodeType**, **R-Hierarchy**, and **R-ClassNodeDescribes**. When you add a module class to the catalog hierarchy, you must update these sheets, where necessary, in order to see the data in the Catalog task or Catalog browser dialog box.

CatalogRoot is the RootNode of the ReferenceData Catalog Browser. It cannot have a parent node. It is a named-object. Similarly RefDataModulesRoot is the root for the module hierarchy which appears as a child of the CatalogRoot. *Electrical, Transfomers, Structure and PipeRacks* are the nodes to facilitate the easy browsing. *TransformerType1 and PipeRackType1* are the Module Classes.

1. Open the ModuleTypes.xls Excel workbook.

2. Go the ClassNodeType sheet and add the following entries. Remember to add the letter A to all new records.

Head	*ObjectName*	*Name*
a	Electrical	Electrical
a	Structure	Structure
a	Transformers	Transformers
a	PipeRacks	PipeRacks
End		

   Note: This sheet describes the nodes used to navigate the CatalogBrowser hierarchy.

   ***ObjectName** should be unique across the entire database to identify a node uniquely.*
   ***Name** is the display name which appears in the CatalogBrowser hierarchy.*

3. Go the R-Hierarchy sheet and add the following entries. Remember to add the letter A to all new records.

Head	RelationSource	RelationDestination
Start		
	CatalogRoot	RefDataModulesRoot
a	RefDataModulesRoot	Electrical
a	RefDataModulesRoot	Structure
a	Electrical	Transformers
a	Structure	PipeRacks
End		

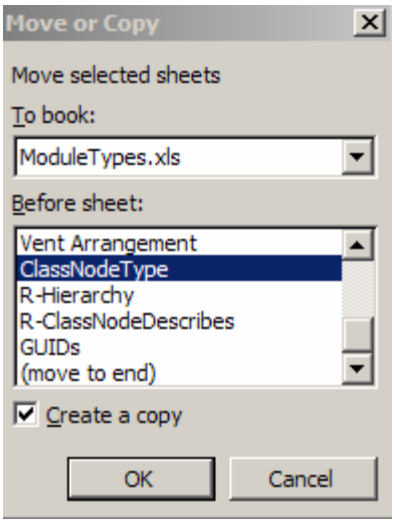
*Note: RelationSource and RelationDestination entries are **ObjectNames** of the objects participating in the relationship. A relationship can't be made unless the objects mentioned in Relationsource / RelationDestination columns are already created.*

4. Go the R-ClassNodeDescribes sheet and add the following entry. Remember to add the letter A to all new records.

Head	RelationSource	RelationDestination
Start		
a	Transformers	TransformerType1
a	PipeRacks	PipeRackType1
End		

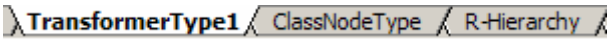
*Note: 'R-ClassNodeDescribes' is the relationship between an object from ClassNodeType worksheet as RelationSource and another object which is a PartClass as RelationDestination. RelationSource entries are **ObjectNames** of the objects participating in the relationship. RelationDestination entries are names of the PartClasses sheets participating in the relationship.*

5. Copy the Vent Arrangement Class by doing the following:
Select the Vent Arrangement Sheet. Right Click to Open the Move or Copy dialog box. Enable the copy option. Select the OK button to copy the sheet before the GUIDs sheet.

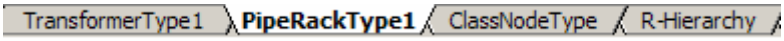


6. Rename the sheet as TransformerType1.

   Note: Make sure you do not add any blank space or special characters for the name.



