SmartPlant Foundation 2008 (4.2) Configuration and Administration II

Course Guide Volume 2

INTERGRAPH

Version 4.2.1	February 2009	DSPF1-TP-100016A

SmartPlant Foundation 2008 (4.2) Configuration and Administration II

Course Guide Volume 2

February 2009 Version 4.2.1

DSPF1-TP-100016A

Copyright

Copyright © 2002 - 2009 Intergraph Corporation. All Rights Reserved.

Including software, file formats, and audiovisual displays; may be used pursuant to applicable software license agreement; contains confidential and proprietary information of Intergraph and/or third parties which is protected by copyright law, trade secret law, and international treaty, and may not be provided or otherwise made available without proper authorization.

Restricted Rights Legend

Use, duplication, or disclosure by the Government is subject to restrictions as set forth in subparagraph (c) of the *Contractor Rights in Technical Data* clause at DFARS 252.227-7013, subparagraph (b) of the *Rights in Computer Software or Computer Software Documentation* clause at DFARS 252.227-7014, subparagraphs (b)(1) and (2) of the *License* clause at DFARS 252.227-7015, or subparagraphs (c) (1) and (2) of *Commercial Computer Software---Restricted Rights* at 48 CFR 52.227-19, as applicable.

Unpublished---rights reserved under the copyright laws of the United States.

Intergraph Corporation
Huntsville, Alabama 35894-0001

Warranties and Liabilities

All warranties given by Intergraph Corporation about equipment or software are set forth in your purchase contract, and nothing stated in, or implied by, this document or its contents shall be considered or deemed a modification or amendment of such warranties. Intergraph believes the information in this publication is accurate as of its publication date.

The information and the software discussed in this document are subject to change without notice and are subject to applicable technical product descriptions. Intergraph Corporation is not responsible for any error that may appear in this document.

The software discussed in this document is furnished under a license and may be used or copied only in accordance with the terms of this license.

No responsibility is assumed by Intergraph for the use or reliability of software on equipment that is not supplied by Intergraph or its affiliated companies. THE USER OF THE SOFTWARE IS EXPECTED TO MAKE THE FINAL EVALUATION AS TO THE USEFULNESS OF THE SOFTWARE IN HIS OWN ENVIRONMENT.

Trademarks

Intergraph, the Intergraph logo, SmartSketch, FrameWorks, SmartPlant, SmartPlant Foundation, SmartPlant P&ID, SmartPlant Instrumentation and INtools are registered trademarks of Intergraph Corporation. Microsoft and Windows are registered trademarks of Microsoft Corporation. Other brands and product names are trademarks of their respective owners.

This courseware was developed by PPM-PIM Training, Huntsville, Alabama.

SmartPlant® Foundation

SPF 4.2 Configuration and Administration II (SPFA2)

Course Outline

Day 1

1. **SmartPlant Foundation 2008 Overview and Architecture**
   - Introduction to SPF Architecture
   - SmartPlant Foundation Authoring - Stand-Alone Mode
   - SmartPlant Foundation - Data Warehouse Mode
   - Combined Mode
   - SPF Containers

SPF 4.2 Configuration and Administration II (SPFA2)

- Data Model Layering
- Domains and Domain Groups
- SPF 2008 Database Tables
- Overview of Domains and Roles
- Data Warehouse Overview
- Managing Data Inconsistencies

SmartPlant® Foundation

SPF 4.2 Configuration and Administration II (SPFA2)

2. Understanding the Loader Interface

- XML Load Format
- NLF Load File Format
- Loading Documents Using NLF
- Relationship Data
- Loading a Document with an Attached File
- Processing Load Files
- Reload Files
- Introduction to the Schema Import Wizard

SPF 4.2 Configuration and Administration II (SPFA2)

- Activity 1 – Loading SPF Users, Organizations and Role Assignments
- Activity 2 – Create Design Document Load File
- Activity 3 – Loading Schema Definitions with the Schema Import Wizard

3. Introduction to SPF Infrastructure

- Container Management
- System Administration User Preferences
- Expand Structure
- Subscriptions and Notifications
- Importing Schema Changes
- Creating Custom Notifications

SPF 4.2 Configuration and Administration II (SPFA2)

Day 2

- Activity 1 – Subscriptions and Notifications
- SmartPlant Foundation Scheduler
- Configuring SmartPlant Foundation E-mail
- Configuring E-mail Digests
- Custom Calendars
- Introduction to Vault Replication
- Activity 2 – SPF Scheduler and Calendars

SmartPlant® Foundation

SPF 4.2 Configuration and Administration II (SPFA2)

4. Overview of Forms

- Generating a Form
- Form Editing with Form Builder
- Modifying Data Form Sections
- Modifying Display Items
- Activity 1 – Creating Forms
- Creating Forms Manually
- Copying Forms
- Activity 2 – Manually Creating Forms

SmartPlant® Foundation

SPF 4.2 Configuration and Administration II (SPFA2)

5. The SPF Administrative GUI

- Introduction to API's and Methods
- Client API's
- Conditions
- Configuring New Methods
- Manage Related Items
- View Related Items
- Relating New Classes to a Domain

Activity 1 – Configuring New Methods

SPF 4.2 Configuration and Administration II (SPFA2)

- Creating and Managing Menus and Menu Items
- Managing Sub Menus
- Creating Toolbars
- Quick Find Menu Items
- Activity 2 – Creating Menus and Menu Items
- Tree View Display Column Set
- Enumeration Lists and Hierarchies
- Activity 3 – Creating Column Sets

SPF 4.2 Configuration and Administration II (SPFA2)

Day 3

6. Introduction to Classified Objects

- Modeling the Classification
- Loading and Viewing Classified Definitions
- Viewing the Classification Tree
- Creating a New Form for Classification
- Creating Methods for Classified Objects
- Creating Menu Items for Classified Objects
- Creating a Drill Down Tree
- Configuring the Engineering Numbering System

SPF 4.2 Configuration and Administration II (SPFA2)

- Testing Homogeneous Classifications
- Configuring and Testing Heterogeneous Classifications
- Activity - Creating Classified Objects

7. Introduction to SmartPlant Foundation Workflow

(with an interactive activity during the chapter)

- Creating Workflows
- Distribution Matrix Overview
- Building a Workflow
- Viewing Workflows
- Attaching Workflows

SPF 4.2 Configuration and Administration II (SPFA2)

- Workflow Options
- Using Workflows
- Submitting a Document to the Workflow
- Workflow Signoffs
- Workflow History

SmartPlant® Foundation

SPF 4.2 Configuration and Administration II (SPFA2)

8. Introduction to Transmittals

- Transmittal Project Roles
- Transmittal Structure
- Transmittal Administrative Setup
- Transmittal Users and Roles
- Modifying Transmittal Workflows
- Distribution Matrix Overview

Activity 1 – Transmittal Administrative Setup

SPF 4.2 Configuration and Administration II (SPFA2)

Day 4

- Creating an Internal Transmittal
- Creating a Transmittal Section
- Expanding the Transmittal Structure
- Creating an External Transmittal
- Saving a Transmittal Template
- Create a Transmittal for a Selected Set of Documents
- Creating a Transmittal from a Template

Activity 2 – Creating Transmittals

SmartPlant® Foundation

SPF 4.2 Configuration and Administration II (SPFA2)

9. Using and Managing Transmittals

- Searching for Transmittals
- Processing a Transmittal
- Preparing a Transmittal
- Approve Transmittal
- Exporting a Transmittal Structure
- Issuing a Transmittal and Recipient Response
- Completing a Transmittal
- Transmittal Manipulations
- Activity – Using and Managing Transmittals

SPF 4.2 Configuration and Administration II (SPFA2)

10. Creating and Using Datasheets

- Working with Datasheets
- The SmartPlant Schema
- Creating a Custom Interfaces and Properties
- Creating a Datasheet Graph Definition
- Creating a Datasheet View Definition
- CMF File Manager
- Importing Datasheet Schema Additions
- Loading Additional Relationships

Activity 1 – Schema Modeling to Support Datasheets

SPF 4.2 Configuration and Administration II (SPFA2)

- Creating New Datasheet Templates
- Creating a Datasheet Definition
- Using the Datasheet Definer
- Mapping a String Property Value
- Mapping a UOM Property Value
- Saving the Datasheet Mapping

Activity 2 – Creating Datasheet Template Documents, Datasheet Definitions and Using Datasheet Definer

SPF 4.2 Configuration and Administration II (SPFA2)

- Registering an Authoring Tool
- Retrieving a Published Instrument
- Defining Process Cases
- Testing Datasheet Functionality
- Using Datasheets Offline
- Loading Offline Datasheet Updates

Activity 3 – Testing Custom Datasheets

SmartPlant® Foundation

SPF 4.2 Configuration and Administration II (SPFA2)

11. Adhoc Reporting

- Creating a Report Graph Definition
- Creating a Report View Definition
- Custom Line List Adhoc Report Contents
- Creating a Graph Definition for the Line List Report
- Creating a View Definition for the Line List Report
- Importing Report Schema Additions
- Generating a Report
- Additional Adhoc Report Options
- Generating a Line List Adhoc Report

Activity – Creating and Running AdhocReports

SPF 4.2 Configuration and Administration II (SPFA2)

Day 5

12. Introduction to the Excel Import

- Excel Import Setup
- Preparing the Import File
- Importing the Objects

13. Creating Plant Hierarchies

- Creating the Custom Hierarchy in the Schema Editor
- Loading the New Hierarchy into the Database
- Create Admin Objects for the New Hierarchy

SPF 4.2 Configuration and Administration II (SPFA2)

- Update the PBS Map Files
- Test the Custom PBS Hierarchy
- Activity – Creating a Custom Plant Hierarchy

Wrap up and Dismissal

Table of Contents

8. SPF Transmittal Overview 8-3

8.1 Transmittal Project Roles 8-7

8.2 Transmittal Structure 8-9

8.3 Transmittal Administrative Setup 8-11
8.3.1 Creating a Department / Office 8-12
8.3.2 External Organizations 8-15
8.3.3 Creating a Supplier 8-18
8.3.4 Creating a Contract 8-21
8.3.5 Transmittal Users and User Groups 8-24
8.3.6 Transmittal Role Assignments 8-28

8.4 Modifying Transmittal Workflows 8-31

8.5 Distribution Matrix Overview 8-39
8.5.1 Creating an Internal Transmittal Matrix 8-42
8.5.2 Creating an External Transmittal Matrix 8-49

8.6 Activity 1 – Transmittal Administrative Setup 8-55

8.7 Creating an Internal Transmittal 8-57
8.7.1 Creating a Transmittal Section 8-63
8.7.2 Expanding the Transmittal Structure 8-66

8.8 Creating an External Transmittal 8-68

8.9 Saving a Transmittal Template 8-71

8.10 Create a Transmittal for a Selected Set of Documents 8-73

8.11 Creating a Transmittal from a Template 8-76
8.12 Activity 2 – Creating Transmittals 8-79

9. Using and Managing Transmittals 9-3

9.1 Searching for Transmittals 9-5

9.2 Transmittal Preparation and Approval 9-11
9.2.1 Preparing a Transmittal 9-14
9.2.2 Approve Transmittal 9-23

9.3 Issuing a Transmittal 9-32
9.3.1 Exporting a Transmittal Structure 9-38
9.3.2 Tracking Recipient Responses 9-44

9.4 Completing a Transmittal 9-49

9.5 Transmittal Manipulations 9-59
9.5.1 Updating Transmittals 9-59
9.5.2 Canceling a Transmittal 9-61
9.5.3 Terminating Transmittals 9-63
9.5.4 Terminating Transmittal Sections 9-65

9.6 Activity – Using and Managing Transmittals Error! Bookmark not defined.

10. Introduction 10-3

10.1 Objectives 10-4

10.2 Working with Datasheets 10-6

10.3 The SmartPlant Schema 10-9
10.3.1 Launching the Schema Editor 10-10
10.3.2 Editing an Open Schema File 10-16
10.3.3 Reviewing the Delivered Schema 10-20
10.3.4 Creating a Custom Interface 10-23
10.3.5 Creating a Custom Property 10-26
10.3.6 Creating a Datasheet Graph Definition 10-31
10.3.7 Creating a Datasheet View Definition 10-36
10.3.8 Check In Modified Schema 10-41

10.4 CMF File Manager 10-43

10.5 Importing Datasheet Schema Additions 10-47
10.5.1 Loading Additional Relationships 10-52

10.6 Activity 1 – Schema Modeling to Support Datasheets 10-61

10.7 Creating New Datasheet Templates 10-63

10.8 Creating a Datasheet Definition 10-68

10.9 Using the Datasheet Definer 10-81
10.9.1 Mapping a String Property Value 10-84
10.9.2 Mapping a UOM Property Value 10-87
10.9.3 Saving the Datasheet Mapping 10-94

10.10 Activity 2 – Creating Datasheet Template Documents, Datasheet Definitions and Using Datasheet Definer 10-97

10.11 Registering an Authoring Tool 10-99
10.11.1 Retrieving a Published Instrument 10-102

10.12 Defining Process Cases 10-106

10.13 Testing Datasheet Functionality 10-109

10.14 Using Datasheets Offline 10-116
10.14.1 Loading Offline Datasheet Updates 10-123

10.15 Activity 3 – Testing Custom Datasheets 10-127

11. Adhoc Reporting 11-3

11.1 Creating a Report Graph Definition 11-5

11.2 Creating a Report View Definition 11-14

11.3 Custom Line List Adhoc Report Contents 11-22
11.3.1 Creating a Graph Definition for the Line List Report 11-26
11.3.2 Creating a View Definition for the Line List Report 11-31

11.4 Importing Report Schema Additions 11-40

11.5 Adding View Definition Security 11-45

11.6 Generating a Report 11-49
11.6.1 Additional Adhoc Report Options 11-62
11.7 Generating a Line List Adhoc Report 11-68
11.8 Activity – Creating and Running Adhoc Reports 11-71

12. Introduction to the Excel Import 12-3
12.1 Excel Import Setup 12-4
12.2 Preparing the Import File 12-6
12.3 Importing the Objects 12-8

13. Creating Plant Hierarchies 13-3
13.1 Creating the Custom Hierarchy in the Schema Editor 13-4
13.2 Loading the New Hierarchy into the Database 13-16
13.3 Create Admin Objects for the New Hierarchy 13-22
13.4 Update the PBS Map Files 13-30
13.5 Test the Custom PBS Hierarchy 13-36
13.6 Activity – Creating a Custom Plant Hierarchy 13-47

CHAPTER 8

Introduction to Transmittals

8. SPF Transmittal Overview

Transmittals are used to distribute documentation around an organization and between different organizations. They record what documents are sent to whom, why, what response is expected of them by when and the response received. In a paper based system, the transmittal is used by the print room to prepare physical prints.

This chapter details how transmittals are set up and configured in the Schema Object model to enable you to change the configuration to match the site requirements.

Overview of Transmittals

What is a Transmittal?

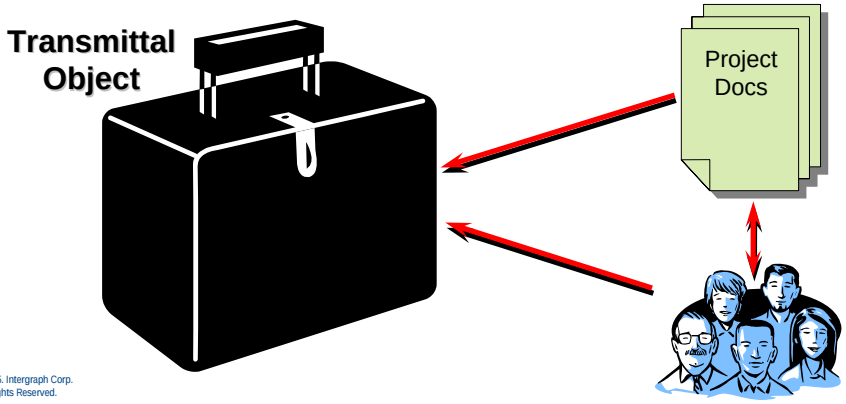
The term transmittal usually refers to the top sheet or report that lists how many copies of each document are sent to whom, and for what reason.

© 2005. Intergraph Corp.
All Rights Reserved.

Overview of Transmittals

What is a Transmittal?

In an electronic system such as SmartPlant Foundation, the transmittal becomes a collection object that links a set of documents to a set of recipients with reasons for receipt.



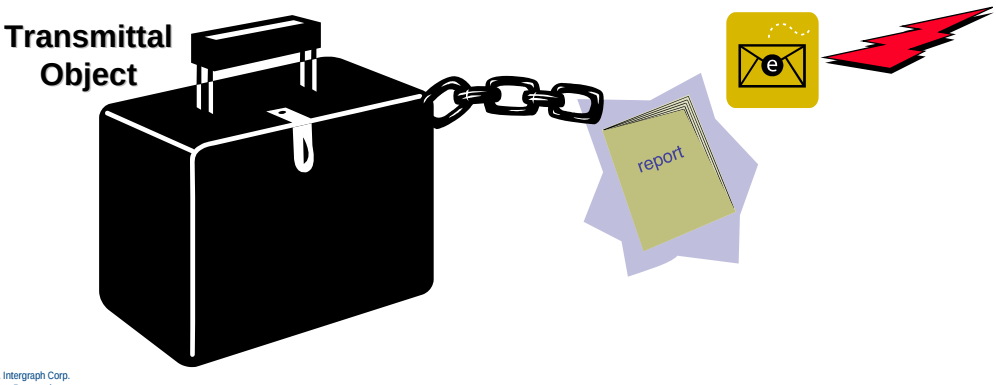
© 2005. Intergraph Corp.
All Rights Reserved.

Transmittal object acts as a container for a package of documentation.

Overview of Transmittals

What is a Transmittal?

A transmittal report is attached to the collection object and is emailed to the recipients upon issue of the transmittal.



© 2005. Intergraph Corp.
All Rights Reserved.

The Schema Object model has been extended to provide the transmittals functionality.

Overview of Transmittals

What is a Transmittal?

- **A formal release and distribution mechanism for document control – a controlled package of documentation**
  - **Within internal organizations**
  - **To external organizations (etween different companies)**
- **Notifies recipients of their involvement via email**
- **Allows responses from recipients to be formally recorded**
- **Plays an important part in tracking the progress of a project**

© 2005. Intergraph Corp.
All Rights Reserved.

Transmittals play an important role in tracking the progress of a project. Milestone payments from the client are often linked to the distribution of particular documentation on transmittals, the most notable of which is the site construction transmittal when documents are released to the site for construction.

Transmittals are also useful for internal document management, such as the distribution of control documentation, safety procedures, and other documents between internal organizations.

Transmittals can be modeled with or without transmittal sections that group the documents together.

Distribution matrices are used to set up lists of recipients for specific types of documents, such as mechanical P&IDs. Each distribution matrix is created with a *Reason For Issue*, such as *For Design Review* or *For Construction*. Each recipient on the matrix has a **Reason for Receipt** field, such as *For Information*, *For Comment* or *For Work* to specify which action, if any, is required of the user upon receipt of the transmittal.

Overview of Transmittals

- A **Distribution Matrix** is used to set up a list of recipients for specific types of documents.
- Each distribution matrix is set to a **Reason For Issue**, such as ***For Design Review*** or ***For Construction***.
- Each recipient on the matrix has a **Reason for Receipt**, such as ***For Comment***, ***For Information***, or ***For Work***.
- In SPF there are 2 kinds of Distribution Matrices delivered:
  - Internal Matrix
  - External Matrix

© 2005. Intergraph Corp.
All Rights Reserved.

Transmittals often have a controlling recipient, so that the responses from all the recipients are fed back through the controlling recipient rather than individually.

The transmittal is issued and the attached documents are distributed to the list of recipients. In a paper-based world, a transmittal report is printed and sent to the Print Room, where all the relevant documents are printed and packaged for distribution. In a fully integrated transmittal and document management system, the transmittal report is mailed electronically to the recipients, who log in to retrieve the relevant documents and perform whatever actions are necessary, such as comments or changes. If recipients do not have access to the document management system, the documents must be made available through some other mechanism, such as shared folders, FTP sites, or distribution on CD-ROM.

Transmittals that are issued for information are closed out after issue. Transmittals that are issued for comment remain active until all comments are received, at which point the transmittal can be closed, usually by the Document Controller. Transmittals that are issued in error can be cancelled. In this case, a transmittal report with an issue state of **CANCELLED** is redistributed as a form of recall notice.

8.1 Transmittal Project Roles

This section lists typical user roles associated with transmittals. These roles are the *document controller*, *design engineer*, *client*, and *vendors/sub-contractors*.

INTERGRAPH

Transmittal Project Roles

Document Controllers

These personnel are responsible for the integrity of all project documentation and the distribution of that documentation to the relevant project groups at the appropriate time. The tasks that they perform are typically:

- ❑ **Project document index management**
- ❑ **Transmittal preparation and distribution**
- ❑ **Transmittal distribution management**
- ❑ **Transmittal response tracking and follow up**

© 2005. Intergraph Corp.
All Rights Reserved.

INTERGRAPH

Transmittal Project Roles

Design Engineer

These users are responsible for the generation of the project documentation. Although they do not manage transmittals themselves, they typically:

- ❑ **Review transmittal histories of documents**
- ❑ **Prepare outline transmittals**
- ❑ **Prepare transmittal issue requests**
- ❑ **Receive and respond to transmittals**

© 2005. Intergraph Corp.
All Rights Reserved.

Transmittal Project Roles

Client

Client recipients have to be clearly marked and distinguished from the main project recipients on most transmittals. They typically:

- ❑ **Review transmittal histories of documents (via email)**
- ❑ **Receive and respond to transmittals (via email)**

© 2005. Intergraph Corp.
All Rights Reserved.

Transmittal Project Roles

Vendors and Sub-Contractors

These personnel are usually not connected to the project management system, but still exchange documentation with the project team, and often in large batches.

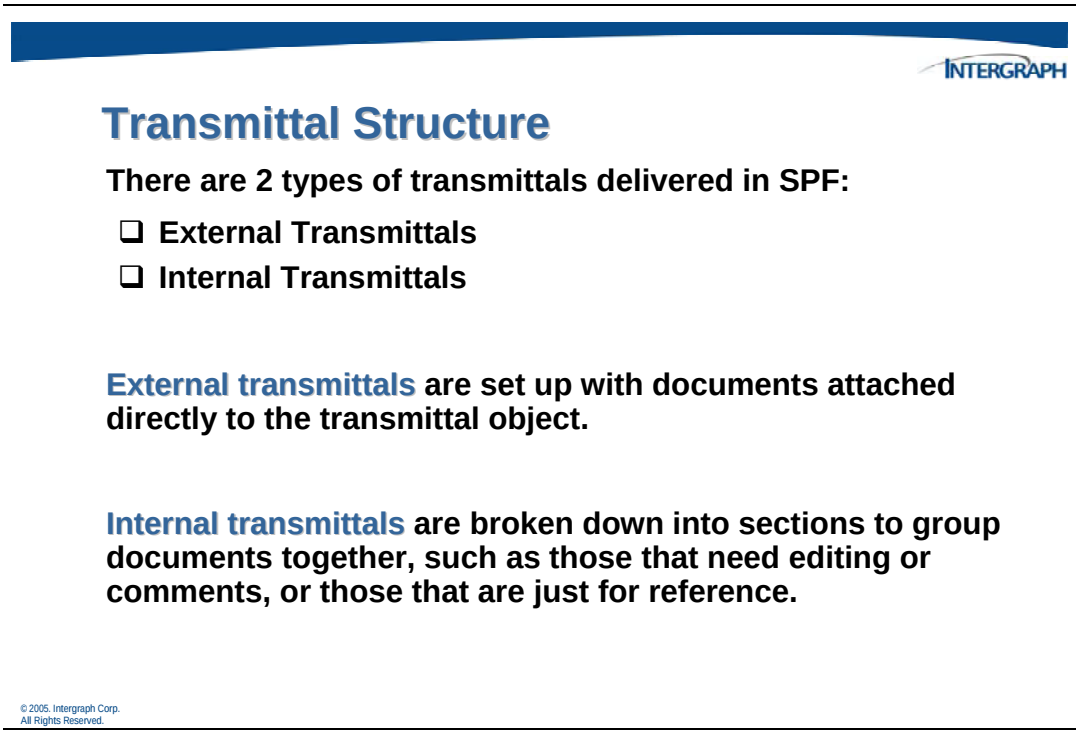
Transmittals are the mechanism for the exchange, but this process requires packaging the documentation for distribution and access from a separate environment, often outside the firewall. They typically:

- ❑ **Review transmittal histories of documents (via email)**
- ❑ **Receive and respond to transmittals (via email)**
- ❑ **Return project documentation for transmittals**

© 2005. Intergraph Corp.
All Rights Reserved.

8.2 Transmittal Structure

Transmittal functionality consists of *internal transmittals* and *external transmittals*.



When you create a transmittal, it is attached to a workflow that manages transmittal *approval*, *issue*, *distribution*, *recipient responses*, and *completion*.

You can also use template transmittals to create transmittals that already have relevant sections defined, a workflow attached, and optionally some key recipients already identified by their project roles.

Internal Transmittal Structure

Here is an example of an *Internal* Transmittal with Sections:

Transmittal Structure

Name	Rev	Default Status	Classification	LastUpdated D
INT-SG-001		ISSUED - (WF)	SPFInternalTra...	2004/01/29-2
Show Sections				
INT-SG-001-Design		ISSUED -	SPFInternalTra...	2004/01/29-0
Show Documents				
SG-C-544	[A1,1]	CURRENT -	NPD	2004/01/29-0
SG-C-545	[A1,1]	CURRENT -	NPD	2004/01/29-0
INT-SG-001-Reference		ISSUED -	SPFInternalTra...	2004/01/29-0
Show Documents				
SG-C-546	[A1,1]	CURRENT -	NPD	2004/01/29-0

© 2005. Intergraph Corp.
All Rights Reserved.

External Transmittal Structure

Here is an example of an *External* Transmittal, where documents are attached directly to the transmittal object.

Transmittal Structure

Name	Rev	Default Status	Classification	L
EXT_RBGAS REVIEW		WF-S	SPFExternalTransmittal	1
Show Documents				
REQ-PRJ-2001-100	[1A,1]	CURRENT -	DocumentVersion	1
REQ-PRJ-2001-200	[1A,1]	CURRENT -	DocumentVersion	1
REQ-PRJ-2001-300	[1A,1]	CURRENT -	DocumentVersion	1

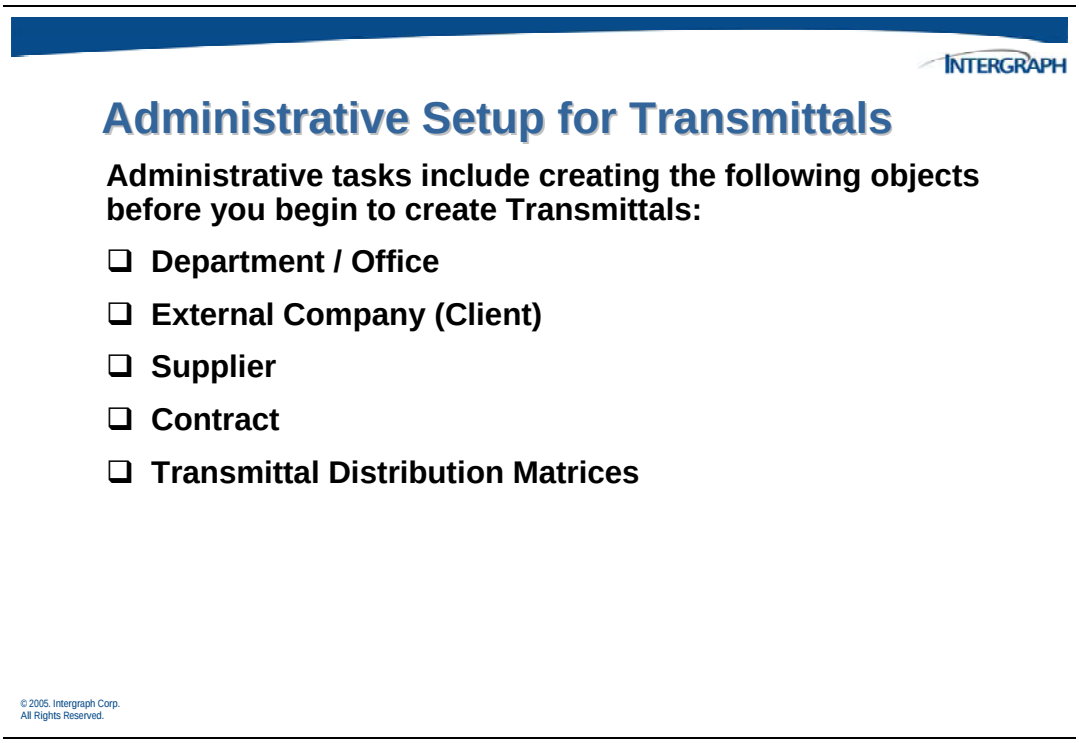
© 2005. Intergraph Corp.
All Rights Reserved.

8.3 Transmittal Administrative Setup

Before creating Transmittals, some administrative setup tasks must first be accomplished.

Internal Transmittals are used for distribution of documents between the departments, site and affiliate offices of the organization.

External Transmittals are used for the distribution of documents to clients and suppliers.



The *Department/Office* is an **Internal Organization** while *External Company* and *Supplier* are **External Organizations**. The picklists for **From Organization** and **To Organization** on a transmittal are set up accordingly.

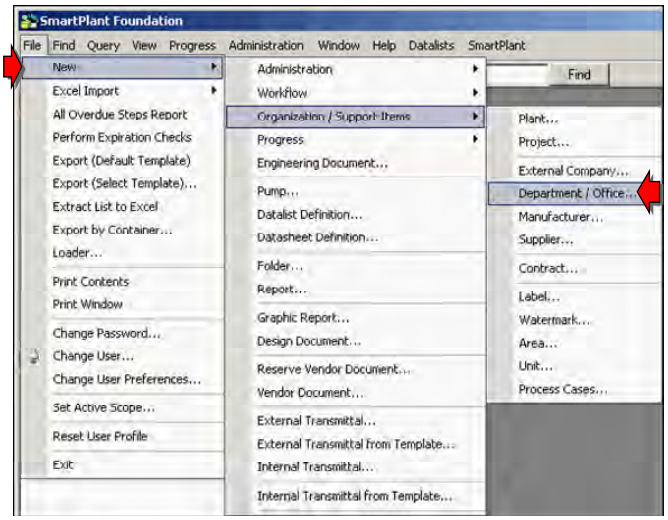
8.3.1 Creating a Department / Office

The **Department / Office** is classed as an *Internal Organization*. To use *Internal Transmittals* for the distribution of documents between internal *departments*, *site* and *affiliate offices*, you would need to create an object for each of these internal organizations.

INTERGRAPH

Create Department / Office

- **Select *File > New > Department / Office…* from the menu.**

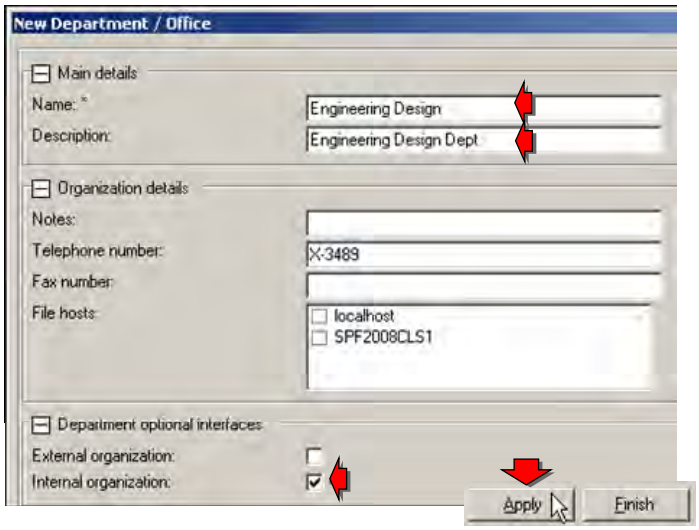


© 2005. Intergraph Corp.
All Rights Reserved.

The *New Department / Office* dialog will display.

Create Department / Office

- **Enter the new department information and click *Apply*.**



© 2005. Intergraph Corp.
All Rights Reserved.

The following fields are displayed on the New Department / Office form:

- **Name** – is a text field that can contain up to 32 characters. It is a required field, denoted by the *****.
- **Description** – is a text field that can contain up to 40 characters. It is an optional field.
- **Notes** – is a text field that can contain up to 35 characters. It is optional.
- **Telephone Number** - is a text field that can contain up to 35 characters. It is optional.
- **Fax Number** – is a text field that can contain up to 35 characters. It is optional.
- **File hosts** – the host associated with the organization. Hosts may be associated with only one organization at a time. It is optional.
- **Department optional interfaces** – the External Organization / Internal Organization toggle box is used to instantiate the object as an internal organization. Once the interface has been instantiated, it can not be changed.

Click **Finish** or **Apply** when the new Department / Office information has been entered. The Apply button can be used when multiple Department / Office objects need to be created.

Create Department / Office

- **Repeat this for all internal departments and offices that will be using Internal Transmittals within the same company.**

© 2005. Intergraph Corp.
All Rights Reserved.

8.3.2 External Organizations

Once you have created your internal organization objects, which will be used for creating Internal Transmittals, you will need to create any external organization objects such as *External Companies*, *Manufacturers* and *Suppliers*.

INTERGRAPH

External Organizations

There are 3 types of External Organizations that can be created for *External Transmittals*

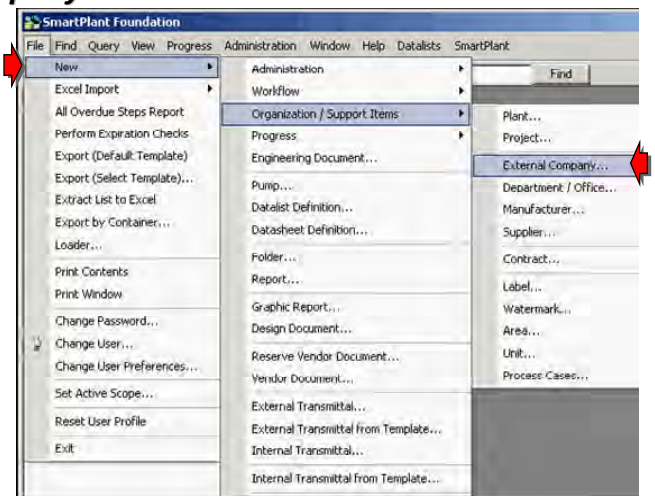
- **External Company**
- **Manufacturer**
- **Supplier**

External Transmittals can be used for the distribution of documents to external companies (clients) or to suppliers.

© 2005. Intergraph Corp.
All Rights Reserved.

Create External Company

- **Select *File > New > Oragization/Support Items > External Company* from the menu.**

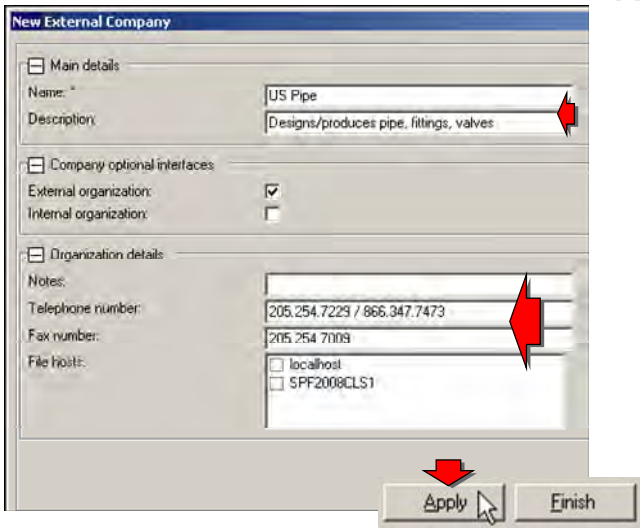


© 2005. Intergraph Corp.
All Rights Reserved.

The *New External Company* dialog will display.

Create External Company

- **Enter the new company information and click *Apply*.**



© 2005. Intergraph Corp.
All Rights Reserved.

The following fields are displayed on the *New External Company* form:

- **Name** – is a text field that can contain up to 32 characters. It is a required field, denoted by the *****.
- **Description** – is a text field that can contain up to 40 characters and is optional.
- **Company optional interfaces** – the External Organization / Internal Organization toggle box is used to instantiate the object as an external organization. Once the interface has been instantiated, it can not be changed.
- **Notes** – is a text field that can contain up to 35 characters and is optional.
- **Telephone number** – is a text field that can contain up to 35 characters and is optional.
- **Fax number** – is a text field that can contain up to 35 characters and is optional.
- **File hosts** – the host associated with the organization. Hosts may be associated with only one organization at a time. It is optional.

Click **Finish** or **Apply** when the new company information has been entered.

Repeat this for all external companies that would be participating in External Transmittals distributed from your company.

Create External Company

The new External Company's are displayed in the *New Items* window.

External Company objects will be used in pick list values when creating External Transmittal objects.

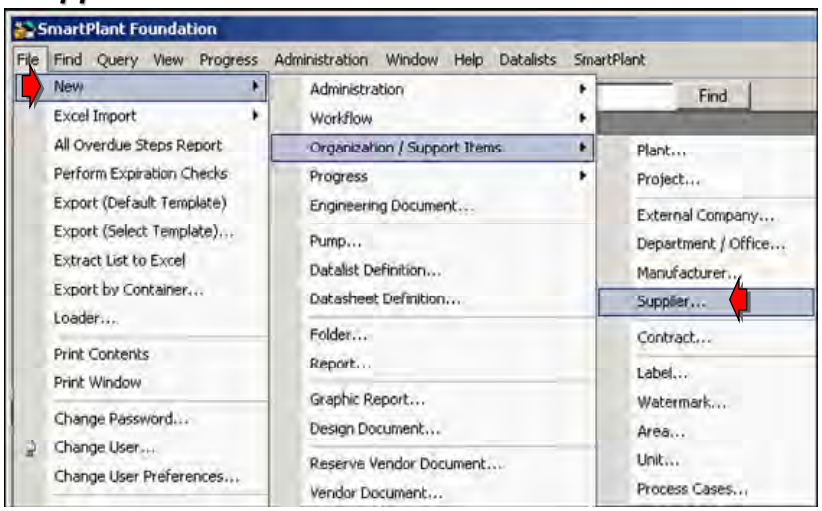
© 2005. Intergraph Corp.
All Rights Reserved.

8.3.3 Creating a Supplier

If you plan to distribute documents to suppliers through the use of Transmittals, then you will need to create *Supplier* objects.

Create Supplier

- **Select *File > New > Organization / Support Items > Supplier…* from the menu.**

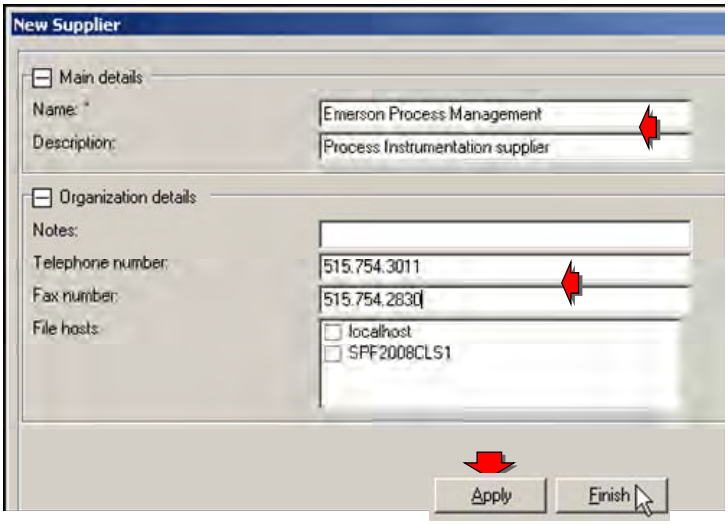


© 2005. Intergraph Corp.
All Rights Reserved.

The *New Supplier* dialog will be displayed.

Create Supplier

- **Enter the new supplier information and click OK.**



© 2005. Intergraph Corp.
All Rights Reserved.

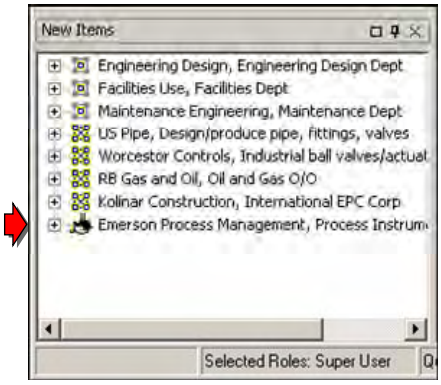
The following fields are displayed on the *New Supplier* form:

- **Name** – is a text field that can contain up to 32 characters. It is a required field, denoted by the *****.
- **Description** – is a text field that can contain up to 40 characters and is optional.
- **Notes** – is a text field that can contain up to 35 characters and is optional.
- **Telephone number** – is a text field that can contain up to 35 characters and is optional.
- **Fax number** – is a text field that can contain up to 35 characters and is optional.
- **File hosts** – the host associated with the organization. Hosts may be associated with only one organization at a time. It is optional.

Click **Finish** when the new Supplier information has been entered.

Create Supplier

The new supplier is displayed in the *New Items* window.



Repeat this for all suppliers that would be participating in External Transmittals distributed from your company.

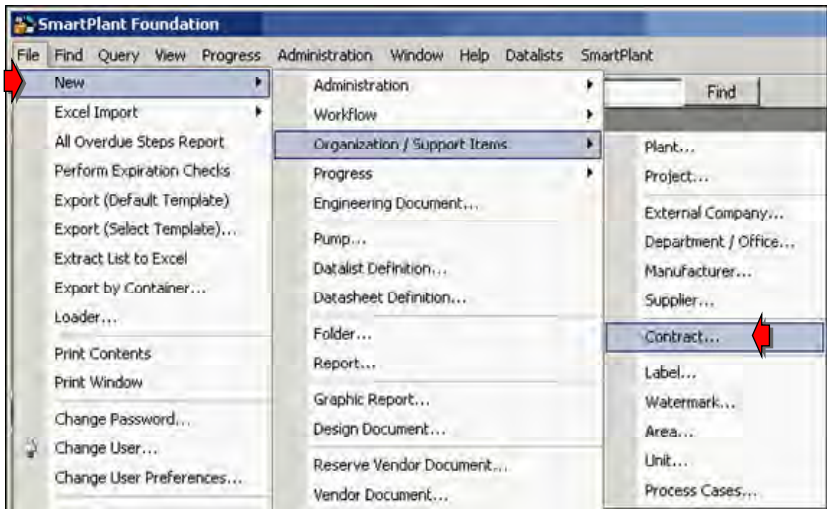
© 2005. Intergraph Corp.
All Rights Reserved.

8.3.4 Creating a Contract

Within a project there may be multiple contracts in use. As part of the Transmittals' administrative setup, you can create **Contracts** and then use them during the creation of Transmittals for tracking purposes.

Create Contract

- **Select *File > New > Organization / Support Items > Contract* from the menu.**

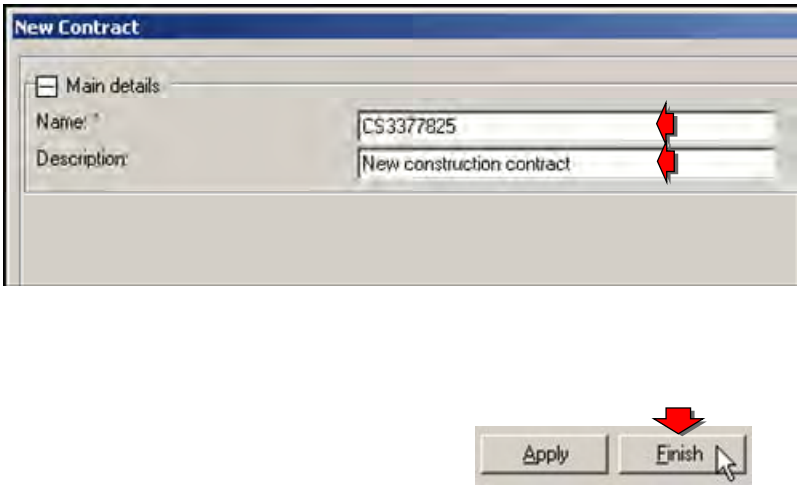


© 2005. Intergraph Corp.
All Rights Reserved.

The *New Contract* dialog will be displayed.

Create Contract

- **Enter the new contract information and click *Finish*.**



© 2005. Intergraph Corp.
All Rights Reserved.

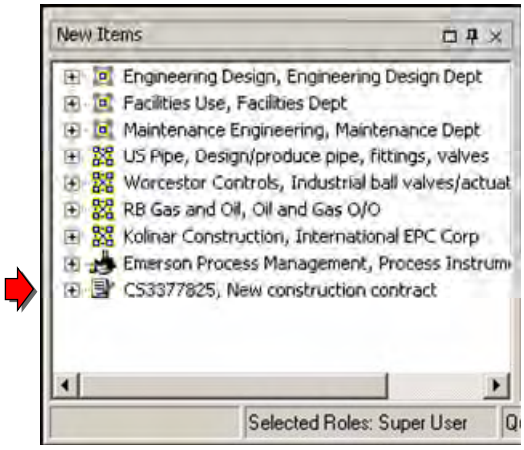
The following fields are displayed on the *New Contract* form:

- **Name** – is a text field that can contain up to 32 characters. It is a required field, denoted by the *****.
- **Description** – is a text field that can contain up to 40 characters and is optional.

Click **Finish** when the new Contract information has been entered.

Create Contract

The new contract is displayed in the *New Items* window.



© 2005. Intergraph Corp.
All Rights Reserved.

Contract objects are used as pick list values when creating Internal Transmittal objects.

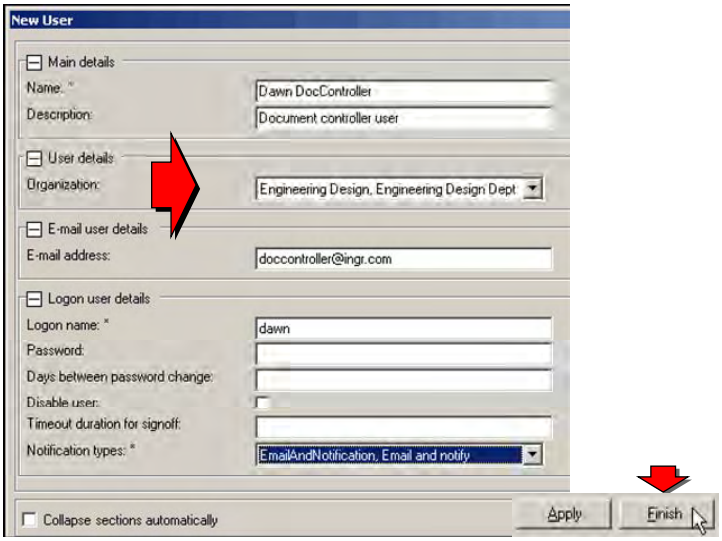
8.3.5 Transmittal Users and Roles

As part of the administrative setup for transmittals, the users who will be participating in the transmittal process will need to be modified and the **Company name** field updated. This can only be done after the *departments*, *offices*, *external companies* and *suppliers* have been added to the system.

If a needed user doesn't exist, use the ***File*** > ***New*** > ***Administration*** > ***User*** menu command to display the *New user* form.

