Process, Power and Marine Division

SP3D Equipment Reference Data



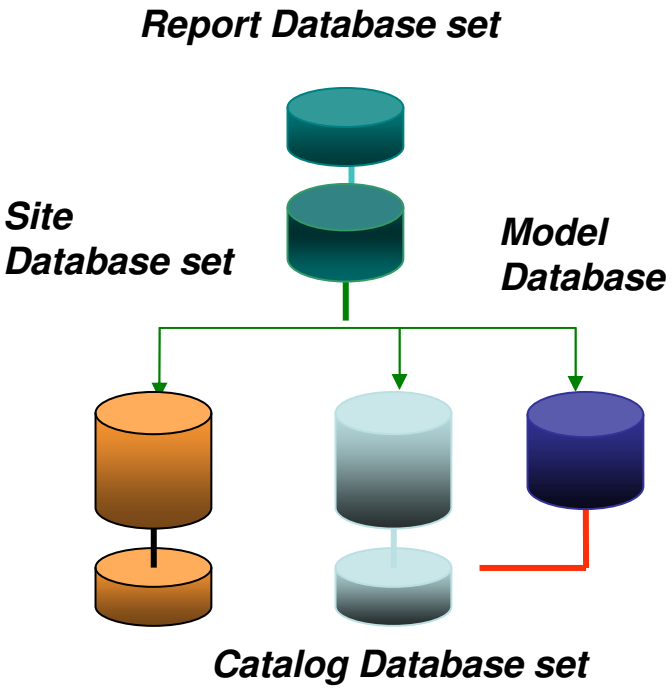
INTERGRAPH

What will be covered in this training?

Overview:

- SmartPlant 3D Reference Data
  - Delivered Catalog
  - Bulkload Utility
  - Catalog Hierarchy
  - Module Types
  - Code List
  - Equipment Hierarchy
  - Custom Interface
  - Equipment Assembly Class

SP3D Databases - Overview



Site Database:
Contains Project Management data such as the names of the databases, global work share locations and the permissions on the model and catalog databases.

Catalog Database:
Contains the design rules and the parts.

Model Database: **Contains instances of the parts defined in the catalog.**

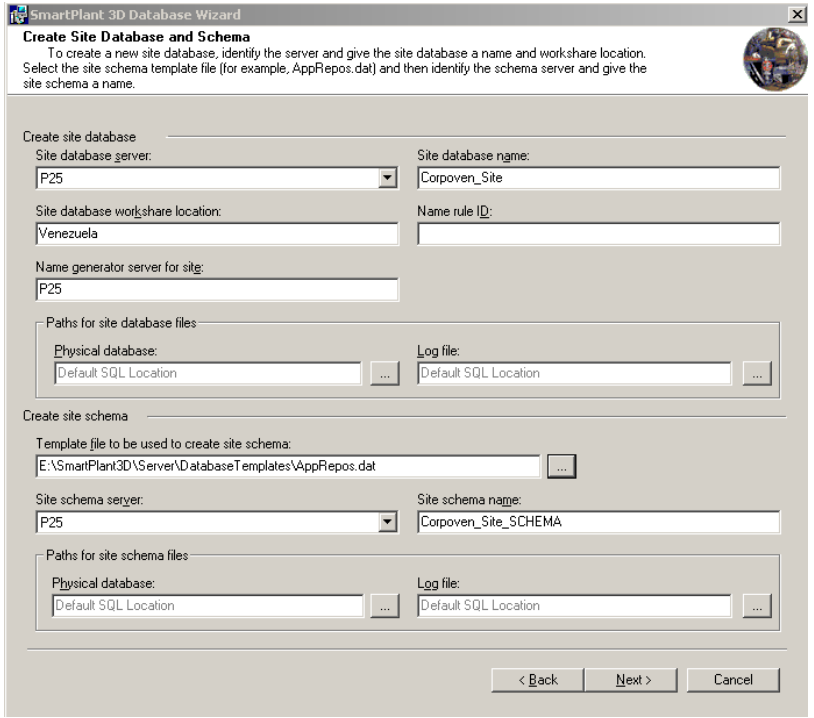
Report Database : **Collection of views on the model, site and catalog.**

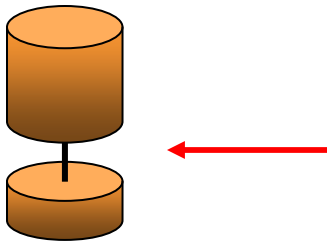
Schemas: **Contains the data about the data. Describes all the business objects for the applications (pipe, fitting, beam, etc…) and their relationships.**

SP3D Databases - Overview

Step 1

- **A site database and schema are created**
  - **The ".dat" file contains the MetaData (or data about the data), which describes all the business objects for the core, and project management applications and their relationships.**





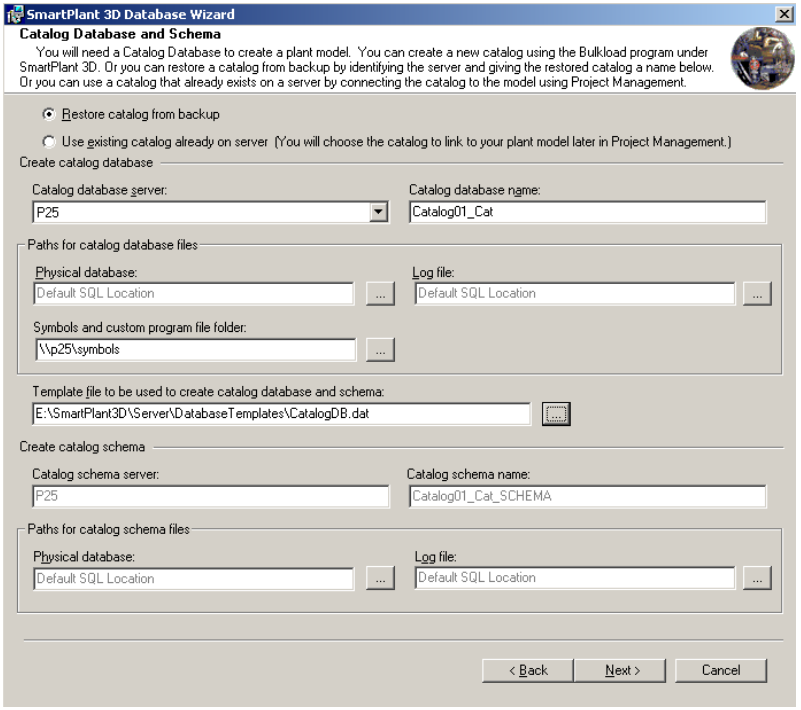
Site Database Schema

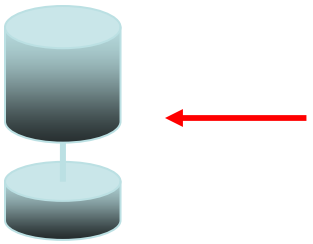
Metadata from AppRepos.dat

SP3D Databases - Overview

Step 2

- **A catalog database and schema are created from a ".dat" file delivered with the product.**
  - **The ".dat" file contains the design rules, parts and the MetaData of the other applications (Equipment, Route, Structure, etc..)**