7. Repeat the above steps to create the PipeRackType1 class.



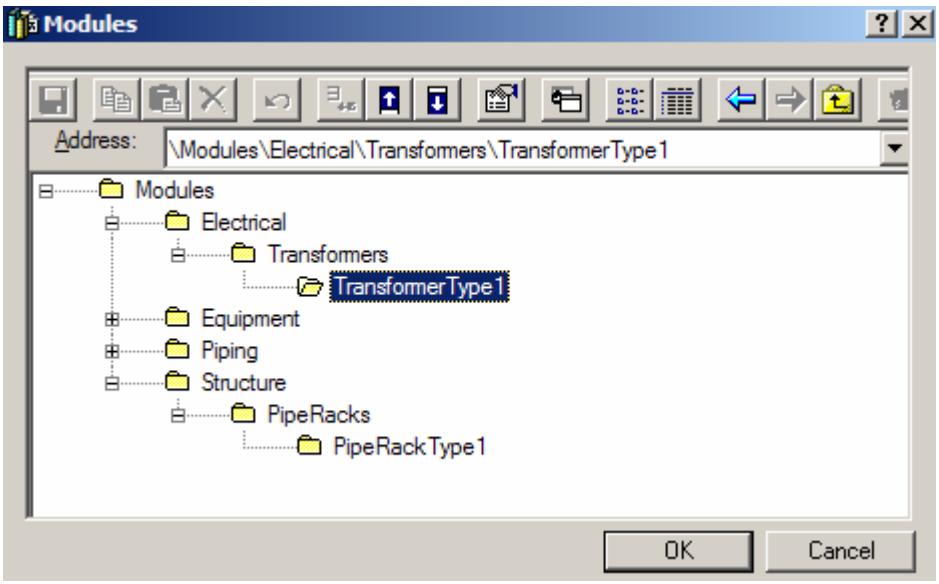
8. Add A on both classes as follows:

Definition	*PartClassType*	*SymbolDefinition*
a	ModuleClass	
Head	*Name*	*Description*
Start		
End		

9. Save the changes to a new workbook called ModuleTypes.xls and use the Bulkload Utility to load the new classes. Remember to add the letter A to all new records.

10. Once the bulkload process is complete, run the View Generator utility on the model to re-create the views in the model database. Go to the Project Management Task, Right mouse click the plant and select the Regenerate Reports Database command to re-generate the report database. Go to the Common Task and run the Copy to Catalog command.

Note: The ViewGenerator.exe is located at [Install Directory]\Core\Tools\Administrator\Bin



Lab 3: Equipment Catalog Hierarchy

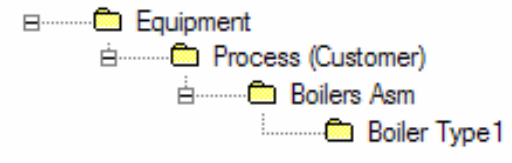
Objective

After completing this lab, you will be able to:

- Add/Modify Equipment Catalog Hierarchy

Equipment Hierarchy
All the nodes (Classification folders) are ClassNodeType objects except for the leaf nodes which are Smart Classes. A relation between two nodes can be created in the 'R-Hierarchy' worksheet. A relation between a ClassNodeType object and a Smart Class can also be created in the 'R-Hierarchy' worksheet.

In this lab, you will add a new smart class called Boiler Type1 into the equipment catalog hierarchy. To create the classification folders as shown below, you must edit the Equipment Excel workbook, which contain two sheets that control the hierarchy: **ClassNodeType** and **R-Hierarchy**. When you add a smart class to the catalog hierarchy, you must update these sheets, where necessary, in order to see the data in the Catalog task or Catalog browser dialog box.



RelationSource	*RelationDestination*
CatalogRoot	RefDataEquipmentRoot
RefDataEquipmentRoot	Process (Customer)
Process (Customer)	Boilers Asm
Boilers Asm	BoilerType1

CatalogRoot is the RootNode of the ReferenceData Catalog Browser. It cannot have a parent node. It is a named-object. Similarly *Equipment* is the root for the equipment hierarchy which appears as a child of the CatalogRoot. *Process (Customer) and Boilers Asm* are the nodes to facilitate the easy browsing. *Boiler Type1* is the Smart Class.