Creating Transmittal Users

- **Click *Finish* once all new user information has been entered.**

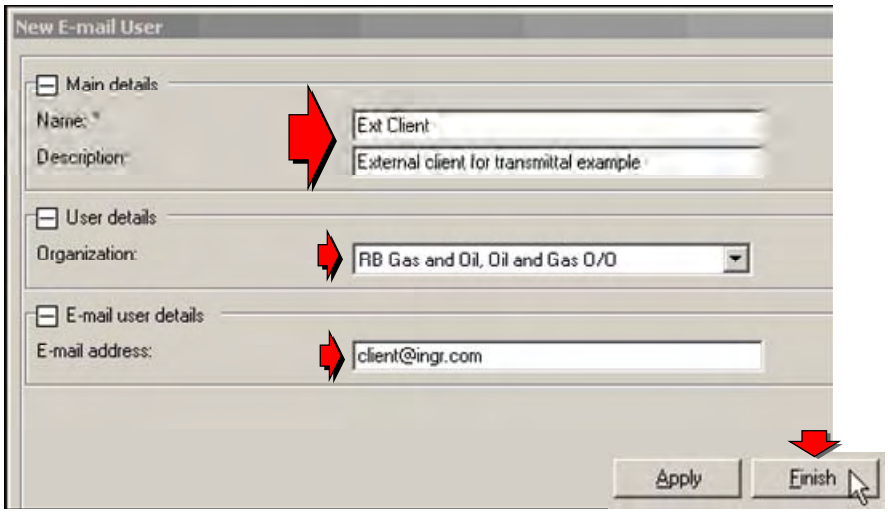


© 2005. Intergraph Corp.
All Rights Reserved.

Also, use the ***File*** > ***New*** > ***Administration*** > ***E-mail User*** command to create any external users who will participate as transmittal recipients.

Creating Transmittal Users

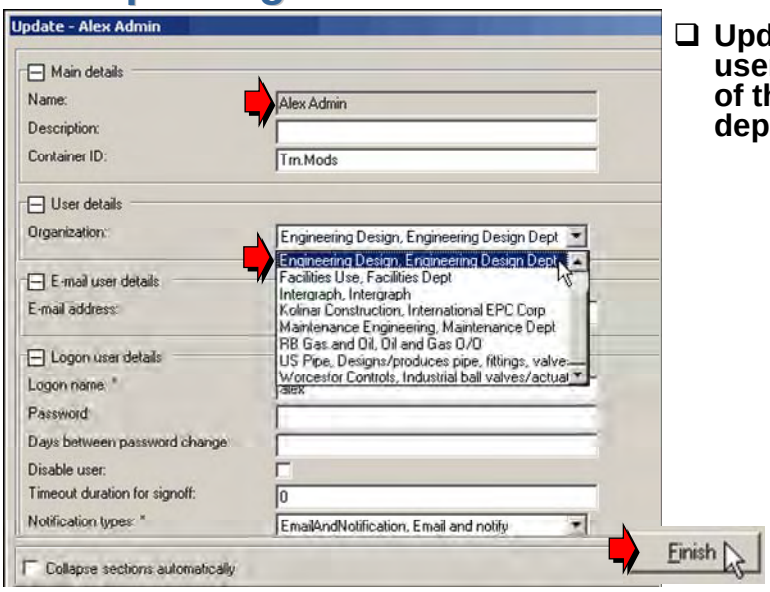
- **Click *Finish* once all new user information has been entered.**



© 2005. Intergraph Corp.
All Rights Reserved.

Remember to search for any existing users, then select the user and use the **Update** menu command.

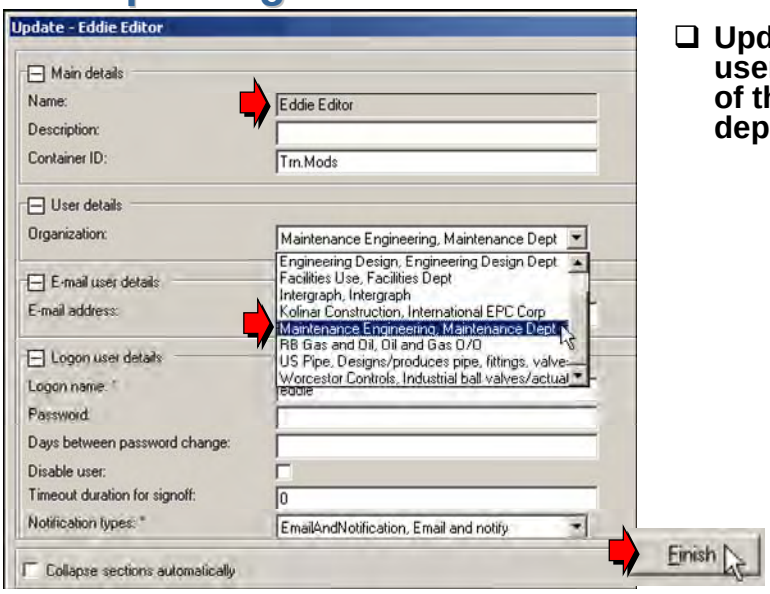
Updating Transmittal Users



- **Update each internal user and choose one of the recently added departments.**

Select a **Organization** value from the displayed list. Continue to update the appropriate user accounts.

Updating Transmittal Users

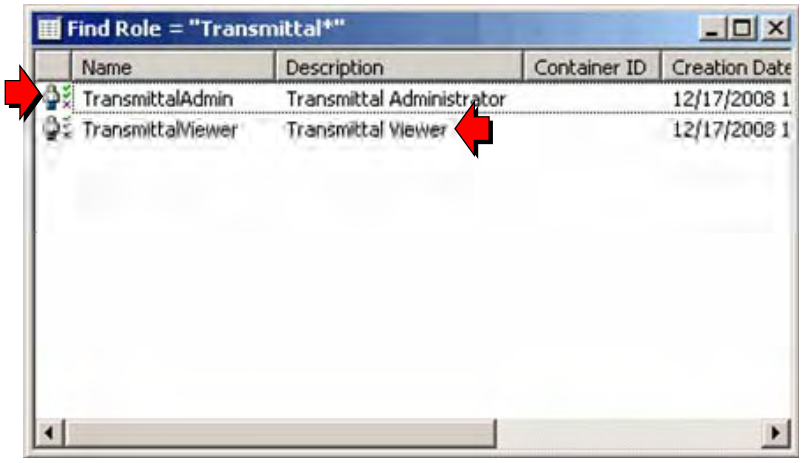


- **Update each internal user and choose one of the recently added departments.**

If any new roles are needed, add them using appropriate administration commands. In the following example, two new roles have been created, *TransmittalAdmin* and *TransmittalViewer*.

Creating Transmittal Roles

- **Create the new roles needed for transmittal manipulation.**

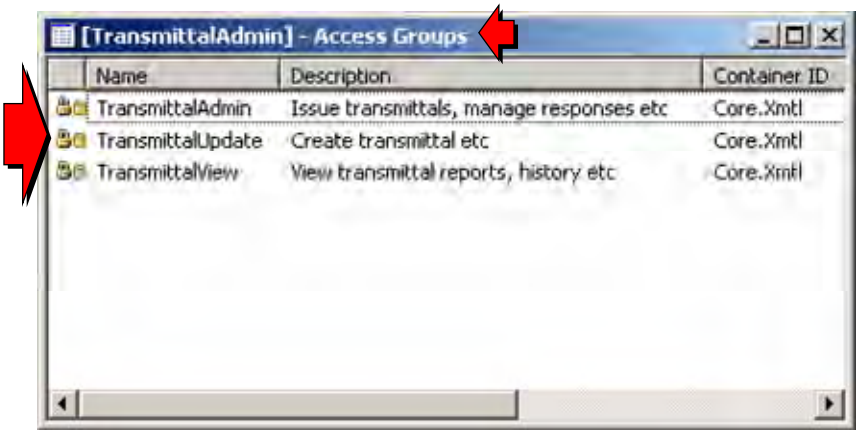


© 2005. Intergraph Corp.
All Rights Reserved.

The *TransmittalAdmin* role will relate to the Access Groups that will allow a user to **view**, **create** and **manipulate** transmittal objects.

Creating Transmittal Roles

- **Expand the TransmittalAdmin role to view the related *Access Groups*.**

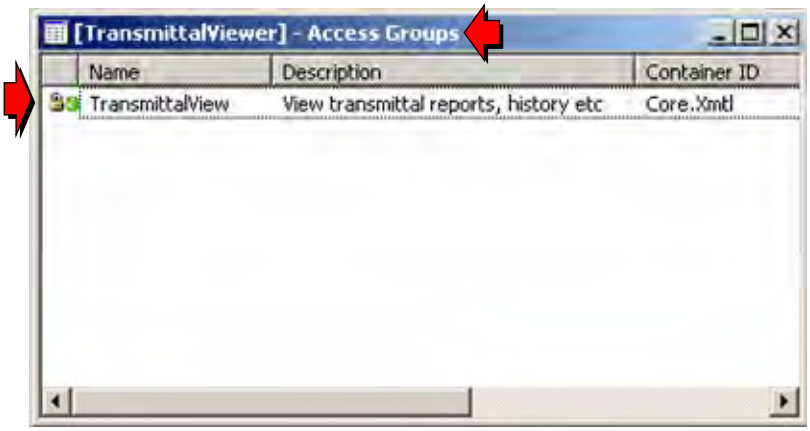


© 2005. Intergraph Corp.
All Rights Reserved.

The *TransmittalViewer* role will relate to the Access Group that will allow a user to **view** transmittal objects.

Creating Transmittal Roles

- **Expand the TransmittalViewer role to view the related *Access Groups*.**



© 2005. Intergraph Corp.
All Rights Reserved.

8.3.6 Transmittal Role Assignments

Any users or roles that have been added and need access to transmittal functionality, will need to be assigned to the appropriate *role assignment*.

The role assignment links the user to a role in a given configuration, such as an *Engineer* (role) in *SPF42* (configuration).

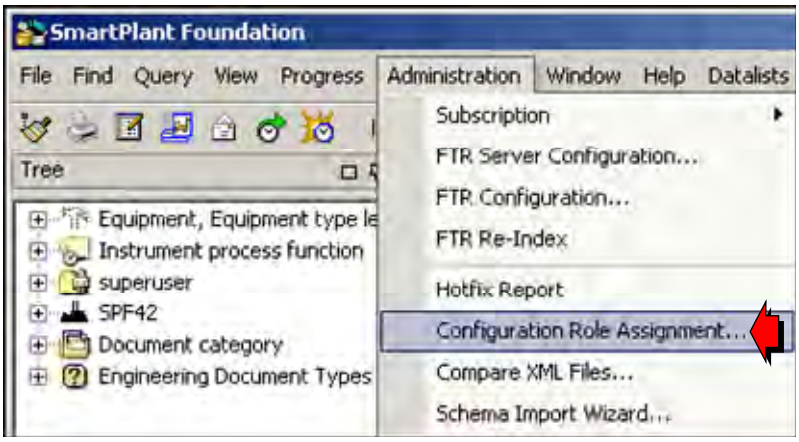
Note: It is strongly recommended that the student be knowledgable in the SPF 4.x Security Model prior to configuring transmittals. This material is covered in detail in the **SmartPlant Foundation 2008 (4.2) Introduction and Administration I** training course and will not be repeated in this class.

To display the *Role Assignment* form, select ***Administration*** > ***Configuration Role Assignment*** from the menu.

INTERGRAPH

Transmittal Role Assignments

- **Select *Administration > Configuration Role Assignment* from the menu.**



© 2005. Intergraph Corp.
All Rights Reserved.

Configuration Role Assignment has two tabs:

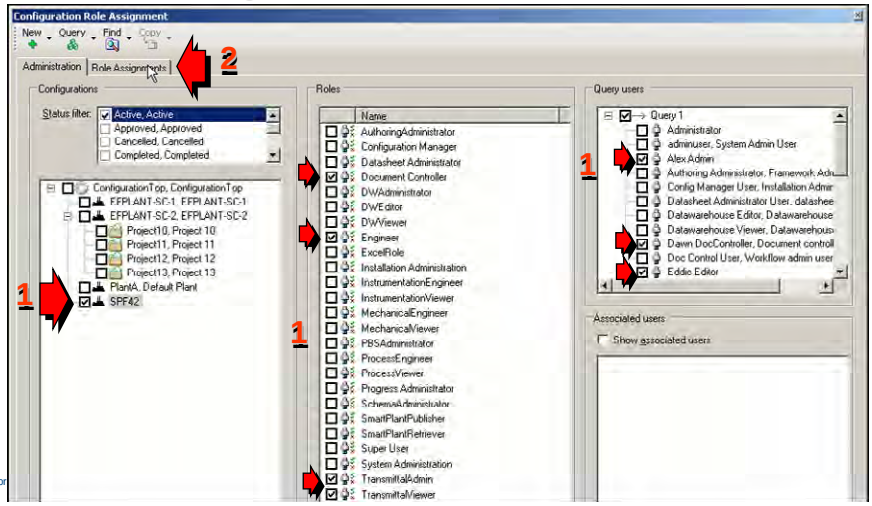
- **Administration** – Used to create and delete users and to select the sets of user, configurations and roles for which role assignments are to be viewed and configured.
- **Role Assignments** – Used to view and assign users to roles in configurations.

Before choosing the **Role Assignments** tab, the users to assign to roles must be queried. The user must first select the configurations, users, and roles under the ***Administration*** tab before moving to the ***Role Assignments*** tab to manage the assignments.

INTERGRAPH

Transmittal Role Assignments

- **Select the configuration that you wish to configure and click the *Role Assignments* button.**

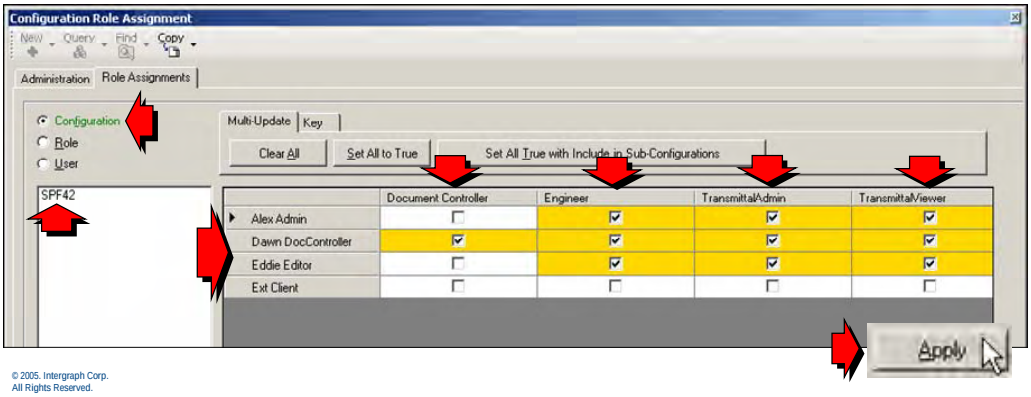


© 2005. Intergraph Cor
All Rights Reserved.

When a configuration is selected, this populates the roles available to assign.

Transmittal Role Assignments

- **Select the type of view to use for making role assignments and then enable the toggle in the matrix to assign a specific user to a specific role within this configuration.**

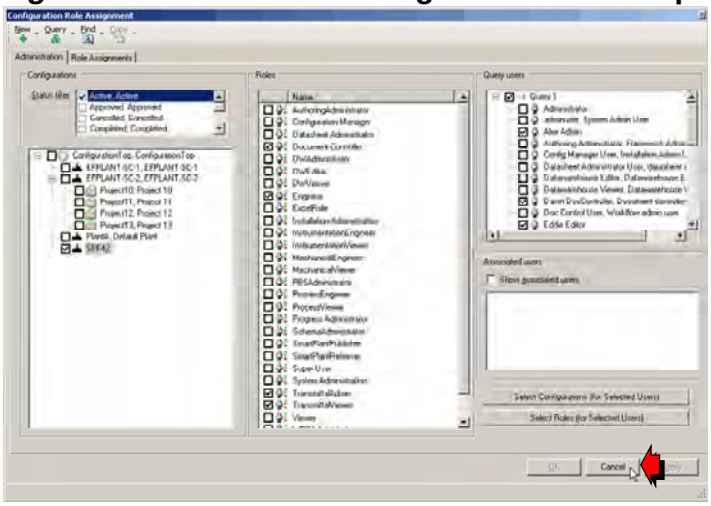


© 2005. Intergraph Corp.
All Rights Reserved.

Click ***Apply*** to commit the changes to the database without exiting the form to allow for further changes to be made. Since the role assignment changes have been saved, the ***OK*** button is now grayed out.

Transmittal Role Assignments

- **Select Cancel to exit from the *Configuration Role Assignment* once the role assignments are complete.**



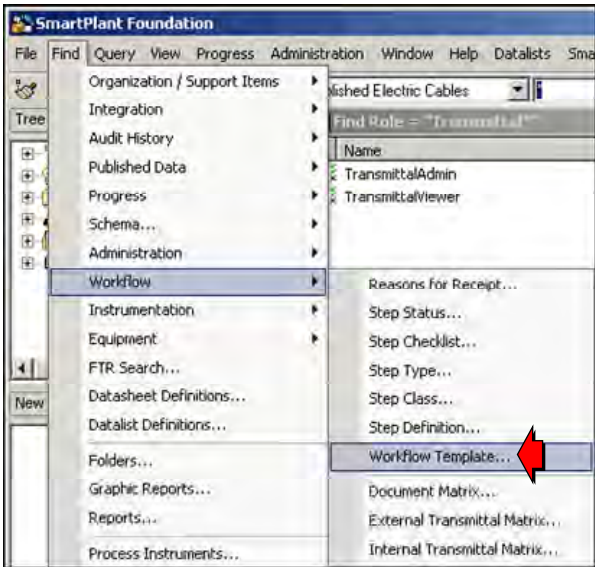
© 2005. Intergraph Corp.
All Rights Reserved.

8.4 Modifying Transmittal Workflows

There are two pre-defined workflows delivered with transmittals, one for internal transmittals and one for external transmittals. These are example workflows and can be modified as needed by finding these delivered workflow templates and then updating them.

Modifying a Transmittal Workflow

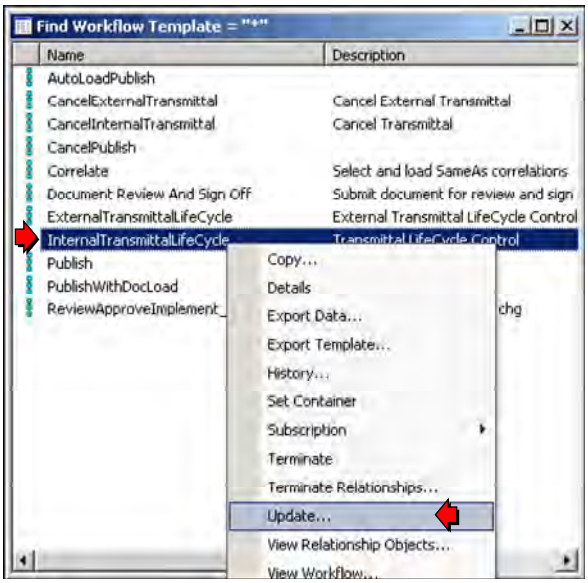
- **From the menu, choose *Find > Workflow > Workflow Template.***



© 2005. Intergraph Corp.
All Rights Reserved.

The two delivered workflows are the **ExternalTransmittalLifeCycle** workflow and the **InternalTransmittalLifeCycle** workflow.

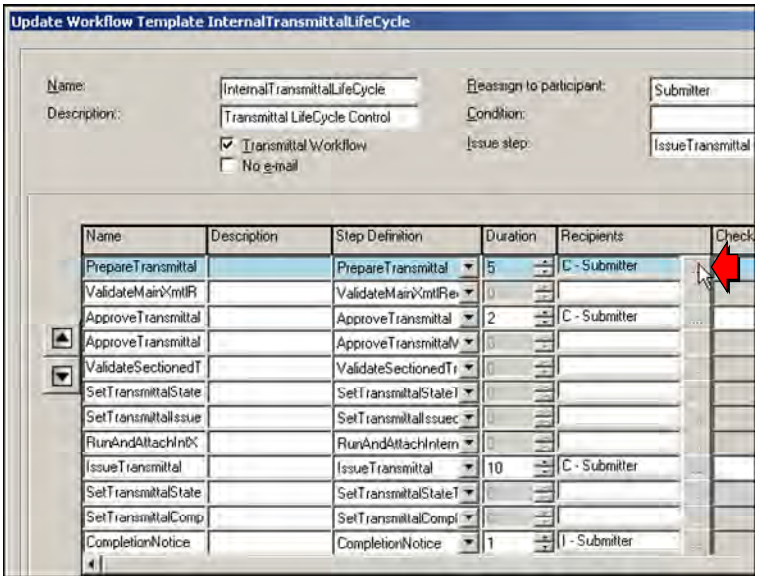
Modifying a Transmittal Workflow



- **Right-click on *InternalTransmittalLife Cycle* and choose *Update* from the pop up menu.**

You can change the recipient (user/role) who will be responsible for the work in this step of the workflow.

Modifying a Transmittal Workflow

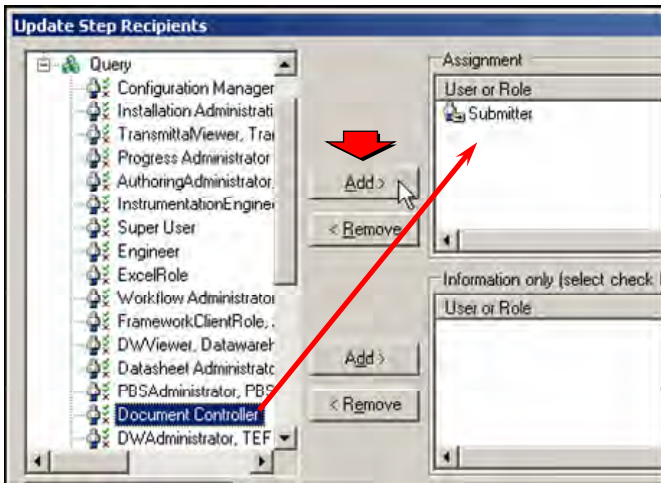


- **Choose the ellipses to select the recipient that will perform this workflow step.**

Perform a query to show the **Users** or **Role** in the tree view of the *Update Step Recipients* dialog. From the *Update Step Recipients* dialog, users/roles can be added and removed from the **Assignment** and **Information** fields.

Modifying a Transmittal Workflow

- **Choose a *recipient* User or Role from the displayed list, then click Add.**

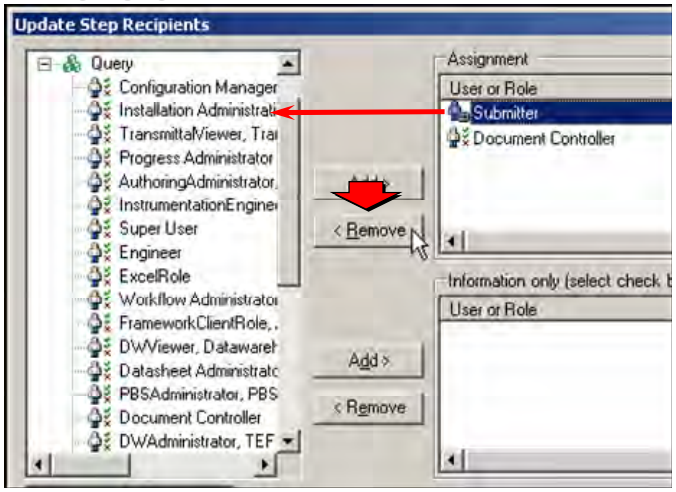


© 2005. Intergraph Corp.
All Rights Reserved.

In these examples the default participant **Submitter** is being removed from the step *Assignment* and role **Document Controller** is being added.

Modifying a Transmittal Workflow

- **Choose the *Submitter* User from the Assignment list, then click Remove.**

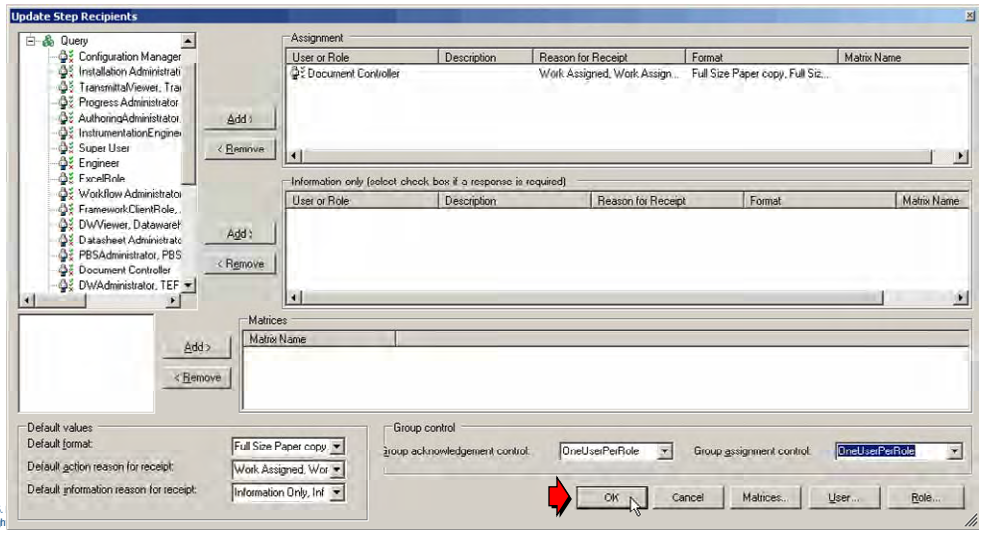


© 2005. Intergraph Corp.
All Rights Reserved.

This completes the updates for this workflow step.

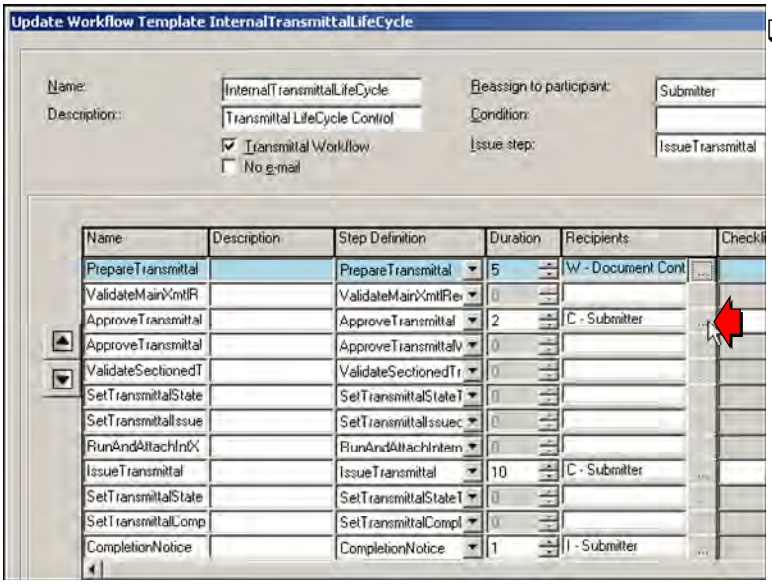
Modifying a Transmittal Workflow

- **After the *Assignment* users have been modified, click OK.**



Make any changes for the other steps in the *InternalTransmittalLifeCycle* workflow.

Modifying a Transmittal Workflow

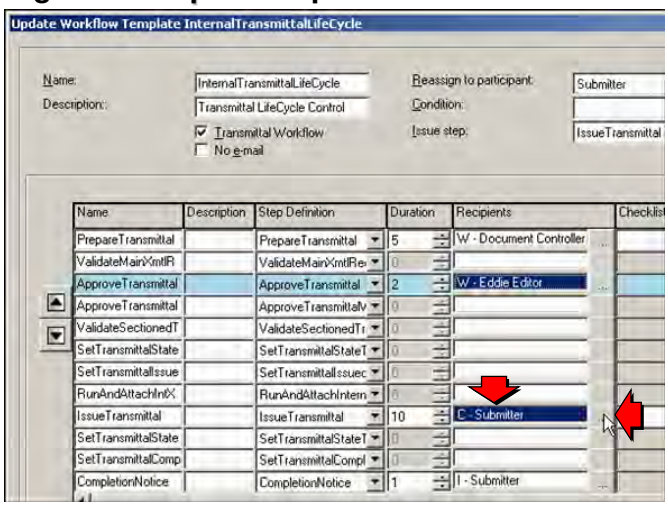


- **Choose the ellipses to select the recipient that will perform the next workflow step.**

In this step the default participant **Submitter** has been supplemented with the role **Document Controller** being added.

Modifying a Transmittal Workflow

- **After the *ApproveTransmittal* recipient modification, change the recipient to perform the *IssueTransmittal* step.**

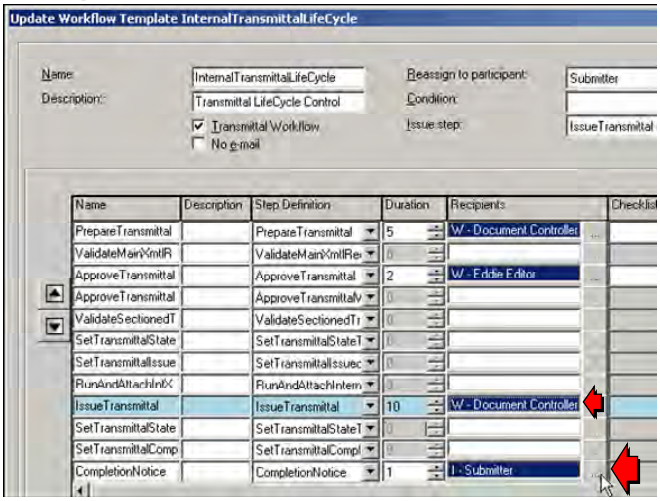


© 2005. Intergraph Corp.
All Rights Reserved.

Also make a change to the *CompletionNotice* step by changing the participant.

Modifying a Transmittal Workflow

- **Choose the ellipses to select the recipient that will perform the *CompletionNotice* step.**

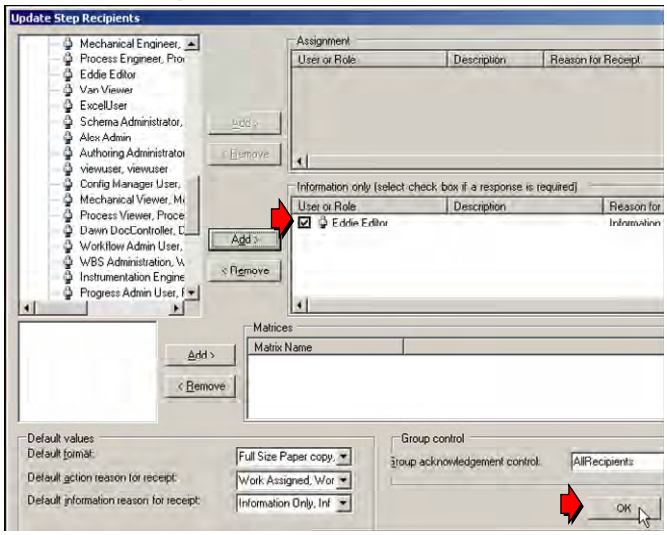


© 2005. Intergraph Corp.
All Rights Reserved.

In this step the default participant **Submitter** has been removed from the step *Assignment* and user **eddie** has been added.

Modifying a Transmittal Workflow

- **After this *Assignment* user has been modified, click OK.**

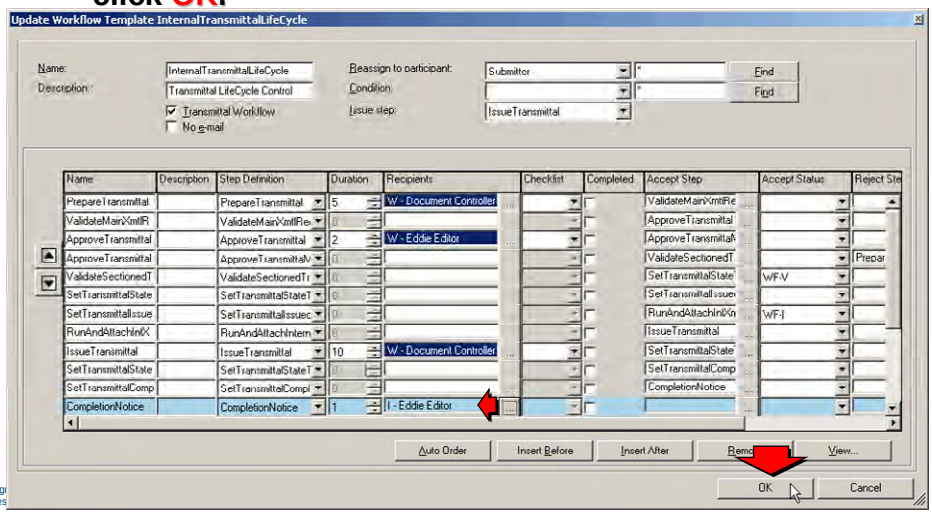


© 2005. Intergraph Corp.
All Rights Reserved.

Now that the step participants have been changed, **OK** and save the workflow updates.

Modifying a Transmittal Workflow

- **When all of the steps have been modified for the workflow, click OK.**

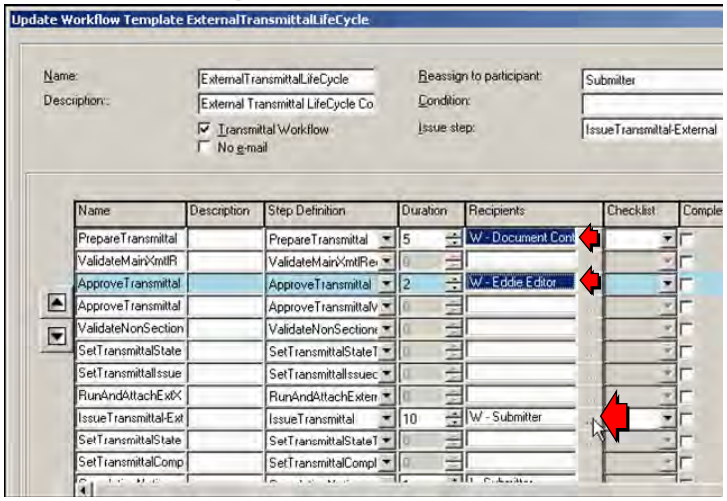


© 2005. Intergr
All Rights Res

The previous modifications apply to the **internal** transmittal workflow. The same kinds of changes can be made to the **external** transmittal workflow.

Modifying a Transmittal Workflow

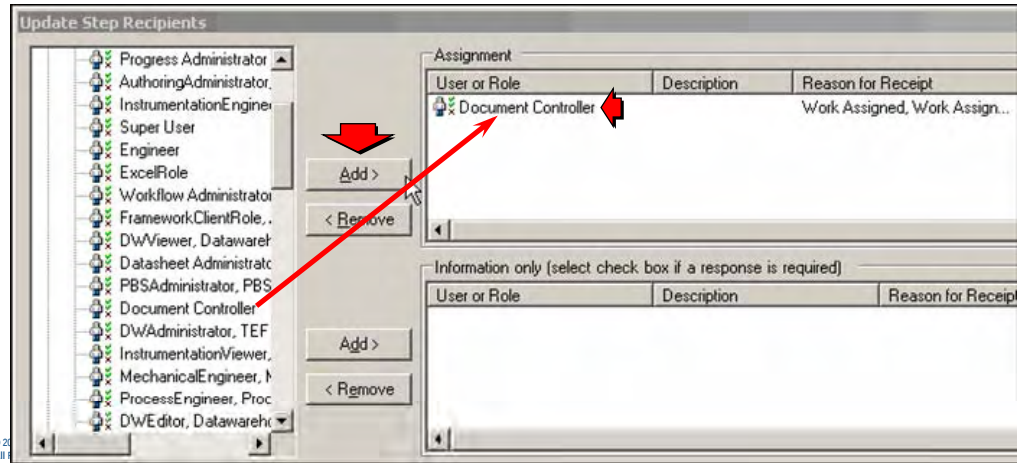
- **Repeat the changes for any other users/roles in *External TransmittalLifeCycle*.**



© 2005. Intergraph Corp.
All Rights Reserved.

Modifying a Transmittal Workflow

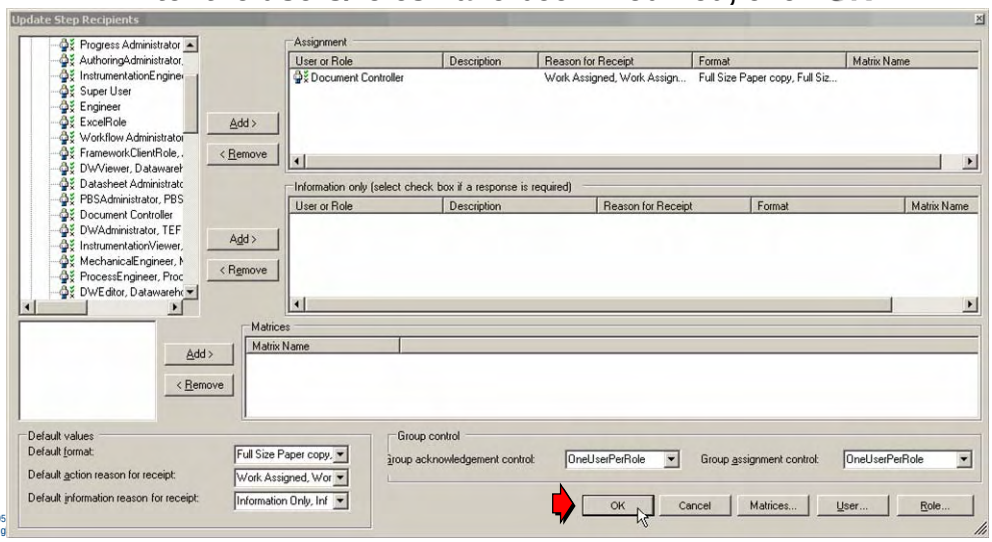
- **Assign a full user or role, such as the document controller, to perform work on behalf of an email (informational) only user.**



In this step the default participant **Submitter** has been removed and the role **Document Controller** has been added.

Modifying a Transmittal Workflow

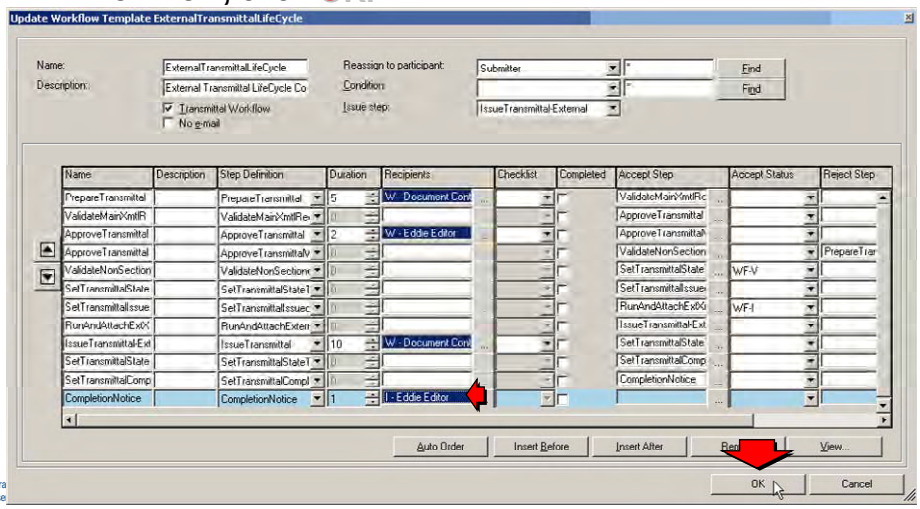
- **After the users/roles have been modified, click OK.**



Now that the step participants have been changed, **OK** and save the workflow updates.

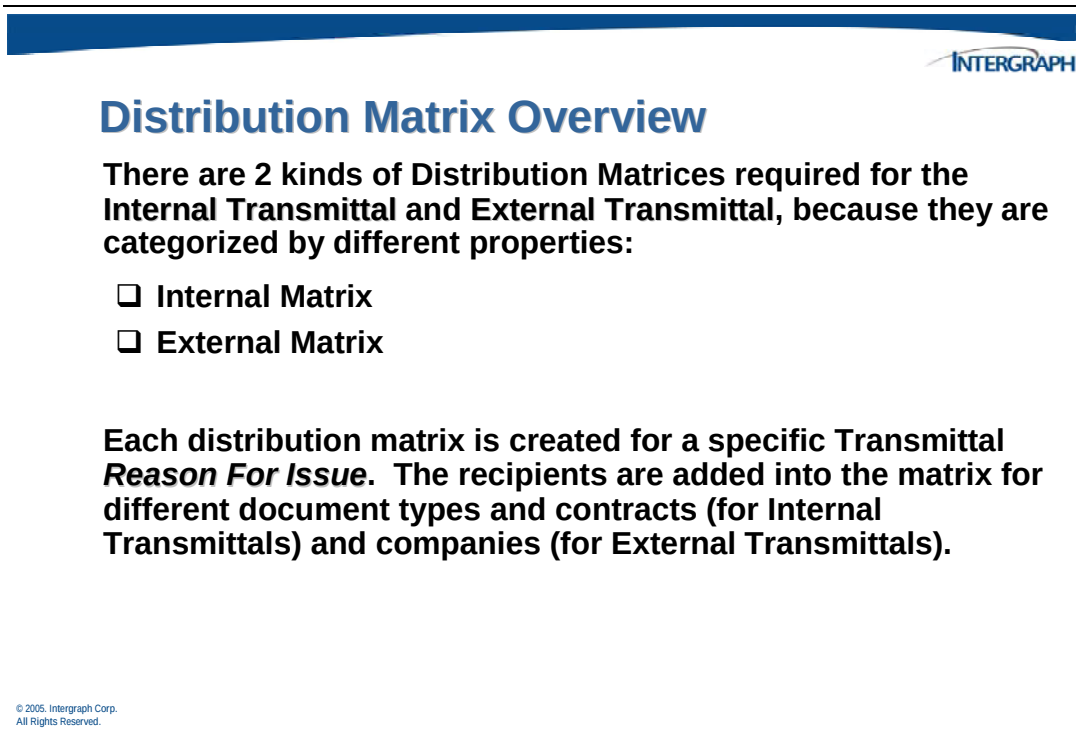
Modifying a Transmittal Workflow

- **When all of the steps have been modified for this workflow, click OK.**



8.5 Distribution Matrix Overview

One of the most difficult tasks performed by the Document Controller is the management of the project personnel index and the Transmittal Distribution Matrices.



The Transmittal Distribution Matrix is used to determine who receives documentation via Transmittals and what is required of them. The term *matrix* is applied to the table with recipients along the top and transmittal categories down the side. Transmittal categories could be based on document type, project, contract, etc. Each ‘cell’ is marked with the *Reason For Receipt* for each recipient. There is usually more than one matrix for each type of Transmittal with the unique factor being the *Reason For Issue*.

Distribution Matrix Overview

When a Transmittal is created, the selected *Reason For Issue* determines which matrix to utilize.

The document type and contract are row properties that are set up in the body of the matrix.

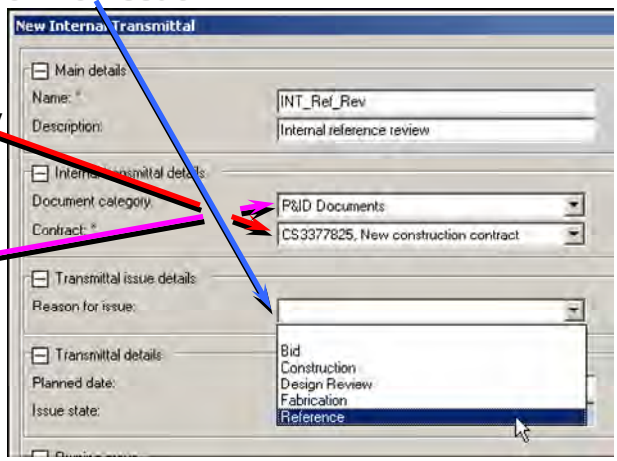
To determine the recipients that are to be obtained from the matrix, the row properties are matched to extract the correct row from the matrix.

© 2005. Intergraph Corp.
All Rights Reserved.

Distribution Matrix Overview

The *Internal Transmittal* matrix information to use is determined by the *Reason For Issue*. It is further determined by:

- **Contract**
- **Document Category**



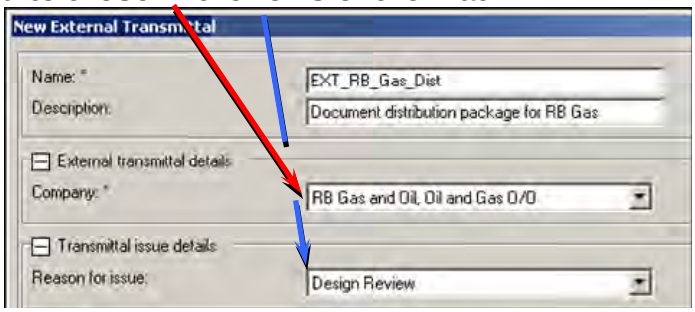
© 2005. Intergraph Corp.
All Rights Reserved.

Distribution Matrix Overview

The *External Transmittal* matrix information to use is determined by the *Reason For Issue*. It is further determined by:

- **Company**

To determine the recipients that are to be extracted from the matrix, these additional properties on the transmittal are matched to those in the rows of the matrix.



© 2005. Intergraph Corp.
All Rights Reserved.

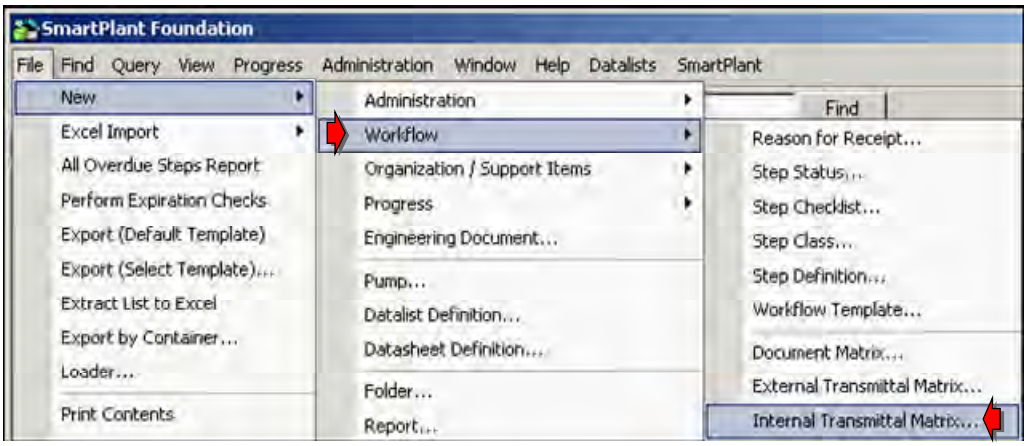
8.5.1 Creating an Internal Transmittal Matrix

The following section will demonstrate how to create an **Internal Transmittal Matrix**.

INTERGRAPH

Creating an Internal Transmittal Matrix

- **Select *File > New > Workflow > Internal Transmittal Matrix* from the menu.**

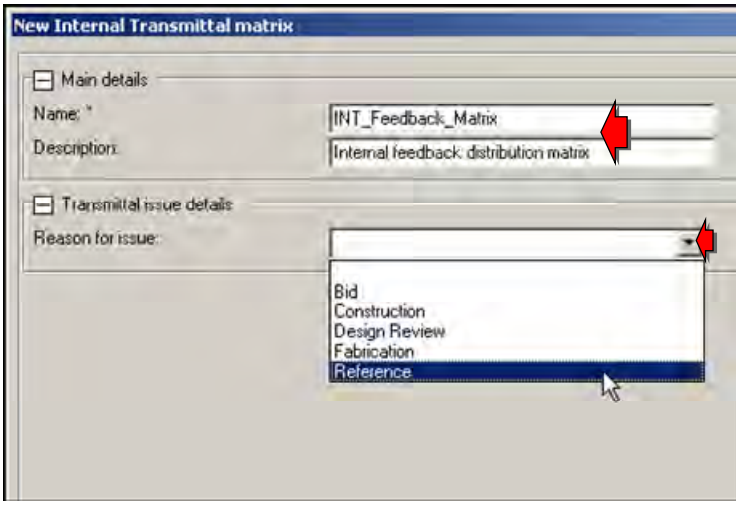


© 2005. Intergraph Corp.
All Rights Reserved.