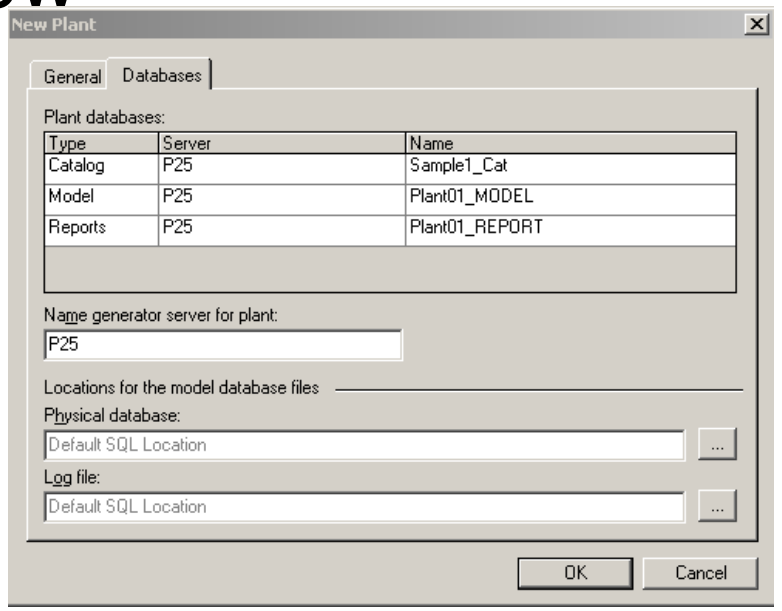




Catalog Database Schema

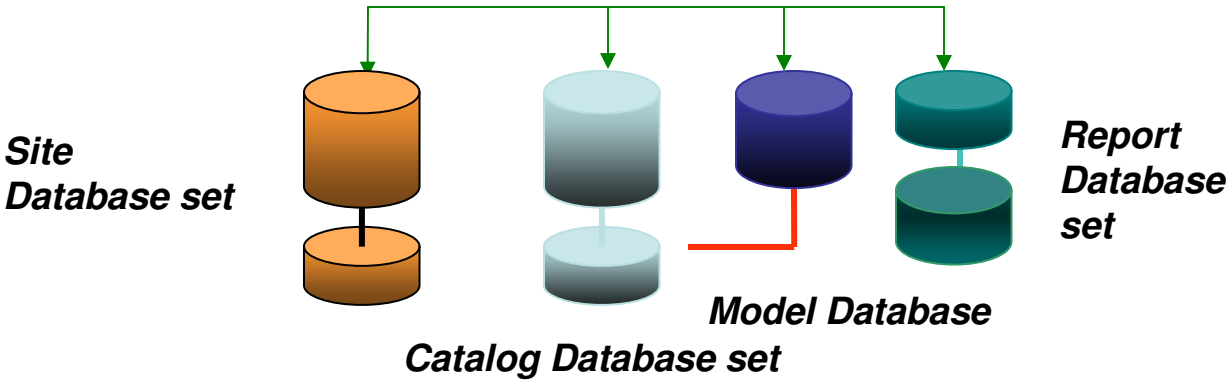
Metadata from Catalogdb.dat

SP3D Databases - Overview



Step 3

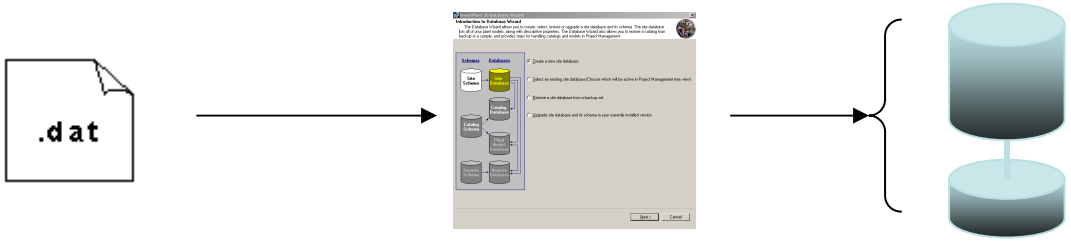
- **A Model is created using the Project Management environment. This action creates a new model database and associates the Model to the desired catalog.**
- **The Report database and schema are created in this step.**



Catalog Database

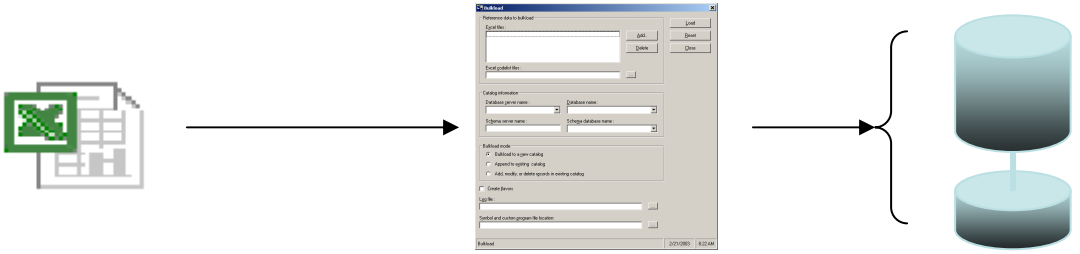
Database Wizard:

Quick restorable Catalog Database set that contains all Intergraph delivered sample data or restore your our CatalogUser.dat



Bulkload Utility:

Creates new Catalog Database(s), and is used to maintain existing Catalog Database(s).



Catalogdb.Dat (SQL Backup Database)

Reference Data

- **Parts (Equipment, Piping, HVAC, Cable tray, Structure, etc..)**
- **Rules (piping specifications, slabs specifications, etc…)**
- **Generic data tables**
- **Labels and report definition**
- **IFC Rules**
- **Naming rule definition**

and so on……

Using Excel Workbooks to Configure Reference Data:

All non-graphical SmartPlant 3D *reference data* is stored in Microsoft Excel Workbooks. The default location for reference data workbooks is *[Product Directory]*\Catalog Data\BulkLoad\DataFiles.
For example,

- AllCodelist.xls
- AllCommon.xls
- ModuleTypes.xls
- GenericNamingRules.xls
- Reports.xls
- IFCRule.xls
- InsulationData.xls
- Drawings.xls
- BulkLoadIsoKeys.xls
- Equipment.xls
- EquipmentComponent.xls
- Standard Nozzle Data.xls
- Shapes.xls

Using Excel Workbooks to Configure Reference Data: (Cont.)

Additional Reference Data is located in *[Product Directory]* \CatalogData\BulkLoad\AdditionalDataFiles\ and

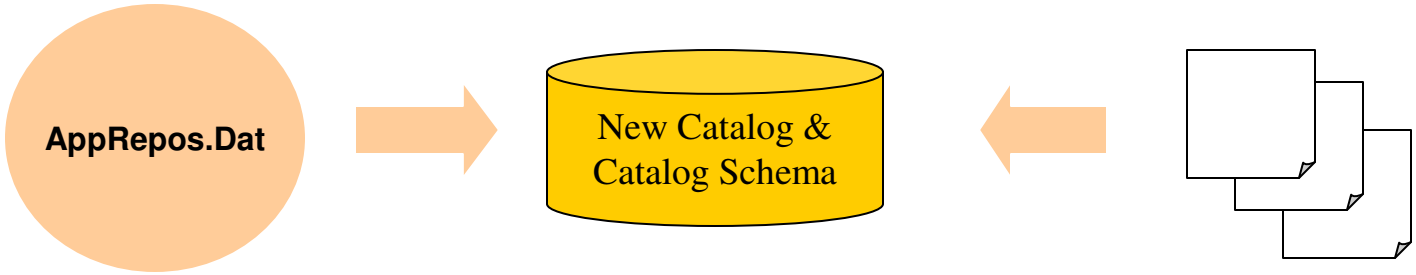
***[Product Directory]* \CatalogData\BulkLoad\SampleDataFiles**