1. Open the Equipment.xls Excel workbook.

2. Go the ClassNodeType sheet and add the following entries. Remember to add the letter A to all new records.

Head	*ObjectName*	*Name*
Start		
a	Process (Customer)	Process (Customer)
a	Boilers Asm	Boilers Asm

Note: This sheet describes the nodes used to navigate the CatalogBrowser hierarchy.

***ObjectName** should be unique across the entire database to identify a node uniquely.*

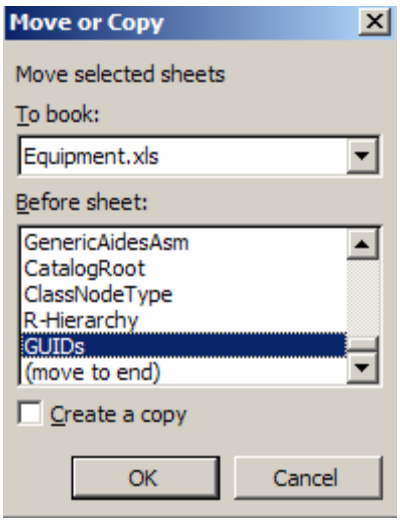
***Name** is the display name which appears in the CatalogBrowser hierarchy.*

3. Go the R-Hierarchy sheet and add the following entries. Remember to add the letter A to all new records.

Head	RelationSource	RelationDestination
Start		
a	RefDataEquipmentRoot	Process (Customer)
a	Process (Customer)	Boilers Asm
a	Boilers Asm	BoilerType1

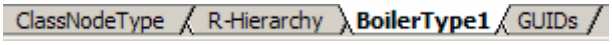
*Note: RelationSource and RelationDestination entries are **ObjectNames** of the objects participating in the relationship. A relationship can't be made unless the objects mentioned in Relationsource / RelationDestination columns are already created.*

4. Copy the StorageTankAsm sheet by doing the following:
Select the StorageTankAsm Sheet. Right Click to Open the Move or Copy dialog box. Enable the copy option. Select the OK button to copy the sheet before the GUIDs sheet.



5. Rename the sheet as BoilerType1.

Note: Make sure you do not add any blank space or special characters for the name.



6. Rename the name and description for both items as follows:

Name	*PartDescription*
BoilerType1_001A-E	Boiler Type1
BoilerType1_IMP-E	Boiler Type1

7. Rename UserClassName and OccClassName as follows:

UserClassName	***OccClassName***
Boiler Type1	Boiler Type1

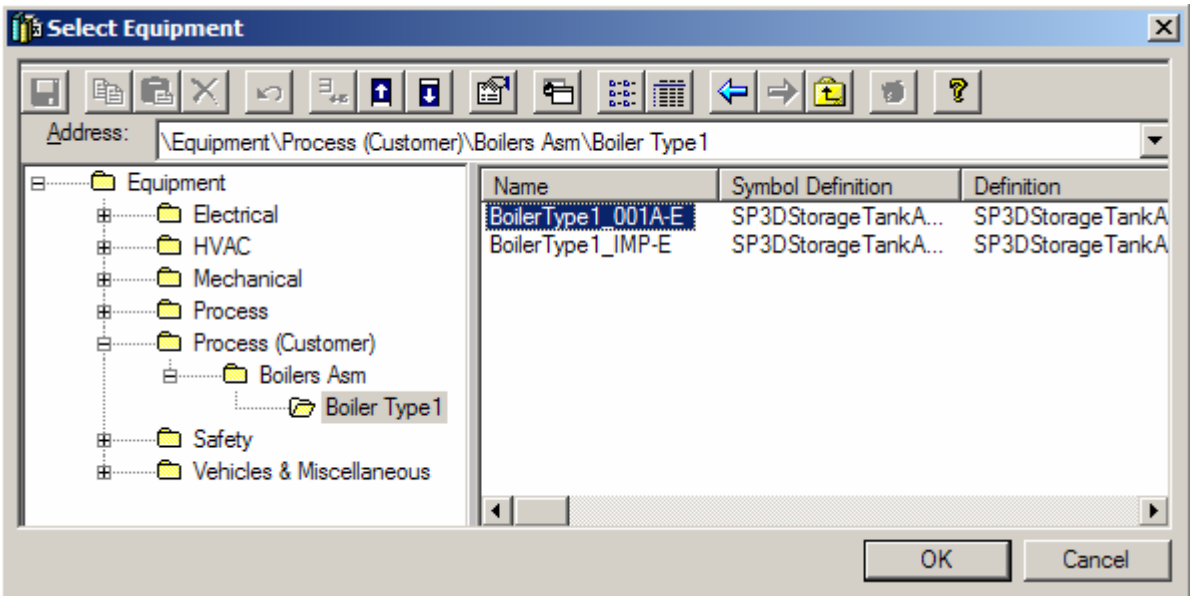
Note: The UserClassName is also known as a definition class name. You can use this field to provide a more meaningful name for the class or a name with blank spaces in it. This name appears in the Catalog task and Catalog browser dialog box. The OccClassName appears in the business object hierarchy on the Object Type tab on the Filter Properties dialog boxes.