The *New Internal Transmittal Matrix* dialog will display.

Creating an Internal Transmittal Matrix

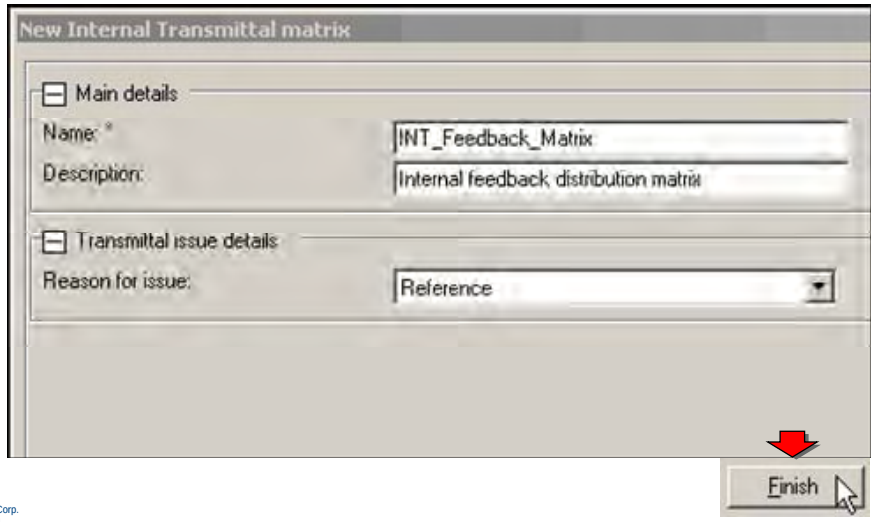
- **Enter the *Name, Description* and select a *Reason For Issue* for the Internal Transmittal Matrix.**



© 2005. Intergraph Corp.
All Rights Reserved.

Creating an Internal Transmittal Matrix

- **Click Finish to create the new *Internal Transmittal Matrix*.**

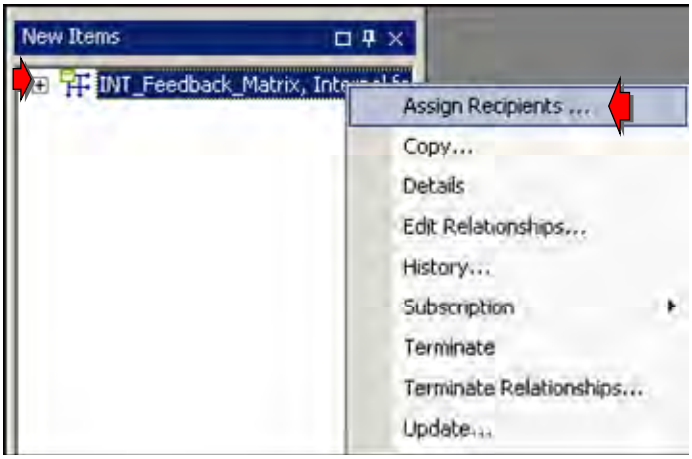


© 2005. Intergraph Corp.
All Rights Reserved.

Once the *Internal Transmittal Matrix* has been created, the next step is to add the users/roles that will be associated with this matrix.

Creating an Internal Transmittal Matrix

- **Right-click the Internal Transmittal Matrix and select *Assign Recipients* from the pop-up menu.**

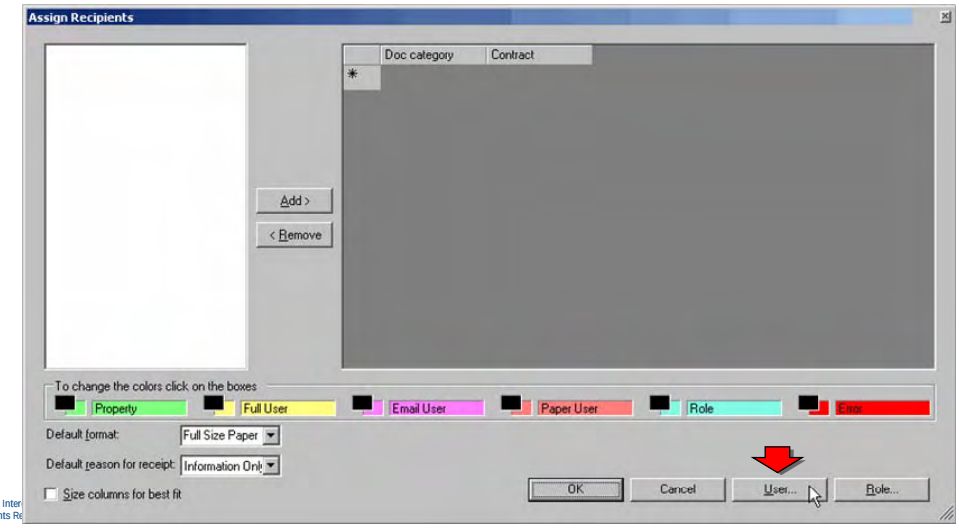


© 2005. Intergraph Corp.
All Rights Reserved.

The *Assign Recipients* dialog will display.

Creating an Internal Transmittal Matrix

- **Select the User button to query for available users.**

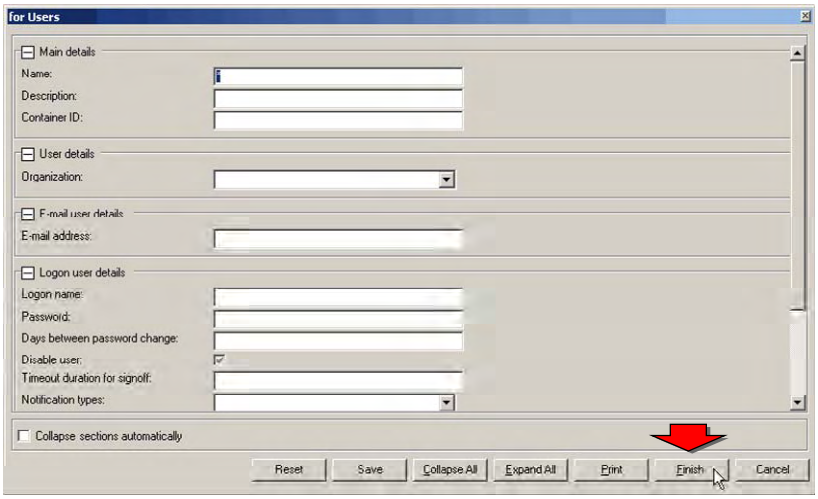


© 2005. Inter
All Rights Re

A search for users form will appear.

Creating an Internal Transmittal Matrix

- **Enter the search criteria to locate users you want to assign to the *Internal* Transmittal Matrix.**

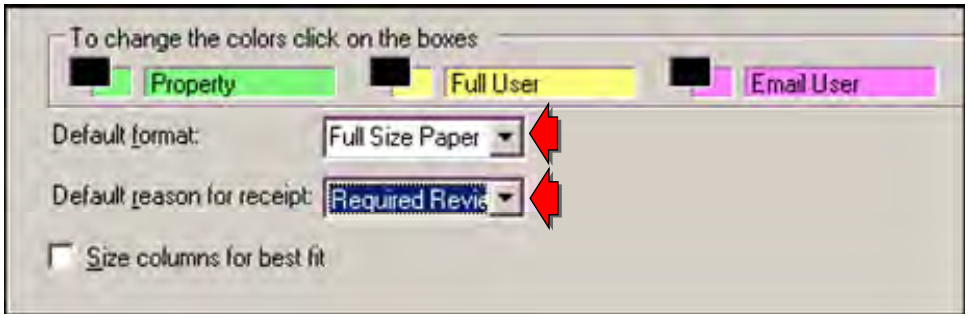


© 2005. Intergraph Corp.
All Rights Reserved.

On the *Assign Recipients* dialog, there is a **Default format** and **Default reason for receipt**. Select the values that will be default settings for the Internal Matrix.

Creating an Internal Transmittal Matrix

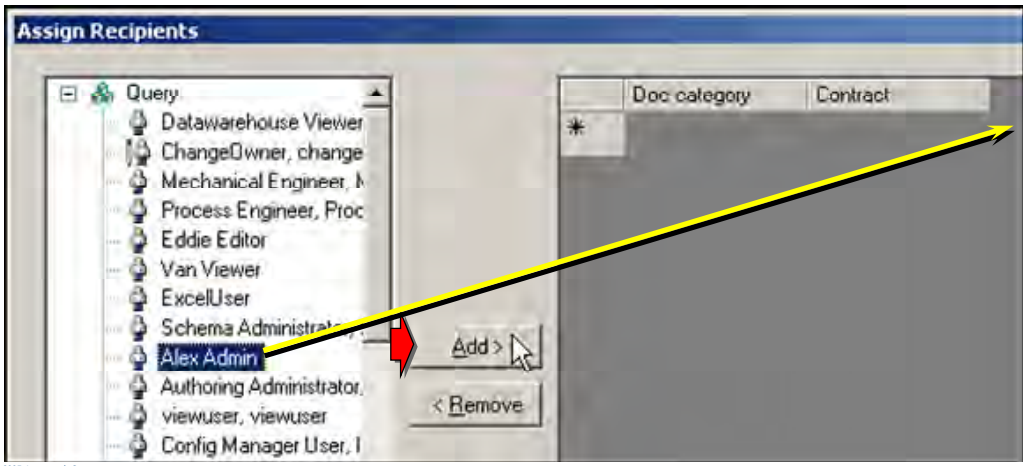
- **Set the *Default reason for receipt* and the *Default format* on the Internal Transmittal Matrix.**



© 2005. Intergraph Corp.
All Rights Reserved.

Creating an Internal Transmittal Matrix

- **Select a user from the tree view and click the Add button to add the user to the Matrix.**

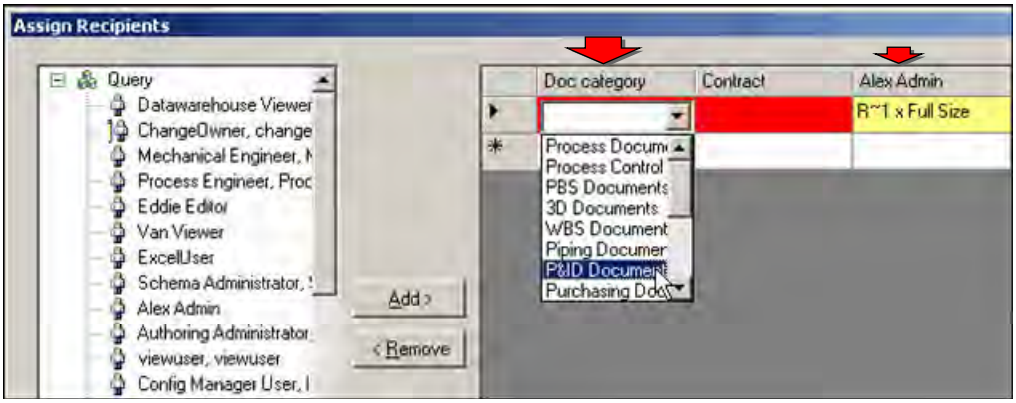


© 2005. Intergraph Corp.
All Rights Reserved.

Users are added to the Transmittal Matrix. After setting the *Reason for Receipt* and *Format* for each recipient, these settings appear in the matrix. The Internal Transmittal matrix information to use when a transmittal is created is determined by *Document Type* and *Contract*.

Creating an Internal Transmittal Matrix

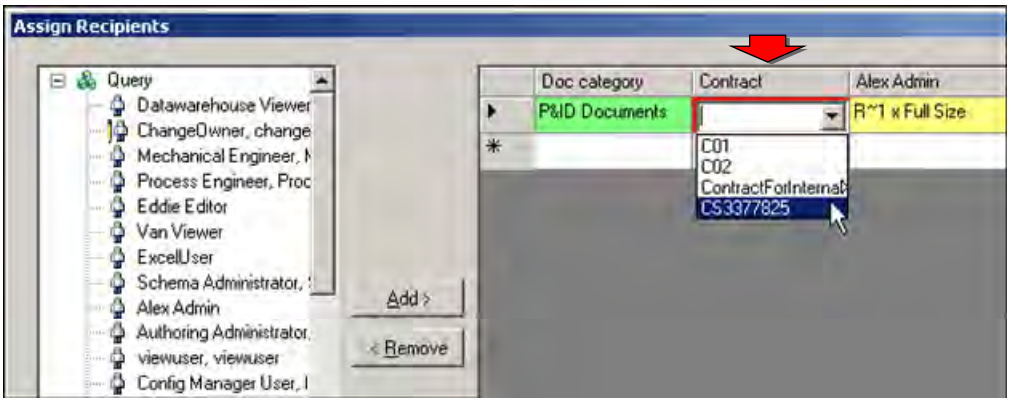
- **Click in the *Doc category* field to display a picklist of values.**



© 2005. Intergraph Corp.
All Rights Reserved.

Creating an Internal Transmittal Matrix

- **Click in the *Contract* field to select a valid contract number.**

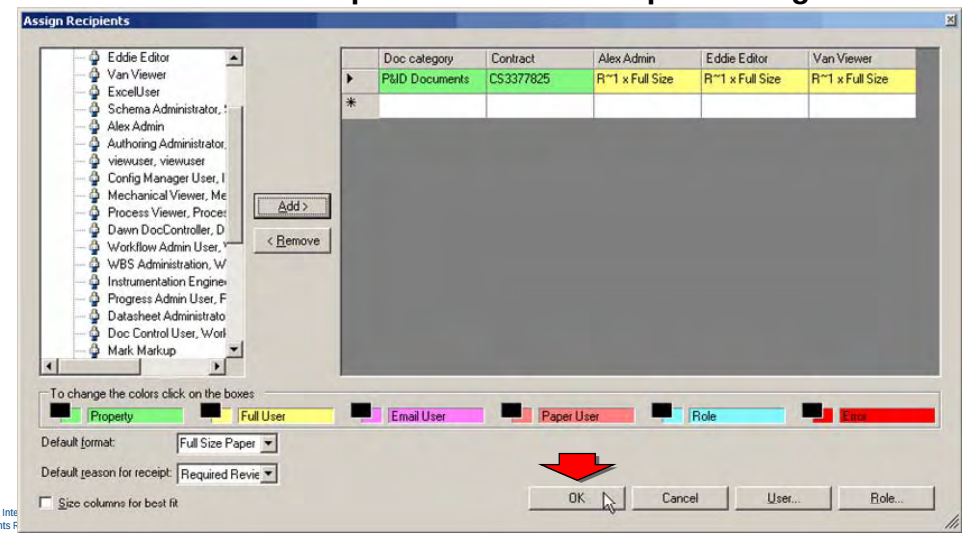


© 2005. Intergraph Corp.
All Rights Reserved.

When the Internal Transmittal Matrix is complete, select the **OK** button on the *Assign Recipients* dialog.

Creating an Internal Transmittal Matrix

- **Click OK to complete the matrix recipient assignments.**



© 2005. Inte
All Rights F

Other actions that can performed on the Transmittal Matrix:

- **Add a new matrix row** - Select the * on the next row or right-click to add a new Document Type or Contract.
- **Duplicate a recipient or row** - right-click in the column or row header.
- **Export to spreadsheet** - right-click in the top left cell of the border and paste from Clipboard into spreadsheet.
- **Import from spreadsheet** – copy selected area from spreadsheet into Clipboard. Then right-click in the top left cell of the border.
- **Data Validation** - It is valid to enter values for the row attributes that are not listed in the picklists, such as a *Contract* that does not yet exist. However, it is not valid to enter a *Reason for Receipt* that is not yet available in its picklist. The validation takes place on selection of the OK button to capture any cut-n-paste errors in the data.

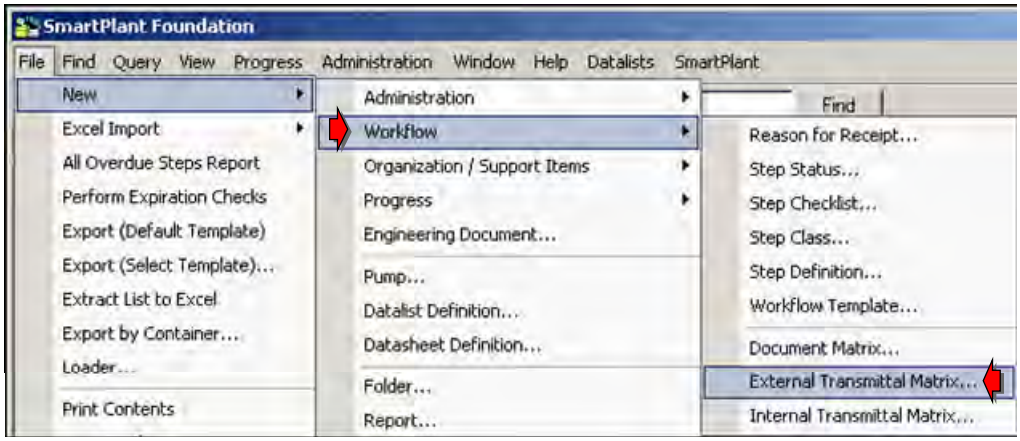
8.5.2 Creating an External Transmittal Matrix

This section demonstrates how to create an **External Transmittal Matrix**. The procedure for creating it is similar to the *Internal Transmittal Matrix*.

INTERGRAPH

Creating an External Transmittal Matrix

- **Select *File > New > Workflow > External Transmittal Matrix* from the menu.**

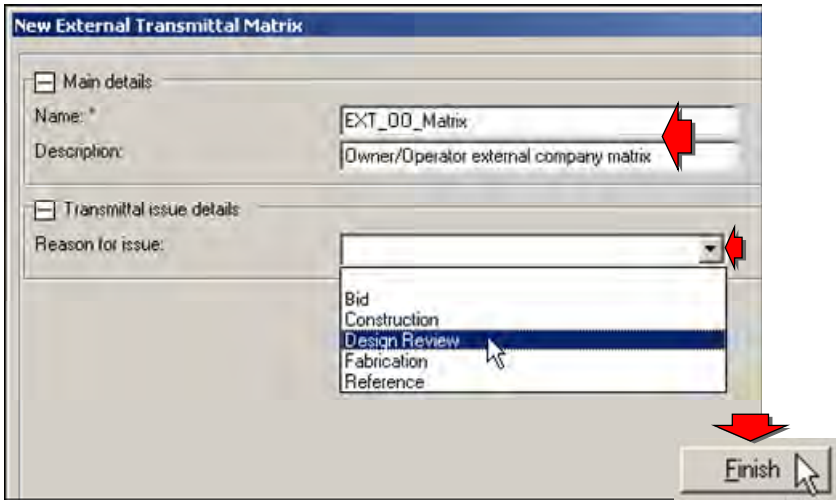


© 2005. Intergraph Corp.
All Rights Reserved.

The *New External Transmittal Matrix* dialog will display.

Creating an External Transmittal Matrix

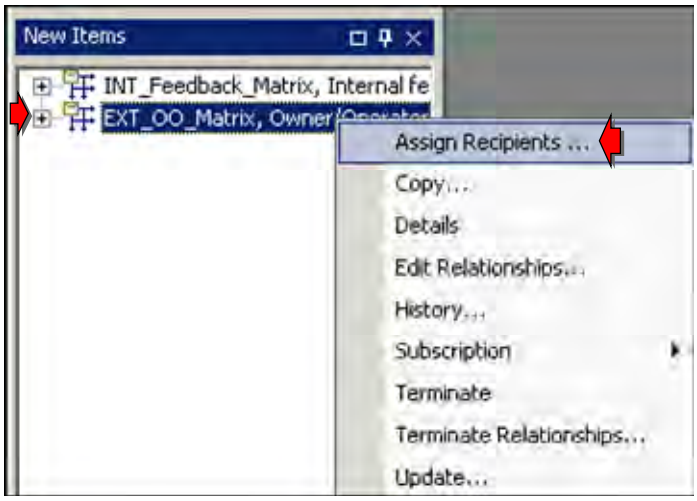
- **Enter the *Name, Description* and select a *Reason For Issue* for the External Transmittal Matrix.**



© 2005. Intergraph Corp.
All Rights Reserved.

Creating an External Transmittal Matrix

- **Right-click the External Transmittal Matrix and select *Assign Recipients* from the pop-up menu.**

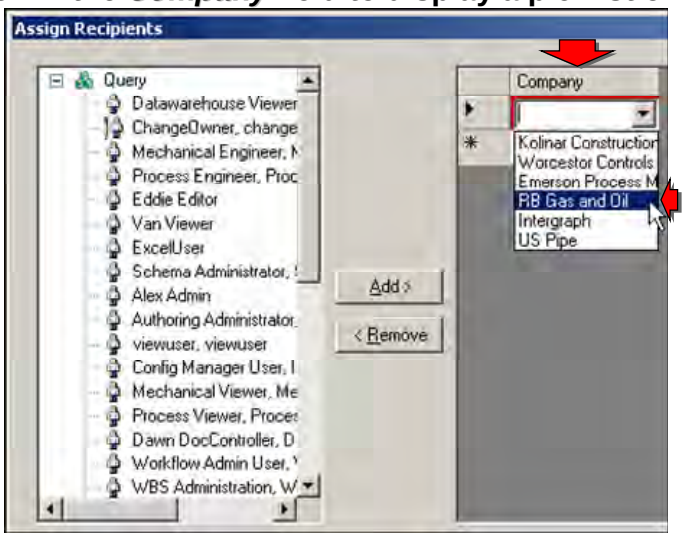


© 2005. Intergraph Corp.
All Rights Reserved.

Next, add the users that will be associated with the External Transmittal Matrix.

Creating an External Transmittal Matrix

- **Click in the *Company* field to display a picklist of values.**



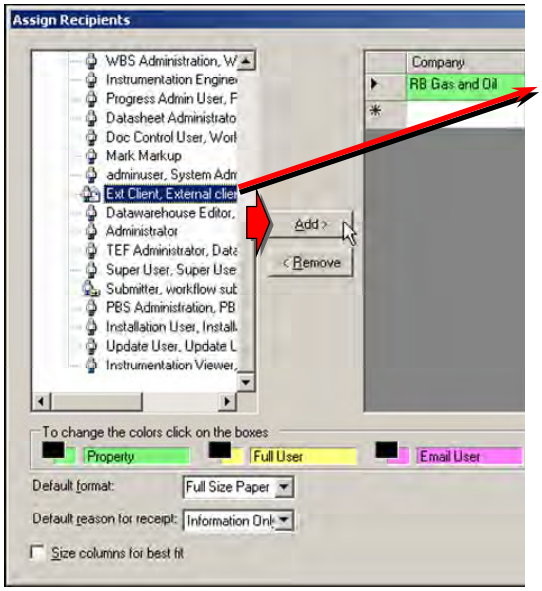
© 2005. Intergraph Corp.
All Rights Reserved.

The External Matrix is slightly different than the Internal Matrix. Where the Internal Matrix contained columns for *Document category* and *Contract* along with the recipients associated to them, the External Matrix contains a column for *Company* along with the recipients to be associated.

The *Assign Recipients* dialog displays.

Creating an External Transmittal Matrix

- **Select an external user from the tree view and click the Add button to add the user to the Matrix.**

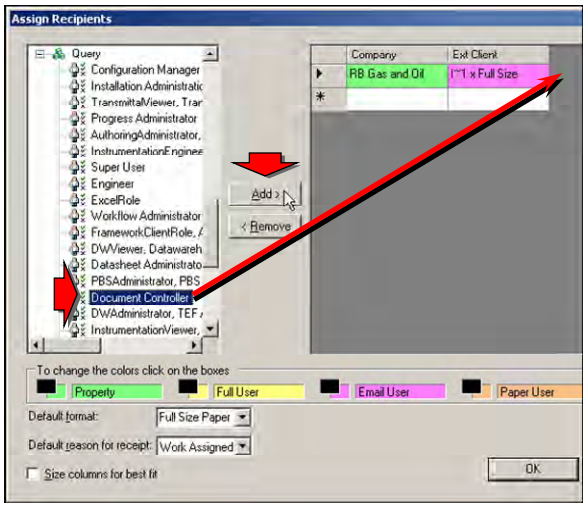


© 2005. Intergraph Corp.
All Rights Reserved.

Set up the matrix assignments for the External Transmittal Matrix in much the same way as for the Internal Transmittal Matrix.

Creating an External Transmittal Matrix

- **Select the next user/role from the tree view and click the Add button to add that user to the Matrix.**

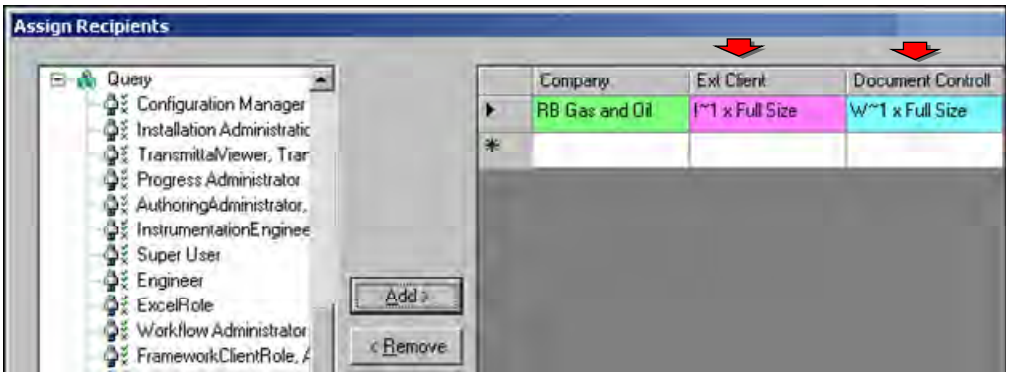


© 2005. Intergraph Corp.
All Rights Reserved.

The *Document Controller* role will actually be responsible for updating the feedback from the external recipient.

Creating an External Transmittal Matrix

Users/roles are added to the matrix recipient assignments.

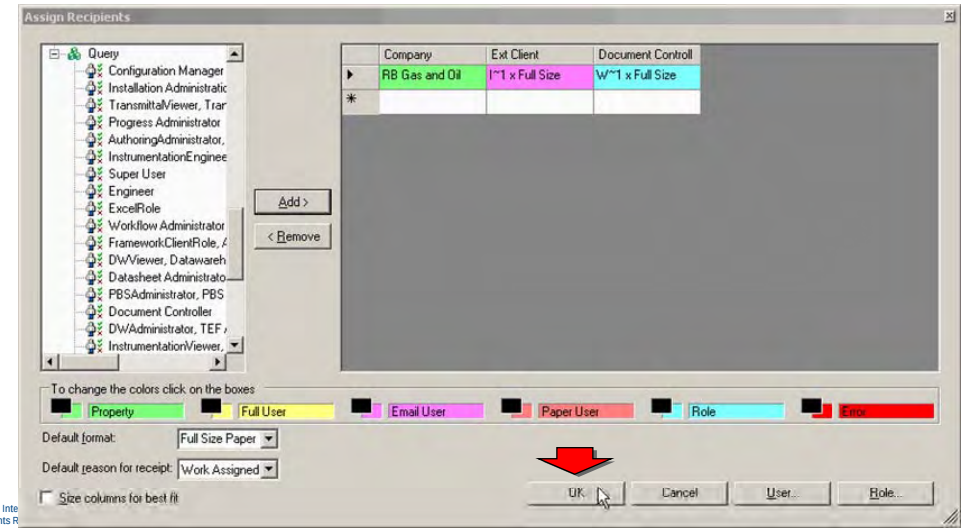


© 2005. Intergraph Corp.
All Rights Reserved.

On the Assign Recipients dialog, there is a *Default format* and *Default reason for receipt*. These values will be default settings for the users added to the External Matrix.

Creating an External Transmittal Matrix

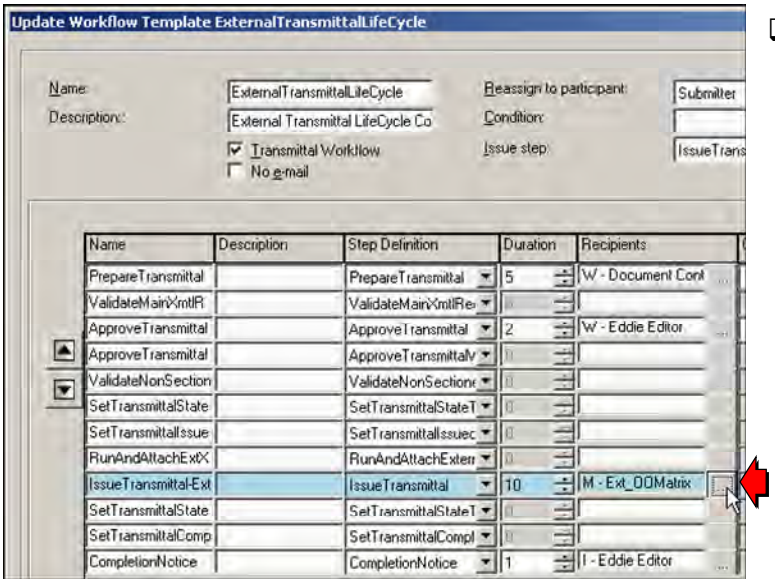
- **Click OK to complete the *External* recipient assignments.**



© 2005. Inte
All Rights R

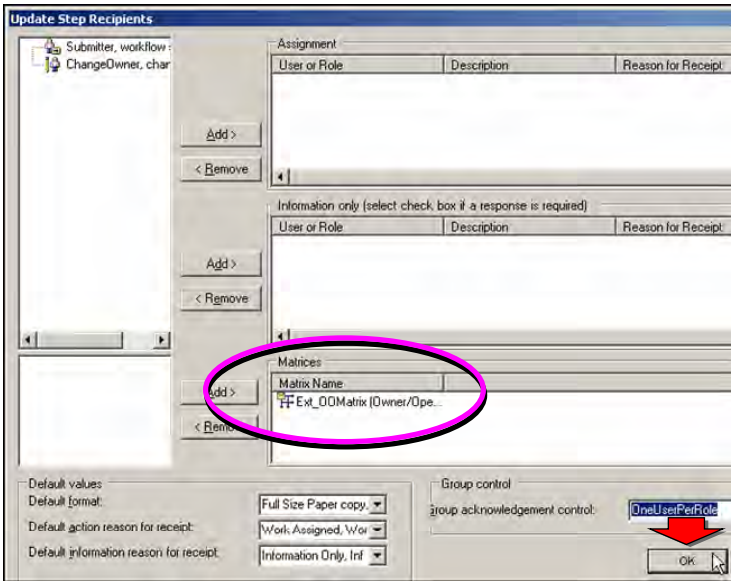
Once an External Transmittal Matrix has been created, a workflow can be modified to utilize the matrix.

Creating an External Transmittal Matrix



- **Once the matrix exists, modify the workflow (*External Transmittal LifeCycle*) to use the new matrix.**

Creating an External Transmittal Matrix



- **After the recipients have been modified, click OK.**

8.6 Activity 1 – Transmittal Administrative Setup

Complete the **Chapter 8** – **Activity 1** in the SPF Configuration and Administration II activity workbook.

8.7 Creating an Internal Transmittal

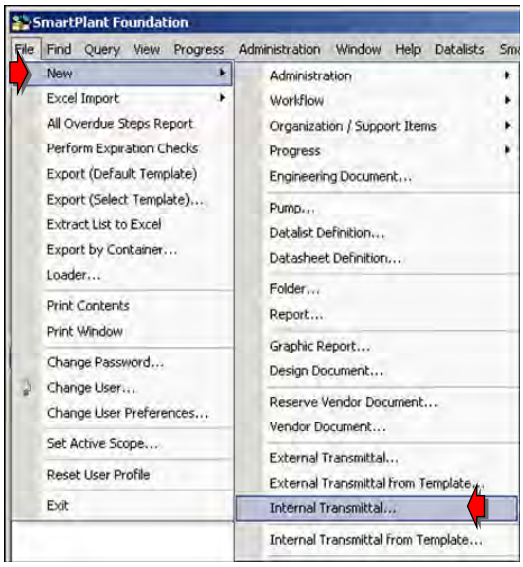
Now that some administrative steps are complete, transmittals can now be created.

An *Internal* transmittal is used to distribute documents within internal organizations. To create an internal transmittal, begin by creating the transmittal object.

INTERGRAPH

Creating an Internal Transmittal

- **Select *File > New > Internal Transmittal…* from the menu.**

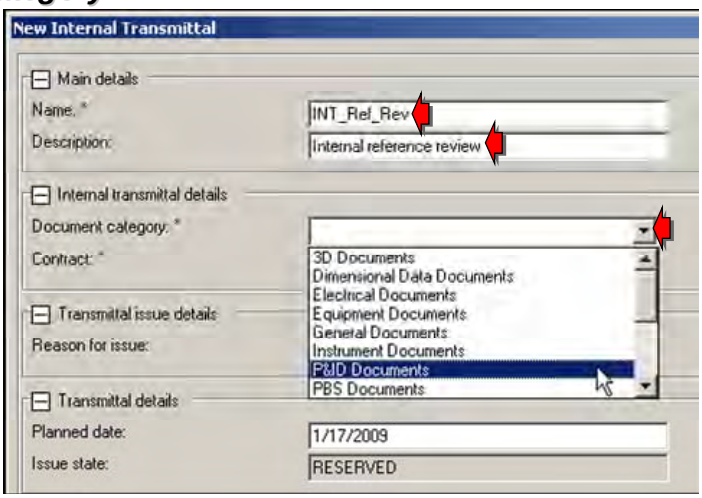


© 2005. Intergraph Corp.
All Rights Reserved.

The *New Internal Transmittal* dialog displays.

Creating an Internal Transmittal

- **Enter a *Name*, *Description* and choose a a *Document category* value.**



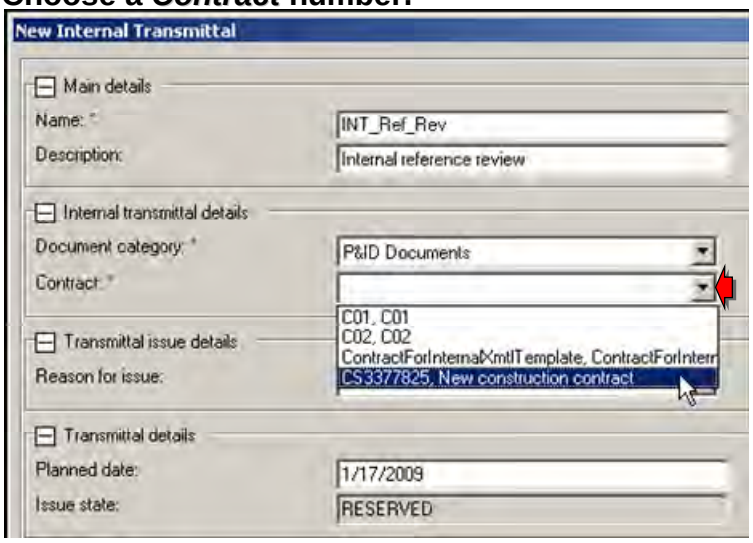
© 2005. Intergraph Corp.
All Rights Reserved.

The following information is entered or populated on this form, with an ***** denoting required fields:

- **Name** – the name for the internal transmittal. ENS can be configured and used for this field.
- **Description** – description of the transmittal
- **Document category** – a field that maps to the distribution matrix

Creating an Internal Transmittal

- **Choose a *Contract* number.**

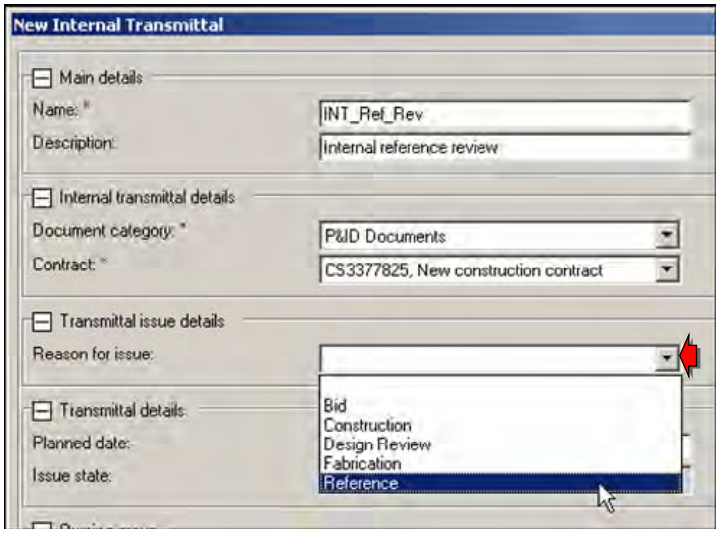


© 2005. Intergraph Corp.
All Rights Reserved.

- **Contract** – a field that maps to the distribution matrix

Creating an Internal Transmittal

- **Choose a *Reason for issue* value.**

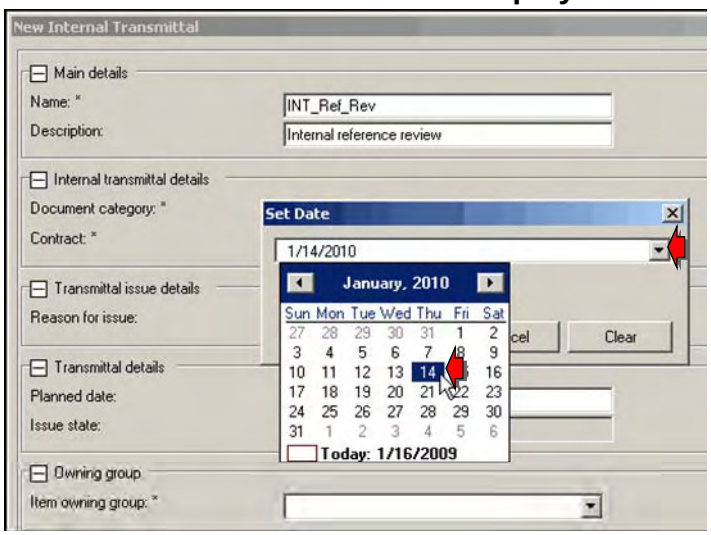


© 2005. Intergraph Corp.
All Rights Reserved.

- **Reason for issue** – a configured pick list

Creating an Internal Transmittal

- **Choose a *Planned date* from the displayed calendar.**



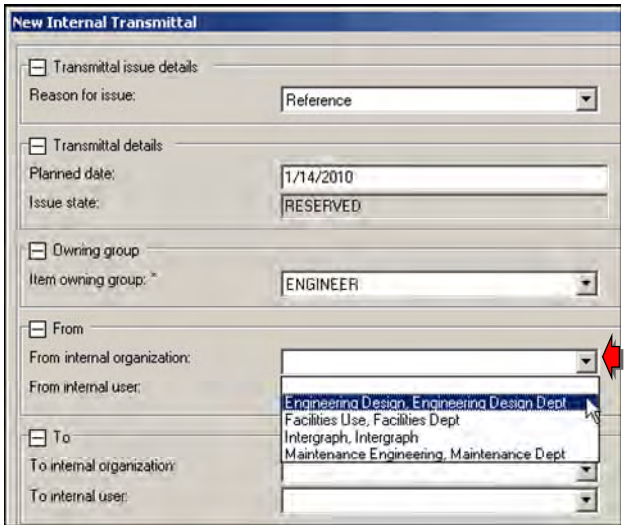
© 2005. Intergraph Corp.
All Rights Reserved.

- **Planned date** – planned date of completion which can also be set by the right mouse menu
- **Issue state** – a read-only field which defaults to RESERVED

- **Item owning group** – used for ownership and vaulting

Creating an Internal Transmittal

- **Choose a value for the *From internal organization*.**

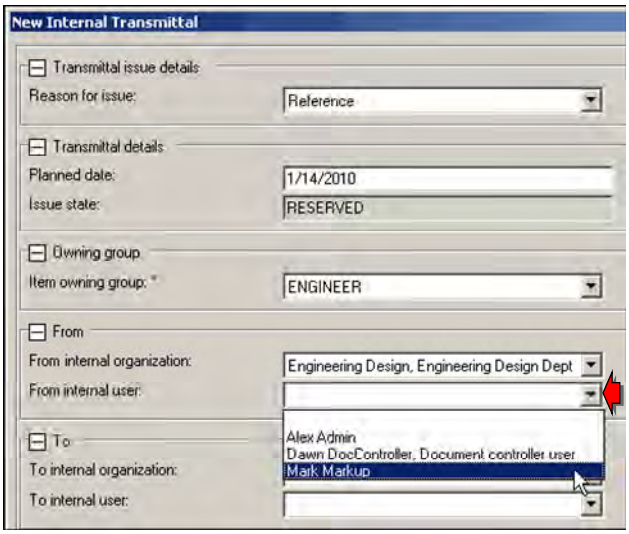


© 2005. Intergraph Corp.
All Rights Reserved.

- **From internal organization** – a pick list of internal organizations

Creating an Internal Transmittal

- **Choose a value for the *From internal user*.**

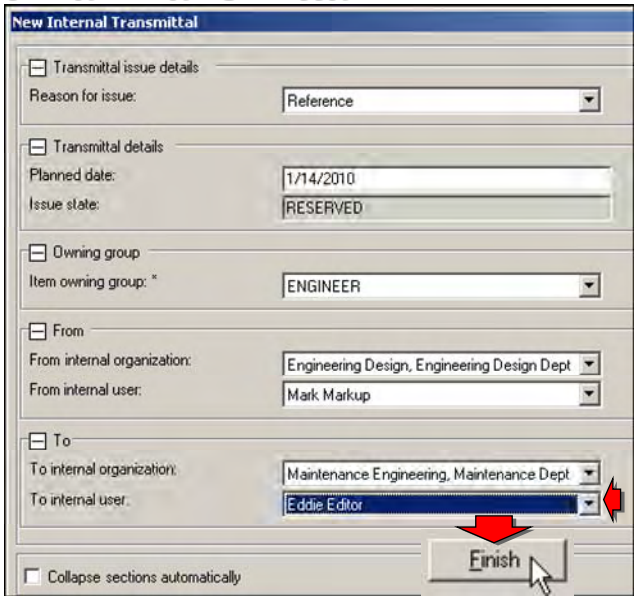


© 2005. Intergraph Corp.
All Rights Reserved.

- **From internal user** – a pick list containing users from the selected organization

Creating an Internal Transmittal

- **Choose a *To internal user* value from the list and click Finish to create the new *Internal Transmittal*.**



© 2005. Intergraph Corp.
All Rights Reserved.

- **To internal organization** – a pick list of internal organizations
- **To internal user** – a pick list containing users from the selected organization

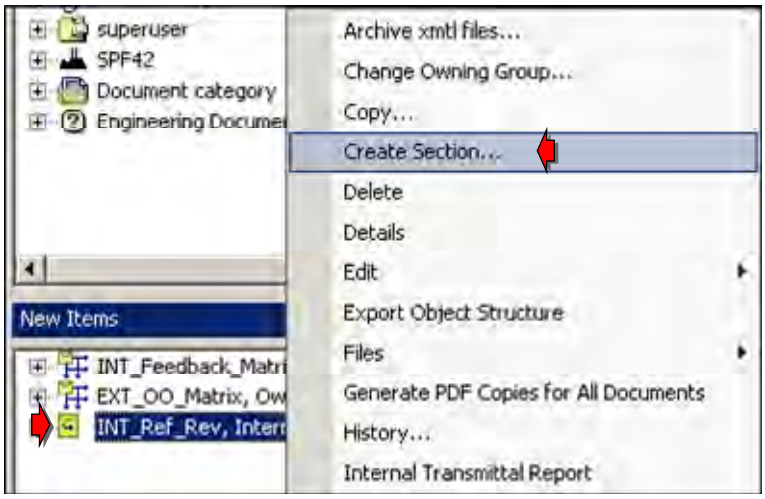
8.7.1 Creating a Transmittal Section

As part of the creation of an Internal Transmittal, the *Create Section* command is available on the Transmittal's right mouse menu. In the delivered model of SPF, Internal Transmittals are configured with sections whereas the External Transmittals are configured with documents attached directly to the transmittal object.

INTERGRAPH

Creating a Transmittal Section

- **To create a Transmittal Section, right-click the Transmittal and select *Create Section* from the right mouse menu.**

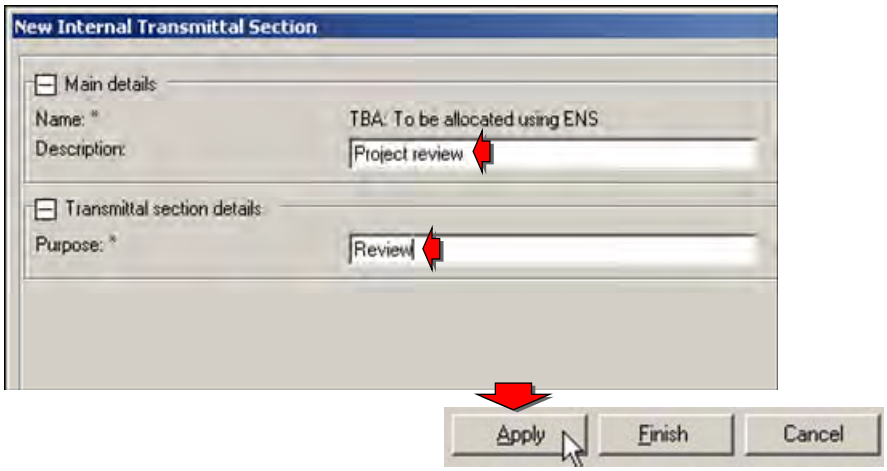


© 2005. Intergraph Corp.
All Rights Reserved.

The *New Internal Transmittal Section* dialog is displayed.

Creating a Transmittal Section

- **Enter an optional *Description* and a required *Purpose* and click Apply.**

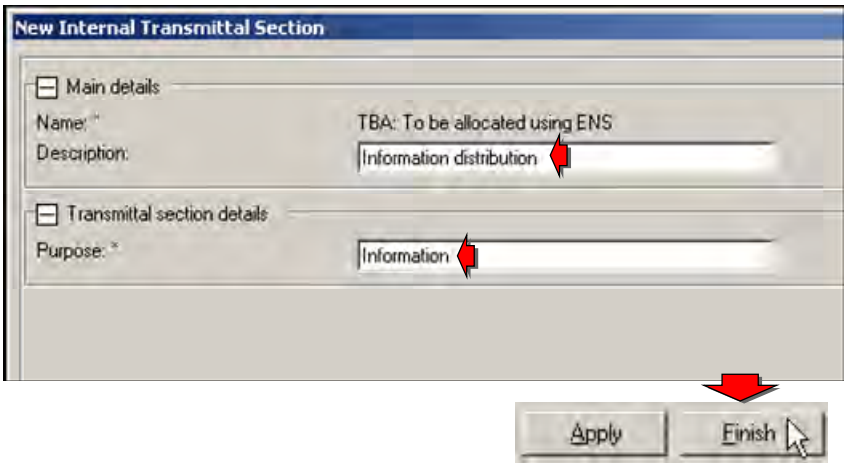


© 2005. Intergraph Corp.
All Rights Reserved.

Repeat this for all needed sections for this specific transmittal.