Equipment_SE.xls

Electrical Equipment.xls

Catalog Database Creation

Bulk Load Utility



Reference Data

Excel workbooks

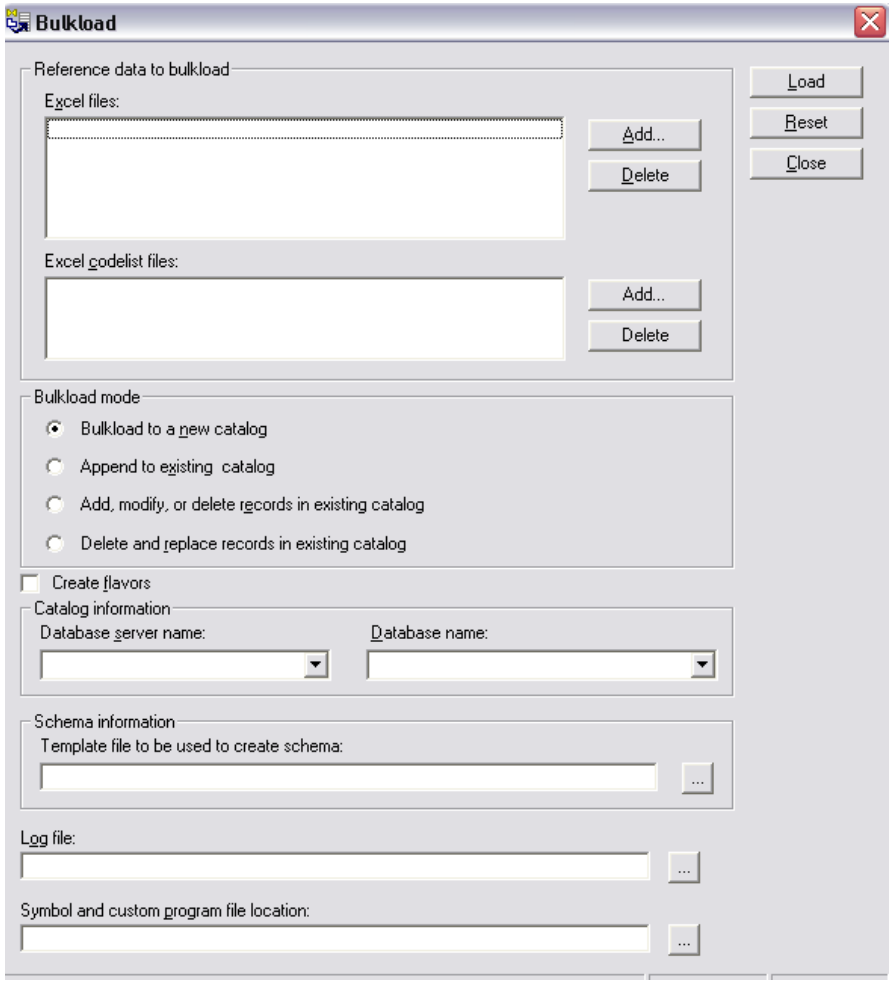
To add reference data to the catalog, you use the Bulkload utility to transfer Excel workbook data into the *Catalog Database*.

Bulkload Utility

The Bulkload Utility provides the primary mechanism to create/add/modify the catalog database. The data for creating the database is defined using Excel workbooks.

Bulkload Mode:

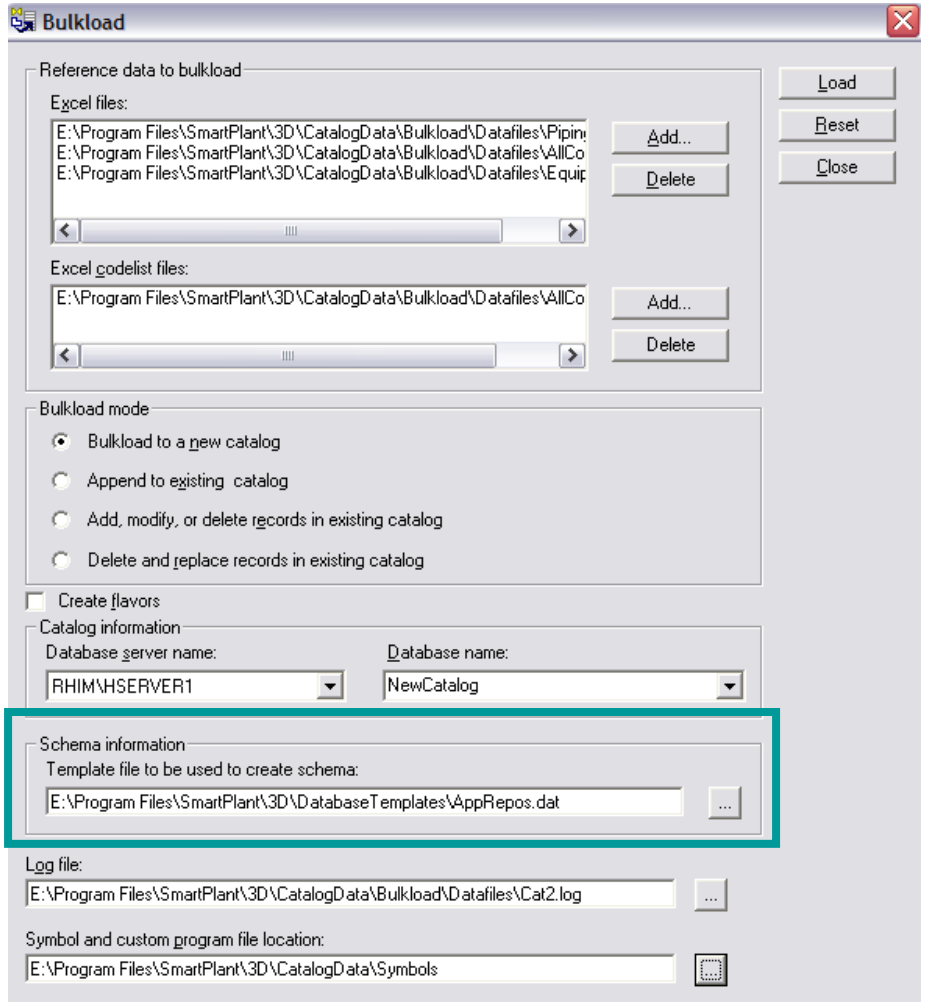
- **Bulkload to a new catalog: is used for creating new catalog database**
- **Append: Add new data only**
- **Add/Modify/Delete: is used for update data**
- **Delete & Replace: is used to replace data in the database with the data currently in the workbooks**



Bulkload Utility

Create New Catalog

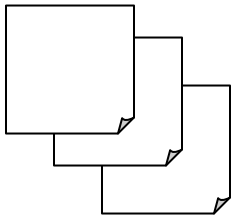
- Bulkload to a new catalog



CatalogDB.Dat

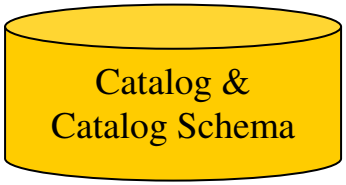
Step 1

Company Excel sheets



Step 2

Bulk Load Utility



Step 3

SQL Enterpriser Manager

Backup Catalog
Backup Catalog Schema

UserCatalogdb.dat

Bulkload Utility

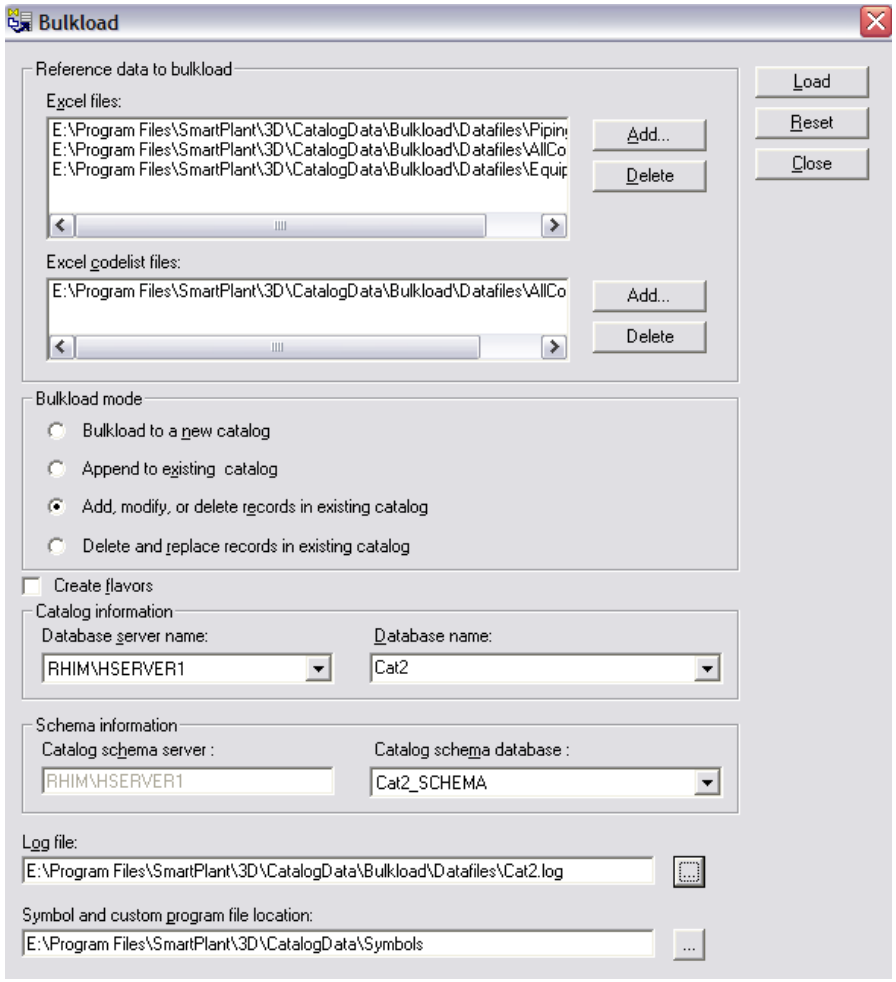
Mode:

- **Append**
- **Add/Modify/Delete**
- **Create Flavors**

  Flavors apply to

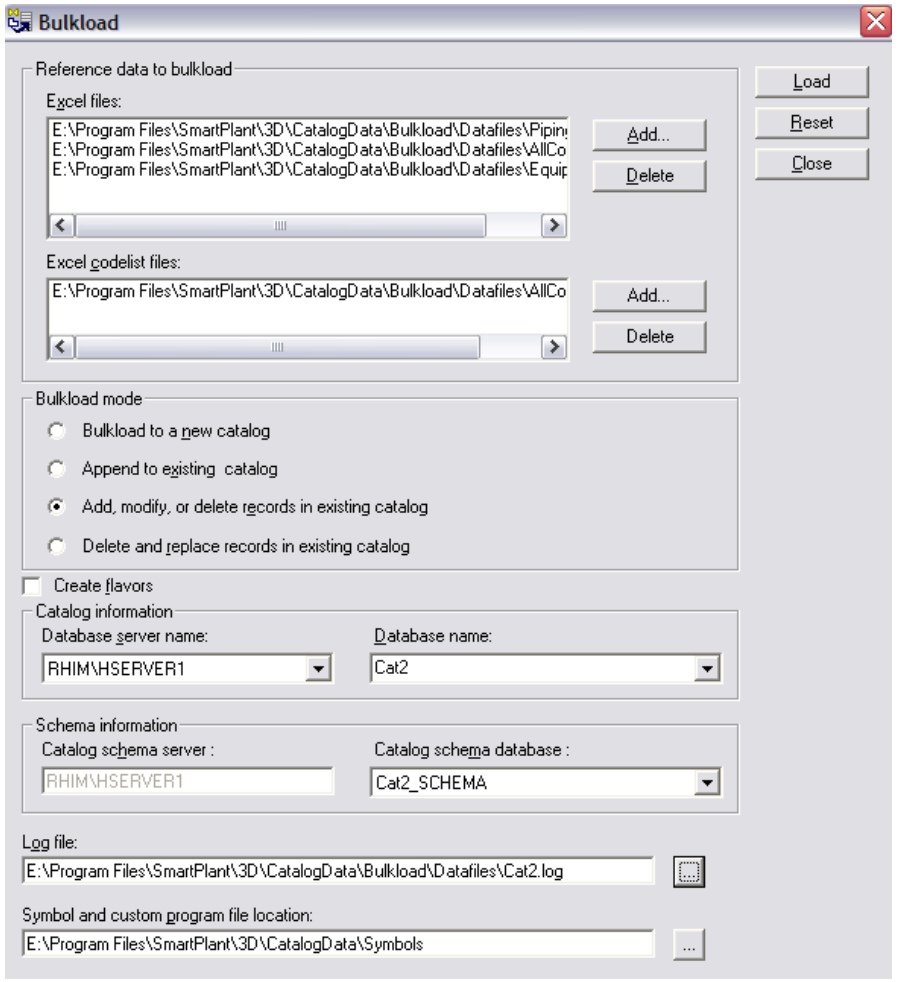
  Solid Edge parts only.

You should close all Excel workbooks before starting the bulkload. Do not open Excel during the bulkload.