8. Save the changes to a new workbook called BoilerTypes.xls and use the Bulkload Utility to load the new class. Remember to add the letter A to all new records.

Definition	*PartClassType*	*SymbolDefinition*
a	EquipmentAssemblyClass	SP3DStorageTankAsm.CSTankSym
Head	*Name*	*PartDescription*
Start		
a	BoilerType1_001A-E	Boiler Type1
a	BoilerType1_IMP-E	Boiler Type1
End		

9. Once the bulkload process is complete, run the View Generator utility on the model to re-create the views in the model database. Go to the Project Management Task, Right mouse click the plant and select the Regenerate Reports Database command to re-generate the report database. Go to the Equipment Task and place the Boiler Type1.

Note: The ViewGenerator.exe is located at [Install Directory]\Core\Tools\Administrator\Bin


Select Equipment
Address:
\Equipment\Process (Customer)\Boilers Asm\Boiler Type1
Equipment
Electrical
HVAC
Mechanical
Process
Process (Customer)
Boilers Asm
Boiler Type1
Safety
Vehicles & Miscellaneous
Name
Symbol Definition
Definition
BoilerType1_001A-E
SP3DStorageTankA...
SP3DStorageTankA
BoilerType1_IMP-E
SP3DStorageTankA...
SP3DStorageTankA
OK
Cancel

Lab 4: Working with the Custom Interface Sheet

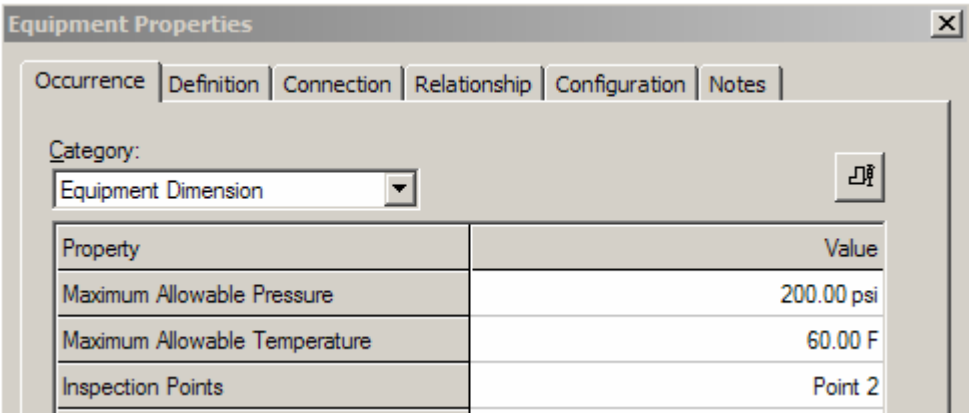
Objective

After completing this lab, you will be able to:

- Add User Defined Code List
- Add User Interfaces

Custom Interfaces
The Custom Interfaces sheet allows you to load a custom schema into the metadata of a catalog. This sheet defines the customized user interfaces and attributes (properties) for the smart/part classes in the workbook.