Creating a Transmittal Section

- **Enter the next optional *Description* and required *Purpose* and click OK.**

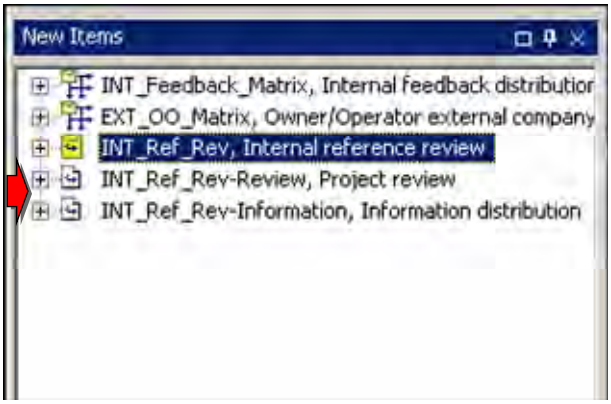


© 2005. Intergraph Corp.
All Rights Reserved.

The new transmittal section is named after the parent internal transmittal (the transmittal that was selected) along with the name using this format **Transmittal Name – Section Purpose**.

Creating a Transmittal Section

Multiple sections can be created for the selected Transmittal.



© 2005. Intergraph Corp.
All Rights Reserved.

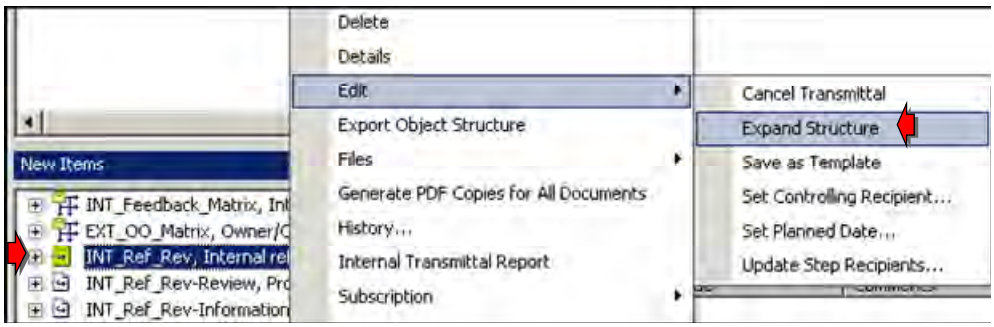
8.7.2 Expanding the Transmittal Structure

Now that an internal transmittal has been created and one or more sections have been added, the transmittal structure can be viewed.

INTERGRAPH

Expanding the Transmittal Structure

- **Right-click on the Internal Transmittal and select *Edit* > *Expand Structure* from the dynamic menu.**

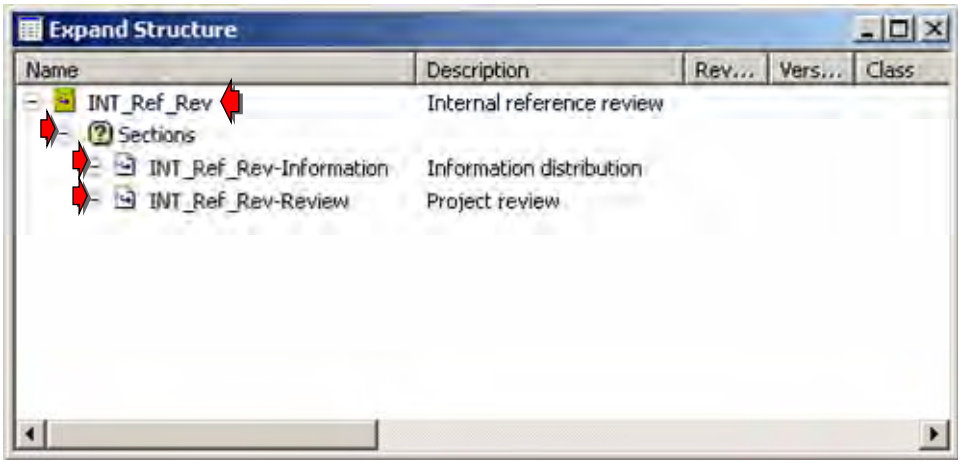


© 2005. Intergraph Corp.
All Rights Reserved.

An *Expand Structure* window will be displayed.

Expanding the Transmittal Structure

The Transmittal Structure is expanded to show its Sections.



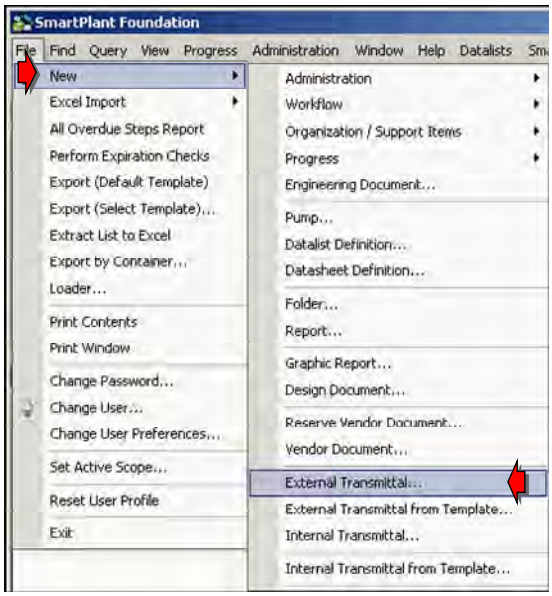
© 2005. Intergraph Corp.
All Rights Reserved.

8.8 Creating an External Transmittal

The steps to create an *External Transmittal* are identical to those used in creating an Internal Transmittal, except External Transmittals do not contain transmittal sections. The main transmittal object is created, and documents are attached directly to it.

Creating an External Transmittal

- **Select *File > New > External Transmittal* from the menu.**

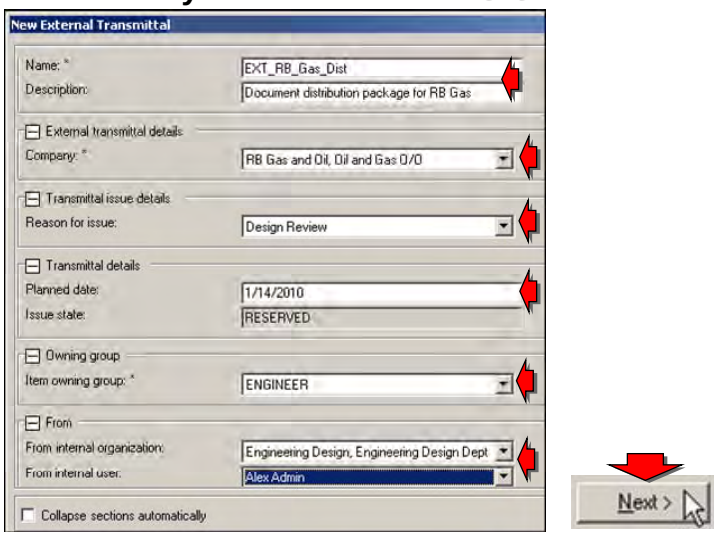


© 2005. Intergraph Corp.
All Rights Reserved.

The *New External Transmittal* dialog displays.

Creating an External Transmittal

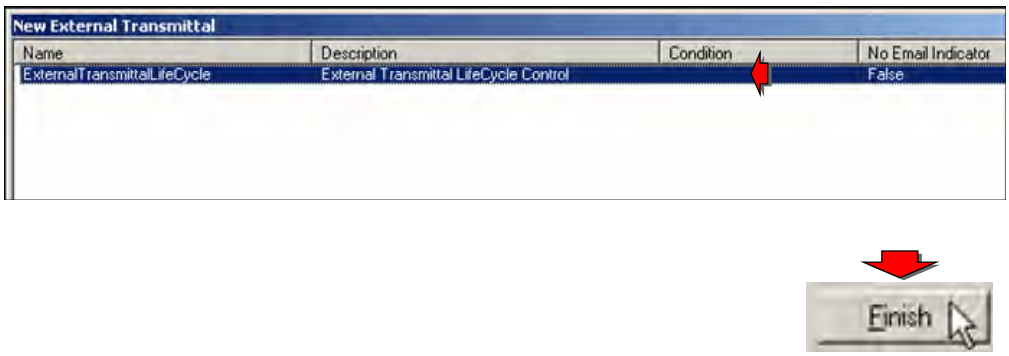
- **Enter the necessary values and click Next.**



© 2005. Intergraph Corp.
All Rights Reserved.

Creating an External Transmittal

- **Verify the workflow and click Finish to create the new *External Transmittal*.**

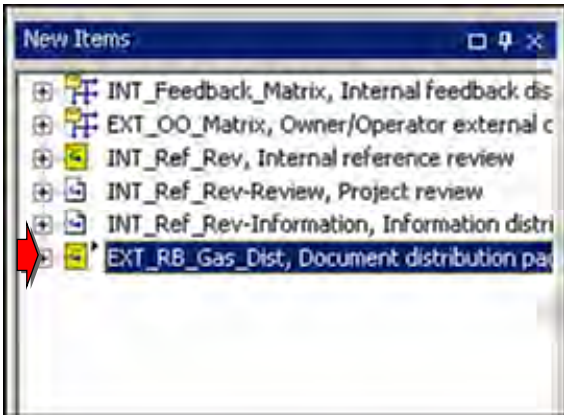


© 2005. Intergraph Corp.
All Rights Reserved.

The new External Transmittal object will be created.

Creating an External Transmittal

The External Transmittal will display in the *New Items* window.



© 2005. Intergraph Corp.
All Rights Reserved.

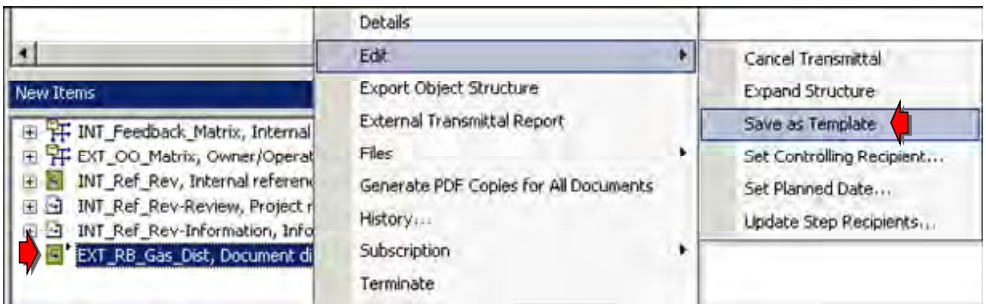
8.9 Saving a Transmittal Template

Any Transmittal can be stored and used as a template. The workflow is terminated and the state of the Transmittal is changed to TEMPLATE effectively freezing it from modification. All section information, relationships to documents and workflow set up is frozen.

INTERGRAPH

Saving a Transmittal Template

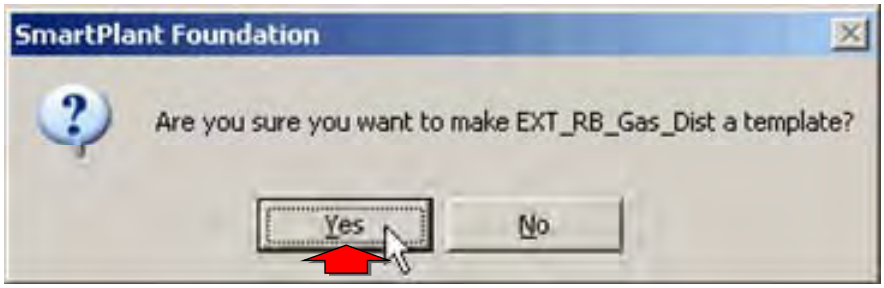
- **Right-click on an External Transmittal and select *Edit > Save as Template.***



© 2005. Intergraph Corp.
All Rights Reserved.

Saving a Transmittal Template

- **Click Yes to make the selected Transmittal a template.**

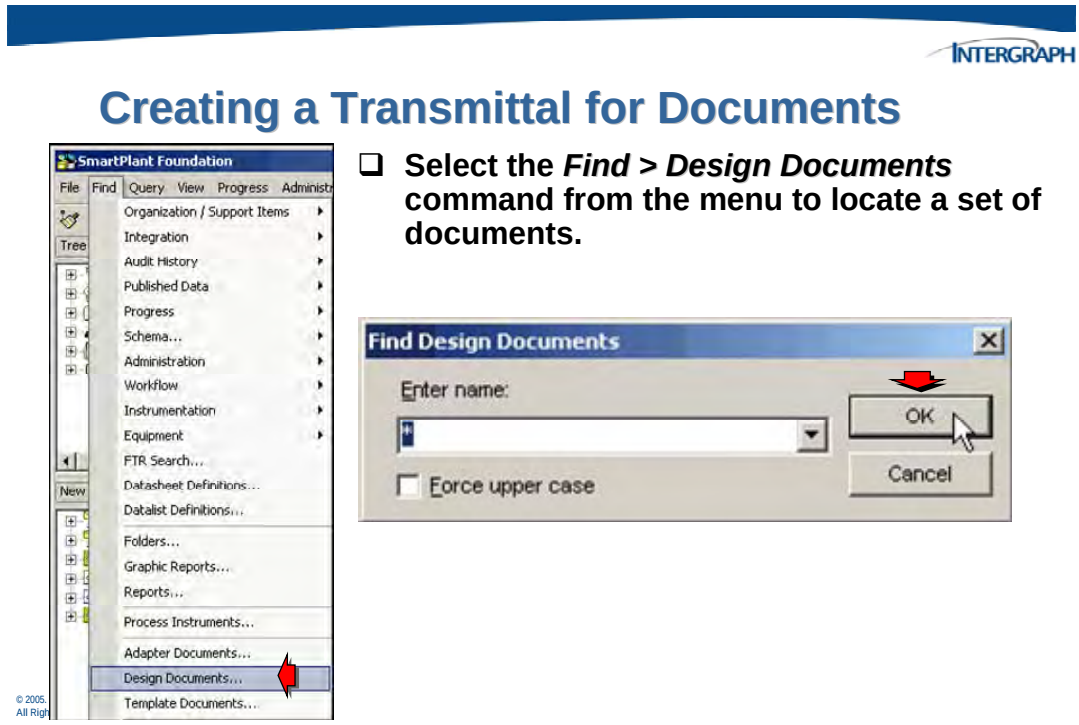


© 2005. Intergraph Corp.
All Rights Reserved.

8.10 Create a Transmittal for a Selected Set of Documents

It is possible to select a set of documents and generate a new Transmittal for them. When the documents are selected, choose either the ***New Internal Transmittal*** command or the ***New External Transmittal*** command from the menu.

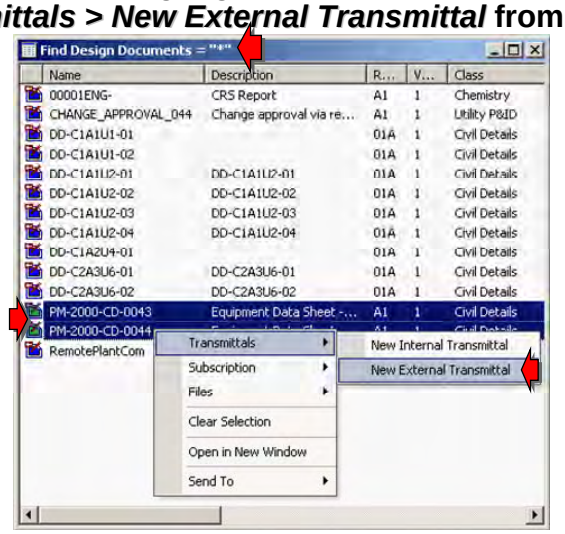
Begin by searching for a set of documents to be added to the transmittal.



Next, highlight a set of documents from the *Find results* window.

Creating a Transmittal for Documents

- **Right click on a highlighted document and select *Transmittals > New External Transmittal* from the menu.**

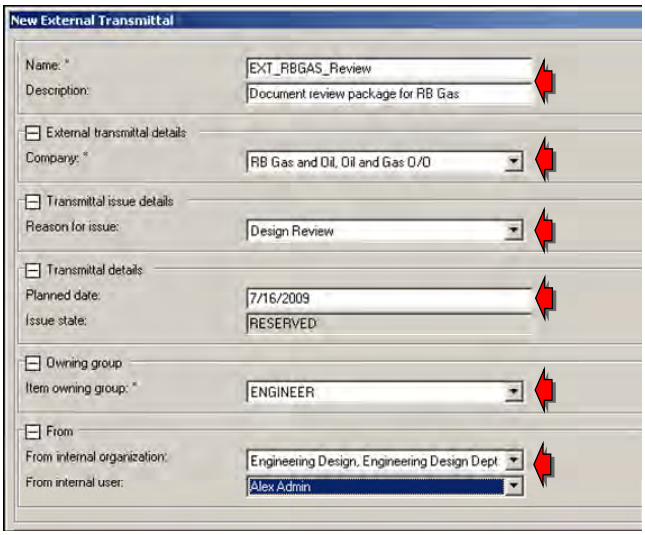


© 2005. Intergraph Corp.
All Rights Reserved.

A *New External Transmittal* dialog will display. Enter the information necessary to create the new transmittal object.

Creating a Transmittal for Documents

- **Click Finish to create the new *Transmittal*.**

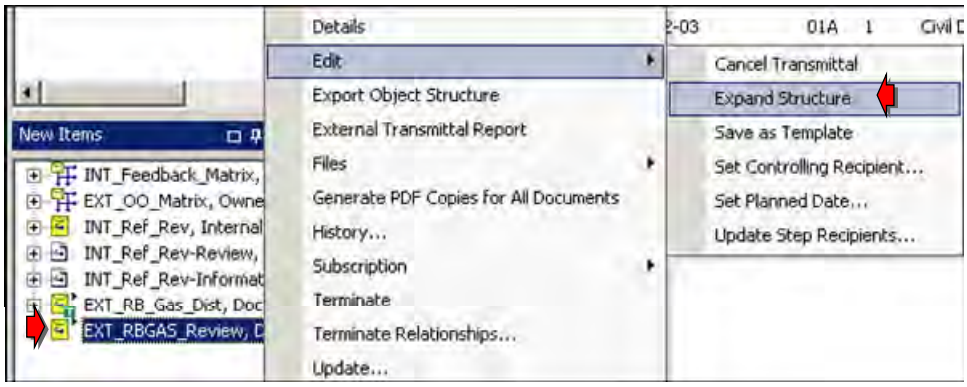


© 2005. Intergraph Corp.
All Rights Reserved.

Expand the transmittal structure to verify that the documents were attached to the new transmittal.

Creating a Transmittal for Documents

- **Right-click on the External Transmittal and select *Edit* > *Expand Structure*.**

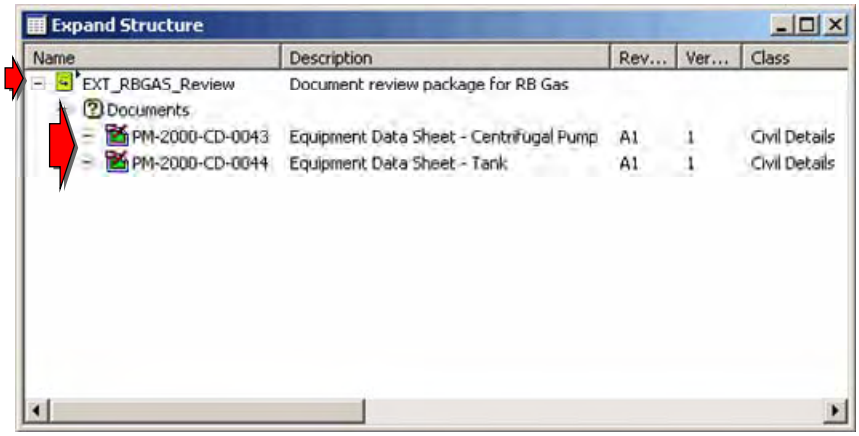


© 2005. Intergraph Corp.
All Rights Reserved.

An *Expand Structure* window will be displayed.

Creating a Transmittal for Documents

The Transmittal Structure is expanded to show the associated documents.



© 2005. Intergraph Corp.
All Rights Reserved.

8.11 Creating a Transmittal from a Template

A Transmittal can be stored as a template and used to create new transmittals. There are two ways to create a transmittal from a template:

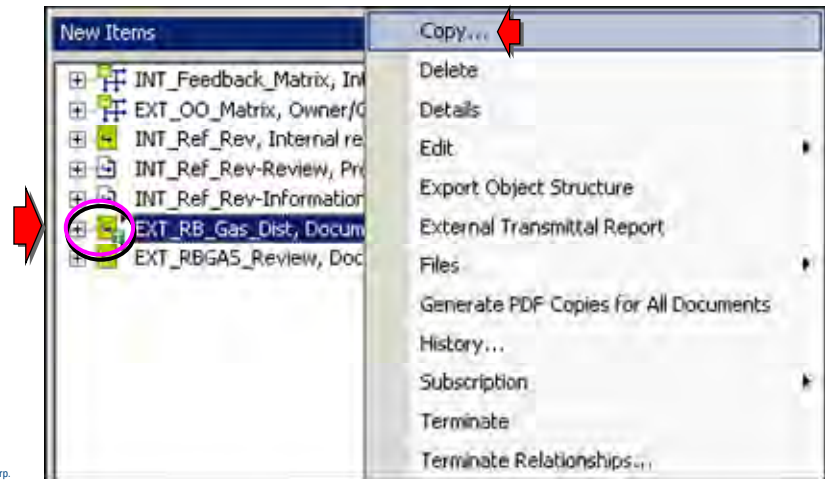
- ❑ Use the ***Find*** > ***Transmittals*** > ***Transmittal Templates*** to retrieve the templates. Right-click a template to display the right mouse menu to use the **Copy** command.
- ❑ Use dedicated menu options. In the delivered SPF model there are commands to create site transmittals from delivered templates using the ***File*** > ***New*** > ***Internal Transmittal from Template*** or the ***File*** > ***New*** > ***External Transmittal from Template*** commands.

Highlight a *Transmittal Template* to be used for creating a new transmittal.

INTERGRAPH

Creating a Transmittal from a Template

- ❑ **Right-click on a Transmittal Template and select *Copy* from the menu.**

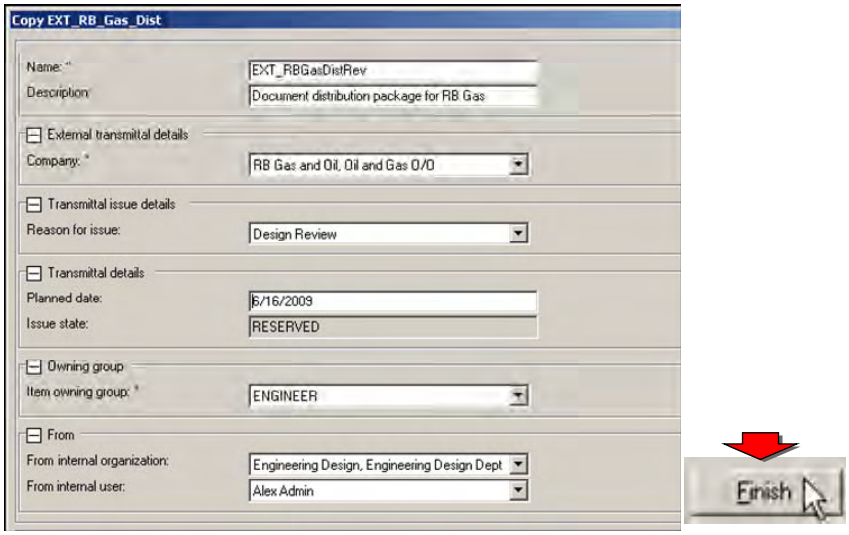


© 2005. Intergraph Corp.
All Rights Reserved.

A *Copy* transmittal dialog will be displayed.

Creating a Transmittal from a Template

- **Click Finish to create the new *Transmittal*.**

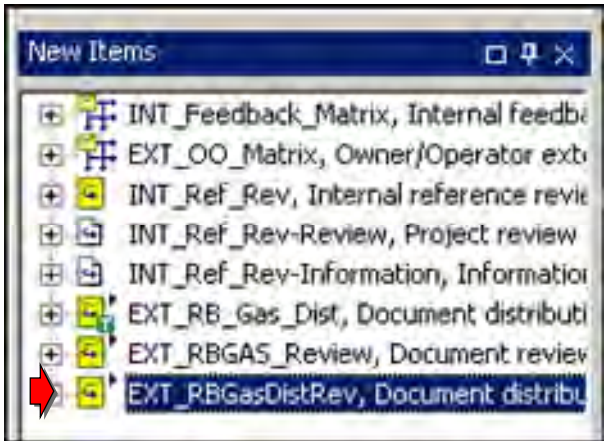


© 2005. Intergraph Corp.
All Rights Reserved.

Enter a new name for the transmittal and change any of the other values.

Creating a Transmittal from a Template

The new transmittal is created from the template.



© 2005. Intergraph Corp.
All Rights Reserved.

8.12 Activity 2 – Creating Transmittals

Complete the **Chapter 8** – **Activity 2** in the SPF Configuration and Administration II activity workbook.

CHAPTER 9

Using and Managing Transmittals

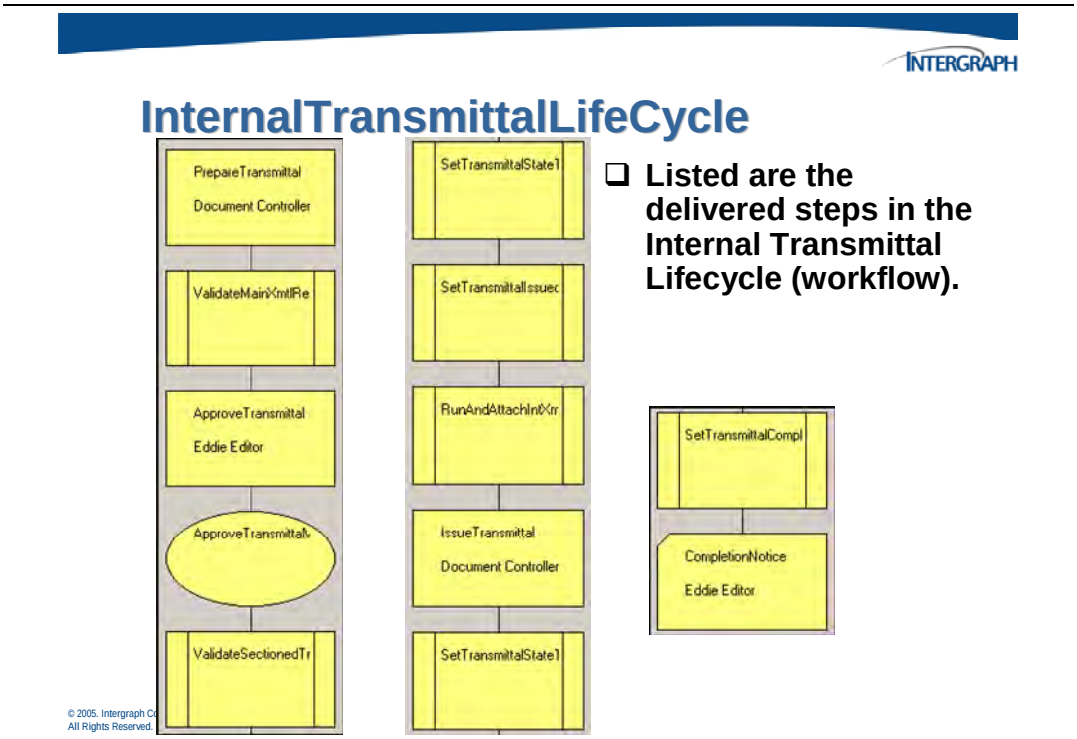
9. Using and Managing Transmittals

In this chapter the commands to use and manage transmittals will be covered. This includes the discussion of the delivered transmittal workflows. In addition to the transmittal workflows, the ability to search for transmittals, update, cancel and terminate transmittals will also be covered in this chapter.

Another topic to be discussed is the Transmittal Export functionality. This allows you to take transmittal files and copy them on to a file system as a structure so that they can be put on a media such as a CD or DVD for distribution.

The initial creation of a transmittal submits it to a *Transmittal Workflow*, which will process it through a series of predefined steps. There are two workflows delivered with the SmartPlant Foundation. The **InternalTransmittalLifeCycle** workflow is designed to process internal transmittals.

The InternalTransmittalLifeCycle workflow contains a mixture of automated processing and manual intervention steps. The workflow begins with a **PrepareTransmittal** step where an assignee has the responsibility to make sure the documents are attached to the transmittal section and the correct recipients have been set up.



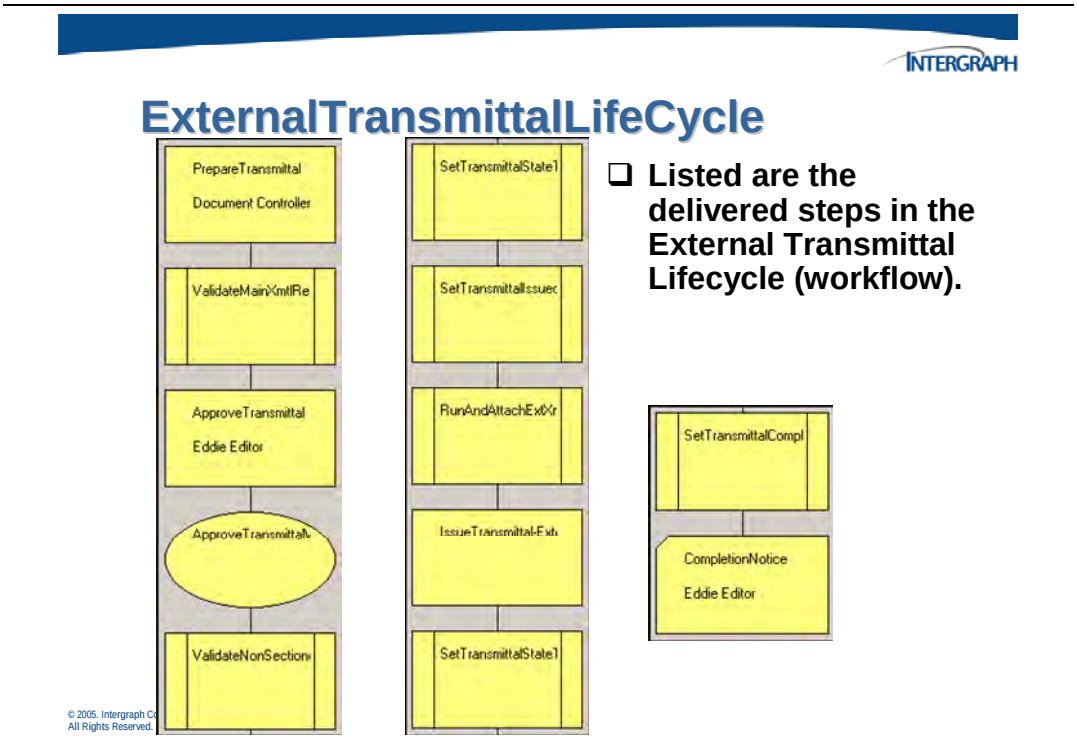
Next, this information is automatically validated and the transmittal is sent to an **ApproveTransmittal** step, which is another manual processing step in the workflow. In this step, an assignee will verify the transmittal recipients and that the correct documents have been attached.

Once the transmittal has been approved it will again go through an automatic validation process and then an **Issue** step which is also automated.

As part of the automated Issue process, a transmittal summary report will be generated and attached to the transmittal. The workflow will pause at this point waiting for the recipient responses. The **Recipient Response Management** is usually handled by a designated contact, the **Document Controller**.

After all of the responses have been recorded by the Document Controller, the transmittal is moved to a Completed state (status) where it will wait for a user to act on the **CompletionNotice** step.

The **ExternalTransmittalLife** is a workflow designed to process external transmittals.



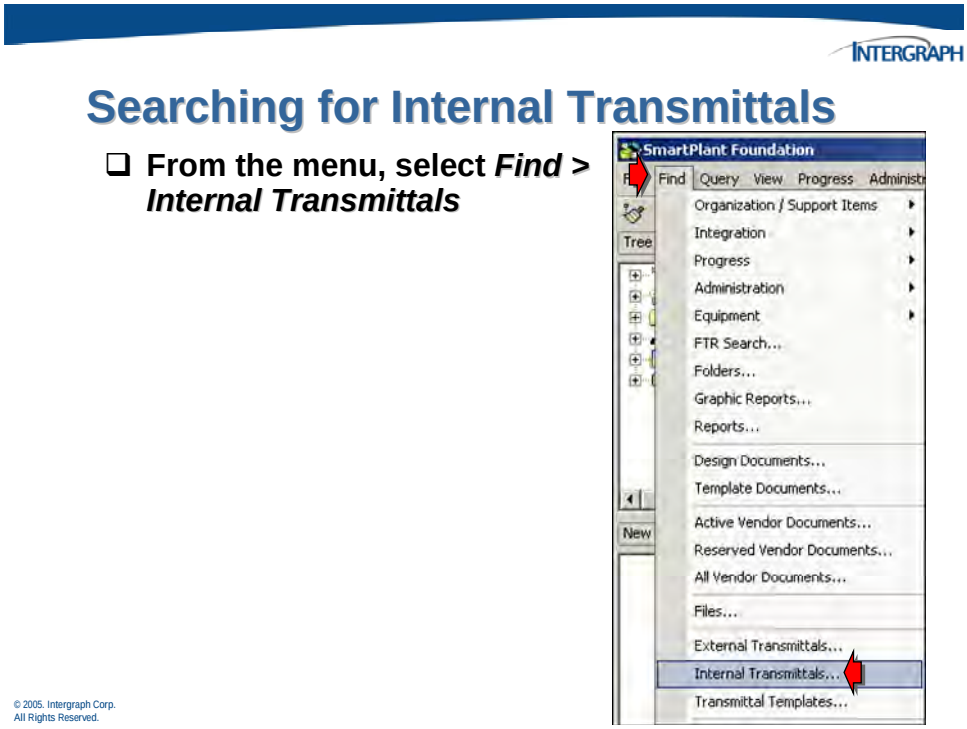
The ExternalTransmittalLife workflow works very much in the same manner as the InternalTransmittalLifeCycle.

9.1 Searching for Transmittals

SmartPlant Foundation provides the capability to retrieve transmittal objects from the database according to specified search requirements. In this section we want to cover the command sequences used to find transmittal objects.

Users can perform searches for *Internal* or *External* transmittals and *Transmittal Templates*.

There may be the need to search for a specific type of transmittal. In this example, searching for internal transmittals is discussed.



The *Find Internal Transmittal* dialog will display.

Searching for Internal Transmittals

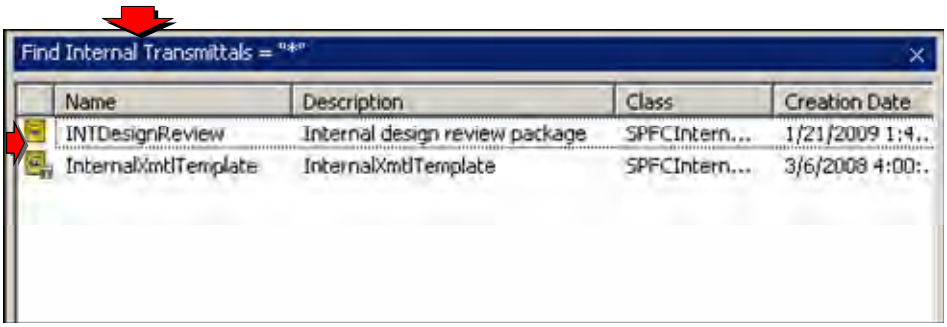
- **Enter the search criteria to locate any existing Internal Transmittals.**

© 2005. Intergraph Corp.
All Rights Reserved.

A window will be displayed containing the results of the *Find* command.

Searching for Internal Transmittals

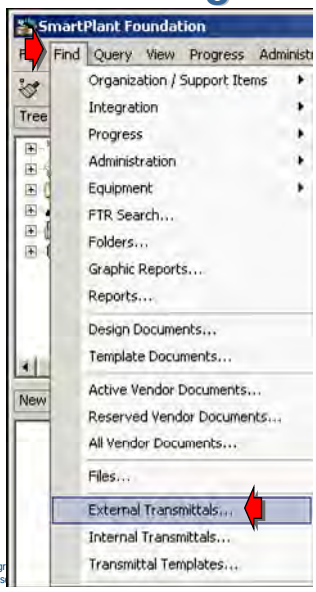
The objects returned by the search are displayed in a *Find* results window.



© 2005. Intergraph Corp.
All Rights Reserved.

Searching for *External* transmittals is performed the same way as searching for an Internal transmittal. The document controller, who may be the single contact point within a company or organization, would use this search to locate an outgoing packet of documents. This packet might be destined for a supplier or an external company.

Searching for External Transmittals



- **From the menu, select *Find > External Transmittals***

© 2005. Intergr
All Rights Res

The *Find External Transmittal* dialog will display.

Searching for External Transmittals

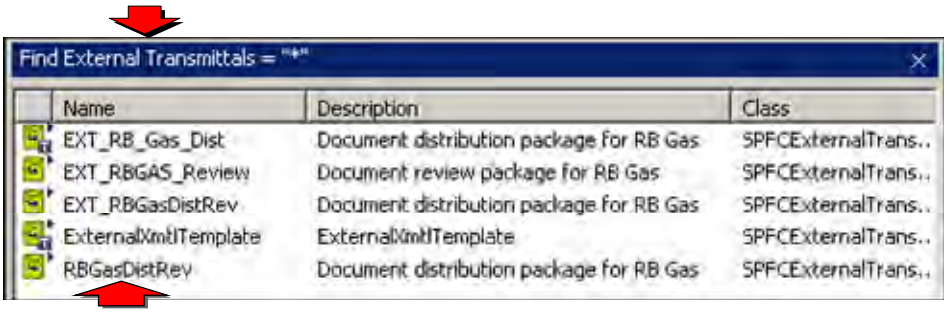
- **Enter the search criteria to locate any existing External Transmittals.**

© 2005. Intergraph Corp.
All Rights Reserved.

The external transmittals are displayed in a new results window.

Searching for External Transmittals

The objects returned by the search are displayed in a *Find* results window.



© 2005. Intergraph Corp.
All Rights Reserved.

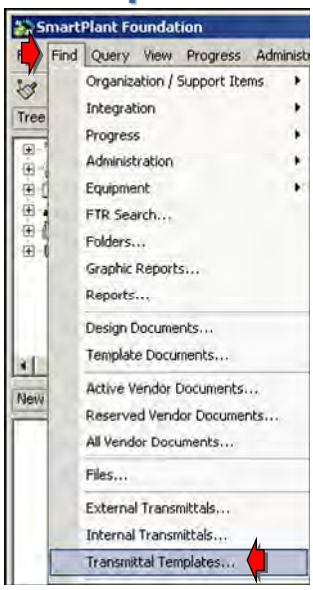
Remember that transmittal objects can be saved and then used as a template to create new, future transmittals. Each template could contain a different set of recipients, document categories, contracts, etc.

In the following example, the ability to search for transmittal templates is demonstrated.

INTERGRAPH

Searching for Transmittal Templates

- **From the menu, select *Find > Transmittal Templates***



© 2005. Intergraph Corp.
All Rights Reserved.

When you save a transmittal as a template, the transmittal workflow is terminated, and the transmittal issue state changes to TEMPLATE.

Searching for Transmittal Templates

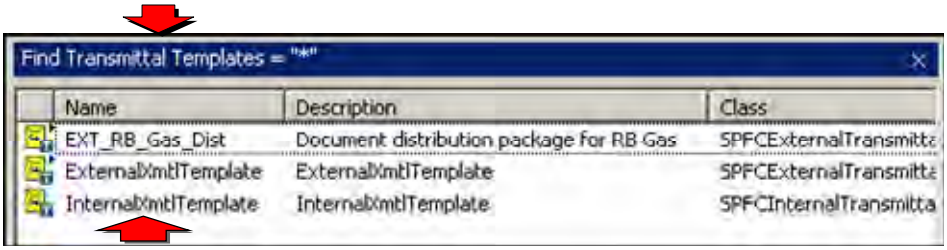
- **Enter the search criteria to locate any existing Transmittal Templates.**

© 2005. Intergraph Corp.
All Rights Reserved.

All section information, relationships to documents, and workflow setup are frozen.

Searching for Transmittal Templates

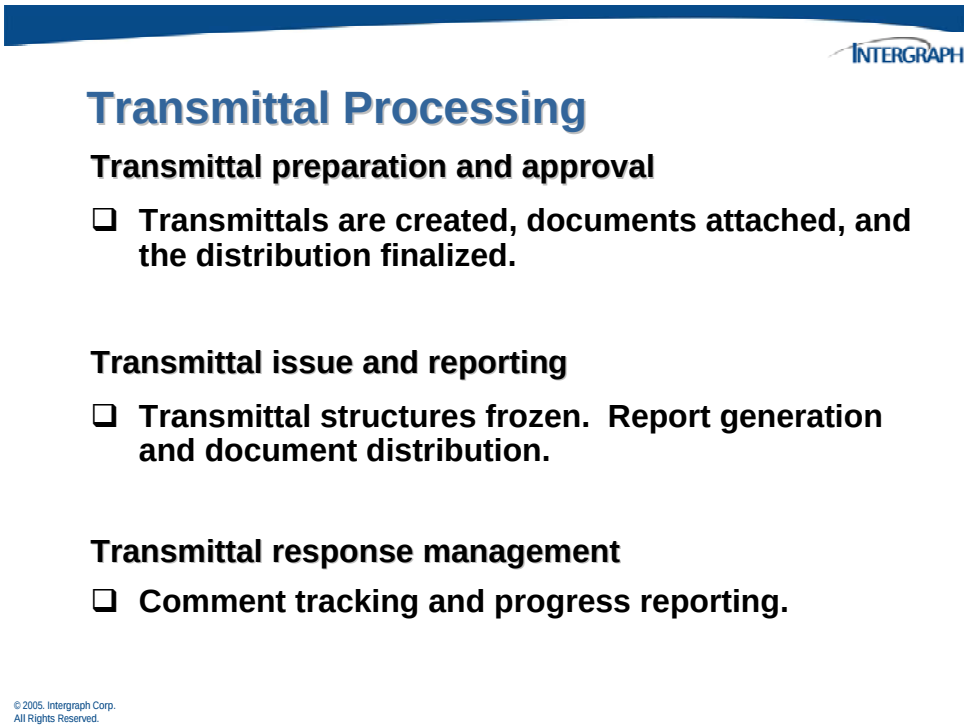
The objects returned by the search are displayed in a *Find* results window.



© 2005. Intergraph Corp.
All Rights Reserved.

9.2 Transmittal Preparation and Approval

Remember that a transmittal workflow contains a mixture of automated processing and manual intervention steps. In this section, the different operations will be explained as a transmittal moves through the defined workflow steps from the preparation to the completion of the transmittal. In chapter 8, the workflow participants were discussed. These are the users who are responsible for the different processing steps in the workflow.



Transmittal Processing

Transmittal completion (closed)

- **No further changes permitted.**

Note: **If a transmittal is issued in error, it can be cancelled. When this happens, the transmittal is reissued with an issue state of CANCELLED.**

© 2005. Intergraph Corp.
All Rights Reserved.

For this discussion, an external transmittal will be used. An external transmittal is used to distribute a package of documentation from an internal organization within a company to an outside company or supplier.

By having the transmittal automatically submitted to a workflow, email notifications are generated and sent to the workflow participants, as their participation is required.

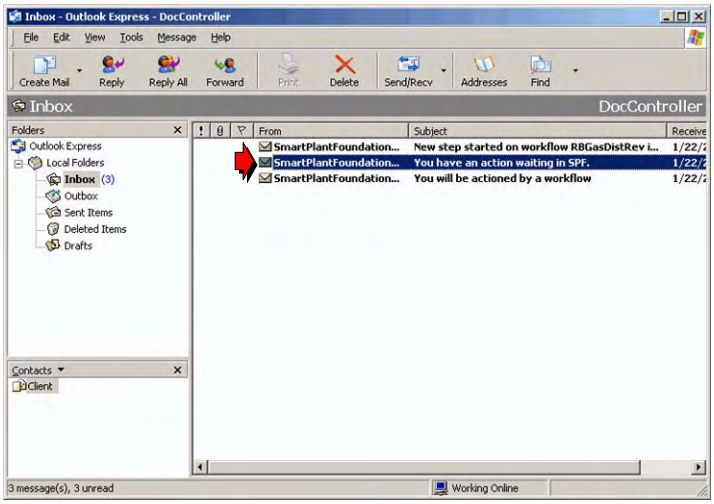
The user will need to open their email client. As part of the transmittal creation process, a workflow is populated by default as one of the transmittal fields. This causes the transmittal object to be automatically submitted upon creation.

From the desktop or the ***All Programs*** menu, start the email client. The mail client window will open and any messages sent by SmartPlant Foundation will be displayed.

As part of the notification process, the user that creates the transmittal is also the workflow submitter.

Transmittal Email Notification

- **Double-click to view the mail message sent by SmartPlant Foundation.**

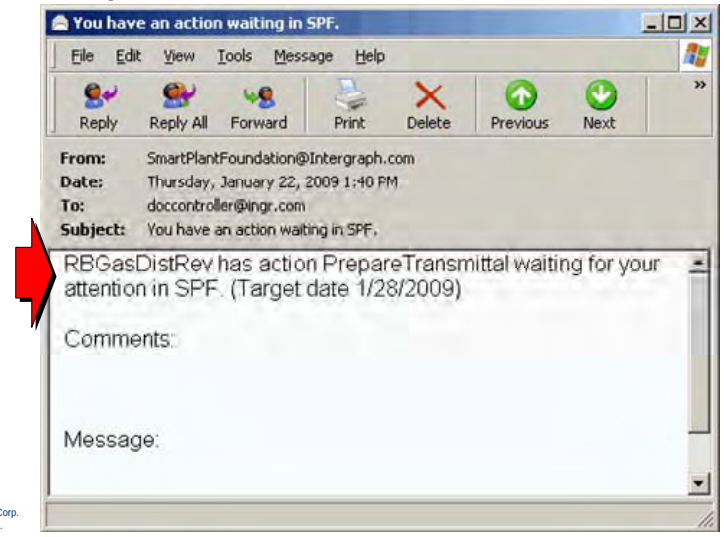


© 2005. Intergraph Corp.
All Rights Reserved.

The submitter will receive a copy of the email that is sent to the first participant in the workflow, the user responsible for preparing the transmittal.

Transmittal Email Notification

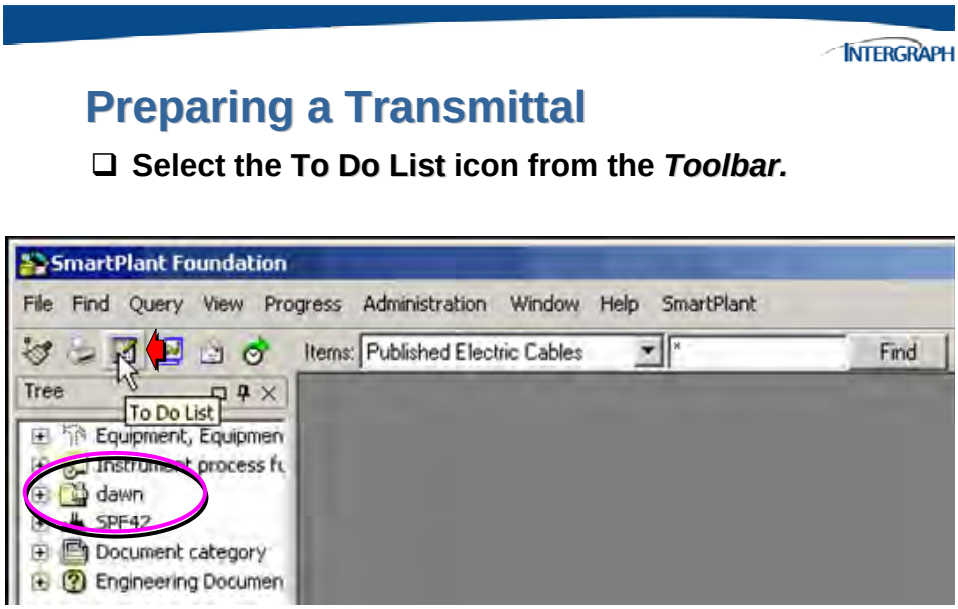
The required action is detailed in the mail message.