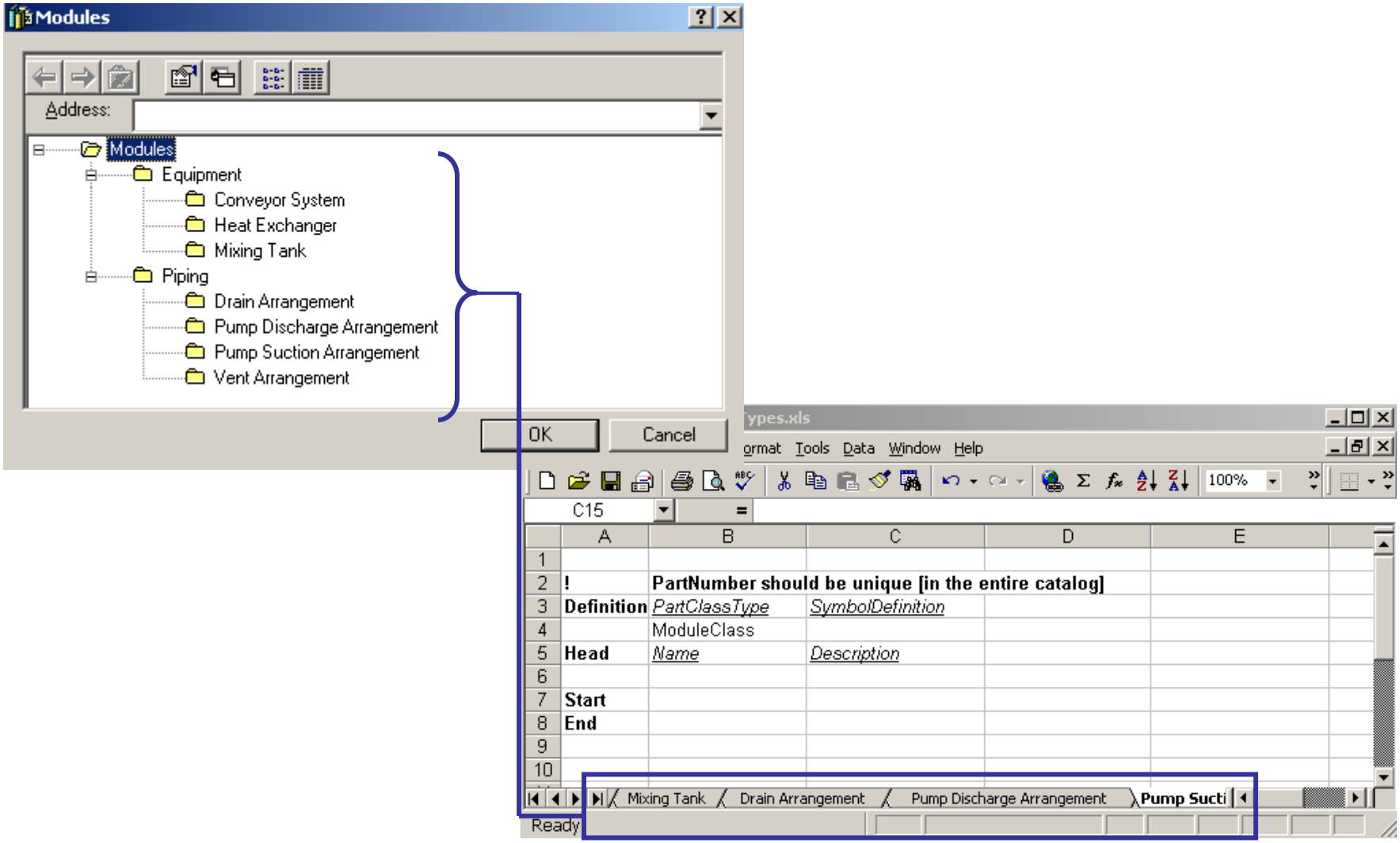


Bulkload Utility

Lab



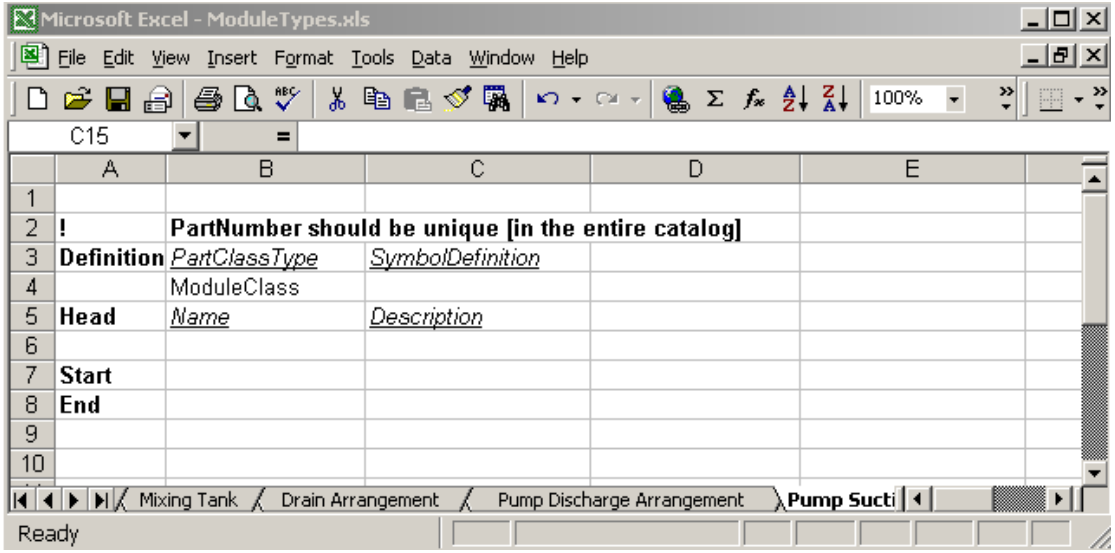
Module Types



Using Excel Workbooks to Configure Catalog Data

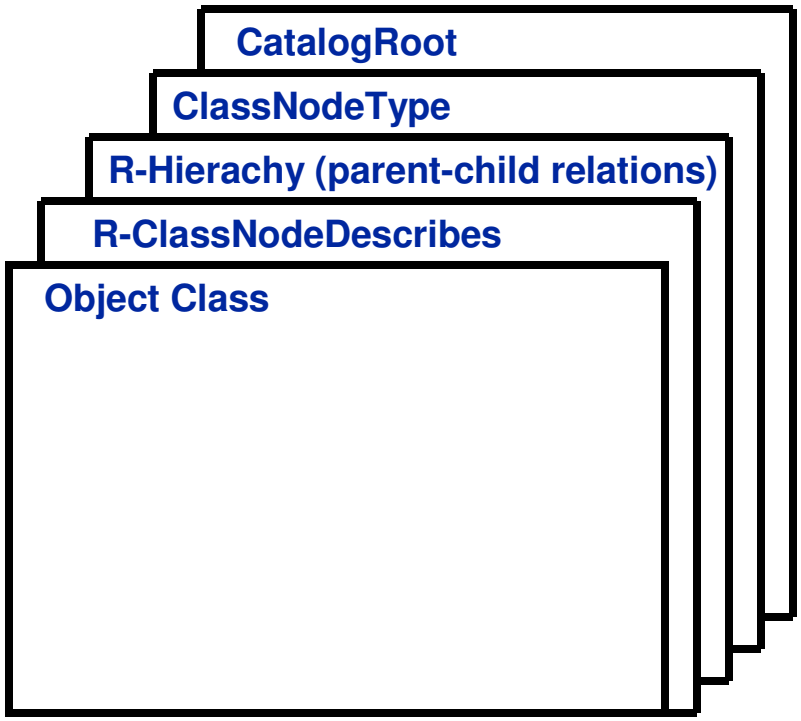
Bulkload Excel Format

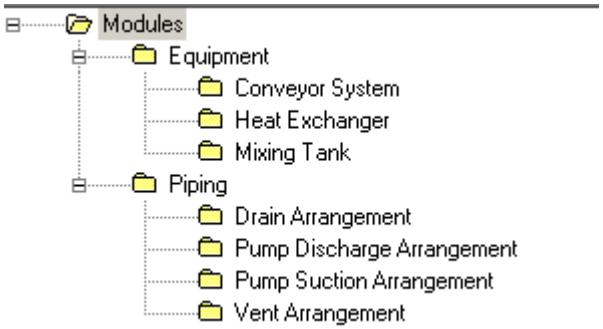
- **The “Head”, “Start” and “End” are always required in the first column. One can have as many empty rows as he/she wants to, anywhere in the sheets. Comments can be put by putting “!” in the first cell of the row in which the comment needs to be put.**
- **Letter bulkload mode A,M,D**



Using Excel Workbooks to Configure Catalog Data

Common Sheets

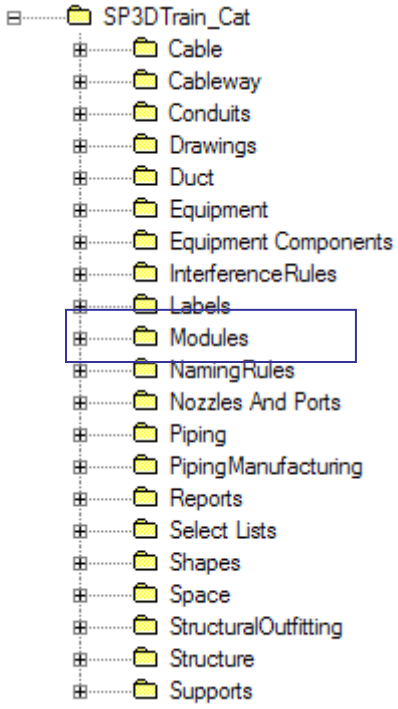




Using Excel Workbooks to Configure Catalog Data

Catalog Hierarchy

- **CatalogRoot**



Using Excel Workbooks to Configure Catalog Data

ClassNodeType

allows you to create a classification folders in the Catalog hierarchy.

- **Object Name column:** **folder object name**
- **Name column:** **folder name in the GUI.**

Head	*ObjectName*	*Name*
Start		
	Equipment Modules	Equipment
	Piping Modules	Piping
End		

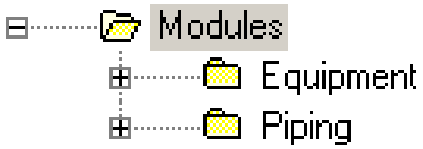
Using Excel Workbooks to Configure Catalog Data

R-Hierarchy

contains the parent-child relationships between folders in the Catalog Hierarchy.

- **RelationSource column:** **specifies the parent object names.**
- **RelationDestination column:** **specifies the children object names.**

Head	*RelationSource*	*RelationDestination*
Start		
	CatalogRoot	RefDataModulesRoot
	RefDataModulesRoot	Equipment Modules
	RefDataModulesRoot	Piping Modules
End		



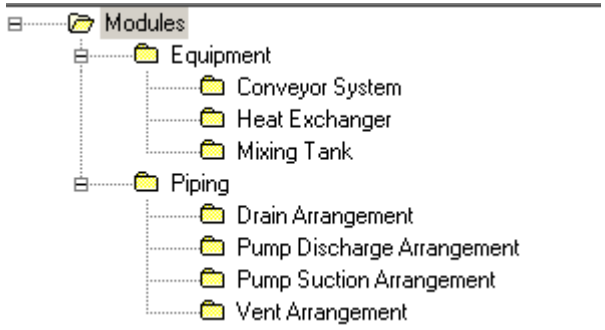
Using Excel Workbooks to Configure Catalog Data

R-ClassNodeDescribes

Defines the parent-child relationships between the classification folders and the part classes.

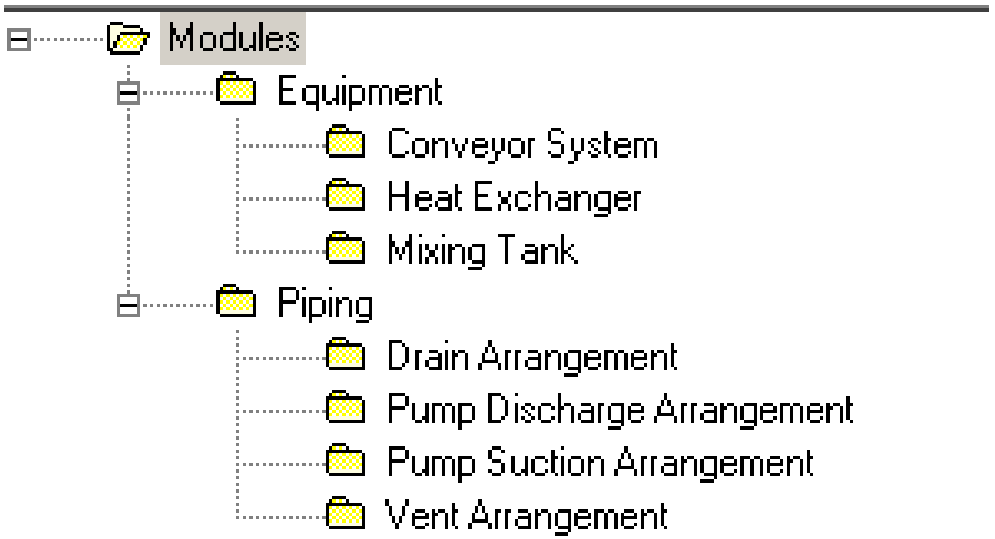
- **RelationSource column: specifies the classification folder.**
- **RelationDestination column: specifies the object classes associated with the classification folder.**