In this lab, you will add a new custom interface and three attributes for a smart class called BoilerType2. Also, you will create a new code list table namespace called Inspection Points in the catalog schema. Use the Custom Interfaces sheet to define the attributes names with associated data type, unit type and code list table namespace as shown below:



1. Open the AllCodeList.xls Excel workbook.
2. Add a User defined Code List as follows:

HEAD	InspectionPoints ShortDescription	InspectionPoints LongDescription	Codelist Number	Sort Order
!				
START				
a	Undefined		1	
a	Point 1		5	
a	Point 2		10	
a	Point 3		15	
a	Point 4		20	
END				

InspectionPoints

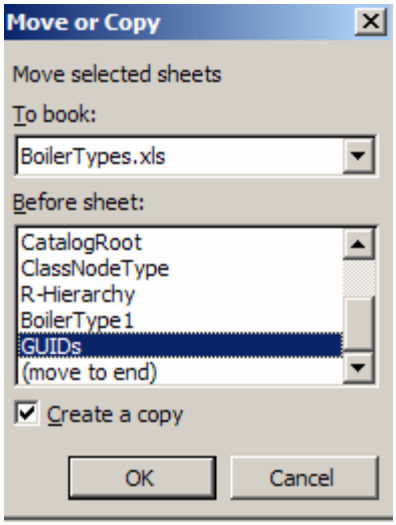
Note: The limit for a codelist name is 30 characters. You cannot use blanks or special characters for the codelist name.

3. Open the BoilerTypes.xls Workbook.

4. Go the R-Hierarchy sheet and add the following entry.

Head	RelationSource	RelationDestination
Start		
a	Boiler Asm	BoilerType2

5. Copy the BoilerType1 Smart Class by doing the following:
6. Select the BoilerType1 Sheet. Right Click to Open the Move or Copy dialog box. Enable the copy option. Copy the sheet next to GUIDs sheet.



7. Rename the sheet as BoilerType2

8. Rename the name and description for both items as follows:

Name	PartDescription
BoilerType2_001A-E	Boiler Type2
BoilerType2_IMP-E	Boiler Type2

9. Rename UserClassName and OccClassName as follows:

UserClassName	OccClassName
Boiler Type2	Boiler Type2

10. Create a new interface called IJUABoilerSpecs. Go to the Custom Interface sheet and add the following entries

InterfaceName	CategoryName	AttributeName	AttributeUserName	Type	UnitsType	PrimaryUnits	CodeList	codelisttablenamespace	OnPropertyPage	ReadOnly	SymbolParameter
IJUABoilerSpecs	Equipment Dimension	MaxPressure	Maximum Allowable Pressure	Double	27	182			TRUE	FALSE	
		MaxTemp	Maximum Allowable Temperature	Double	5	104			TRUE	FALSE	
		InspectionPoints	Inspection Points	Long	0	0	InspectionPoints	UDP	TRUE	FALSE	