© 2005. Intergraph Corp.
All Rights Reserved.

9.2.1 Preparing a Transmittal

After the transmittal has been created, the designated recipient receives email notification of the *Prepare Transmittal* step in the Transmittal Workflow. This step directs the user to attach documents and assign recipients to the transmittal. First, the user assigned to this task must be logged on. Once the user is logged on, open the *To Do List* to access the workflow step and the transmittal.



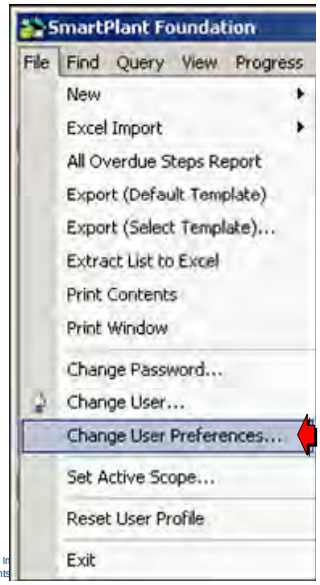
© 2005. Intergraph Corp.
All Rights Reserved.

The *To Do List* window will be opened.

In order to prepare a transmittal, it will be necessary to drag and drop the documents that will be attached onto the transmittal.

Configuring the client to allow multiple floating windows will make this task easier. This is done by changing the user preferences for the current logged in user.

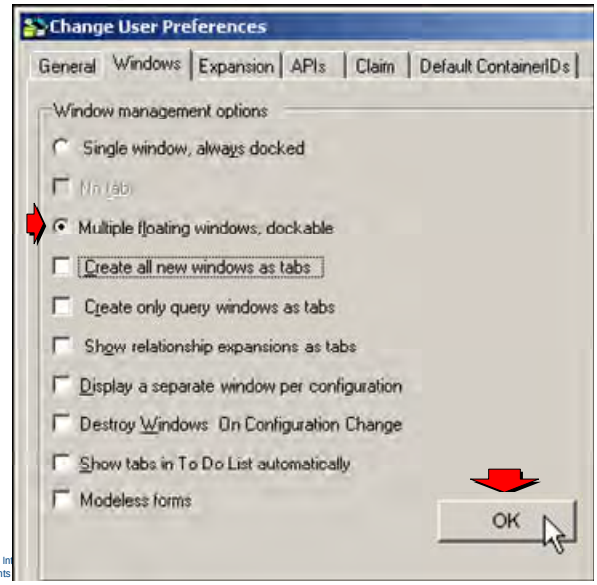
Preparing a Transmittal



- **Choose *File > Change User Preferences* from the menu.**

The *Change User Preferences* dialog will display.

Preparing a Transmittal

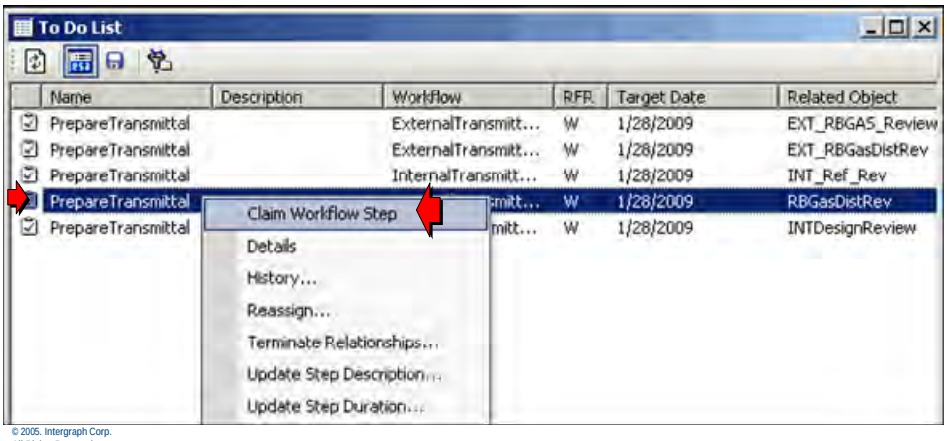


- **Select the *Multiple floating windows, dockable* radio button and click OK.**

Because the *Document Controller* role assigned to the **Prepare Transmittal** step may contain multiple users, the workflow step must first be claimed.

Preparing a Transmittal

- **Right click on the workflow step and select *Claim Workflow Step* since multiple users can be configured for the assigned role.**

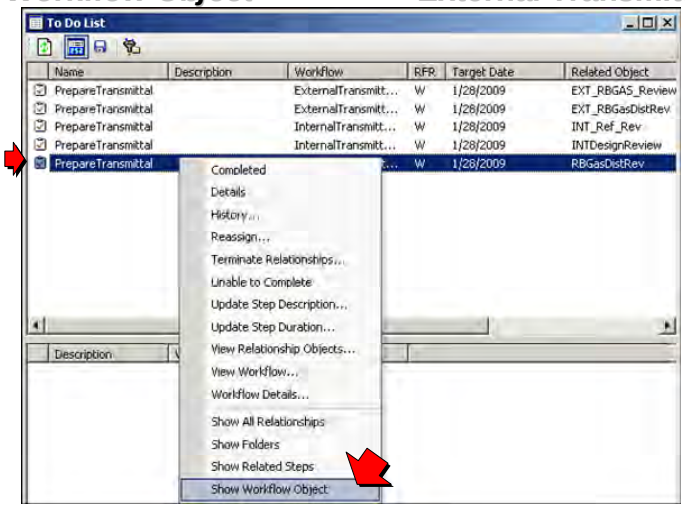


© 2005. Intergraph Corp.
All Rights Reserved.

Next, display the transmittal that is associated with this step in the workflow.

Preparing a Transmittal

- **Right click on the workflow step and select *Show Workflow Object* to see the External Transmittal.**

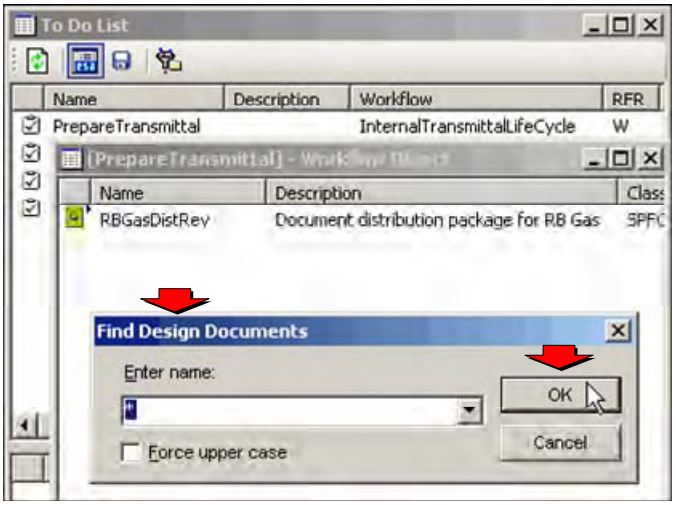


© 2005. Intergraph Corp.
All Rights Reserved.

The *Prepare Transmittal* step is where the appropriate documents are associated to the transmittal.

Preparing a Transmittal

- **Use a Find command and perform a search to find the documents to be attached to the transmittal.**



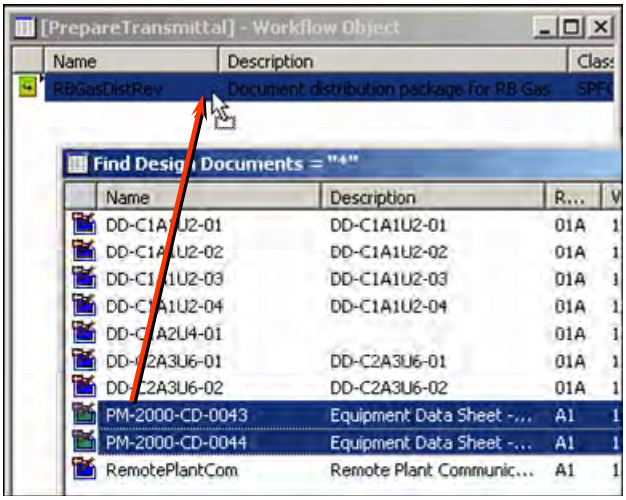
© 2005. Intergraph Corp.
All Rights Reserved.

Documents that will be attached to a transmittal must first be frozen. That is, no changes will be allowed. Before a document can be attached to a transmittal, use the ***Sign Off*** command to freeze the document object.

Attach the documents to be reviewed to this **external transmittal**. Select the documents to be attached using the control key and holding the left mouse button down.

Preparing a Transmittal

- **Drag and drop the documents onto the External Transmittal object.**

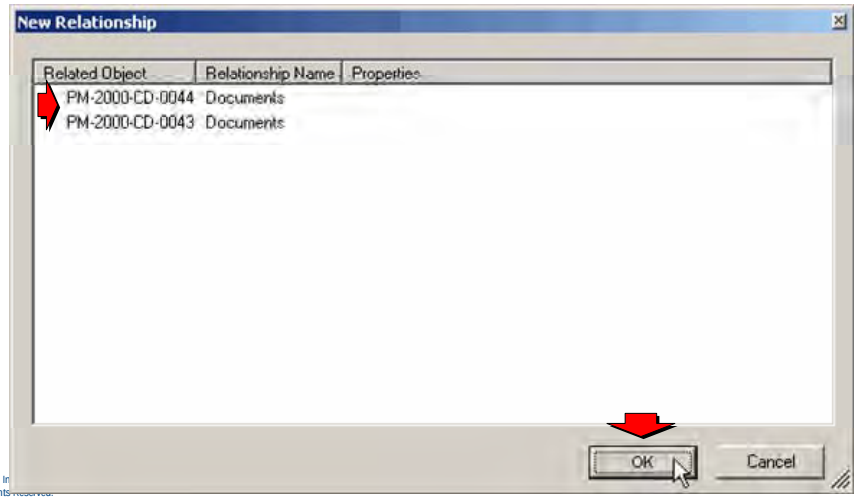


© 2005. Intergraph Corp.
All Rights Reserved.

After the documents have been dragged and dropped onto the transmittal, a *Create Relationship* form displays, allowing the relationship to be changed if needed.

Preparing a Transmittal

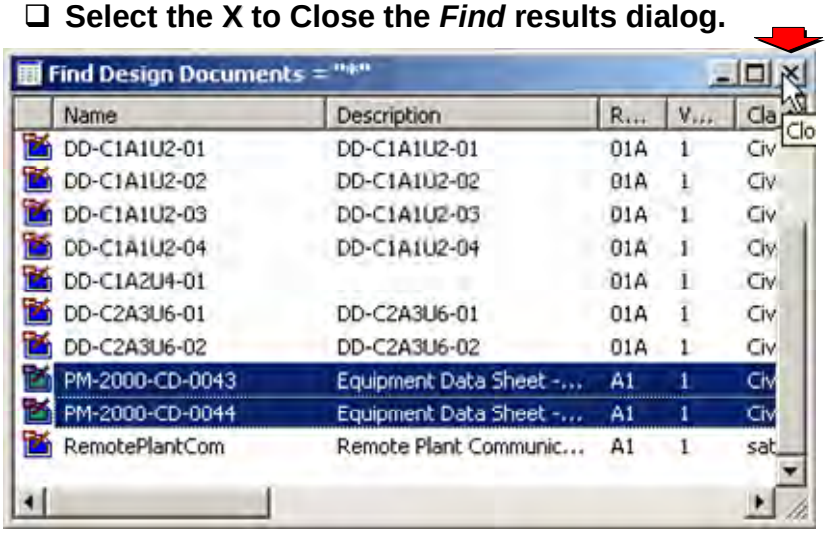
- **Click OK to create a relationship between the selected documents and the External Transmittal.**



You are finished with the *Find results* window so it can be closed.

Preparing a Transmittal

- **Select the X to Close the *Find* results dialog.**

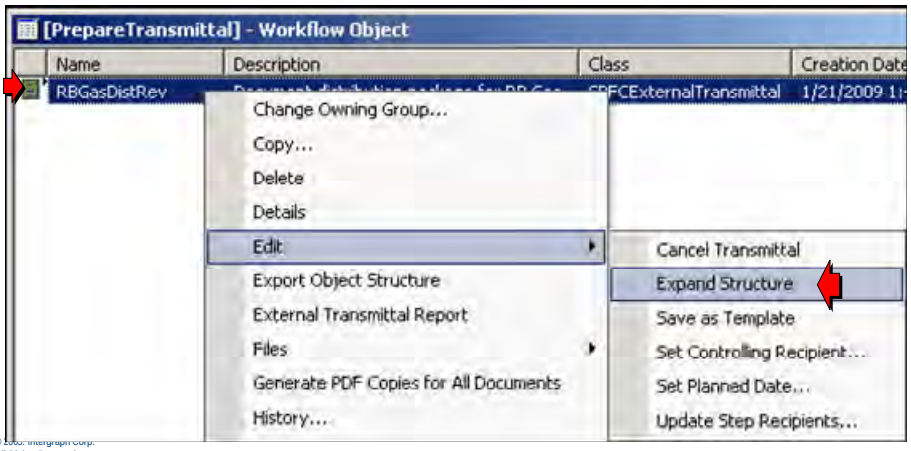


© 2005. Intergraph Corp.
All Rights Reserved.

Verify that the documents are attached to the transmittal.

Preparing a Transmittal

- **Right click on the External Transmittal and select *Edit > Expand Structure* to verify the transmittal structure.**

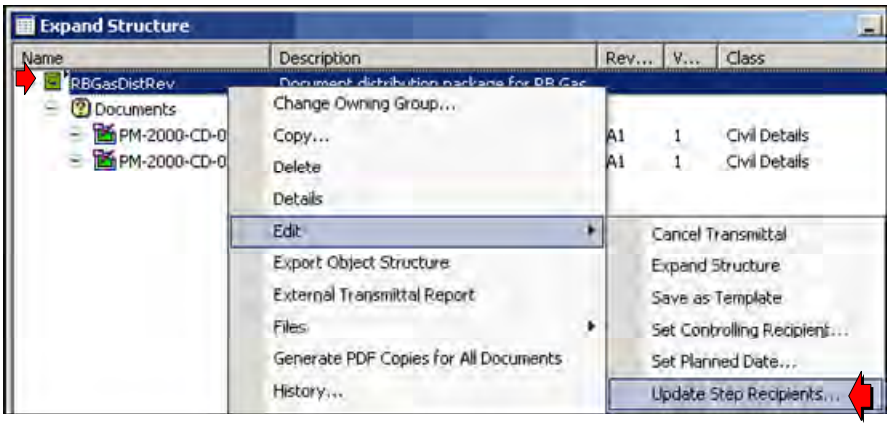


© 2005. Intergraph Corp.
All Rights Reserved.

The **Update Step Recipients** form is accessed from the transmittal's right mouse button menu. This might need to be done if the transmittal was created using a transmittal matrix.

Preparing a Transmittal

- **Right click on the External Transmittal and select *Edit > Update Step Recipients* to verify the recipient list.**

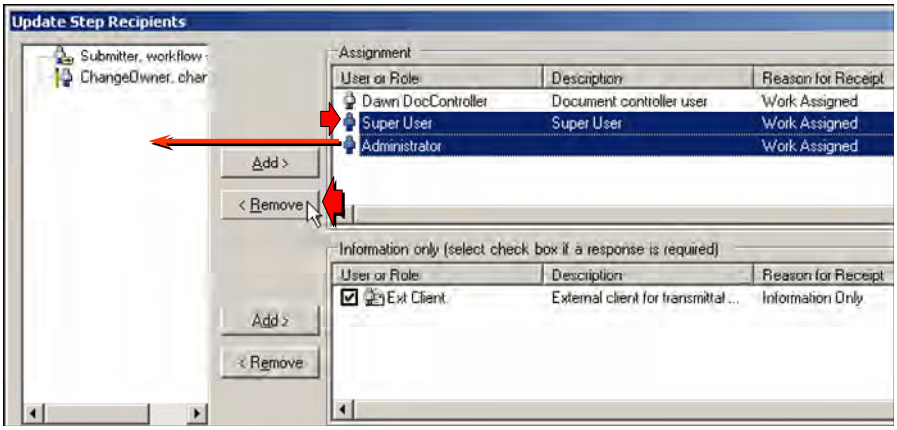


© 2005. Intergraph Corp.
All Rights Reserved.

The *Update Step Recipients* dialog displays.

Preparing a Transmittal

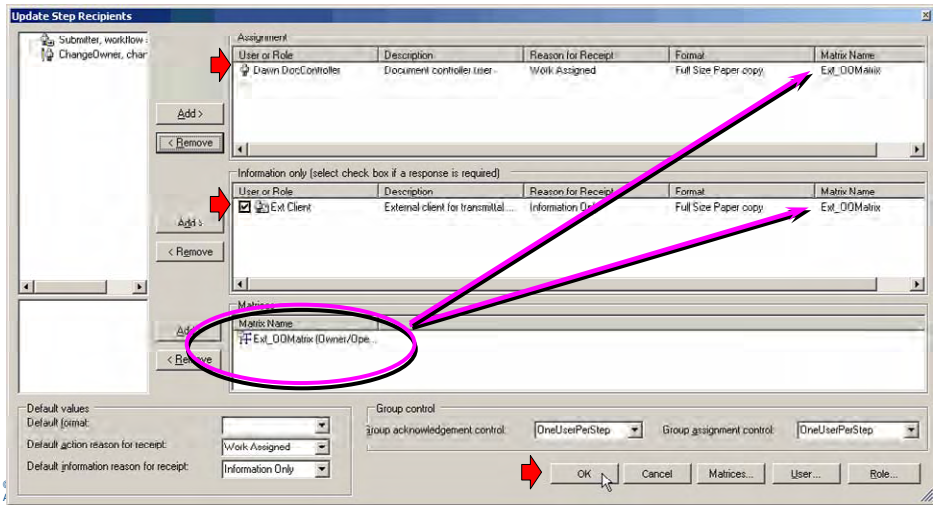
- **Add or remove any recipients based on the role assigned to this step Document Controller (role).**



© 2005. Intergraph Corp.
All Rights Reserved.

Preparing a Transmittal

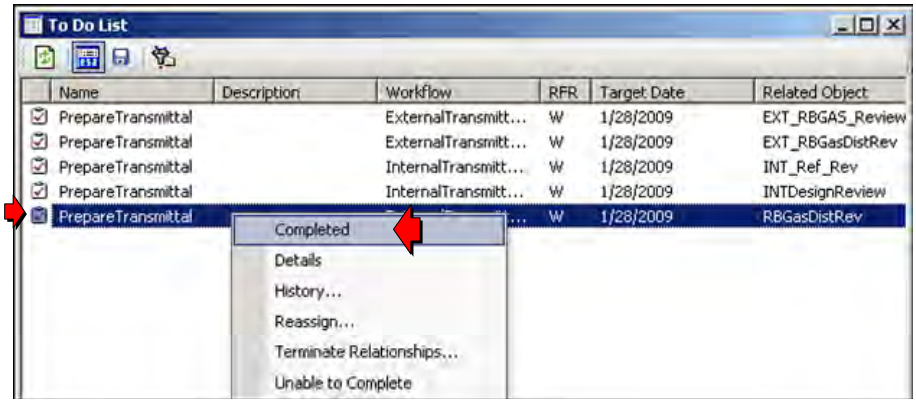
- **Verify the information for the remaining users and the external client and click OK.**



Once the recipients have been modified, *dawn* can **Complete** this step.

Preparing a Transmittal

- **Right click on the workflow step and select *Completed* to finish the *prepare* step and move the transmittal on in the workflow.**

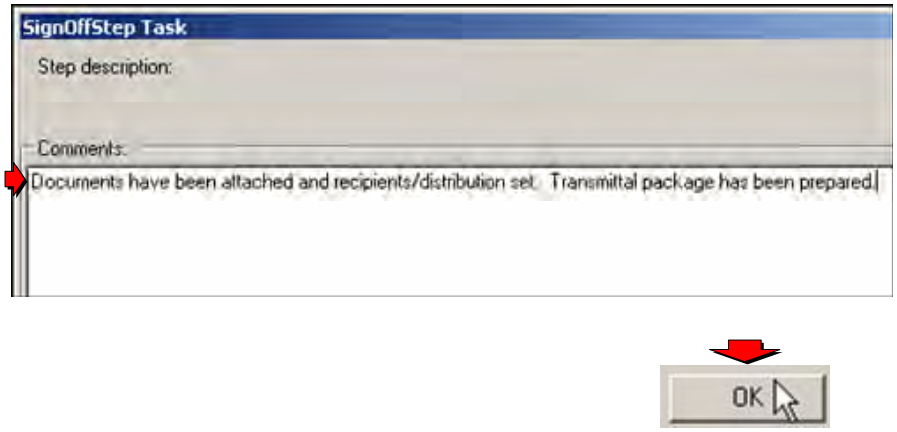


© 2005. Intergraph Corp.
All Rights Reserved.

The *SignOffStep Task* form will display.

Preparing a Transmittal

- **Enter some comments to indicate what has transpired in this workflow step and click OK.**

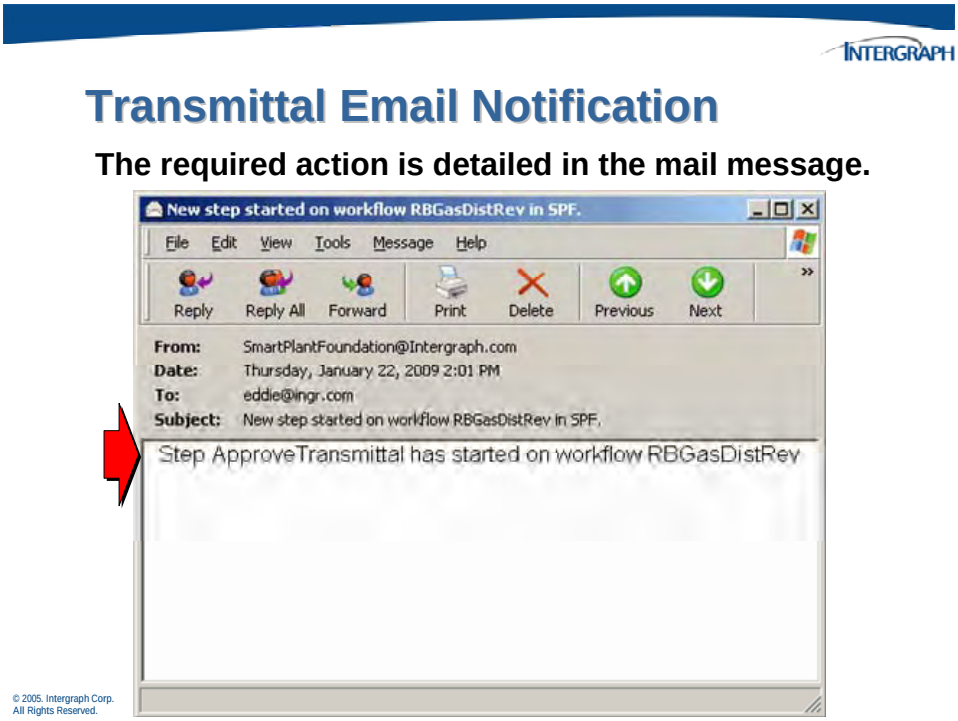


© 2005. Intergraph Corp.
All Rights Reserved.

The **To Do List** will now be empty as the transmittal is moved to the next step in the workflow.

9.2.2 Approve Transmittal

The next user in this workflow scenario is *eddie* who will receive an email notification. Restore the email client and switch the user identity to eddie. The selected message will be opened and displayed.

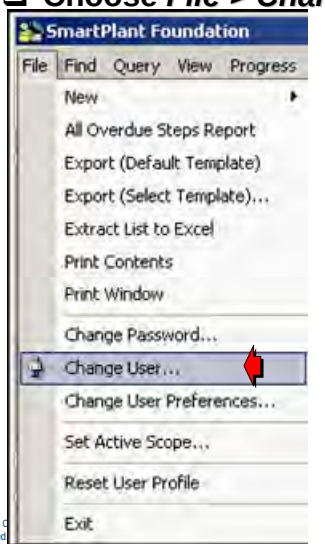


The *Approve Transmittal* step is where the recipients and documents associated with the transmittal are verified and approved. *Superuser* was the user that created the external transmittal but now **eddie** has the action to approve the tasks of the document controller.

First, log in to SPF as user *eddie*.

Approving a Transmittal

- **Choose *File > Change User* from the menu.**

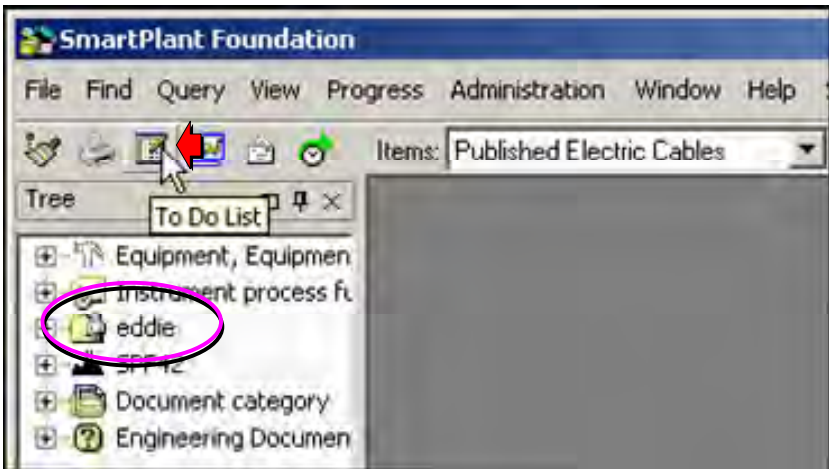


© 2005. Intergraph C
All Rights Reserved.

Once eddie is logged on, open the *To Do List* to access the workflow step and the transmittal.

Approving a Transmittal

- **Select the To Do List icon from the *Toolbar*.**

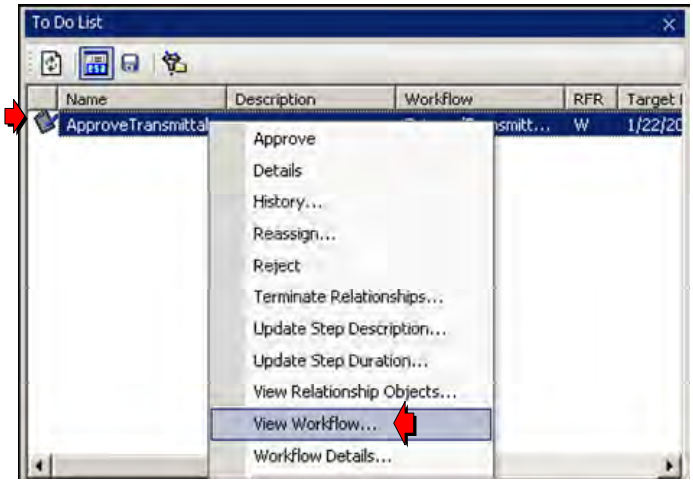


© 2005. Intergraph Corp.
All Rights Reserved.

The next step to appear in the To Do List is the *Approve Transmittal* step.

Approving a Transmittal

- **Right click on the workflow step and select *View Workflow* to see the transmittal progress in the workflow.**

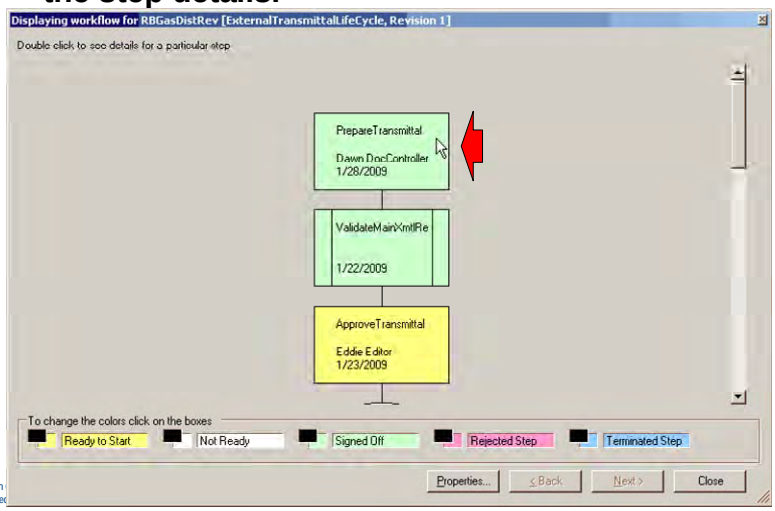


© 2005. Intergraph Corp.
All Rights Reserved.

This will allow *eddie* to verify the workflow steps that have been successfully completed as well as see what steps are still to be performed. It will also show a user which step the transmittal is currently in within the workflow.

Approving a Transmittal

- **Double-click on the *PrepareTransmittal* step to view the step details.**

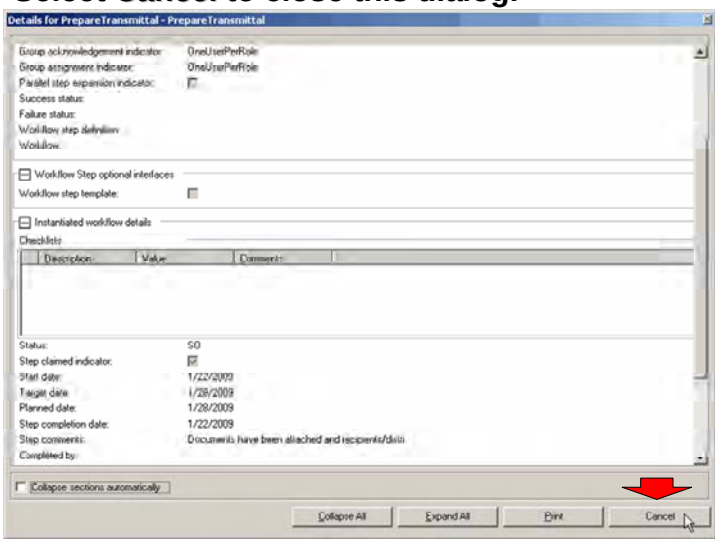


© 2005. Intergraph
All Rights Reserve

A *Details for PrepareTransmittal* dialog window displays.

Approving a Transmittal

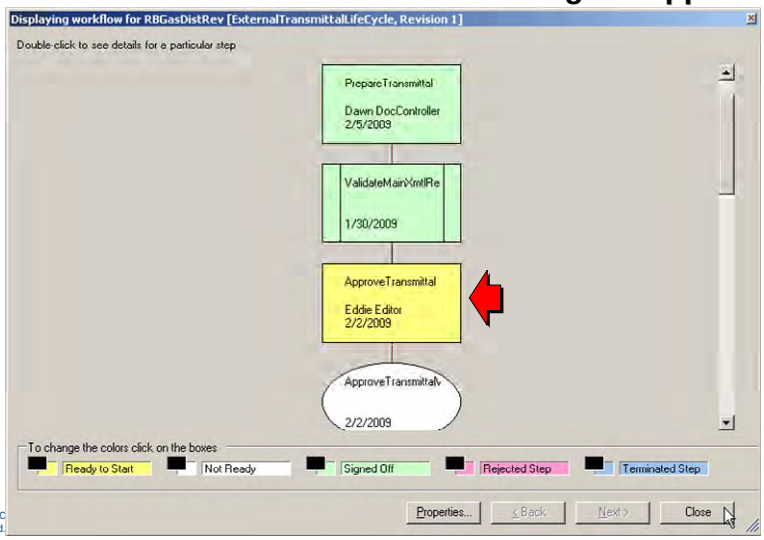
- **Select Cancel to close this dialog.**



© 2005. Intergraph Corp.
All Rights Reserved.

Approving a Transmittal

The *External Transmittal* is now waiting for Approval.

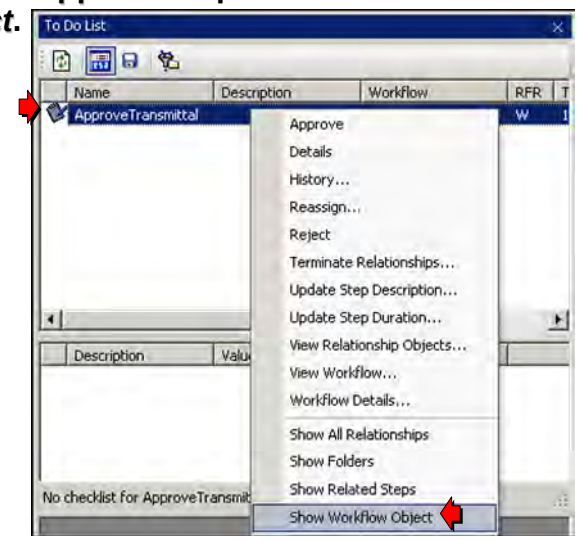


© 2009. Intergraph C
All Rights Reserved.

One way to verify the transmittal contents is to run a transmittal report. In order to run the report, the transmittal object must be displayed.

Approving a Transmittal

- **Right click on the Approve step and select *Show Workflow Object*.**

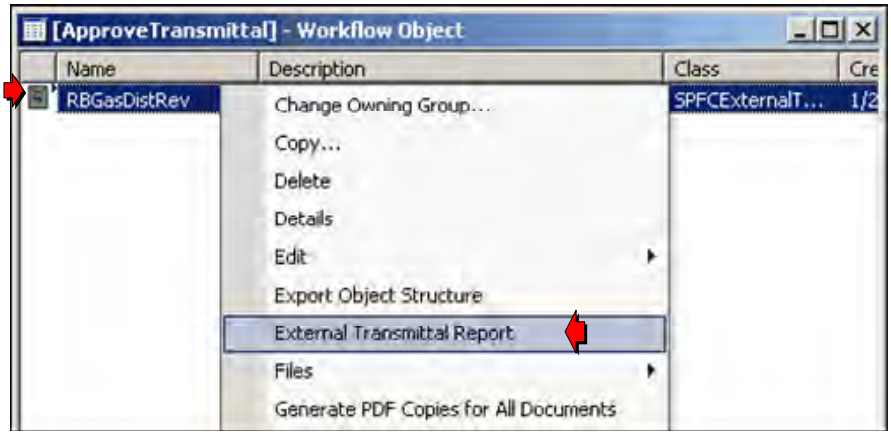


© 2005. Intergraph Corp.
All Rights Reserved.

Run an external transmittal report to display the transmittal information associated with this object in the workflow.

Approving a Transmittal

- **Right click on the external transmittal object and select *External Transmittal Report*.**

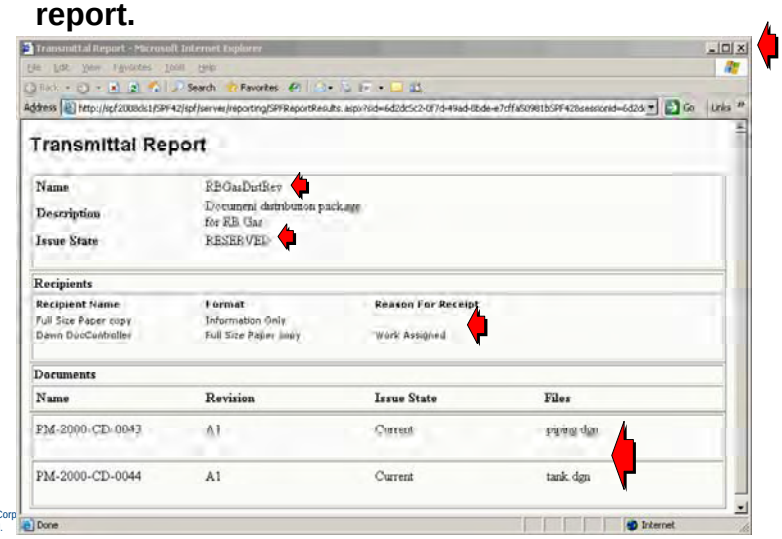


© 2005. Intergraph Corp.
All Rights Reserved.

Note the *Issue State*, the type of user for the *client* and the *Reason For Receipt* listed on this report.

Approving a Transmittal

- ***Close*** **the window when you are finished viewing the report.**

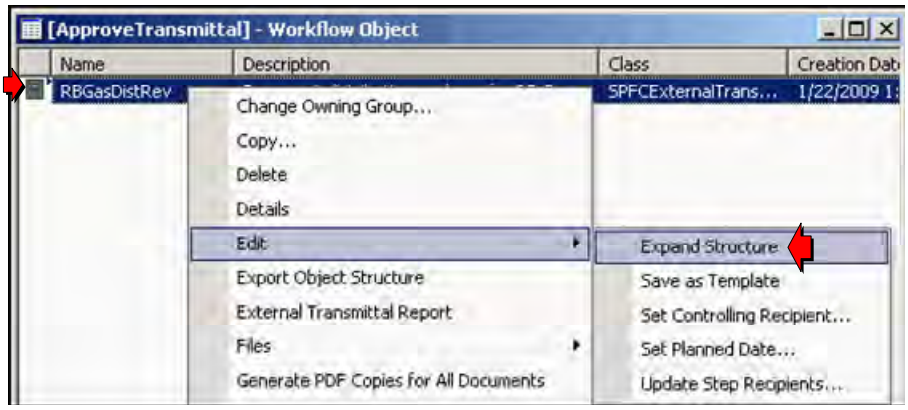


© 2005. Intergraph Corp.
All Rights Reserved.

Eddie can also manually verify that the correct documents were attached to the transmittal.

Approving a Transmittal

- **Right click on the external transmittal object and select *Edit > Expand Structure*.**

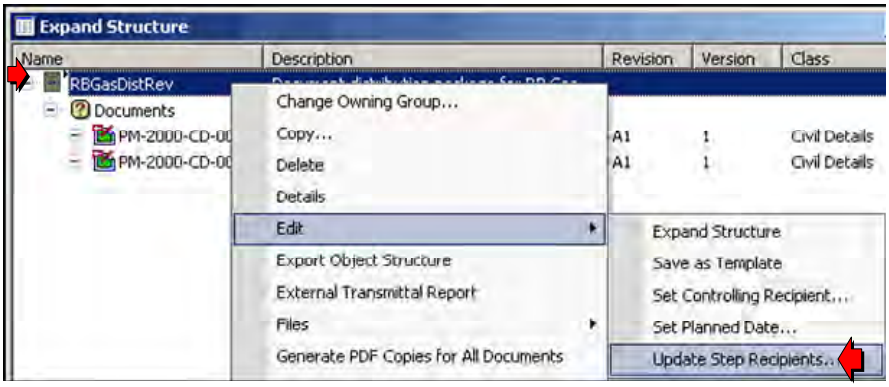


© 2005. Intergraph Corp.
All Rights Reserved.

The *Transmittal Structure* window will display in order to view the attached documents. Use the **Update Step Recipients** form to verify that the correct recipients are assigned to this transmittal.

Approving a Transmittal

- **Right click on the External Transmittal and select *Edit > Update Step Recipients* to review the recipient list.**

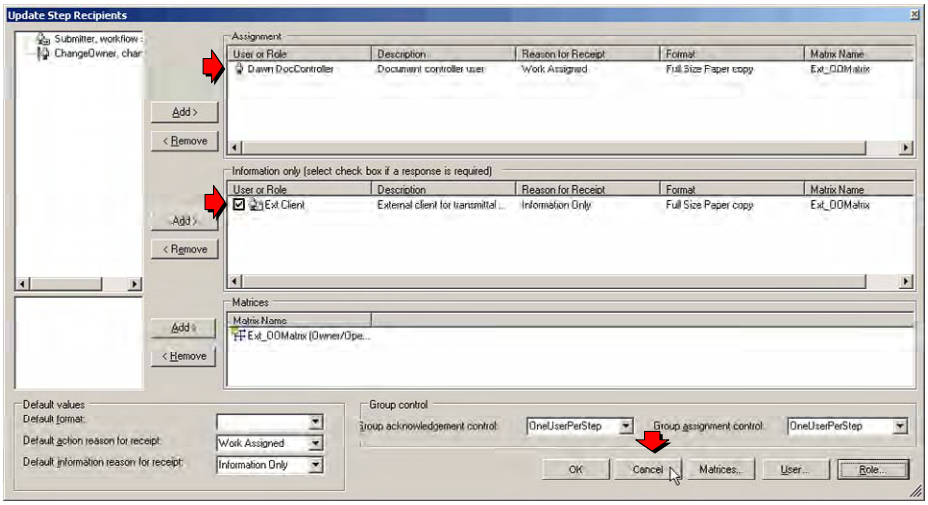


© 2005. Intergraph Corp.
All Rights Reserved.

The *Update Step Recipients* dialog displays.

Approving a Transmittal

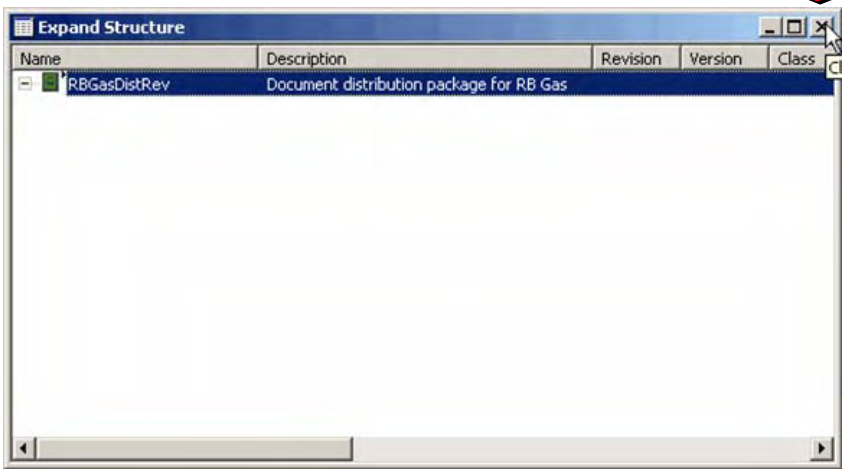
- **Review the information for the Document Controller role and the external client.**



If everything is correct, click **Cancel** on the *Update Step Recipients* form.

Approving a Transmittal

- **Select the X to Close the *Transmittal Structure* dialog.**

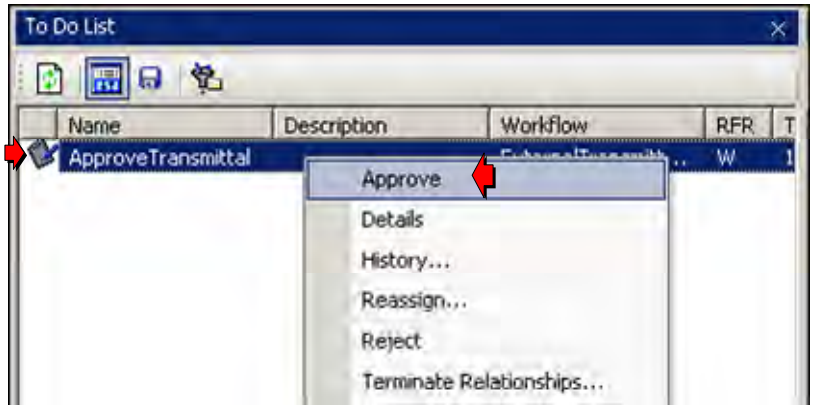


© 2005. Intergraph Corp.
All Rights Reserved.

Eddie is now ready to **Approve** the transmittal is this workflow step.

Approving a Transmittal

- **Right click on the workflow step and select *Approve* to move the transmittal on in the workflow.**

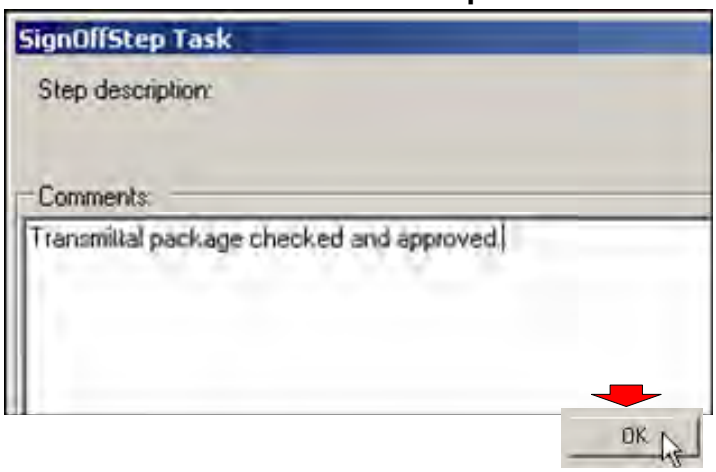


© 2005. Intergraph Corp.
All Rights Reserved.

The *SignOffStep Task* form will display.

Approving a Transmittal

- **Enter some comments to indicate what has transpired in this transmittal workflow step and click OK.**



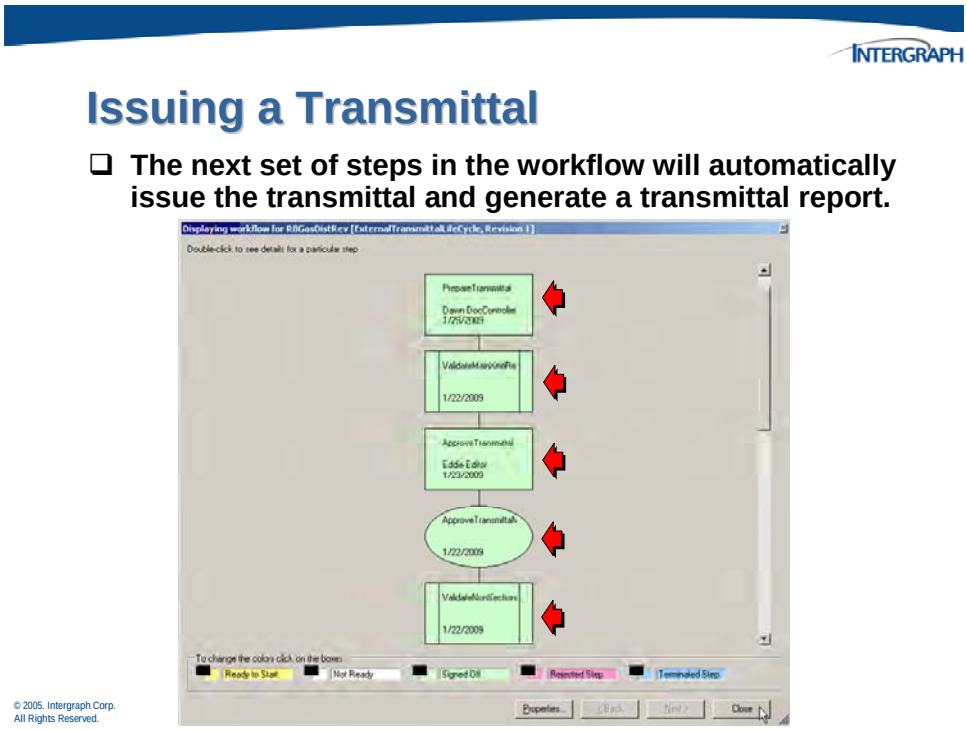
© 2005. Intergraph Corp.
All Rights Reserved.

9.3 Issuing a Transmittal

The next user in this workflow scenario is the *Document Controller* (**dawn**). When the transmittal has been approved, it progresses through the transmittal workflow until it reaches the workflow step, which updates it from RESERVED to ISSUED.

Another automatic process, which takes place, is the generation of a *Transmittal Report*.

It is at this stage that recipients would receive notification of the transmittal through email or their **To Do List** in SPF meaning an email message is sent to the appropriate users, including the client.