Head	*RelationSource*	*RelationDestination*
Start		
	Equipment Modules	Conveyor System
	Equipment Modules	Heat Exchanger
	Equipment Modules	Mixing Tank
	Piping Modules	Drain Arrangement
	Piping Modules	Pump Discharge Arrangement
	Piping Modules	Pump Suction Arrangement
	Piping Modules	Vent Arrangement
End		



Using Excel Workbooks to Configure Catalog Data

Lab



Reference Data Management

Step 1

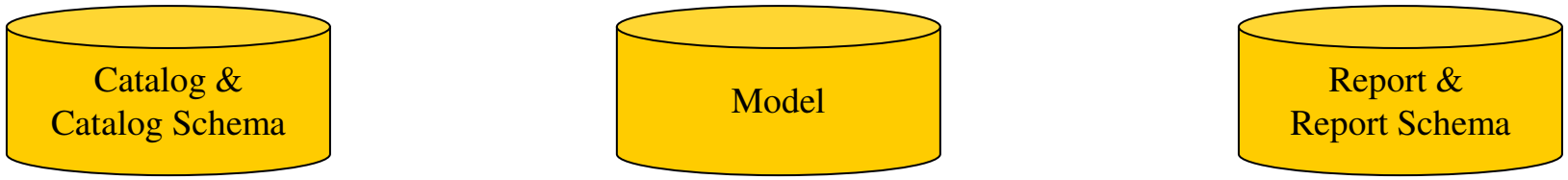
Bulk Load Utility

Step 2

View Generator Utility or Synchronize Model with Catalog Command

Step 3

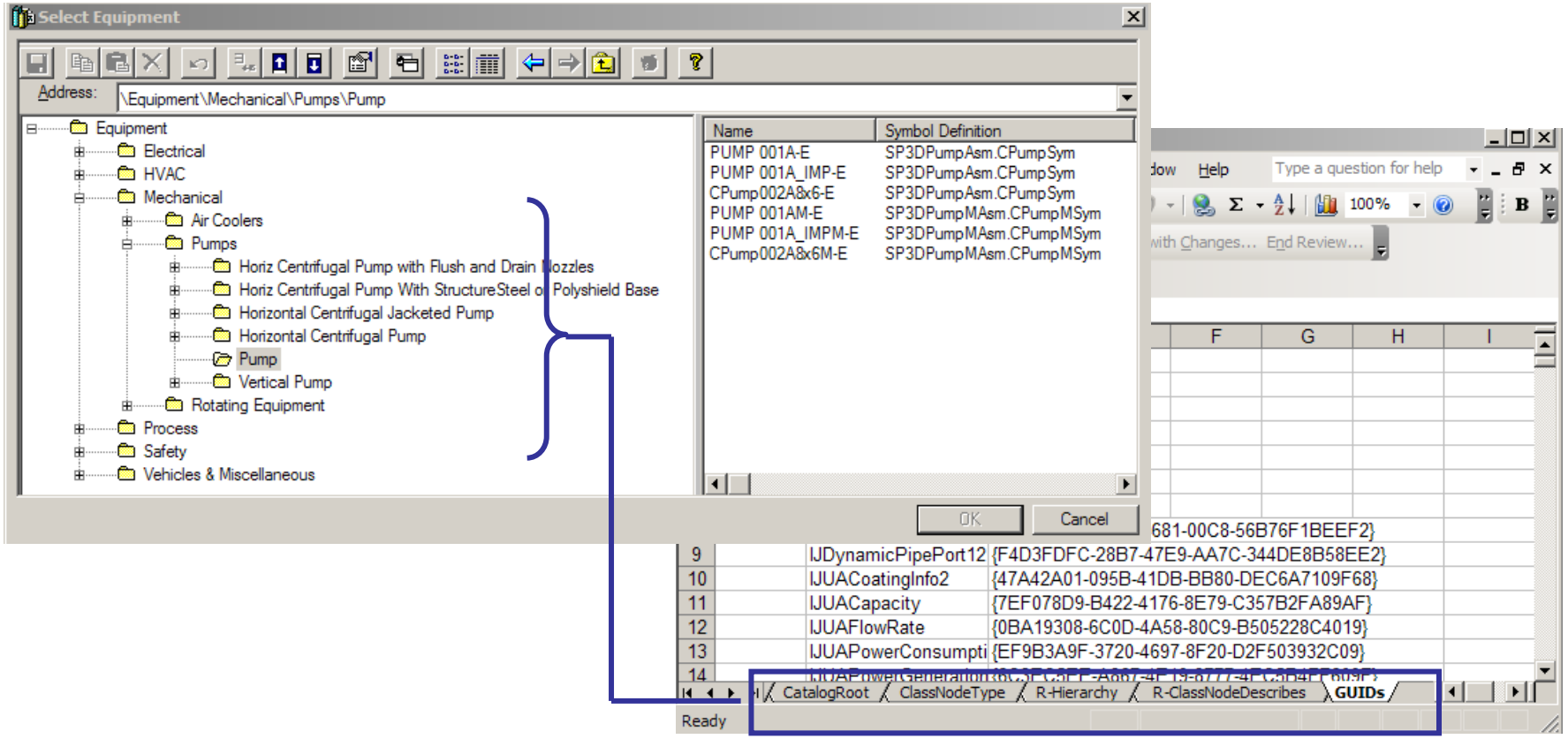
Re-generate the reports database command



- Bulk load utility will update the views in the catalog database
- View Generator Utility will update the views in the model database
- Synchronize model with catalog command will update the views and re-compute all the part occurrences in the model
- Re-generate the report database command will re-generate the views in the model.

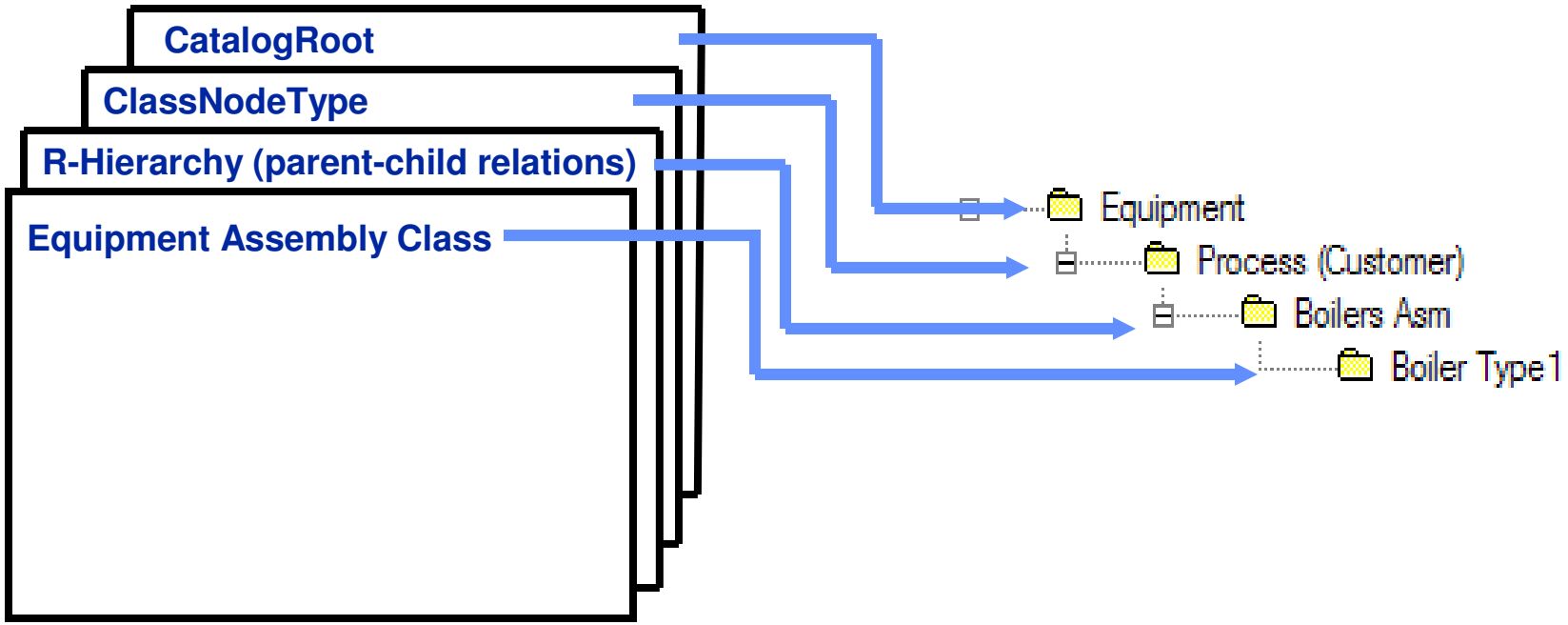
Organizational Hierarchy Sheets

Hierarchy sheets provide the means to manage which items and where items are displayed in the Catalog Task.