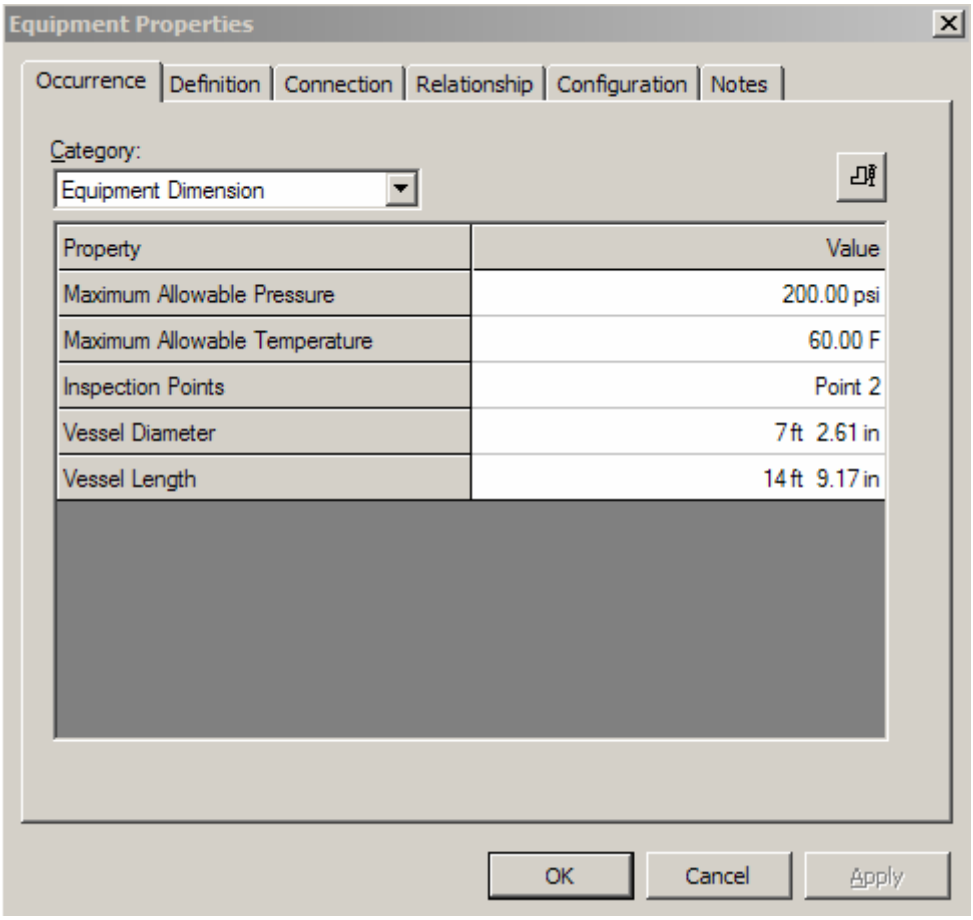
Note: An interface is a collection of attributes. A complete interface definition includes one or more attribute names with associated data type, unit type, and optional symbol parameter. The appropriate unit type and the primary units values are found using the AllCommon.xls workbook. The Category Names are listed in the Property Categories codelist. The codelist namespace for user-defined codelists is UDP.

11. Go to the BoilerType2 Smart Class Definition and key in the following data:

Definition	PartClassType	SymbolDefinition	oa:MaxPressure	oa:MaxTemp	oa:InspectionPoints
A	EquipmentAssemblyClass	SP3DStorageTankAsm.CSTankSym			
Head	Name	PartDescription	MaxPressure	MaxTemp	InspectionPoints
Start					
A	BoilerType2_001A-E	BoilerType2	100	50	5
A	BoilerType2_001A_IMP-E	BoilerType2	200	60	10
End					

*Note: Occurrence attributes are interpreted by the identifier '**OA:**' and are defined along with the definition of the SmartClass in the SmartClass worksheets.*
An attribute with the same name can exist on more than one interface. On our smart class sheet, you can scope the user attributes based on their interfaces and symbol parameters. The scoping syntax is Interface::UserAttribute<Symbol Parameter>.

12. Save the changes and use the Bulkload Utility to load the new class and the codelist. Remember to add the letter A to all sheets. Once the bulkload process is complete, run the View Generator utility on the model to re-create the views in the model database. Finally, Re-generate the report databases. Go to the Equipment Task and place the BoilerType2. Use the Equipment Properties page and review the attributes.


Equipment Properties
Occurrence
Definition
Connection
Relationship
Configuration
Notes
Category:
Equipment Dimension
Property
Value
Maximum Allowable Pressure
200.00 psi
Maximum Allowable Temperature
60.00 F
Inspection Points
Point 2
Vessel Diameter
7 ft 2.61 in
Vessel Length
14 ft 9.17 in
OK
Cancel
Apply