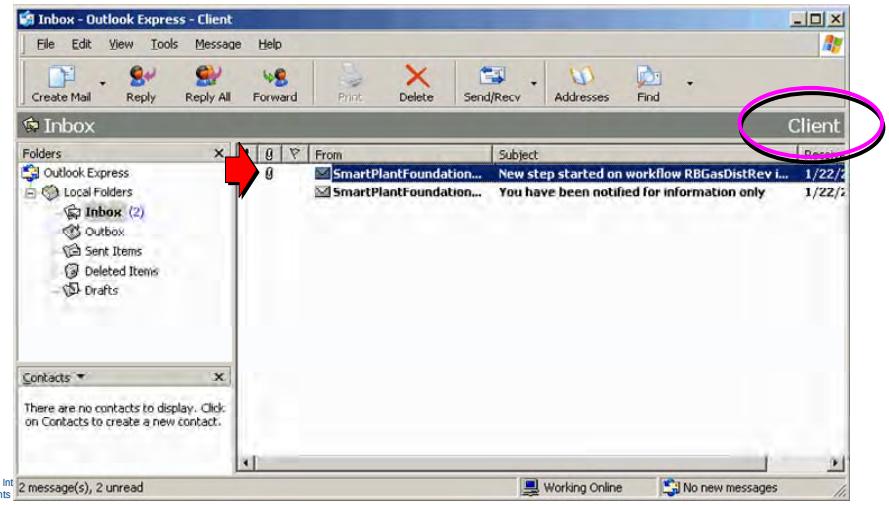


The client is not an SPF logon user but can receive email messages. This user can review the document package and respond via email back to the document controller, who can then perform the transmittal response by adding any comments and feedback from the client.

Restore the email client and switch the user identity to *client*. The mail client window will change to client and any messages sent by SmartPlant Foundation will be displayed.

Transmittal Email Notification

- **Double-click to view the mail message sent by SmartPlant Foundation.**

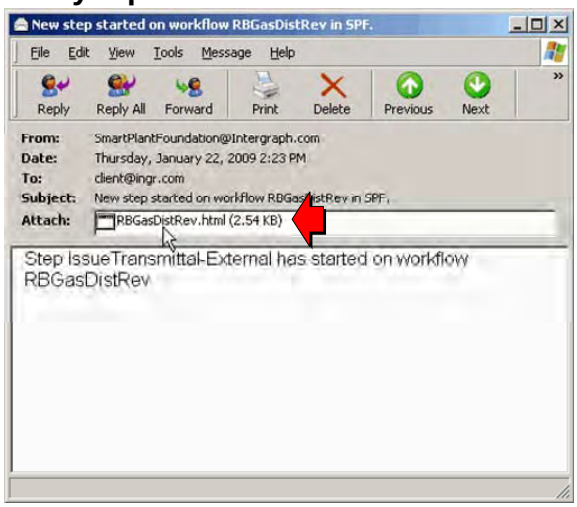


© 2005. Int
All Rights

The selected message will be opened and displayed.

Transmittal Email Notification

- **Double-click on the attached file to review the summary report.**

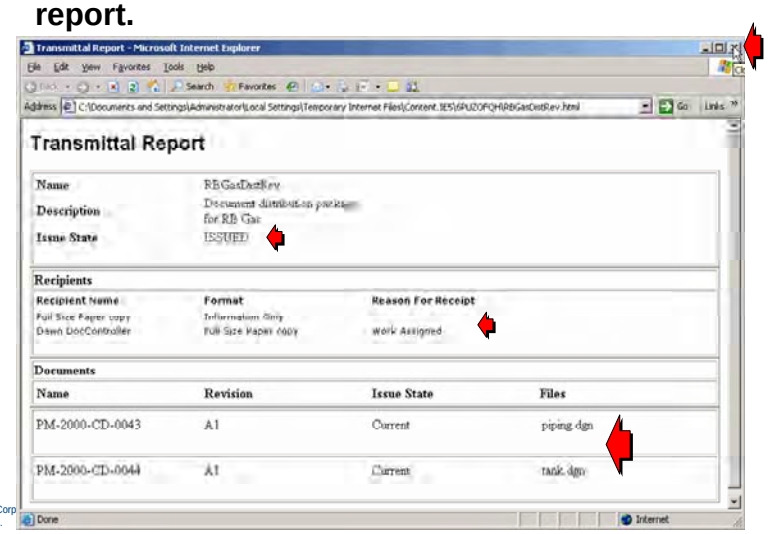


© 2005. Intergraph Corp.
All Rights Reserved.

The attached transmittal summary report will be displayed.

Transmittal Email Notification

- ***Close*** **the window when you are finished viewing the report.**

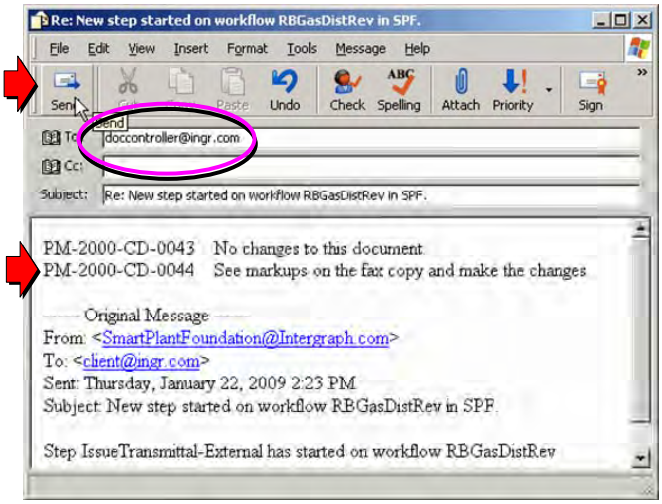


© 2005. Intergraph Corp.
All Rights Reserved.

The external client then responds back to the document controller via email with any changes or feedback.

Client Response Email

The external client will respond to the document controller with the responses to be tracked.

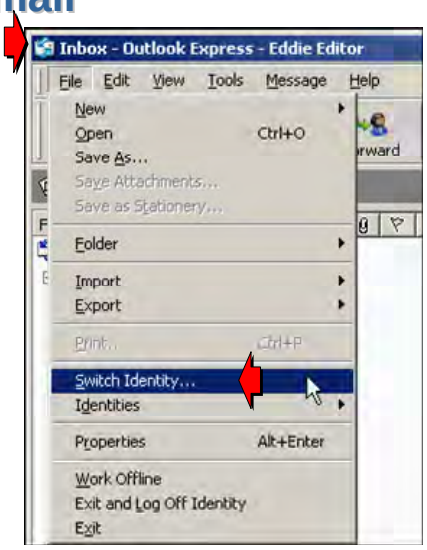


© 2005. Intergraph Corp.
All Rights Reserved.

To see the client responses sent back to the document controller, switch the user identity to *doccontroller*.

Client Response Email

- **Choose *File > Switch Identity* from the Outlook Express menu.**

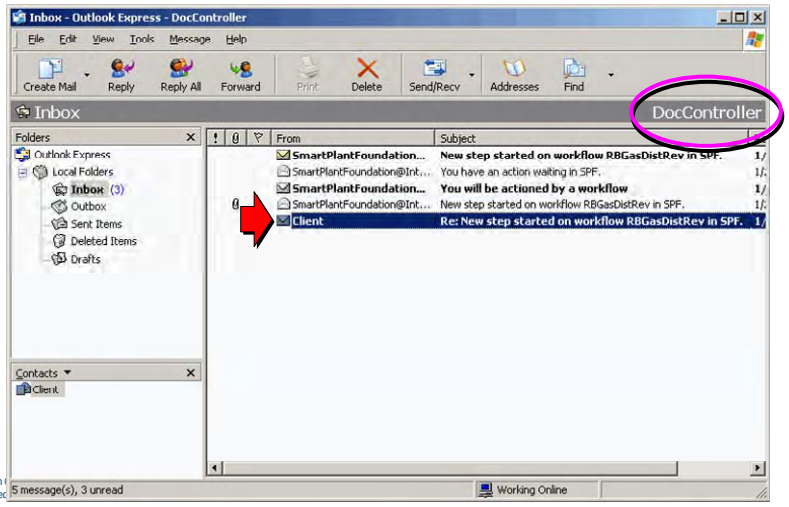


© 2005. Intergraph Corp.
All Rights Reserved.

The mail client window will change to doccontroller and any messages sent by the client will be displayed.

Client Response Email

- **Double-click to view the mail message sent by the external e-mail user.**

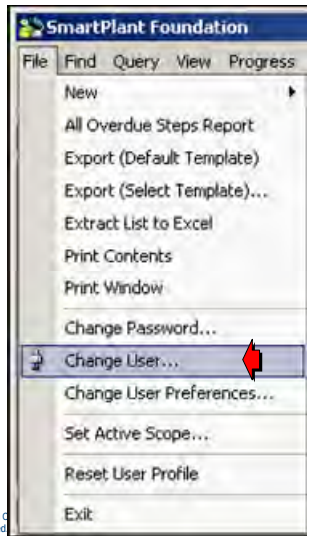


© 2005. Intergraph
All Rights Reserve

Dawn is an SPF logon user that is responsible for monitoring her email and updating the recipient responses with comments from the email users (client).

Tracking Recipient Responses

- **Choose *File > Change User* from the menu.**

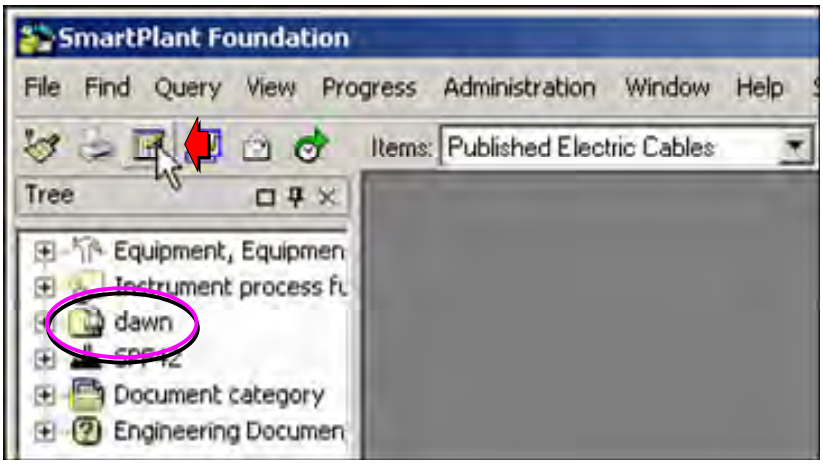


© 2005. Intergraph C
All Rights Reserved.

After the **dawn** is logged on, open the *To Do List* to access the workflow. The next step to appear in the To Do List is the *IssueTransmittal-External* step.

Tracking Recipient Responses

- **Select the To Do List icon from the *Toolbar*.**

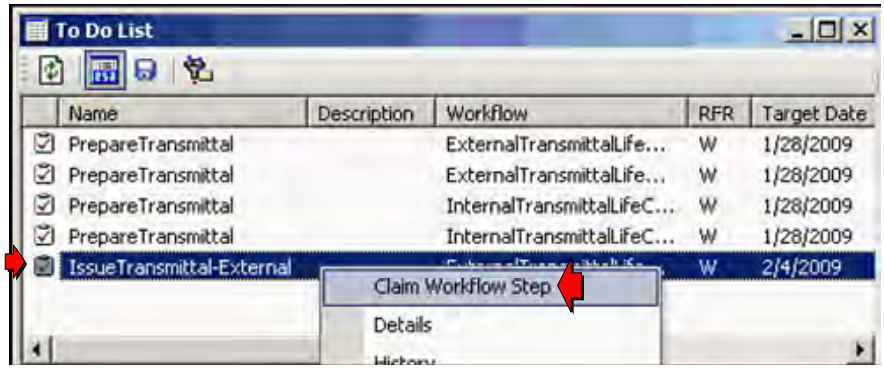


© 2005. Intergraph Corp.
All Rights Reserved.

Again, because the *Document Controller* role may contain multiple users, the workflow step must first be claimed.

Tracking Recipient Responses

- **Right click on the workflow step and select *Claim Workflow Step* since multiple users can be configured for the assigned role.**



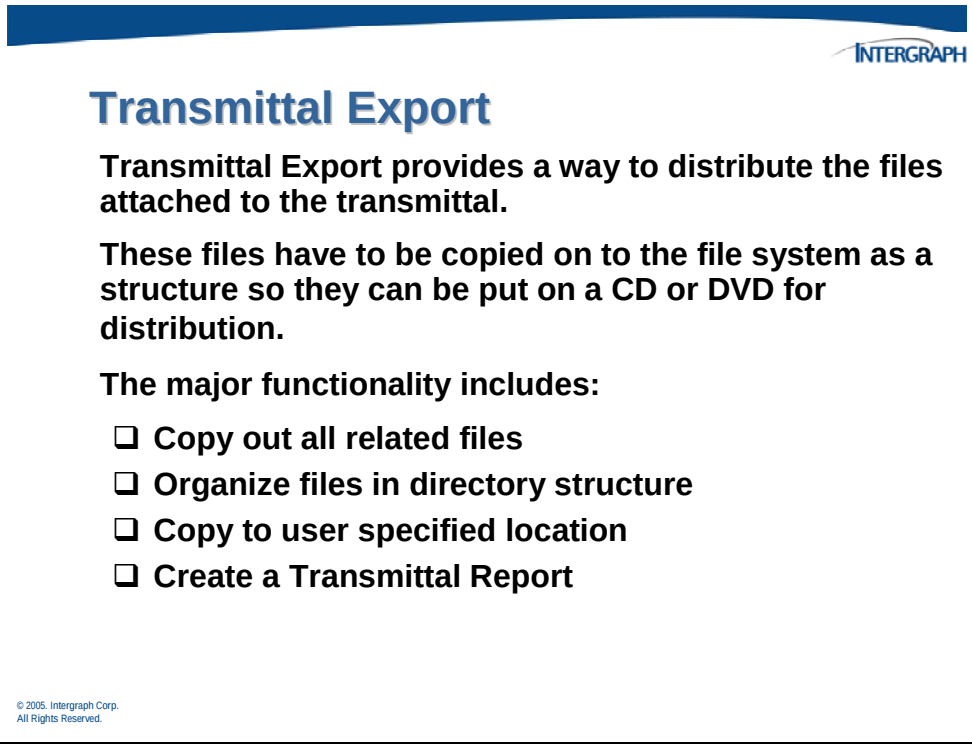
© 2005. Intergraph Corp.
All Rights Reserved.

9.3.1 Exporting a Transmittal Structure

For the recipients of transmittals who are outside of the SPF world, Transmittal Export provides a way for the **Document Controller** to distribute the physical files attached to the transmittal.

These files have to be copied out to the file system (from the vault) as a structure so they can be put on a CD or DVD for distribution.

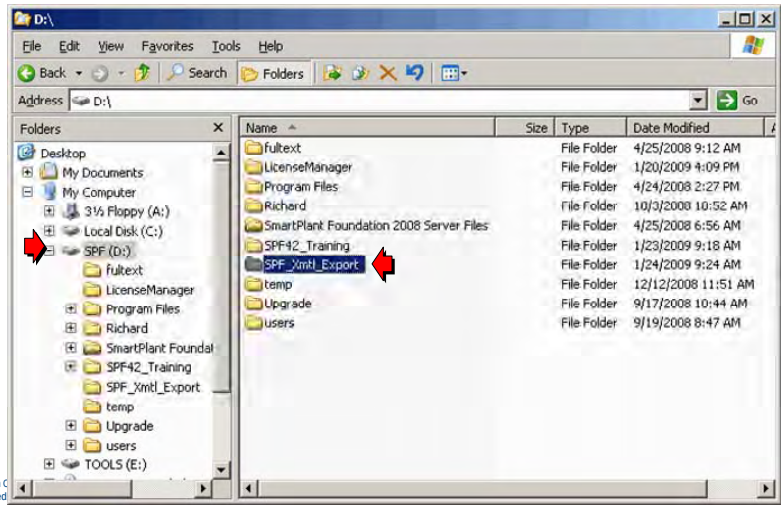
This functionality could be implemented in a generic way such that any object could be exported to hard disk for different purposes like Archiving of vaults.



Before using the *Export Object Structure* command, a target location must be created.

Transmittal Export

- **Create a new folder that will contain the location for the transmittal structure to be exported.**



© 2005. Intergraph C
All Rights Reserved

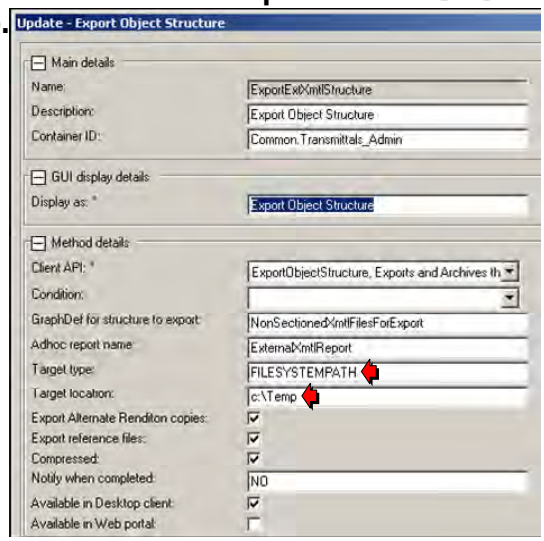
In SPF, after the transmittal has been issued, a pop up menu command can be executed on the transmittal do the following:

- Expand the objects from transmittal using the *GraphDef* specified in the step or method, which results in the objects being copied to the target location under the main transmittal directory.
- For each file node, if *export ref files* is true, get all the nested reference files for the file and copy these to the same target location under the main transmittal directory.
- Run the *Adhoc Report* to create the report in and copy into the target location under the main transmittal directory.

Perform a search to locate the existing method to export a transmittal. In this example, the method name is **ExportExtXmtlStructure**.

Transmittal Export

The default location for the export is *FILESYSTEMPATH* and c:\Temp.

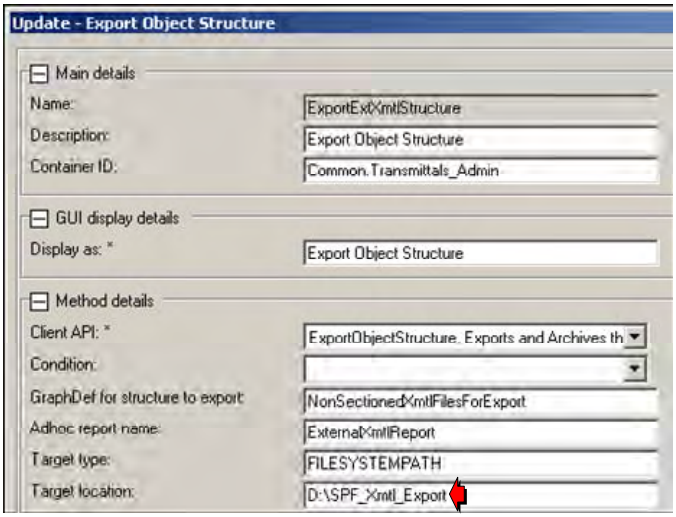


© 2005. Intergraph Corp.
All Rights Reserved.

This is in order to change the default location for the export. These changes will set the location for the export to a different folder path.

Transmittal Export

- **Update the *Target location* field and click OK.**

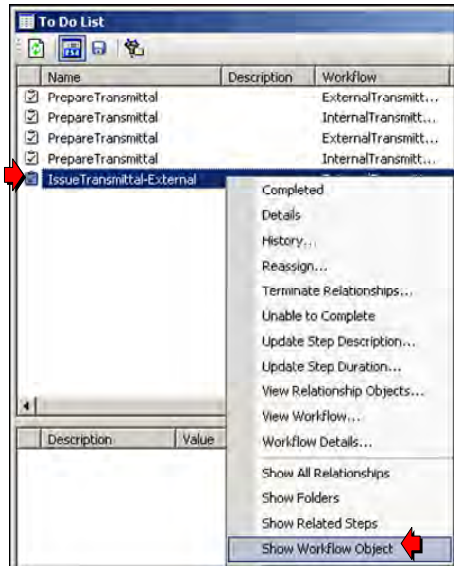


© 2005. Intergraph Corp.
All Rights Reserved.

The Export would most likely be executed by the document controller once the transmittal has been issued. The document controller would open a **To Do List** and select the ***IssueTransmittal*** step.

Transmittal Export

- **Right click on the workflow step and select *Show Workflow Object* to see the External Transmittal object.**

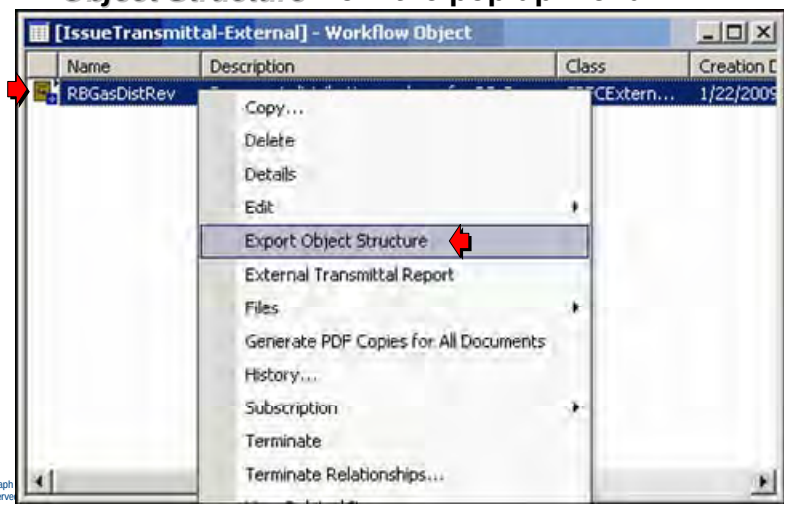


© 2005. Intergraph Corp.
All Rights Reserved.

An *IssueTransmittal-External* results window will display showing the transmittal associated with the workflow step.

Transmittal Export

- **Right click on a Transmittal object and select *Export Object Structure* from the pop up menu.**

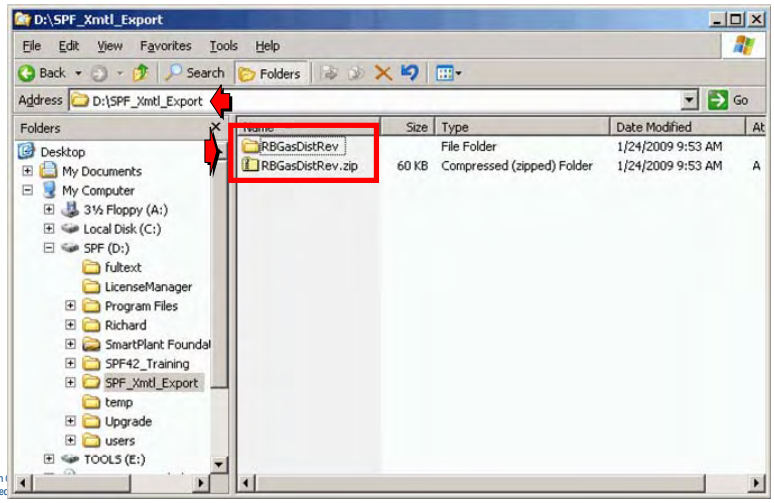


© 2005. Intergraph
All Rights Reserve

Use windows explorer to verify the results of the export operation.

Transmittal Export

The contents of the export folder contain the zip file and a folder.

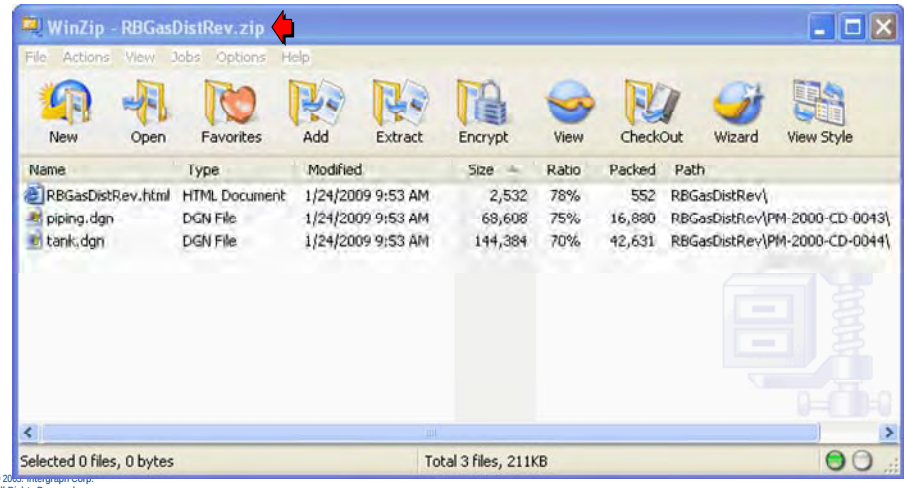


© 2005. Intergraph
All Rights Reserved

You can open the zip file that was produced by the export command and examine the files that will be made available to the external recipients (**clients**).

Transmittal Export

- **Double click on the RBGasDistRev zip file to view the contents.**

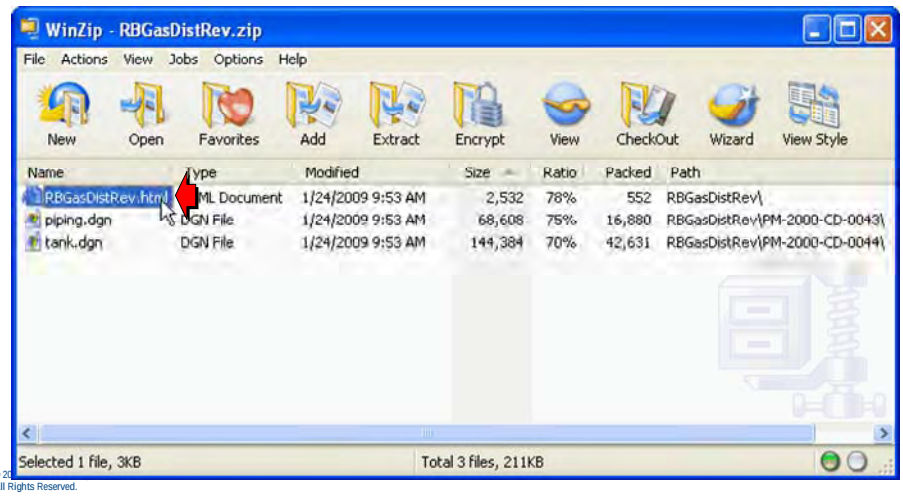


© 2005. Intergraph Corp.
All Rights Reserved.

The client can use the included html file to see the transmittal structure and view the attached file(s).

Transmittal Export

- **Double click on the .html file to see the transmittal report.**

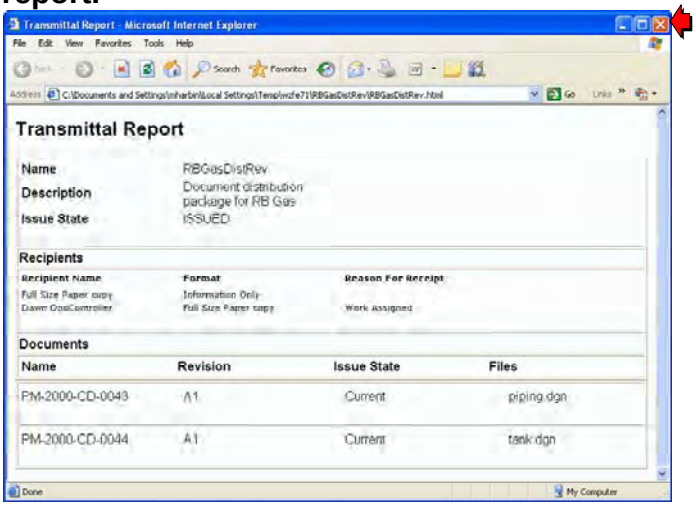


© 20
All Rights Reserved.

Files attached to transmittal documents will be displayed in the report.

Transmittal Export

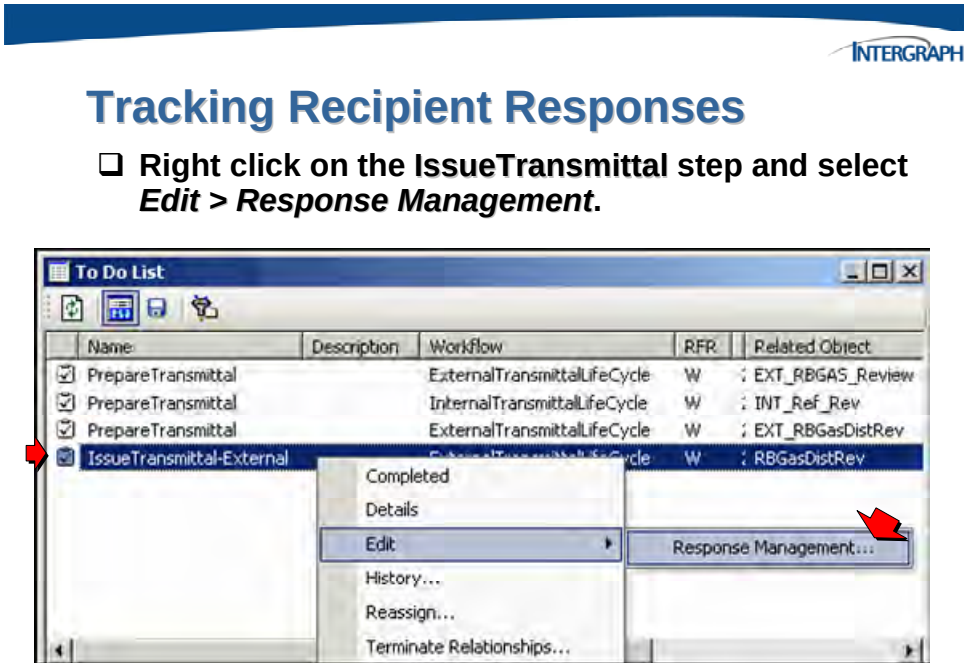
- ***Close* the window when you are finished viewing the report.**



© 2005. Intergraph Corp.
All Rights Reserved.

9.3.2 Tracking Recipient Responses

As recipients provide comments back to the document controller, the comments are tracked through the Response Manager checklist.



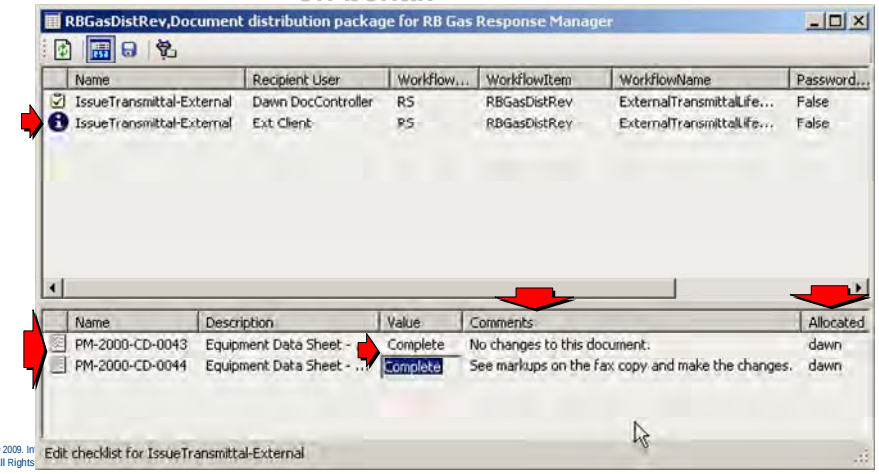
© 2009. Intergraph Corp.
All Rights Reserved.

The *Response Manager* window will display.

Since the client is an *E-mail User* type (I), the ability to enter comments by this user is not permitted. The document controller (**dawn**) will have to enter the client responses.

Tracking Recipient Responses

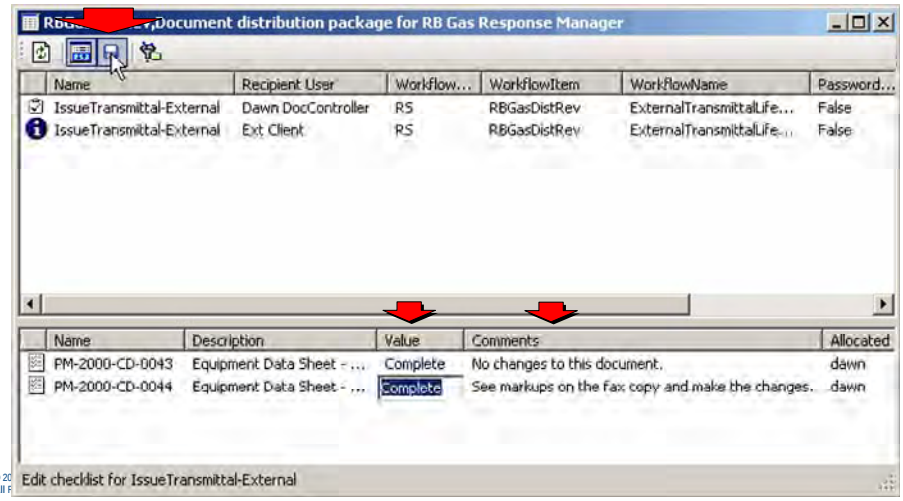
- **Click on the client recipient in the *Recipient Response Manager* dialog and enter the feedback information on behalf of the client.**



The document controller will **save** the client responses before continuing.

Tracking Recipient Responses

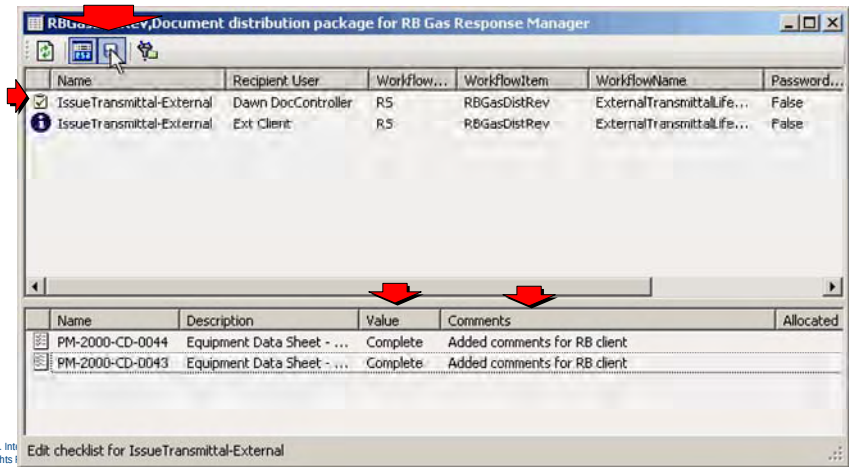
- **After comments and the completion value have been entered, save the checklist.**



Next, the document controller will specify what was done on behalf of the external clients.

Tracking Recipient Responses

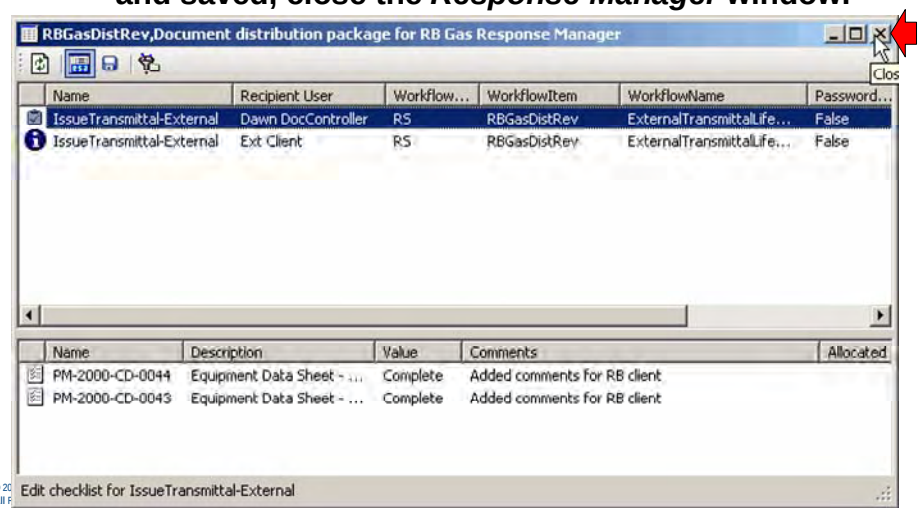
- **After comments and the completion value have been entered for the document controller, save the checklist.**



Click on the appropriate fields in the **Comments** column and in the **Value** column to finish the *Response Manager* checklist.

Tracking Recipient Responses

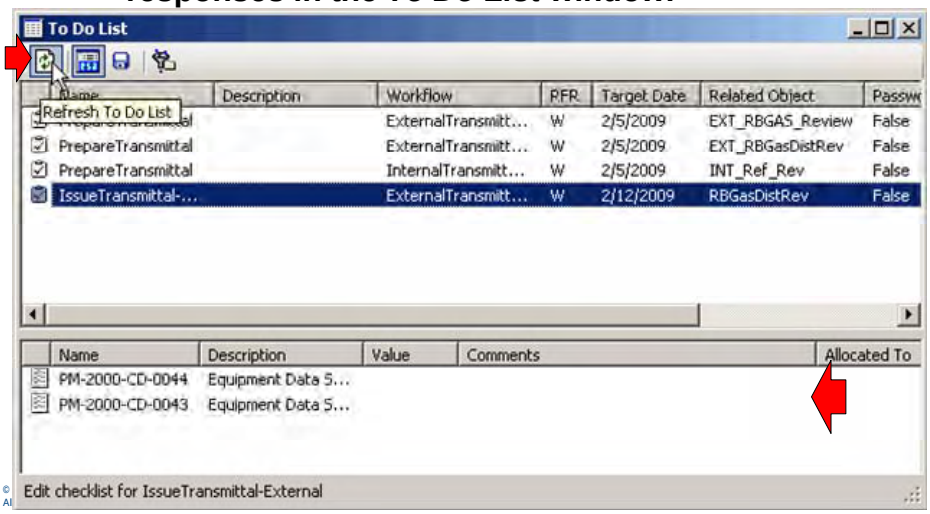
- **If all comments and responses have been entered and saved, close the *Response Manager* window.**



Refresh the *To Do List* to see the *Response Manager* comments that were entered and saved.

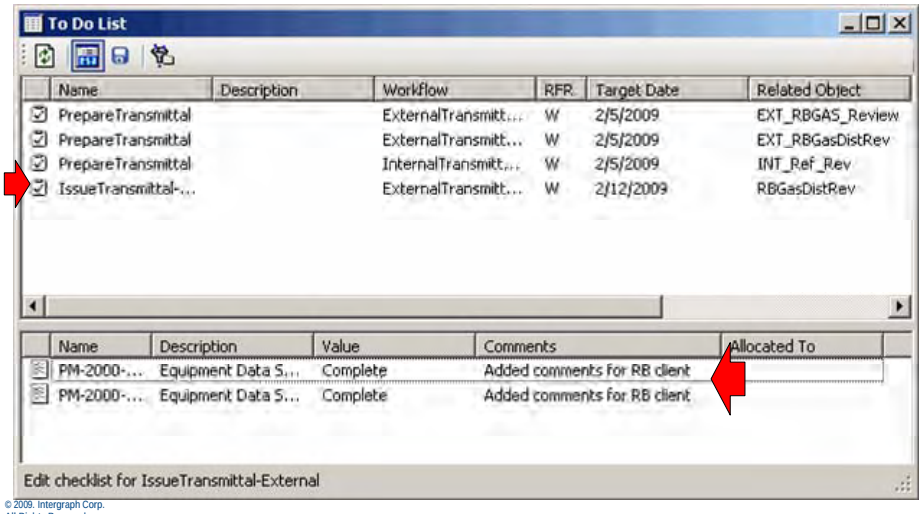
Tracking Recipient Responses

- **Click the Refresh button to display the saved responses in the *To Do List* window.**



Tracking Recipient Responses

The comments for the document controller will display.

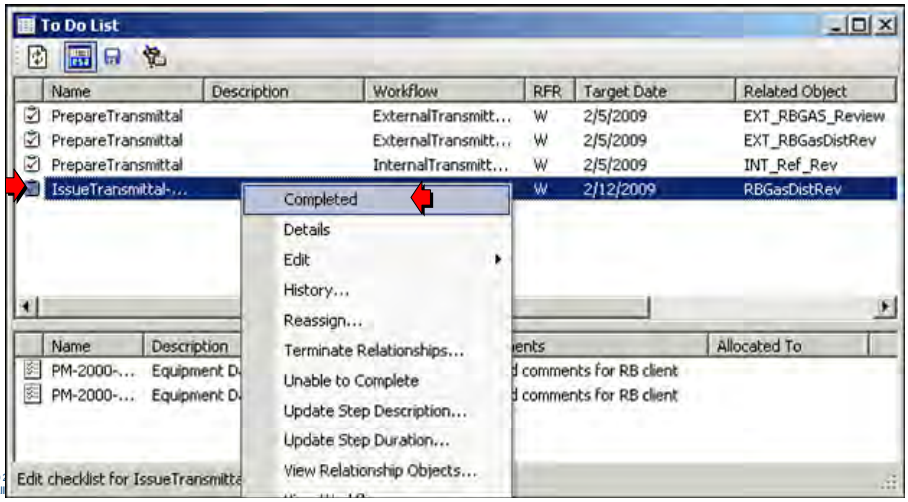


© 2009. Intergraph Corp.
All Rights Reserved.

Once the responses have been recorded, *dawn* can **Complete** this step.

Tracking Recipient Responses

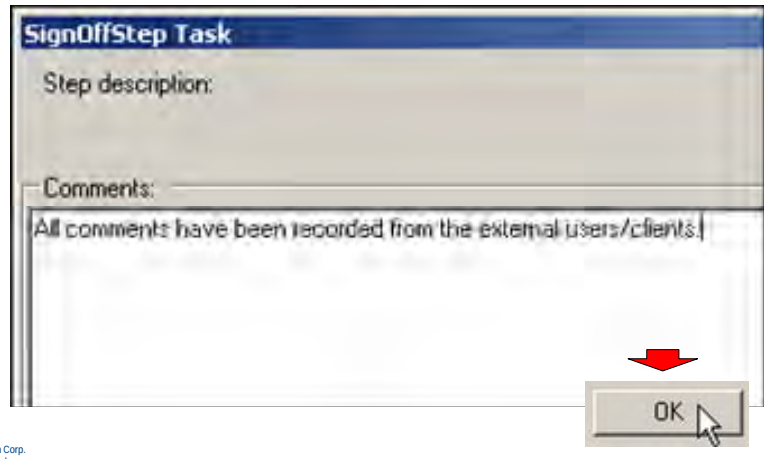
- **Right click on the workflow step and select *Completed* to move the transmittal on in the workflow.**



The *SignOffStep Task* form will display.

Tracking Recipient Responses

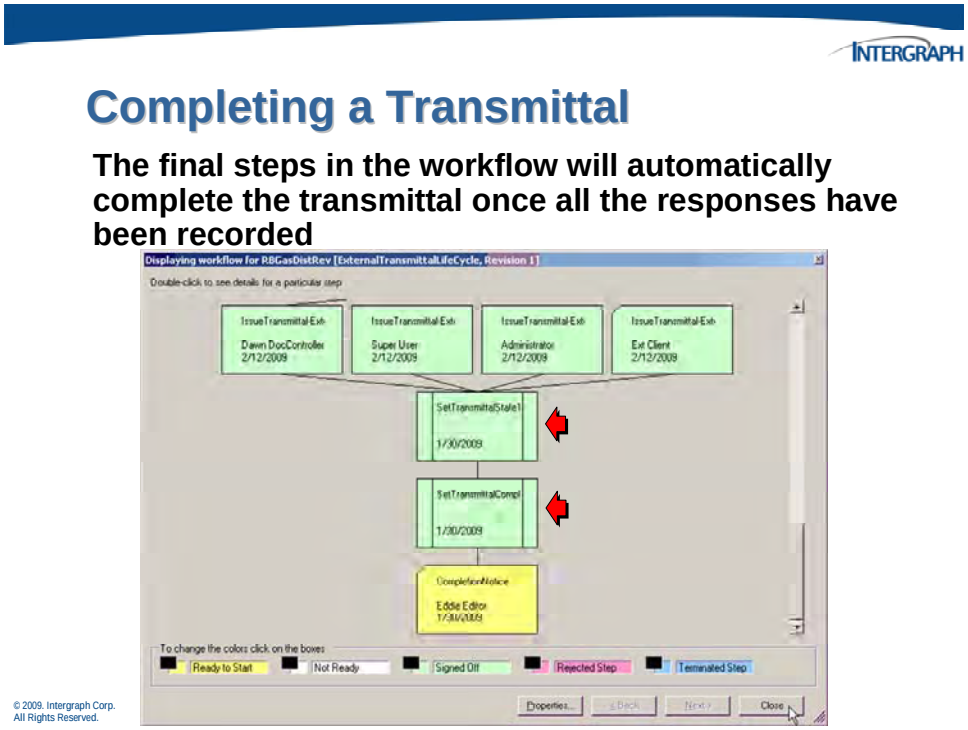
- **Enter some comments to indicate what has happened in this workflow step and click OK.**



© 2009. Intergraph Corp.
All Rights Reserved.

9.4 Completing a Transmittal

When work or comments have been completed for the **Issued** transmittal, it progresses to the final phase of the workflow where the transmittal is **Completed**. This is an automatic process performed by the ExternalTransmittal workflow.

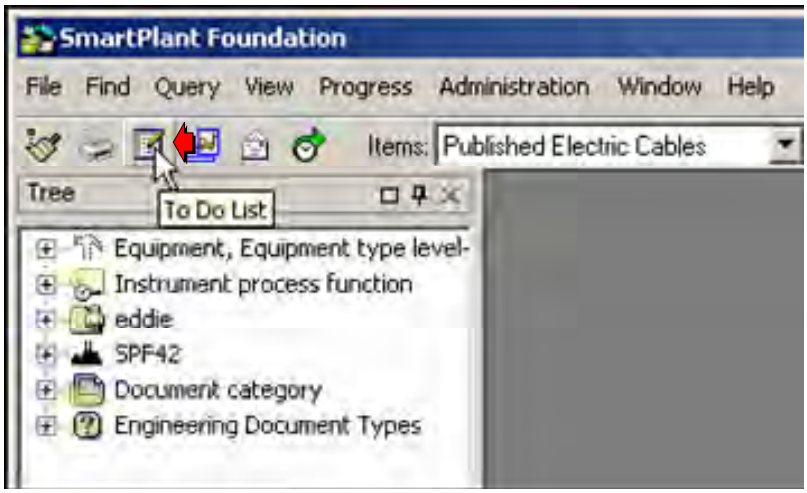


The final user in this workflow scenario is *eddie*. The *CompletionNotice* step is where recipients are notified that the transmittal has been completed.

Once eddie is logged on, open the *To Do List* to access the workflow step and the transmittal.

Transmittal Completion

- **Select the To Do List icon from the *Toolbar*.**

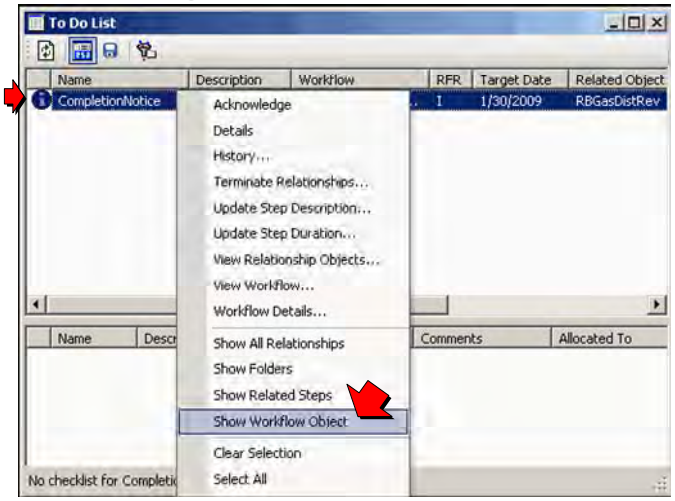


© 2009. Intergraph Corp.
All Rights Reserved.