Using Excel Workbooks to Configure Catalog Data

Common Sheets

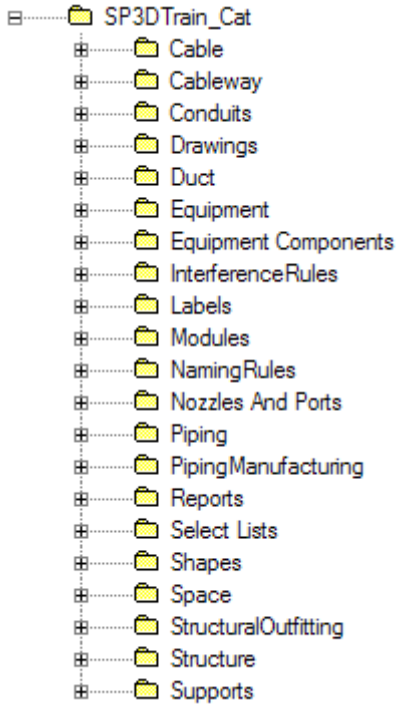


A Equipment Assembly Class is a grouping of items that share similar characteristics

Using Excel Workbooks to Configure Catalog Data

Catalog Hierarchy

CatalogRoot



Head	*Name*
Start	
	CatalogRoot
	Structure
	Equipment
	Piping
	Duct
	Cable
	Cableway
	Space
	Supports
	StructuralOutfitting
End	

Using Excel Workbooks to Configure Catalog Data

ClassNodeType

allows you to create a classification folders in the Catalog hierarchy.

- **Object Name column:** **folder object name**
- **Name column:** **folder name in the GUI.**

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

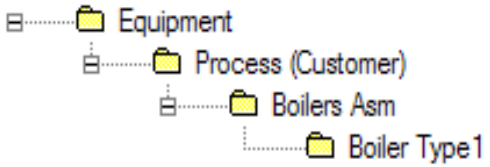
Using Excel Workbooks to Configure Catalog Data

R-Hierarchy

contains the parent-child relationships between folders in the Catalog Hierarchy.

- **RelationSource column:** **specifies the parent object names.**
- **RelationDestination column:** **specifies the children object names.**

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



Using Excel Workbooks to Configure Catalog Data- Part Class Sheet

Equipment Assembly Class is a grouping of smart items that share similar characteristics

	A	B	C	D	E	F	G	H
1								
2	!							
3	!	PartNumber should be unique [in the entire catalog]						
4								
5								
6	Definition	*PartClassType*	*SymbolDefinition*	*UserClassName*	*OccClassName*	*SymbolIcon*	*Nozzle(1):Id*	*Nozzle(1):Type*
7								
8		EquipmentAssemblyClass	SP3DPumpAsm.CPumpSym	Pump	Pump	SymbolIcons\SP3DPumpAsm.gif	Suction	Piping
9								
10								
11								
12								
13	Head	*Name*	*PartDescription*	*MirrorBehaviorOption*	*ReplacementPartNumber*	*ProcessEqTypes5*	*SymbolDefinition*	*Definition*
14								
15	Start							
16		PUMP 001A-E	Centrifugal Pump, 250mm suction, 200mm discharge	50	PUMP 001AM-E	370		SP3DPumpAsm.CPumpDef
17		PUMP 001A_IMP-E	Centrifugal Pump, 10" suction, 8" discharge	50	PUMP 001A_IMPM-E	370		SP3DPumpAsm.CPumpDef
22	End							
23								

PumpAsm | HorizontalCentPumpAsm | HorCFJacketedPumpAsm | HorCFPumpAsm | PumpUnitHCAsm | VerticalPumpAsm | StorageTankAsm | HorizontalDrumAsm | VerticalDrumAsm | VVAirDistrib

Class Definition

Part Class Type:	Type of Class (Example: EquipmentAssemblyClass)
Symbol Definition:	Default Geometric definition for all the parts under this class
SymbolIcon:	Specifies a graphic file for the preview dialog of the part class
UserClassName:	Sets the user name for the part class that appears in the Catalog Browser.
OccClassName:	Sets the occurrence name for the part class that appears in the filter dialog box.
Port ID's:	Defines the port ID
Port Type:	Defines the port Type
Occurrence Attributes:	are properties that you can change for a specific part in the model.

Parts

Part section consists of the following:

- **Common Properties**
- **Custom Assembly Definition**
- **Custom Properties**
- **Port Data**

	A	B	C	D	E	F	G	H
1								
2	!							
3	!	PartNumber should be unique [in the entire catalog]						
4								
5								
6	Definition	PartClassType	SymbolDefinition	UserClassName	OccClassName	SymbolIcon	Nozzle(1):Id	Nozzle(1):Type
7								
8		EquipmentAssemblyClass	SP3DPumpAsm.CPumpSym	Pump	Pump	SymbolIcons\SP3DPumpAsm.gif	Suction	Piping
9								
10								
11								
13	Head	Name	PartDescription	MirrorBehaviorOption	ReplacementPartNumber	ProcessEqTypes5	SymbolDefinition	Definition
14								
15	Start							
16		PUMP 001A-E	Centrifugal Pump, 250mm suction, 200mm discharge	50	PUMP 001AM-E	370		SP3DPumpAsm.CPumpDef
17		PUMP 001A_IMP-E	Centrifugal Pump, 10" suction, 8" discharge	50	PUMP 001A_IMPM-E	370		SP3DPumpAsm.CPumpDef
22	End							
23								

PumpAsm | HorizontalCentPumpAsm | HorCFJacketedPumpAsm | HorCFPumpAsm | PumpUnitHCAsm | VerticalPumpAsm | StorageTankAsm | HorizontalDrumAsm | VerticalDrumAsm | VVAirDistrib

Code List

Codelists – Key or common terms that have been grouped and enumerated.

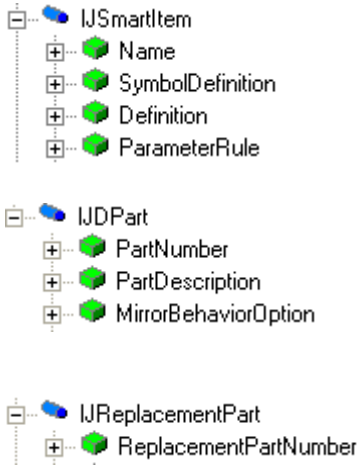
Key Columns:

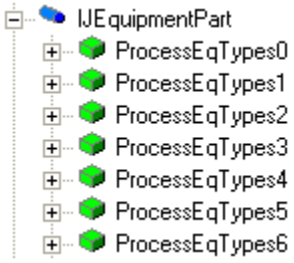
- **Short/Long Description**
- **Codelist Number**
- **Sort Order (Not used in 6.0)**

	SupplyResponsibility ShortDescription	SupplyResponsibility LongDescription	Codelist Number	Sort Order
HEAD				
START				
	Undefined	Undefined	1	
	Contractor	By Contractor	2	
	Owner	By Owner	3	
	Equipment Vendor	By Equipment Vendor	9	
	Vendor	By Vendor	10	
	Piping	By Piping	15	
	Instruments	By Instruments	16	
	Fabrication Shop	By Fabrication Shop	20	
	Others	By Others	25	
END				