The next step to appear in the To Do List is the *CompletionNotice* step. Display the transmittal object that is associated with this step in the workflow.

Transmittal Completion

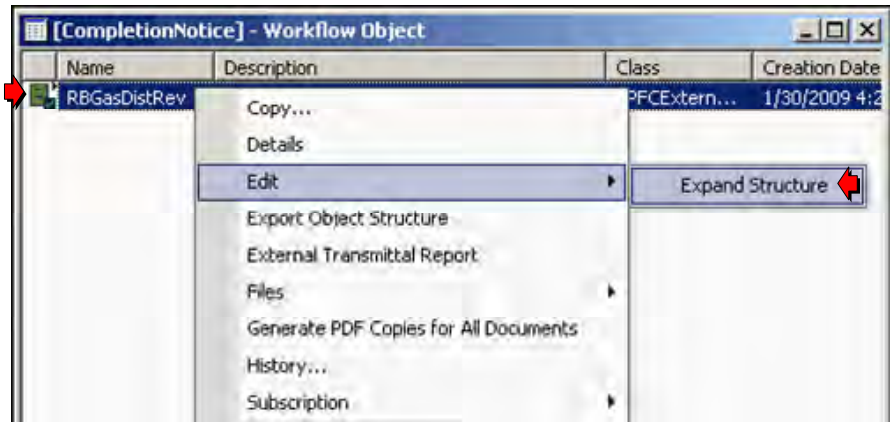
- **Right click on the workflow step and select *Show Workflow Object* to see the External Transmittal.**



© 2009. Intergraph Corp.
All Rights Reserved.

Transmittal Completion

- **Right click on the workflow step and select *Edit > Expand Structure*.**

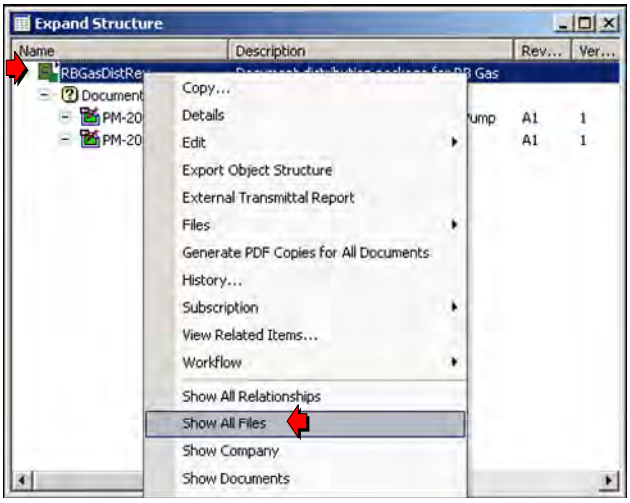


© 2009. Intergraph Corp.
All Rights Reserved.

A transmittal report is generated at the time when the transmittal moves to the ISSUED state. It is stored in a subdirectory of the vault and attached to the transmittal object.

Transmittal Completion

- **Right click on the external transmittal and select *Show All Files* to display the related transmittal report.**

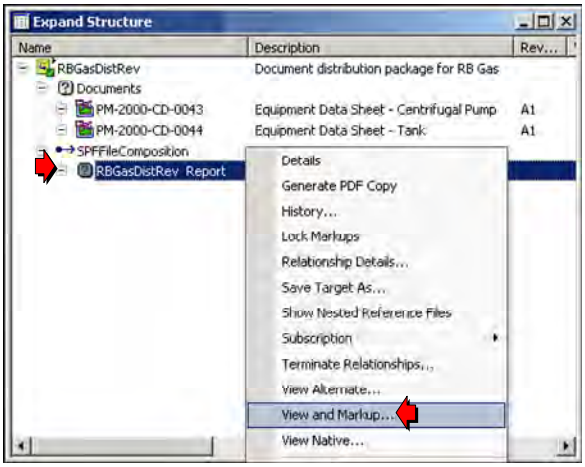


© 2009. Intergraph Corp.
All Rights Reserved.

You can use the SPF file viewing software to review the transmittal report.

Transmittal Completion

- **Right click on the Transmittal Report file and select *View and Markup…* to view the report using SmartPlant Markup.**

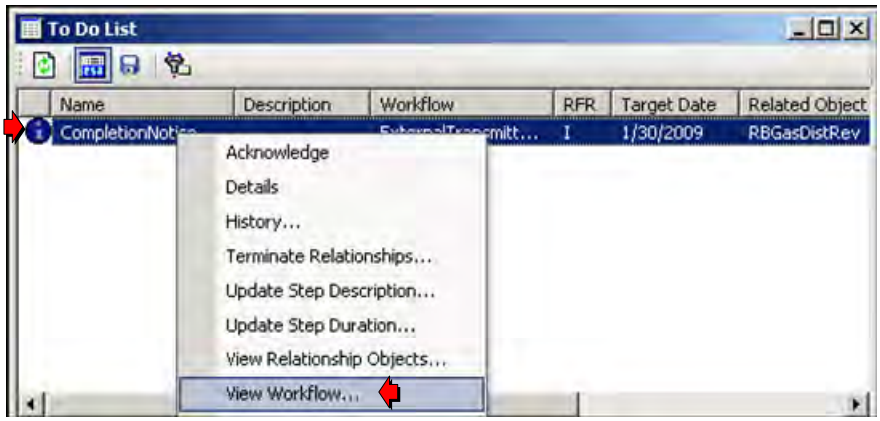


© 2009. Intergraph Corp.
All Rights Reserved.

SmartPlant Markup will be automatically launched to display the report file in a window. You can use the workflow graphical dialog to see the progress of the transmittal.

Transmittal Completion

- **Right click on the workflow step and select *View Workflow* to see the completed steps in the workflow.**

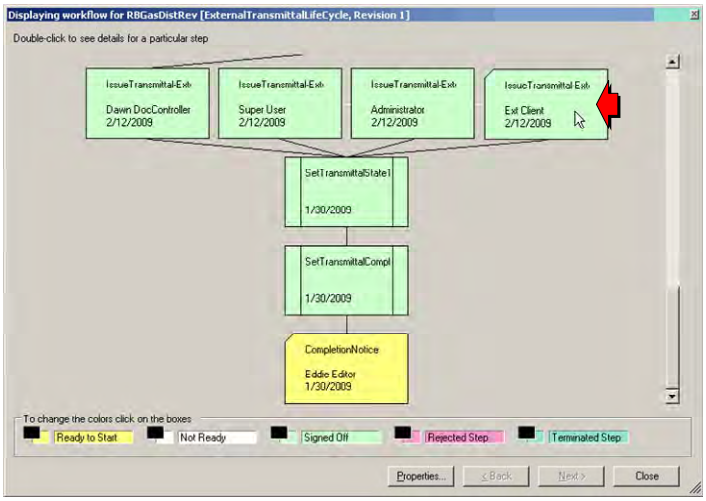


© 2009. Intergraph Corp.
All Rights Reserved.

This will allow *eddie* to verify the workflow steps that have been successfully completed as well as see what steps are left to be performed.

Transmittal Completion

- **Double-click on the IssueTransmittal step for the client in the graphical view.**

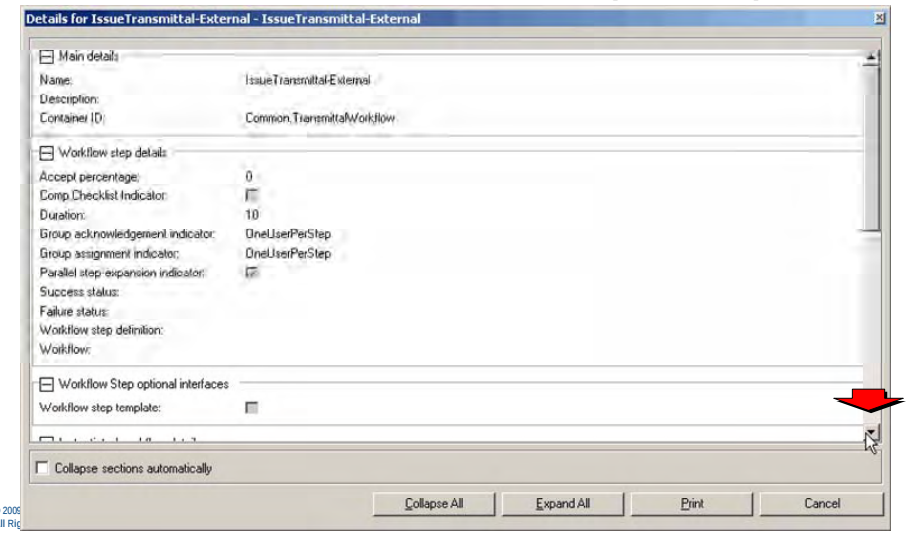


© 2009. Intergraph Corp.
All Rights Reserved.

The *Details for IssueTransmittal* window will show the comments that were entered for this step as well as allow you to see the results of the checklist.

Transmittal Completion

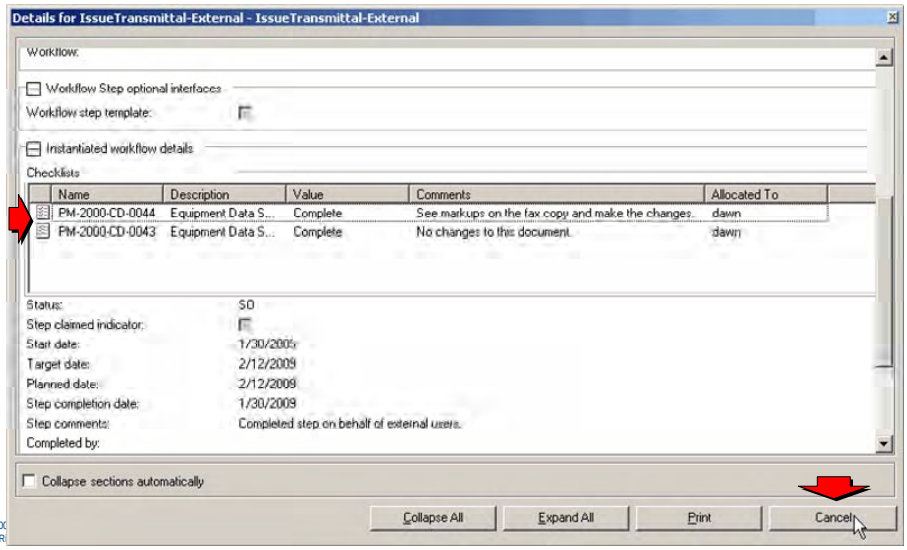
- **Use the scroll bar to see the Recipient Responses**



Use the scroll bar to view the *Recipient Response* checklist.

Transmittal Completion

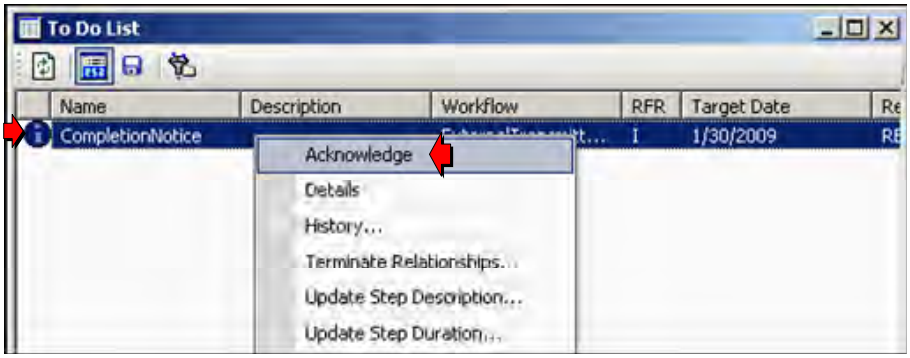
- **Select *Cancel* to close this window.**



After the workflow details window is closed, *eddie* can **Complete** the workflow.

Transmittal Completion

- **Right click on the workflow step and select *Acknowledge* to finish the transmittal workflow.**

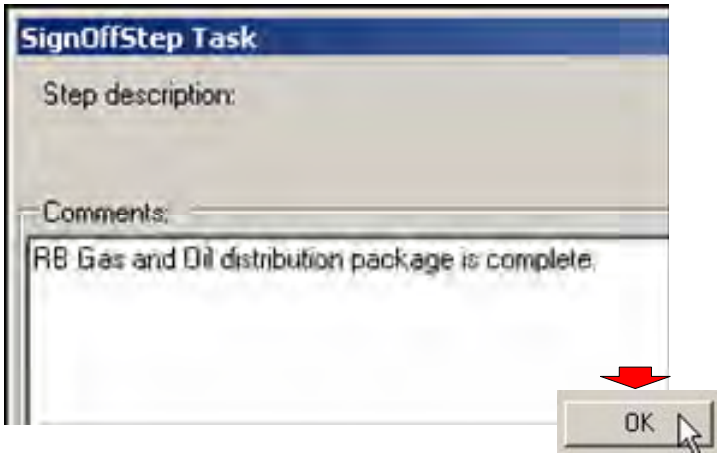


© 2009. Intergraph Corp.
All Rights Reserved.

The *SignOffStep Task* form will display.

Transmittal Completion

- **Enter comments to indicate that the transmittal package is complete and click OK.**

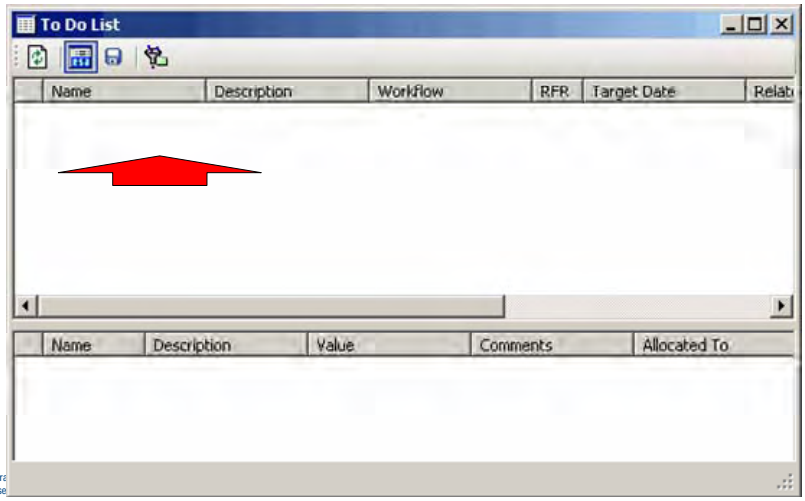


© 2009. Intergraph Corp.
All Rights Reserved.

The external transmittal has now been completed.

Transmittal Completion

The workflow step is removed from the users *To Do List.*

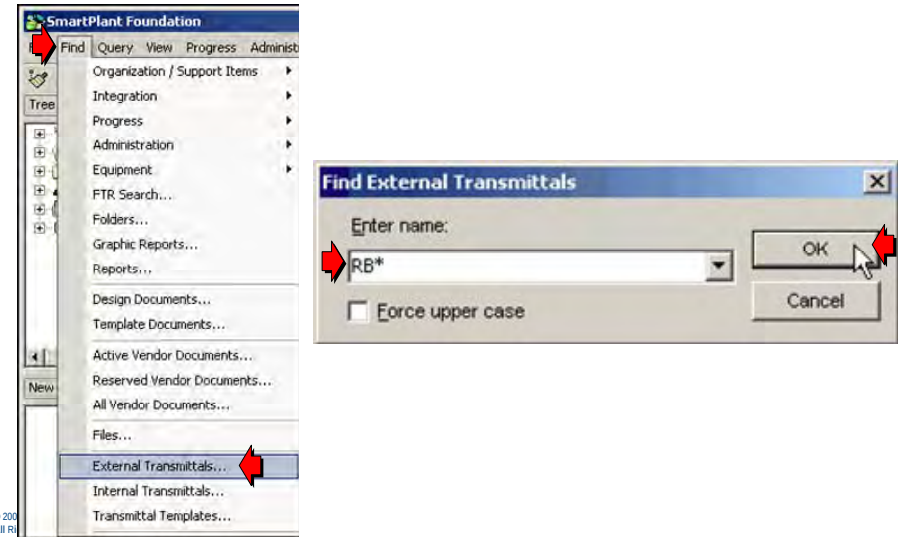


© 2009. Intergra
All Rights Rese

One last thing that a user might do is verify the steps that were performed during the workflow.

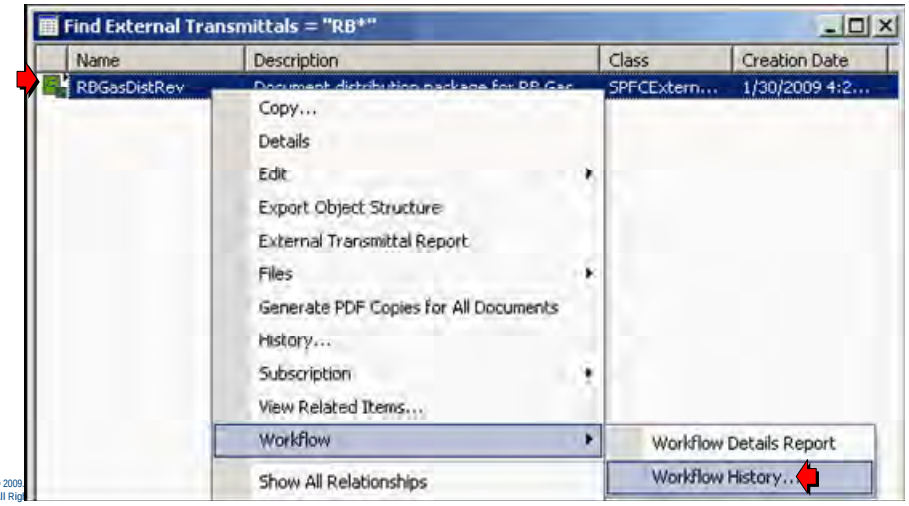
Transmittal Workflow History

- **Use a *Find* to search for external transmittals.**



Transmittal Workflow History

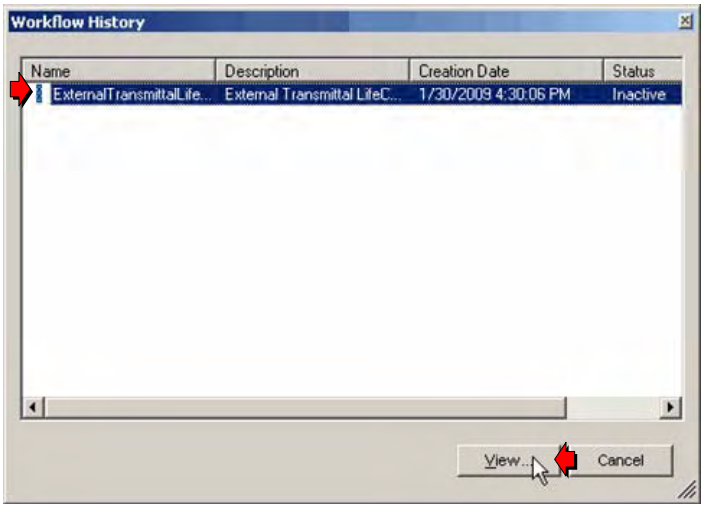
- **Right click on the transmittal and select Workflow > *Workflow History* to see the completed workflow.**



This will allow eddie to verify all workflow steps have been successfully completed.

Transmittal Workflow History

- **Click on the transmittal workflow and select *View* to see the completed graphical workflow.**

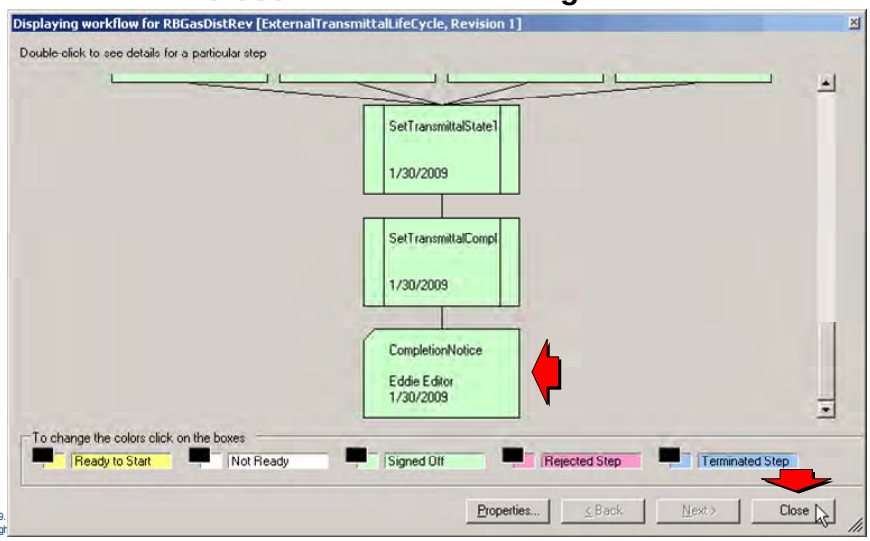


© 2009. Intergraph Corp.
All Rights Reserved.

Notice that all of the workflow steps have been *Signed Off* (green).

Transmittal Workflow History

- **Select *Close* to close this dialog.**

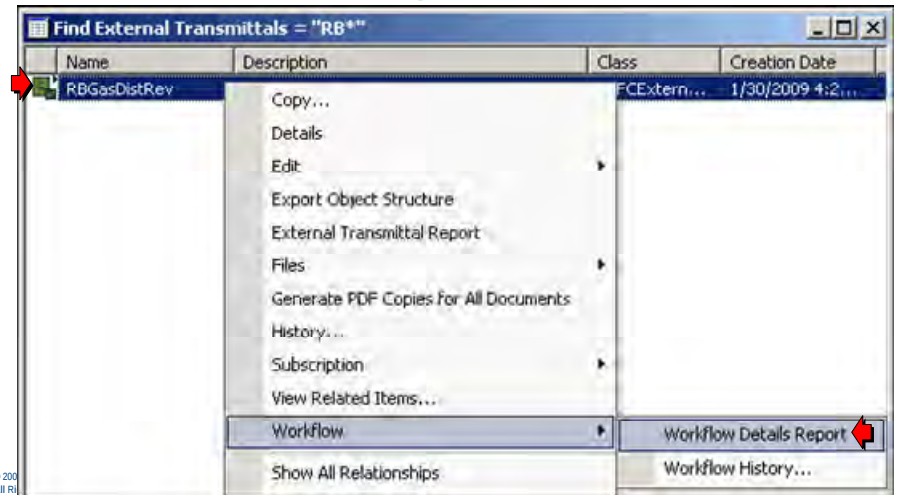


© 2009.
All Righ

A *Workflow Details Report* can be generated to display a history of the workflow processing.

Transmittal Workflow Details

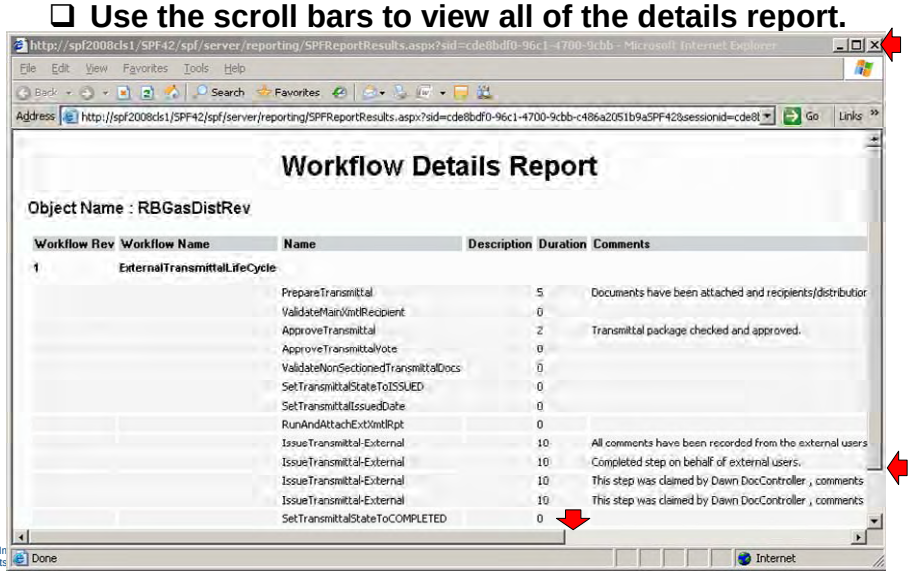
- **Right click on the transmittal and select *Workflow* > *Workflow Details Report* to view a workflow report.**



This report will display details about the finished workflow such as the *Name*, *Workflow Status* (at completion), *Step Names*, and *Assignees*.

Transmittal Workflow Details

- **Use the scroll bars to view all of the details report.**



9.5 Transmittal Manipulations

This part of the chapter will deal with updating a transmittal as well as, canceling, and terminating transmittal objects.

9.5.1 Updating Transmittals

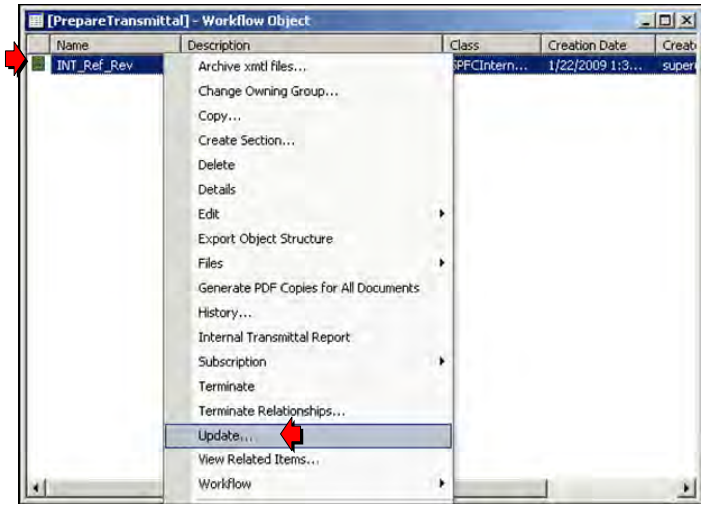
It is possible to update a transmittal as long as the status (Issue State) is not set to **ISSUED**. The update is limited to specific properties and uses the standard Update command from the Object menu.

To perform an update, highlight a transmittal from a *Find results* window or a *Show Workflow Object* window.

INTERGRAPH

Updating Transmittals

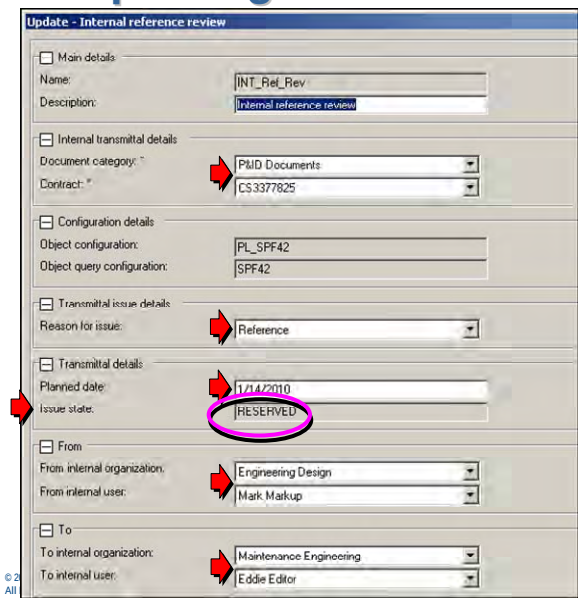
- **Right click on a transmittal and select *Update* from the pop up menu.**



© 2005. Intergraph Corp.
All Rights Reserved.

The *Update* transmittal dialog will display.

Updating Transmittals

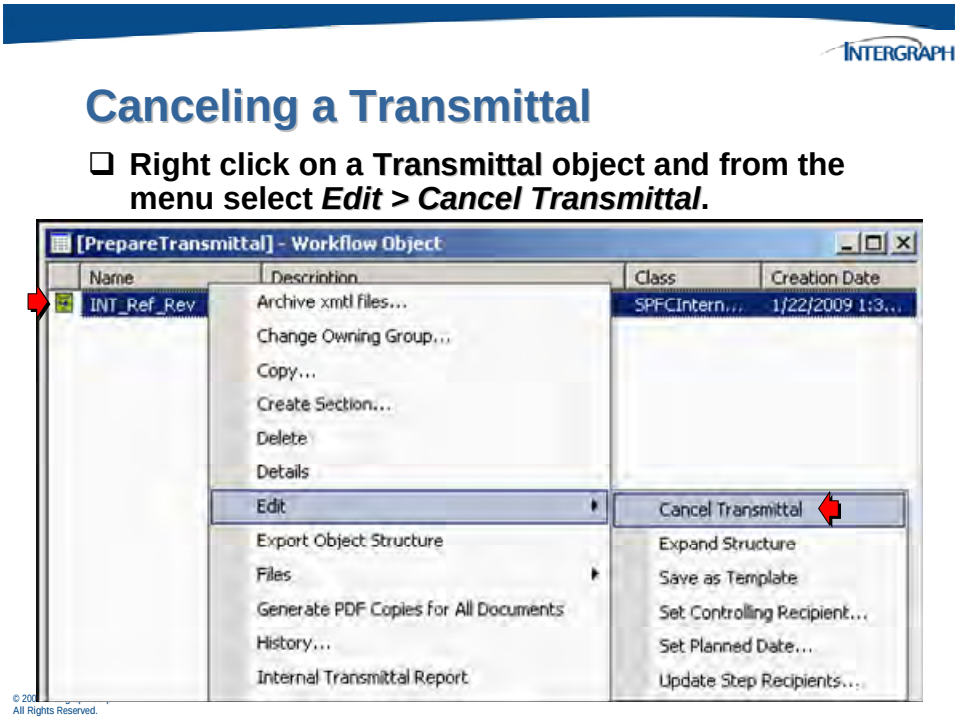


- **Make changes to any of the non-grayed out fields.**

9.5.2 Canceling a Transmittal

A transmittal may be cancelled if needed. If the transmittal has already been issued when it is cancelled, it is reissued with an *Issue State* of CANCELLED to all recipients. The Cancel changes the status of the transmittal and attached sections to CANCELLED. The cancelled transmittal icon has an X attached to it.

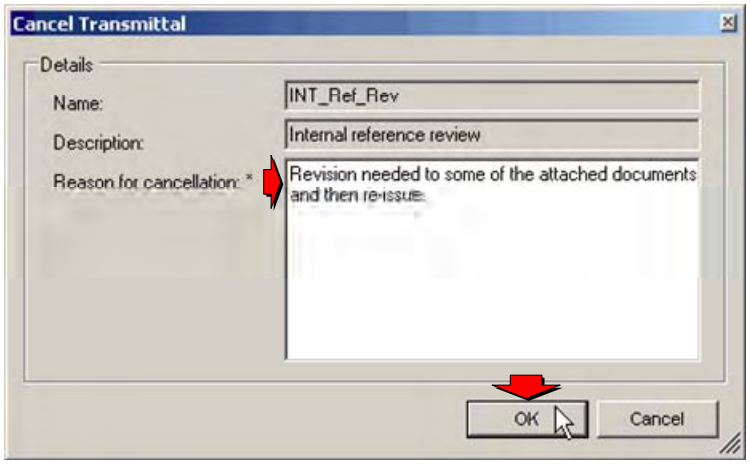
Search to locate and highlight the transmittal to be cancelled or select a transmittal from a *Show Workflow Object* window.



The Cancel Transmittal command will present a confirmation dialog with a *Reason for cancellation* required free-form key-in field. This will provide better record keeping and allow you to prevent the cancellation of a transmittal by mistake.

Canceling a Transmittal

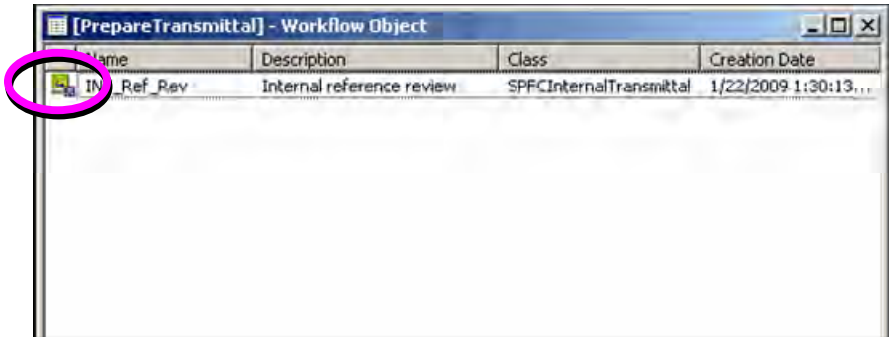
- **Enter the *Reason for cancellation* and click OK.**



© 2005. Intergraph Corp.
All Rights Reserved.

Canceling a Transmittal

The icon changes to show an X indicating that the Transmittal has been canceled.

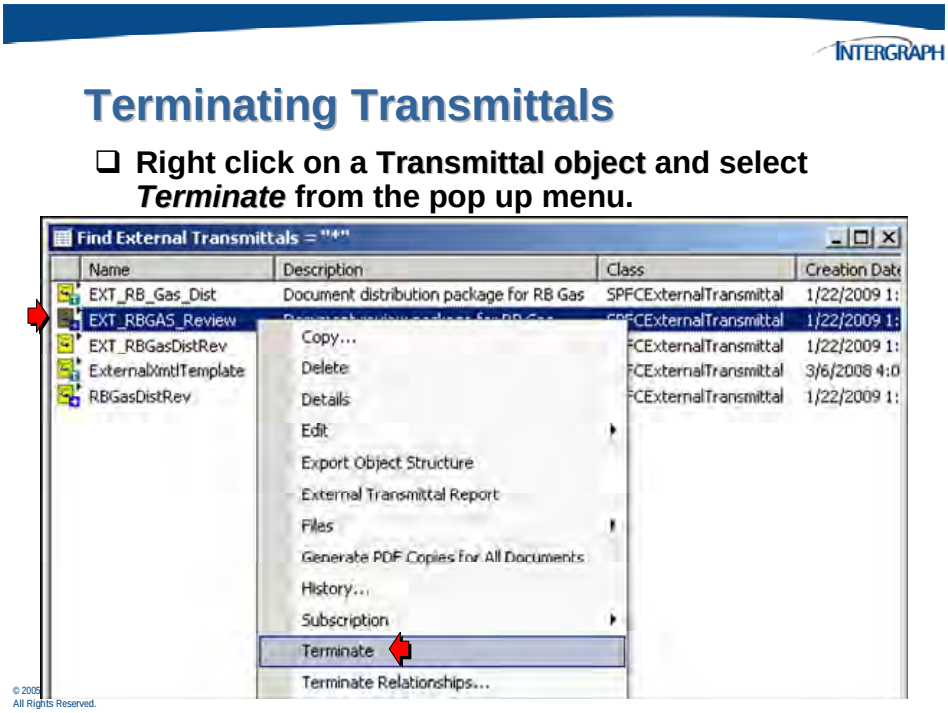


© 2005. Intergraph Corp.
All Rights Reserved.

9.5.3 Terminating Transmittals

The Terminate Transmittal command allows a document controller to delete a transmittal so to speak. However, the transmittal object would not be removed from the database.

Perform a search to locate the transmittal to be terminated. When the *Find results* window displays, highlight the transmittal that will be deleted.

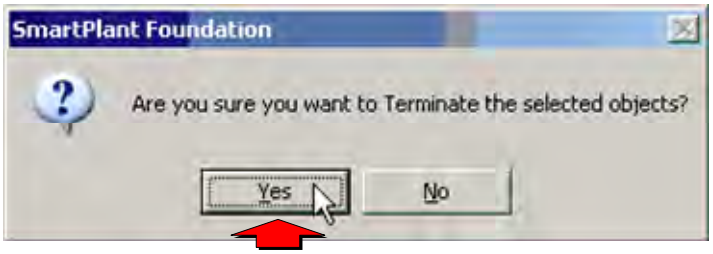


Terminating a transmittal keeps the transmittal's history in the database.

A dialog will display where you will be prompted to continue with the transmittal termination.

Terminating Transmittals

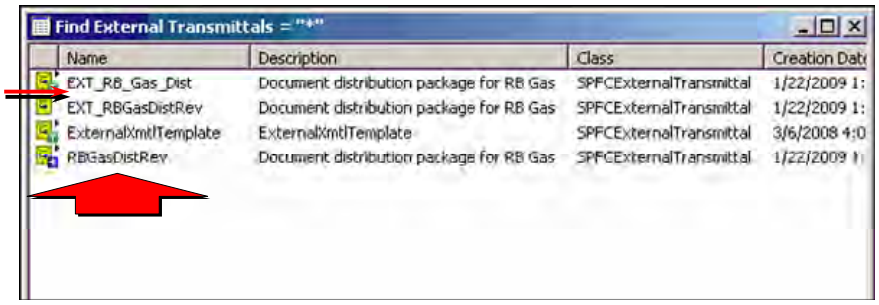
- ❑ **Select Yes to terminate the selected Transmittal.**



© 2005. Intergraph Corp.
All Rights Reserved.

Terminating Transmittals

The terminated transmittal will be removed from the results window.



© 2005. Intergraph Corp.
All Rights Reserved.

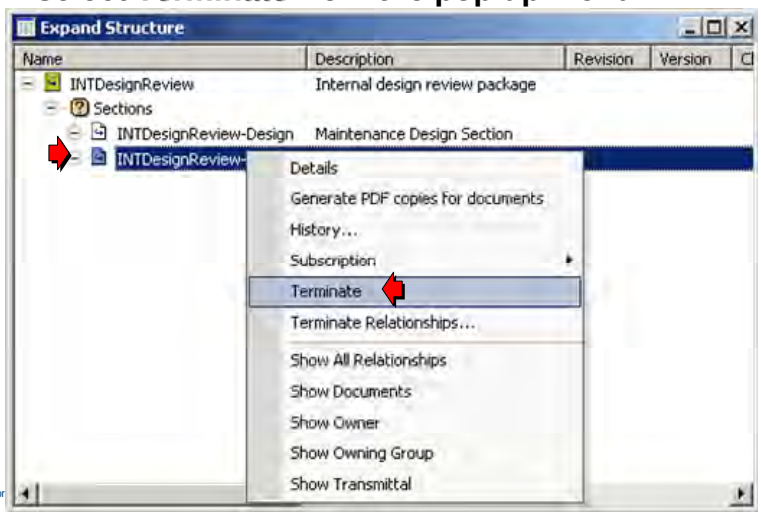
9.5.4 Terminating Transmittal Sections

A *Transmittal Section* can be terminated as well as an internal transmittal.

Perform a search to locate the transmittal Section to be terminated. When the *Find results* window displays, highlight the transmittal Section that will be deleted.

Terminating Transmittal Sections

- **Right click on an internal Transmittal Section and select *Terminate* from the pop up menu.**

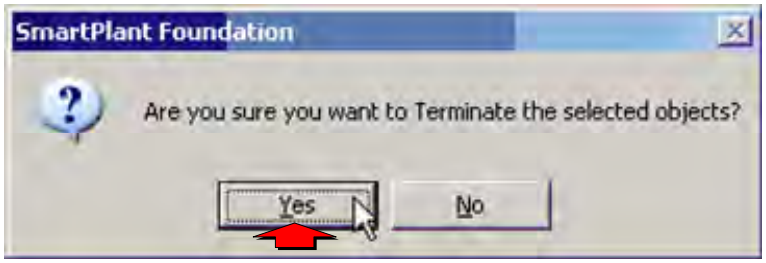


© 2005. Intergraph Cor
All Rights Reserved.

Terminating a transmittal section keeps the section's history in the database.

Terminating Transmittal Sections

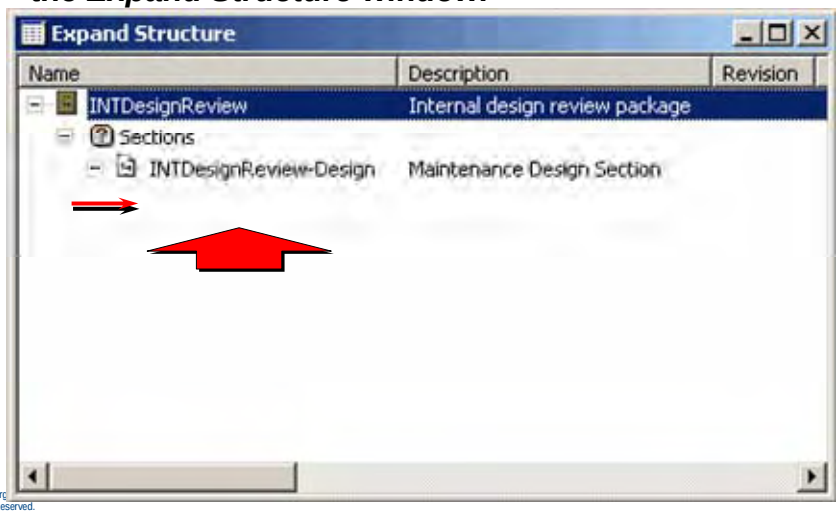
- **Select Yes to terminate the selected internal Transmittal Section.**



© 2005. Intergraph Corp.
All Rights Reserved.

Terminating Transmittal Sections

The terminated transmittal section will be removed from the *Expand Structure* window.



© 2005. Interg
All Rights Reserved.

9.6 Activity – Using and Managing Transmittals

Complete the **Chapter 9** – **Activity** in the SPF Configuration and Administration II activity workbook.

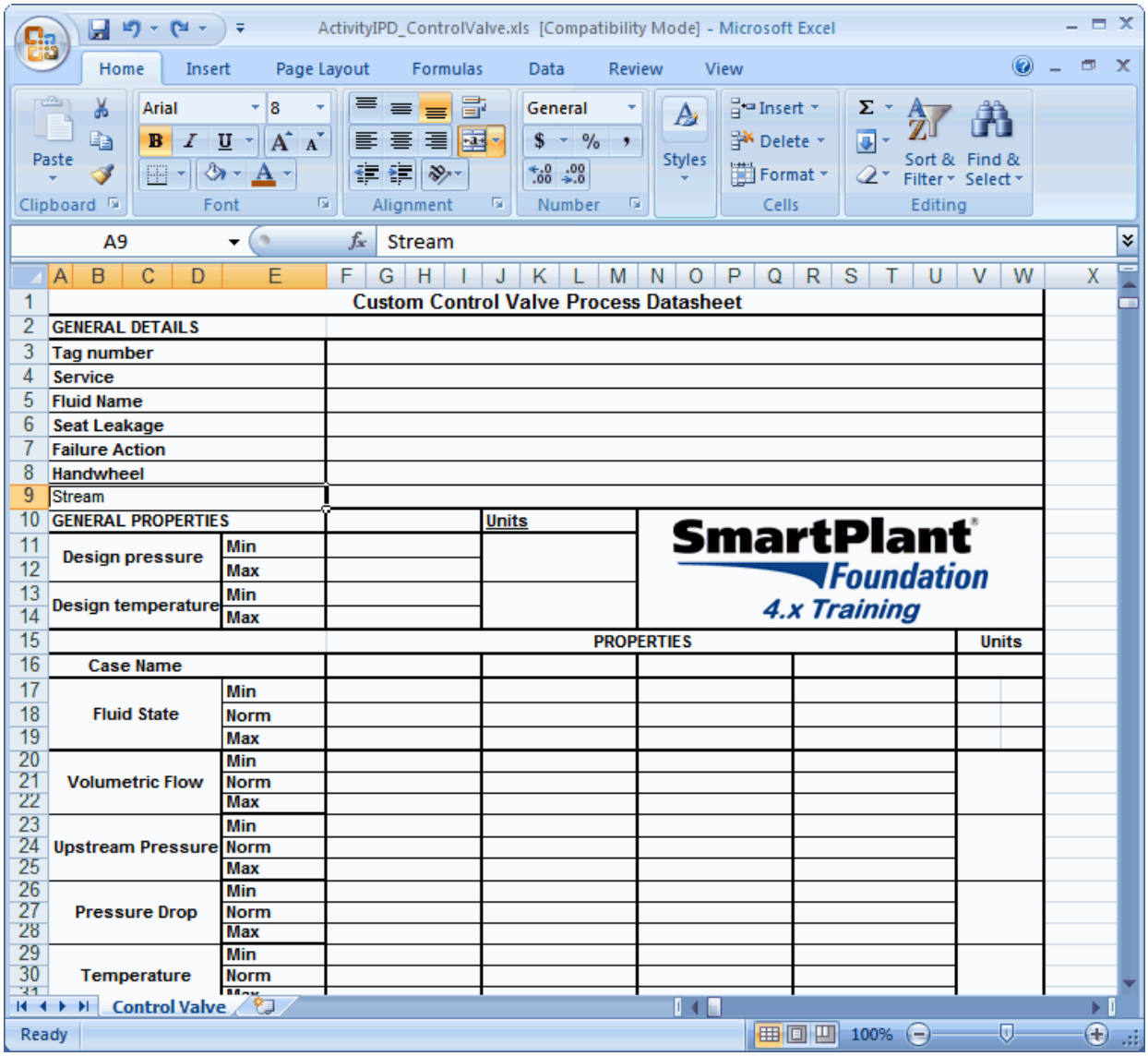
CHAPTER 10

Creating and Using Datasheets

10. Introduction

A data sheet is an Excel document that is based on one or many view definitions. A data sheet requires a pre-defined template in order to map data from the view definitions onto an Excel worksheet. This pre-defined template is populated with data during the preparation process to create a new data sheet.

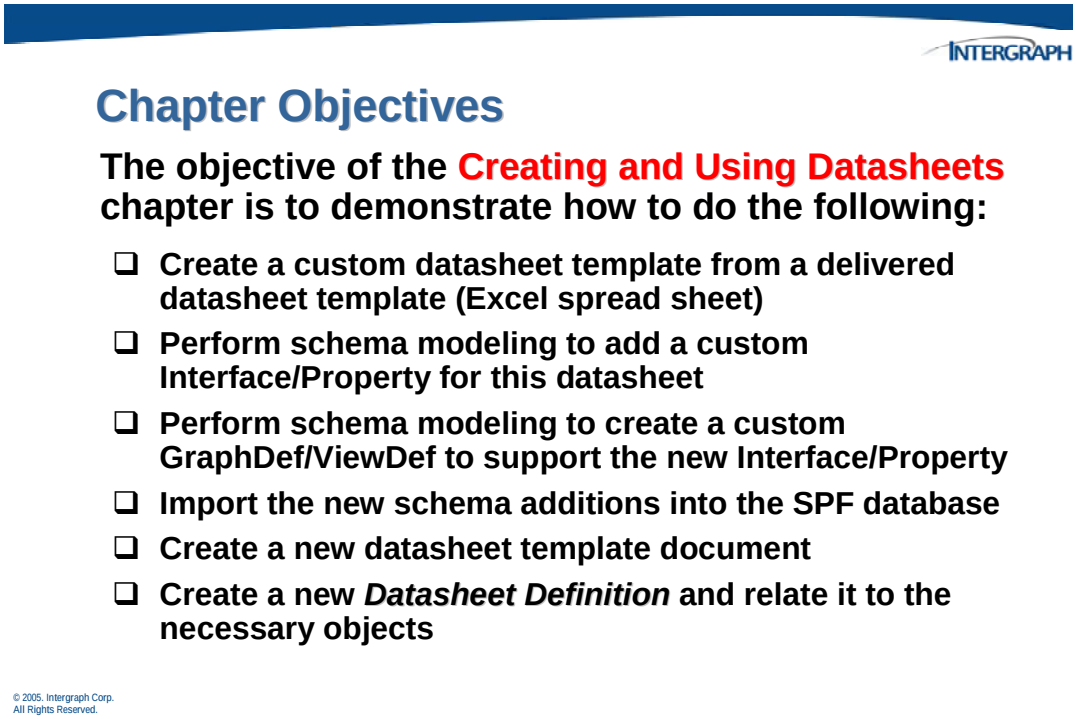
In addition, the datasheet capabilities allow editing to be performed offline and then loaded into SmartPlant Foundation.