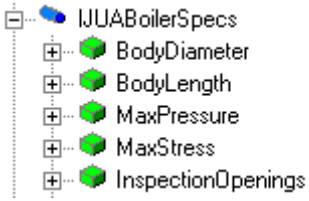
Equipment Data Model

Common Properties





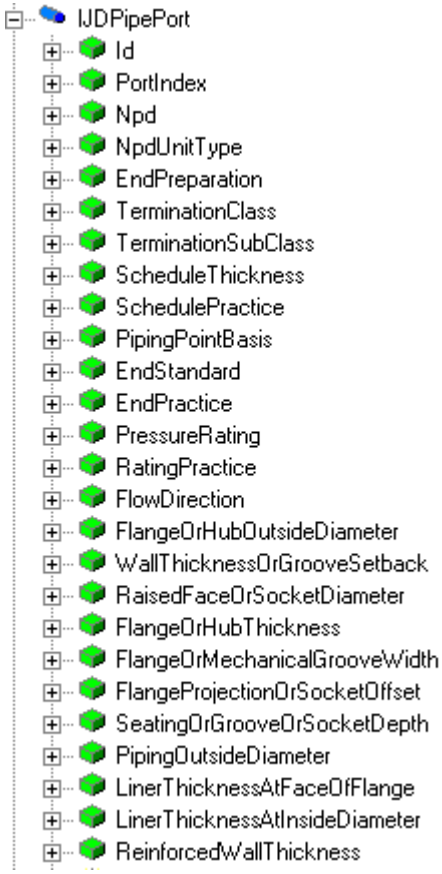
Custom Properties

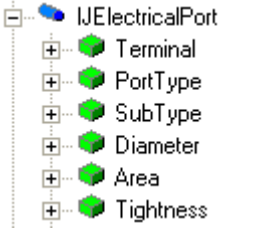


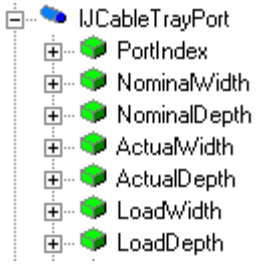
The *Custom Interfaces* sheet defines the customized user interfaces and attributes (properties) for the part classes.

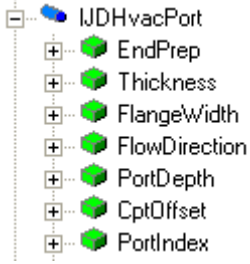
Equipment Data Model

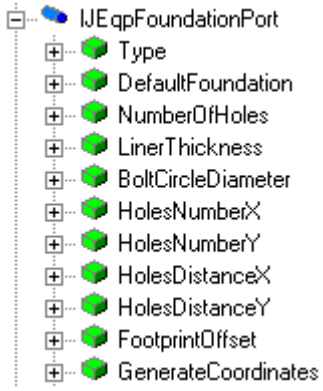
Port Properties











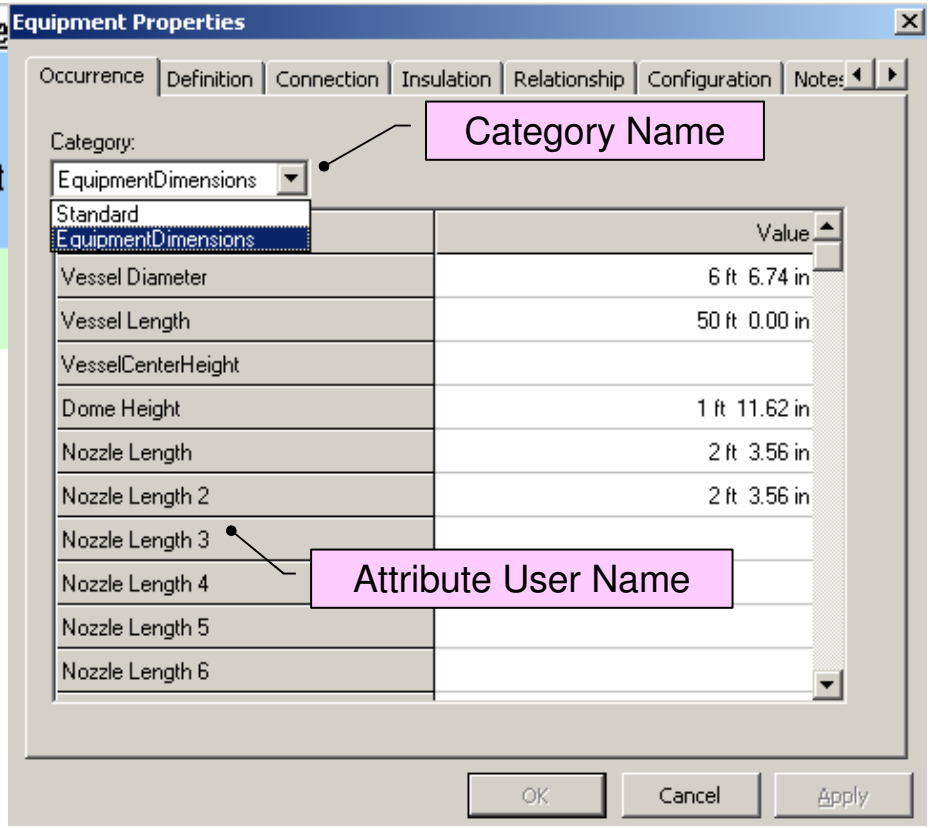
Custom Interfaces Sheet

AttributeName	AttributeUserName	Type	UnitsType	PrimaryUnits	CodeList	CodeListTableNamespace	OnPropertyPage	ReadOnly	SymbolParameter
CoatingArea	Coating Area	Double	Area	m^2			1	0	
MaxCapacity	Maximum Capacity	Double	volume	m^3			1	0	
FlowRate	Flow Rate	Double	flow rate	m^3/s			1	0	
VesselDiameter	Vessel Diameter	Double	Distance	mm			1	0	VesselDiameter
DomeHeight	Dome Height	Double	Distance	mm			1	0	DomeHeight
DomeHeight1	Dome Height 1	Double	Distance	mm			1	0	DomeHeight1
VesselStartPoint	Vessel Start Point	Double	Distance	mm			1	0	VesselStartPoint

- The Custom Interfaces sheet defines the customized user interfaces and attributes (properties) for the part classes in the workbook.
- An interface is a collection of attributes.
- Provides a mechanism to map the attributes of the part class to the symbol inputs.
- When you bulk load the workbook, the software looks at each user attribute on the class sheets and uses the Custom Interfaces sheet to decode the information.

Custom Interfaces Sheet

InterfaceNa	CategoryName	AttributeName	AttributeUserName
IJUAVessel	EquipmentDimensions	VesselDiameter	Vessel Diameter
		VesselLength	Vessel Length
		VesselCenterHeight	VesselCenterHeight
		DomeHeight	Dome Height
IJUAImpeller		ImpellerDiameter	Impeller Diameter
		ImpellerWidth	Impeller Width



- **Category Name (CodeList)**
- **Attribute Name**
- **Attribute User Name**

Custom Interfaces Sheet

An attribute with the same name can exist on more than one interface. On a part class sheet, you can scope the user attributes based on their interfaces and symbol parameters. The scoping syntax is

Interface::UserAttribute<Symbol Parameter>.

InterfaceName	AttributeName	AttributeUserName	Type	UnitsType	PrimaryUnits	OnProperty	ReadOnly	SymbolParameter
IJUAEqpParmOcc	var_a	A	Double	Distance	mm	1	0	TankLength
	var_b	B	Double	Distance	mm	1	0	NozzleLength

oa:var_a<TankLength>	oa:IJUAEqpParmOcc::var_b<NozzleLength>

var_a<TankLength>	IJUAEqpParmOcc::var_b<NozzleLength>
3ft	8in

Custom Interfaces Sheet

When an object uses a single attribute from an interface, the object also inherits all the attributes for that interface regardless of whether the object uses the other attributes.

InterfaceNa	CategoryName	AttributeName	AttributeUserName
IJUAVessel	EquipmentDimensions	VesselDiameter	Vessel Diameter
		VesselLength	Vessel Length
		VesselCenterHeight	VesselCenterHeight
		DomeHeight	Dome Height
IJUAImpeller		ImpellerDiameter	Impeller Diameter
		ImpellerWidth	Impeller Width