Datasheets are another method to get customer data into SPF. They are a way of making a familiar paper process (the spreadsheet) in an electronic format. They can and will be customized for the users and requires the administrator to have industry/domain/ engineering experience and knowledge.

10.1 Objectives

The objectives of this chapter is to demonstrate how to do the following:



The basic process for creating a new data sheet is as follows:

1. Create an Excel template to lay out the data sheet. You can also use the customer's original spreadsheet for this step.
2. Analyze what properties are needed on the data sheet. Try to use properties that already exist in the SmartPlant schema. Properties specific to the customer's data sheet must be modeled in the Schema Editor.
3. Create any new properties, interfaces, and view definitions that are necessary in the Schema Editor.
4. In the SmartPlant Foundation Desktop Client, create a new data sheet template document and attach the Excel template to it.
5. Create a new data sheet definition.

Chapter Objectives

Chapter Objects (con't)

- **Use *Datasheet Definer* to map the properties to the new custom datasheet template**
- **Register a new process tool and retrieve published instruments into the Process Domain**
- **Use the custom datasheet to make changes to a retrieved instrument**
- **Verify the changes in the Desktop Client**
- **Use datasheets offline to make changes**
- **Bring offline changes back into SPF using the DTC Loader**
- **Verify the offline changes in the Desktop Client**

© 2005. Intergraph Corp.
All Rights Reserved.

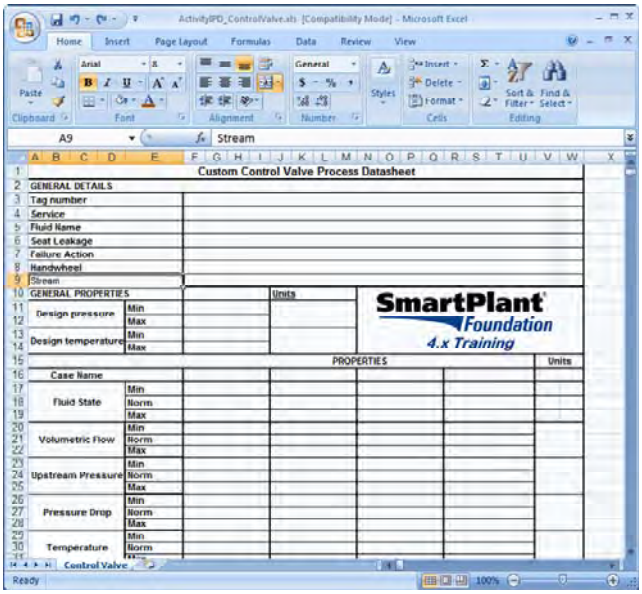
6. Relate each view definition that contains the properties you want to map to the data sheet definition.
7. Relate the data sheet template document to the data sheet definition.
8. Check out the data sheet template document.
9. Open the data sheet definer and map the properties to the relevant worksheet cells.
10. Check in the data sheet template document.
11. Create a relationship between the data sheet definition and the object's class.
12. Test the datasheet in the Desktop Client.

10.2 Working with Datasheets

In SmartPlant Foundation, datasheets allow you to view, edit, and print data for an object in an easy-to-use, customizable format. You can also package datasheets for editing by users who do not have access to SmartPlant Foundation.

Working with Datasheets

- **Datasheets allow you to view, edit, and print the data for an object in an easy-to-use, customizable format.**



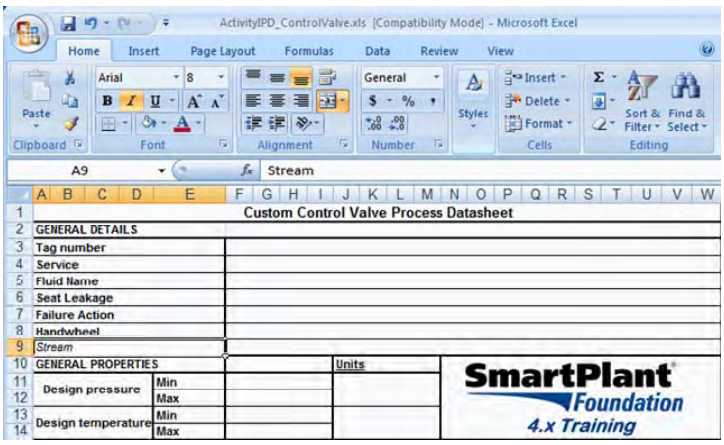
© 2005. Intergraph Corp.
All Rights Reserved.

The Excel worksheet that is to become the data sheet template should be formatted as desired.

INTERGRAPH

Working with Datasheets

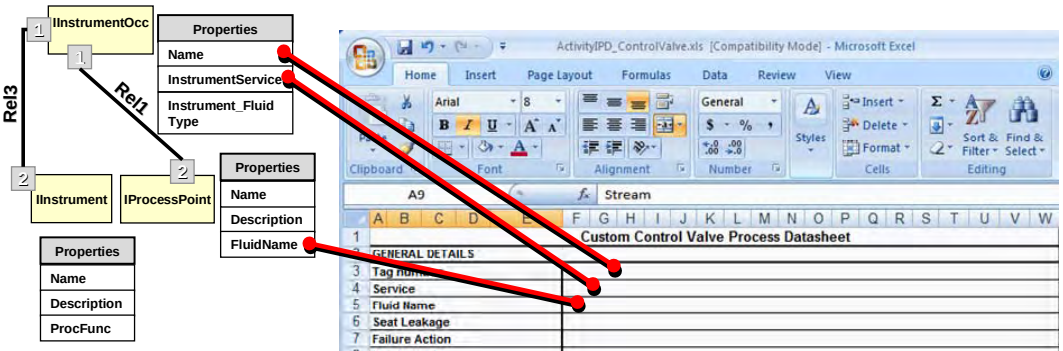
First, define the Excel spreadsheet.



© 2005. Intergraph Corp.
All Rights Reserved.

INTERGRAPH

Working with Datasheets



Next, map the cells to the appropriate view properties (attributes) in the SPF database.

© 2005. Intergraph Corp.
All Rights Reserved.

A copy of this worksheet will become the datasheet template when you create the datasheet in SmartPlant Foundation Desktop Client.

Working with Datasheets

- Datasheets use **View Definitions** to map Excel cells to the corresponding SmartPlant Foundation properties.
- The Datasheet to Excel mapping is performed in the Desktop client.
- Datasheets are edited using the **GenDatasheet** client API, the **GenIPDDatasheet** and the **GenIPDDatasheetOffline** methods. These commands populate the data into an Excel datasheet and then displays the datasheet on the client computer.
- Excel macros control the edit session so you must select the Enable Macro button when the datasheet appears.
- You can also package datasheets for editing by users who do not have access to SmartPlant Foundation.
- Offline datasheets are edited directly in Microsoft Excel.

© 2005. Intergraph Corp.
All Rights Reserved.

Working with Datasheets

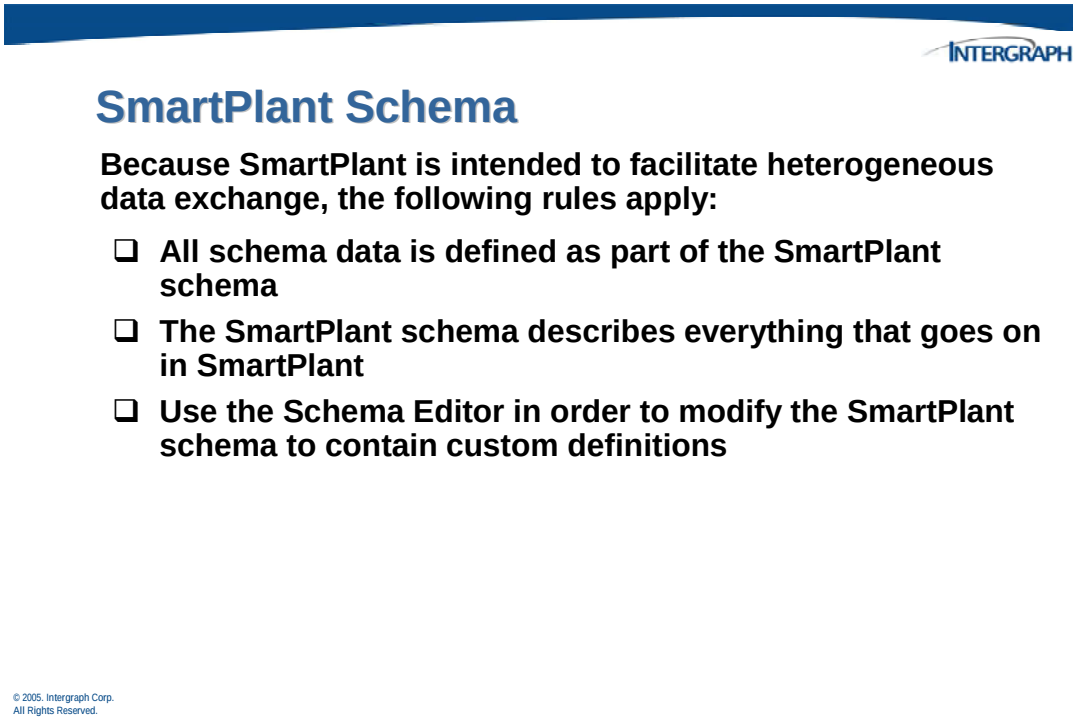
Two types of datasheets in SPF

- IPD—Instrument Process Datasheets. These have been in SPF for quite some time and are part of the out-of-the-box system.
- EQD (API or MED datasheets)
  - EQD (Equipment Datasheets)
  - API (American Petroleum Institute. The API format is the standardized format that has been adopted by a significant number of companies. There are about 20 of these datasheets delivered with SPF currently.
  - MED (Mechanical Equipment Datasheets)
  - The EQD datasheets are additional purchase

© 2005. Intergraph Corp.
All Rights Reserved.

10.3 The SmartPlant Schema

The SmartPlant schema describes the structure of data passed through SmartPlant along with its rules. The SmartPlant schema can be hard to understand; to make it easier to interpret, the **Schema Component** exists. The Schema Component is a set of .DLLs that assists the tools with the generation and subsequent parsing of the XML data definitions.



The SmartPlant schema is an XML file that describes the structure of the XML files generated by the authoring tools in much the same way as a data dictionary describes the structure of a database. As tools publish documents in XML format, those documents must adhere to the format defined by the schema to ensure that the XML data can be loaded into SmartPlant Foundation and retrieved into the other authoring tools.

The building blocks of the schema are classes, interfaces, and relationships. Classes are typically real world objects like instruments, tanks (vessels) or pipe runs.

Any new view definitions, interface definitions, property definitions, and enumerated types for the new datasheet must be modeled in the Schema Editor.

When possible, it is best to reuse properties that are already in the schema. Evaluate the original spreadsheet and analyze the SmartPlant schema to decide which existing properties you can use and which properties are new and unique to this data sheet.

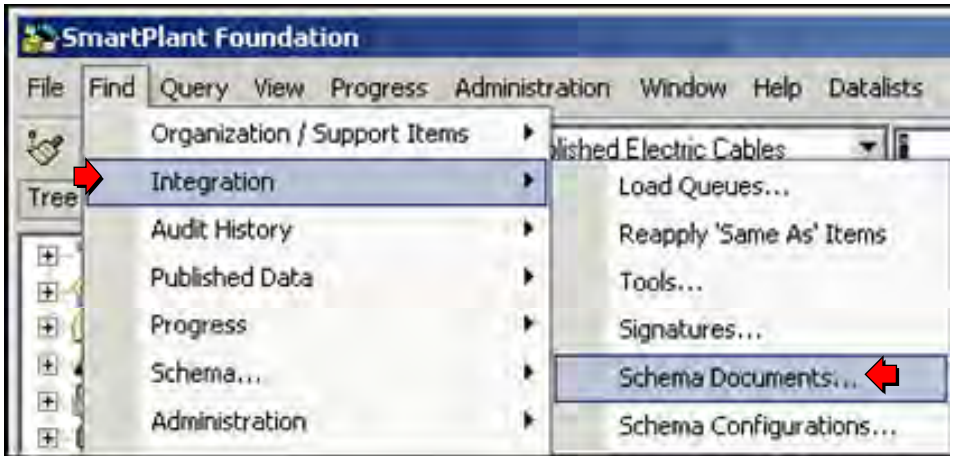
10.3.1 Launching the Schema Editor

The *Schema Editor* is installed as part of the Schema Component installation. There are a variety of ways to do operations using the Schema Editor. When working in an integrated environment, the CMF files that are part of the SmartPlant Schema for integration are stored in SPF for document management. In order to make changes to these files, you need to find them in SPF, use the ***Check Out*** command to create a new version, and open them in the SmartPlant Schema Editor for modification.

INTERGRAPH

Launching the Schema Editor

- **To find a schema file to edit, click *Find* > *Integration* > *Schema Documents*.**



© 2005. Intergraph Corp.
All Rights Reserved.

Find the CMF file that you want to modify.

Launching the Schema Editor

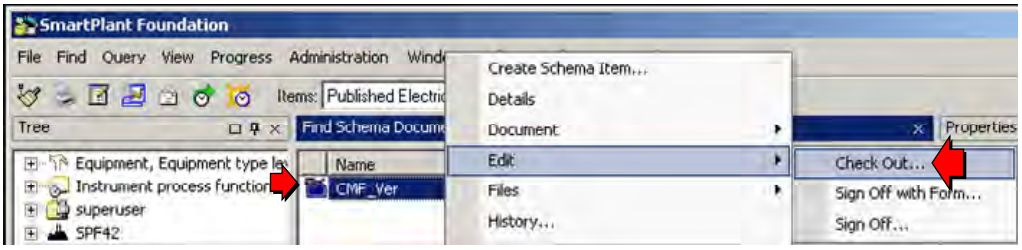
- **Type the exact schema document name or use wildcards, and then, click OK.**

© 2005. Intergraph Corp.
All Rights Reserved.

You must **Check Out** the schema file before launching the schema editor.

Launching the Schema Editor

- **Right-click the schema file, CMF_Ver, and select *Edit > Check Out* from the dynamic menu.**

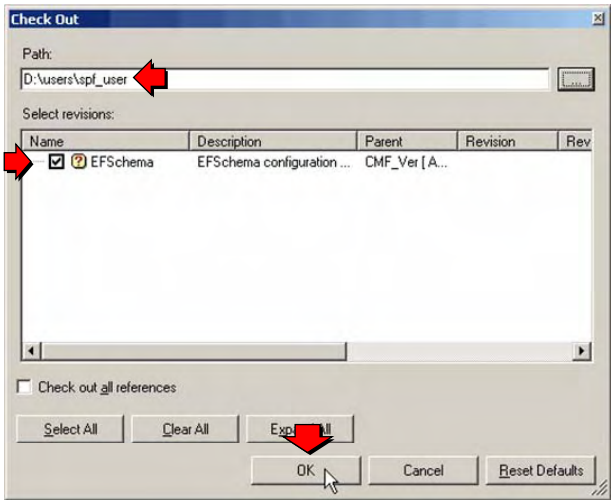


© 2005. Intergraph Corp.
All Rights Reserved.

The *Check Out* dialog box will appear.

Launching the Schema Editor

- **Browse to choose a check out folder location for editing the schema file and select OK.**

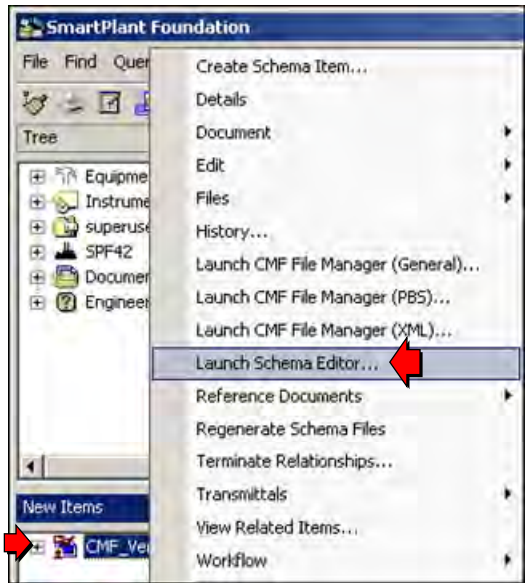


© 2005. Intergraph Corp.
All Rights Reserved.

Launch the schema editor using the command from the shortcut menu.

Launching the Schema Editor

- **Find the checked out CMF file, right-click it, and choose the *Launch Schema Editor* from the dynamic menu.**

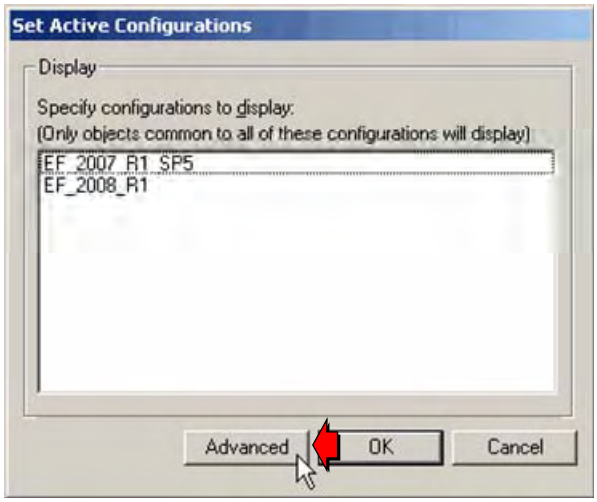


© 2005. Intergraph Corp.
All Rights Reserved.

Starting in the SmartPlant Foundation 2008 release, the Schema Editor and other SmartPlant integration components support forward and backward version compatibility. This means that integration supports the SmartPlant authoring tools' use of different versions of the SmartPlant schema from the version used in SmartPlant Foundation. Integrated SmartPlant tool versions 2007 Service Pack 4 and later can be integrated with SmartPlant Foundation 2008.

Launching the Schema Editor

- **Choose the Advanced button to see more detailed options regarding the active configurations.**

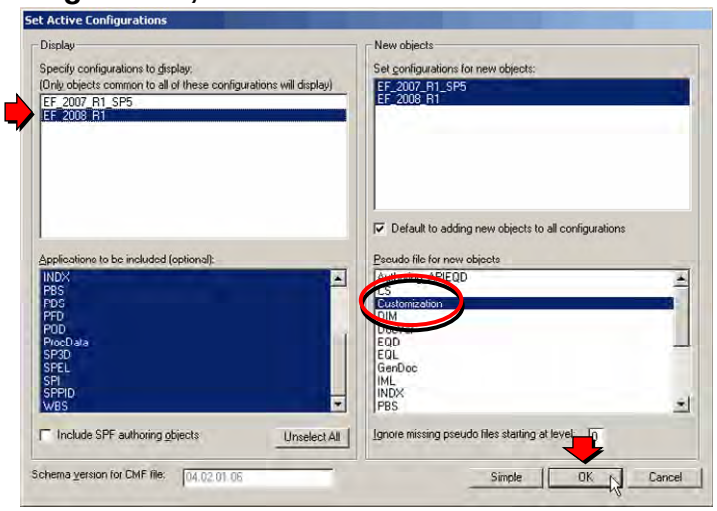


© 2005. Intergraph Corp.
All Rights Reserved.

When you are editing the schema using a CMF file, you can select the configurations you want to edit based on forward and backward compatibility. This allows you to create objects to one or more versions of the SmartPlant schema at the same time.

Launching the Schema Editor

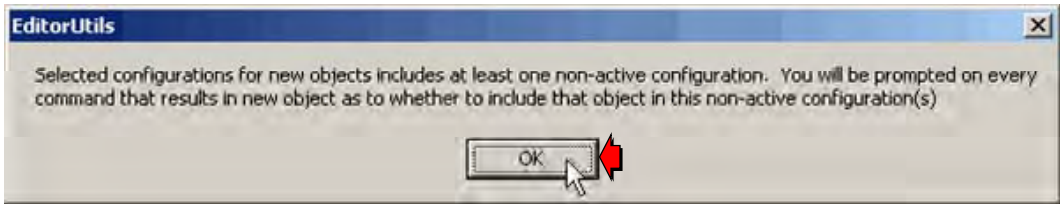
- **In the upper left quadrant, select the EF 2008 R1 configuration, then click OK.**



© 2005. Intergraph Corp.
All Rights Reserved.

Launching the Schema Editor

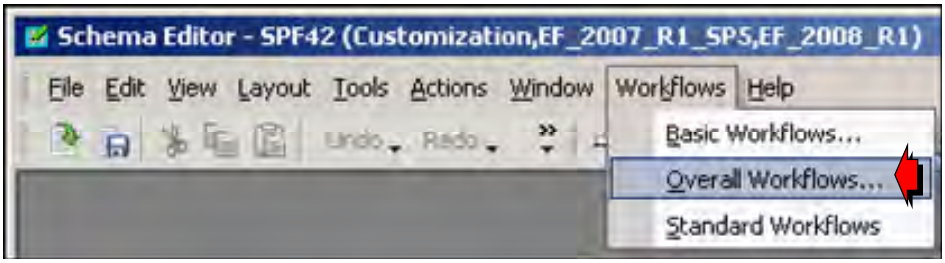
- **Since the *EF_2007_R1_SPF* configuration was not selected, an informational message will be displayed. Click OK on the displayed information message.**



© 2005. Intergraph Corp.
All Rights Reserved.

Launching the Schema Editor

- **From the menu, select the *Workflows > Overall Workflows* command.**

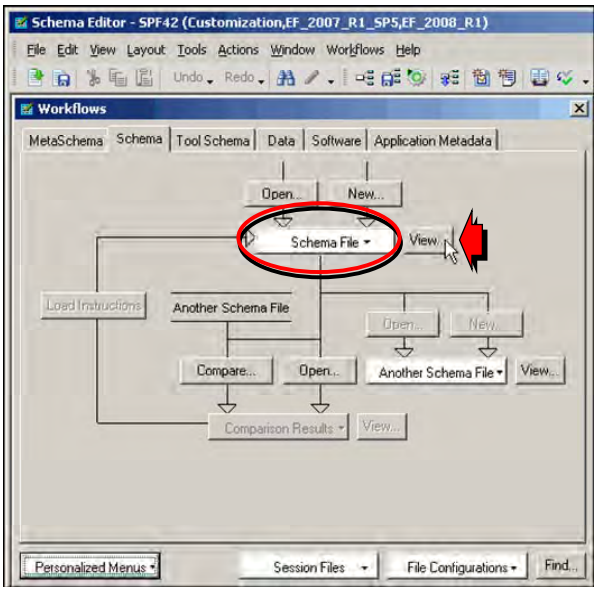


© 2005. Intergraph Corp.
All Rights Reserved.

The view that displays is the ***Workflows*** view. The **Workflows** view presents the Schema Editor functionality in a sequence that must be followed when performing operations using the Schema Editor.

Launching the Schema Editor

- **In the *Workflows* dialog box, select the View button (next to Schema File) to view (and edit) the schema.**



© 2005. Intergraph Corp.
All Rights Reserved.

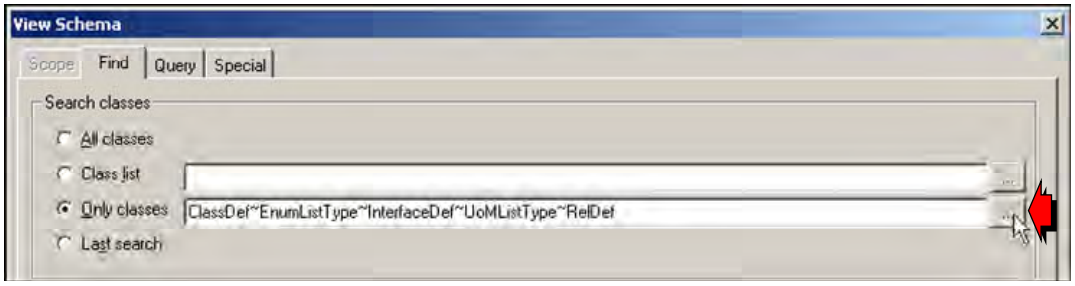
10.3.2 Editing an Open Schema File

Use the Schema Editor to create the necessary definitions to use for creating custom properties and View Definitions for a datasheet. Before you begin viewing the schema, select the **DirectedGraphDef** and **ViewDef** classes and add them to *Only classes* list.

INTERGRAPH

Launching the Schema Editor

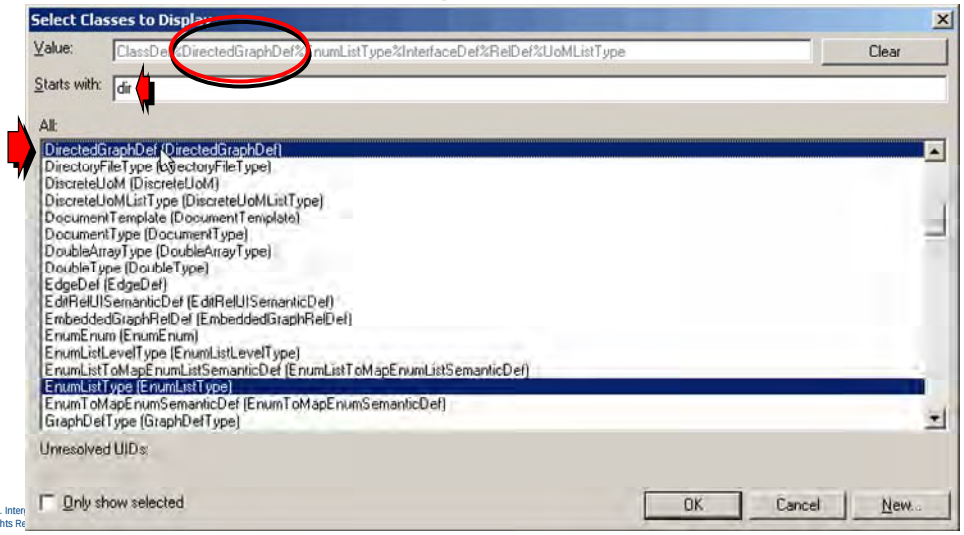
- **Use the Only classes list ellipsis (…) button to choose the additional classes to display.**



© 2005. Intergraph Corp.
All Rights Reserved.

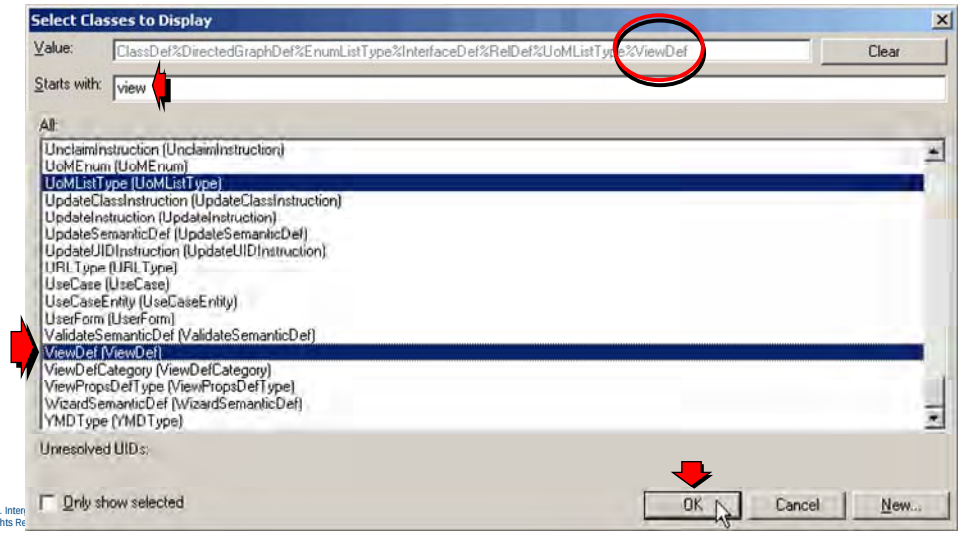
Launching the Schema Editor

- **Select the *DirectedGraphDef* class from the displayed list.**



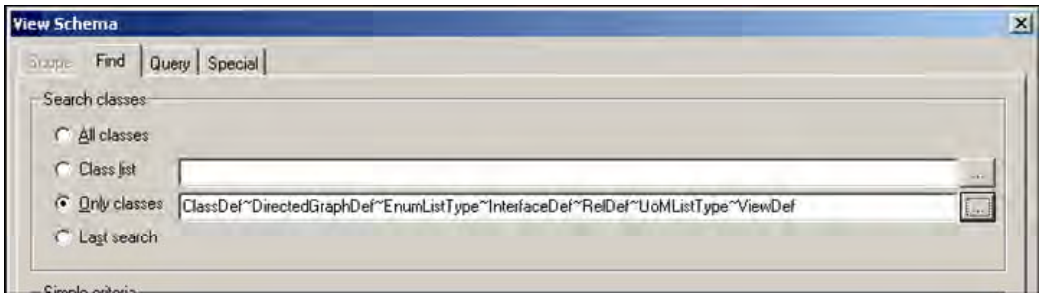
Launching the Schema Editor

- **Select the *ViewDef* class from the displayed list and click OK.**



Launching the Schema Editor

- **Click the Options button to select the type of view to use for making the modifications to the schema.**

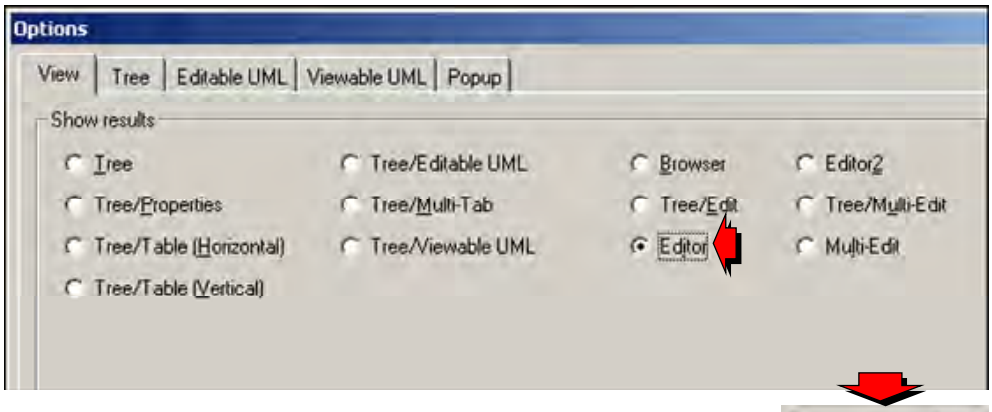


© 2005. Intergraph Corp.
All Rights Reserved.

The easiest way to edit the schema in the Schema Editor is the Schema **Editor** view. The editor view displays the classes in the schema in the top-level nodes and provides a list of meta schema objects that can be created. When you expand a class, you can see the relationships defined for the class.

Launching the Schema Editor

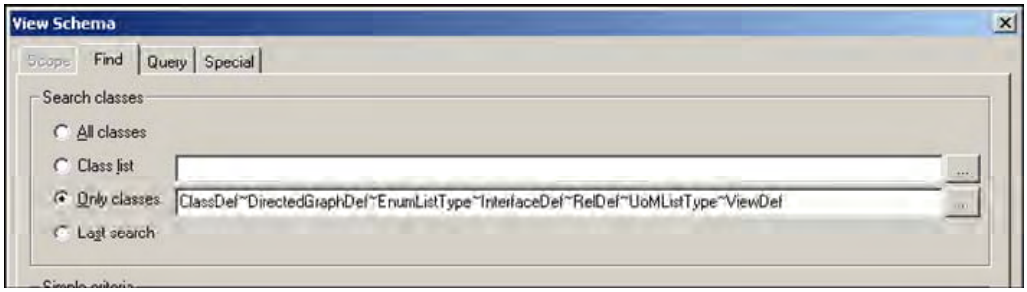
- **Enable the radio button for the Editor view option and click OK to return to the *View Schema* screen.**



© 2005. Intergraph Corp.
All Rights Reserved.

Launching the Schema Editor

- **To view the base classes (plus *GraphDefs* and *ViewDefs*) and begin the modifications, click the OK button.**



© 2005. Intergraph Corp.
All Rights Reserved.

10.3.3 Reviewing the Delivered Schema

In this datasheet example, the delivered IPD_ControlValve datasheet has been copied and renamed so that custom properties can be added without affecting the out-of-the-box datasheet. In doing this, a lot of the delivered schema definitions can be re-used and supplemented with custom definitions.

Prior to modeling custom interfaces and properties, it is recommended that the delivered schema be reviewed in order to become familiar with what is available to use with the custom datasheet.

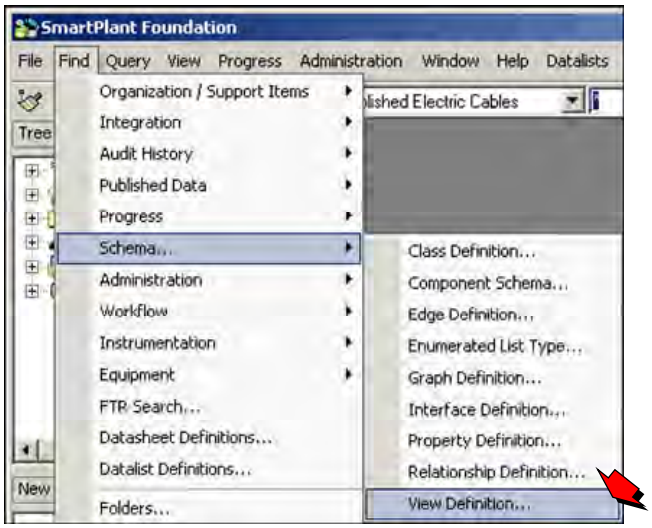
One of the key components to datasheet functionality is **View Definitions**, which are used to map cells in the datasheet (spreadsheet) to database fields.

Use the Desktop Client to find and review the delivered IPD view definitions.

INTERGRAPH

Reviewing the Delivered Schema

- **Select *Find* > *Schema* > *View Definition* from the menu.**



© 2005. Intergraph Corp.
All Rights Reserved.

Reviewing the Delivered Schema

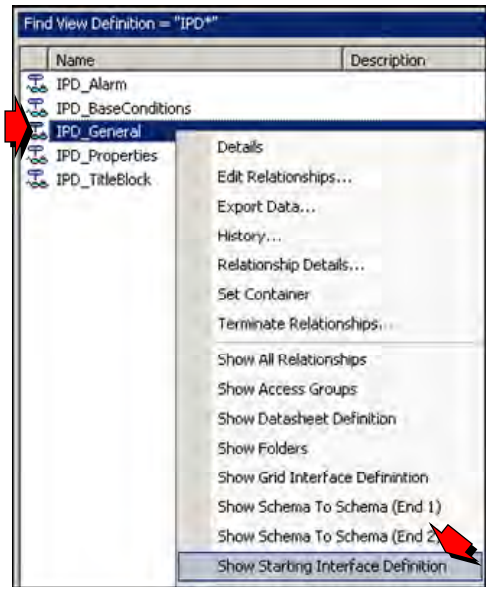
- **Enter the criterion to find the delivered IPD view definitions, then click OK.**

© 2005. Intergraph Corp.
All Rights Reserved.

Next, determine the starting interface for the delivered IPD view definitions.

Reviewing the Delivered Schema

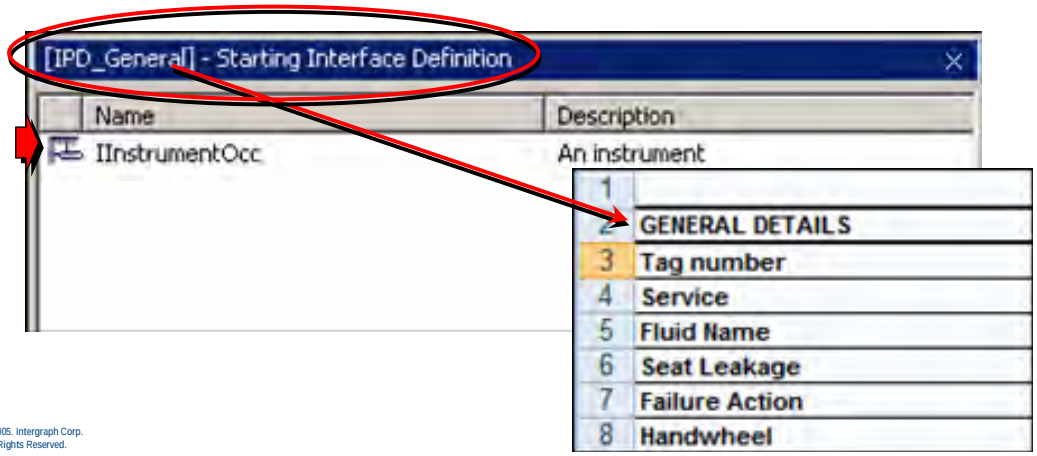
- **Right click on the IPD_General view definition and select *Show Starting Interface Definition* from the dynamic menu.**



© 2005. Intergraph Corp.
All Rights Reserved.

Reviewing the Delivered Schema

The starting interface for this view definition, IInstrumentOcc, is displayed.

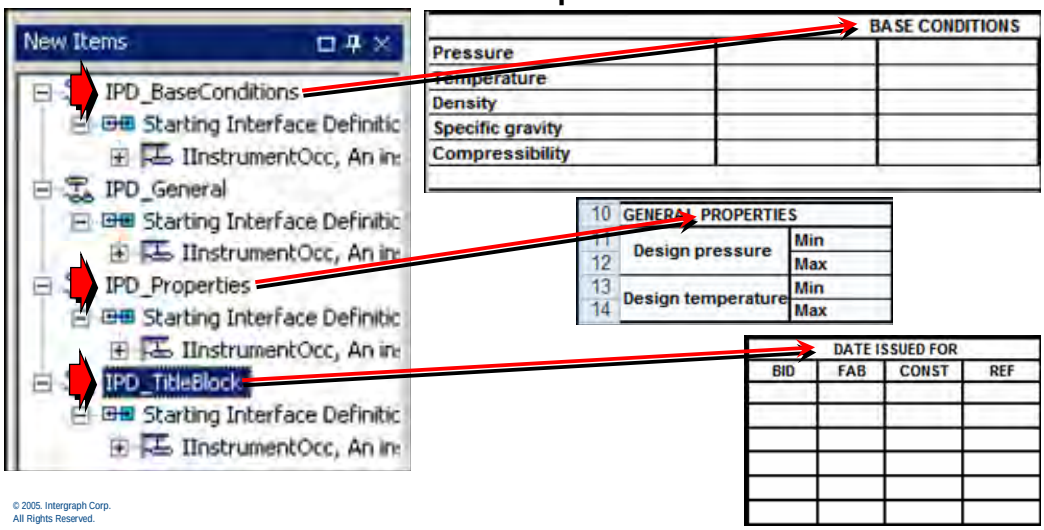


© 2005. Intergraph Corp.
All Rights Reserved.

The *IPD_General* viewdef is used to map those properties displayed in the **GENERAL DETAILS** section of the datasheet.

Reviewing the Delivered Schema

Datasheets can consist of multiple ViewDef's.



© 2005. Intergraph Corp.
All Rights Reserved.

If a custom view definition is needed, then the starting interface would need to be consistent with the delivered viewdefs.

10.3.4 Creating a Custom Interface

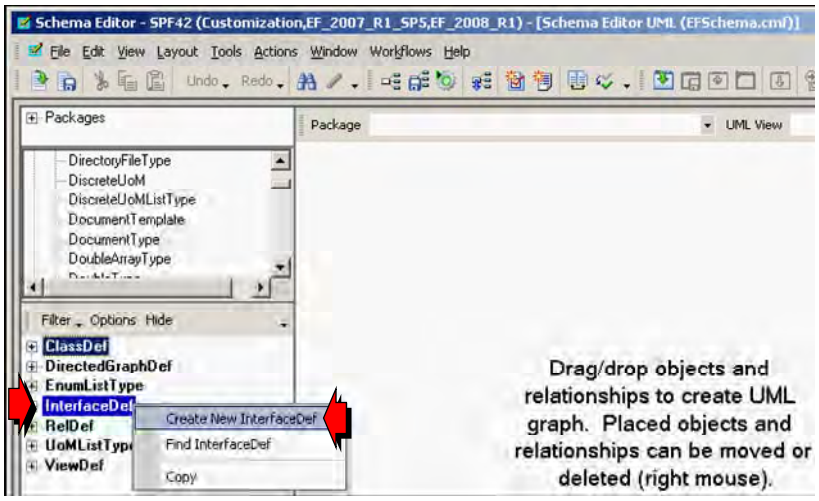
In order to add custom properties used for datasheet mapping, it is recommended that they be exposed by custom interfaces rather than one or more of the delivered interfaces.

Use the *Editor* view in the schema editor to define a new interface for use with the datasheet.

INTERGRAPH

Creating a Custom Interface Definition

- **Right click on *InterfaceDef* in the tree and select *Create New InterfaceDef* from the dynamic menu.**

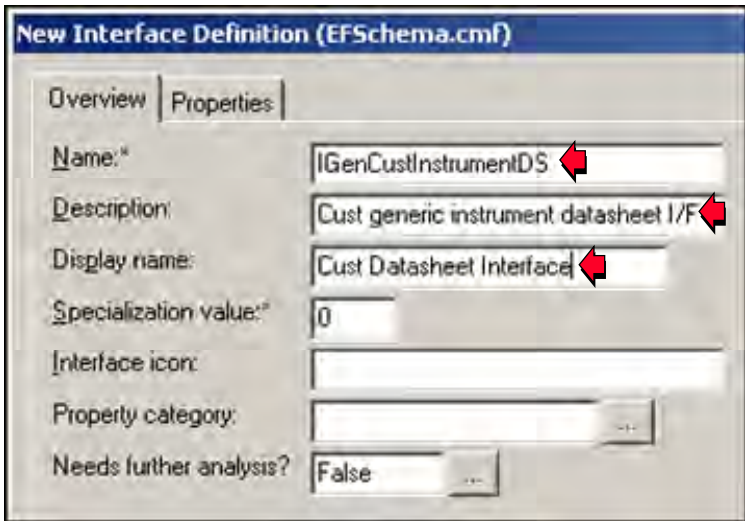


© 2005. Intergraph Corp.
All Rights Reserved.

The *New Interface Definition* form will appear.

Creating a Custom Interface Definition

- **Enter the information to create the new InterfaceDef.**

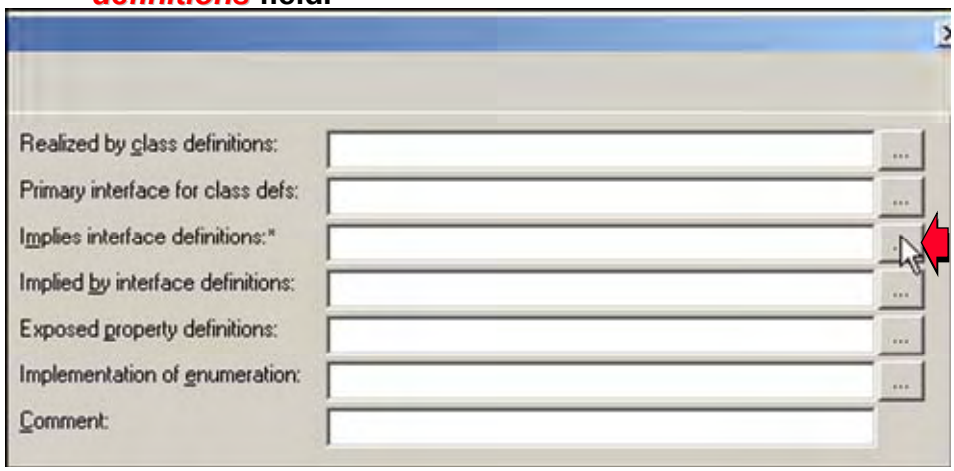


© 2005. Intergraph Corp.
All Rights Reserved.

Next, define an *implies* relationship to the **IInstrumentOcc** interface.

Creating a Custom Interface Definition

- **Click the ellipsis button beside the *Implies interface definitions* field.**



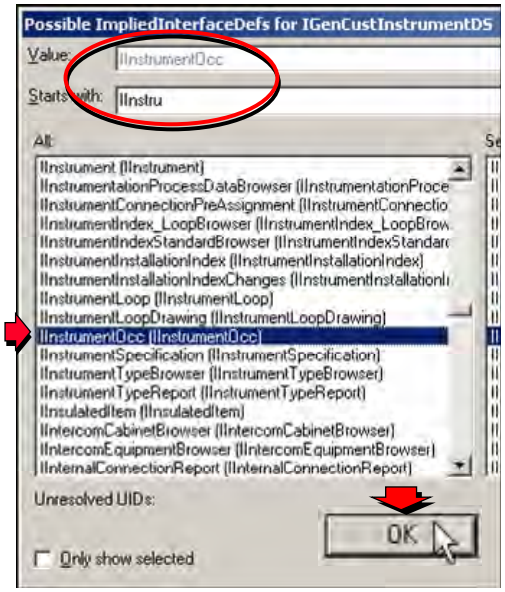
© 2005. Intergraph Corp.
All Rights Reserved.

This interface is selected because it is already used in the delivered viewdefs and it is realized by the *PRCProcessInstrument* class def.

INTERGRAPH

Creating a Custom Interface Definition

- **Choose *IInstrumentOcc* from the *Possible ImpliedInterfaceDefs for IGenCustInstrumentDS* and click OK.**



© 2005. Intergraph Corp.
All Rights Reserved.

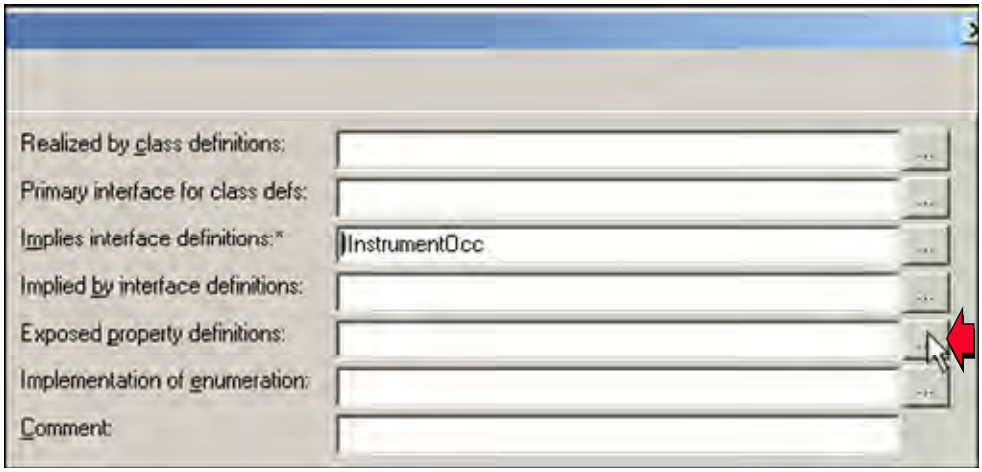
This also means that any new properties exposed by the new custom interface will be displayed when viewing the properties of **Process Instrument** objects.

10.3.5 Creating a Custom Property

The next step in the schema modeling is to define any new properties to be used in the custom datasheet.

Creating a Custom Property Definition

- **Click the ellipsis button beside the *Exposed property definitions* field.**



© 2005. Intergraph Corp.
All Rights Reserved.

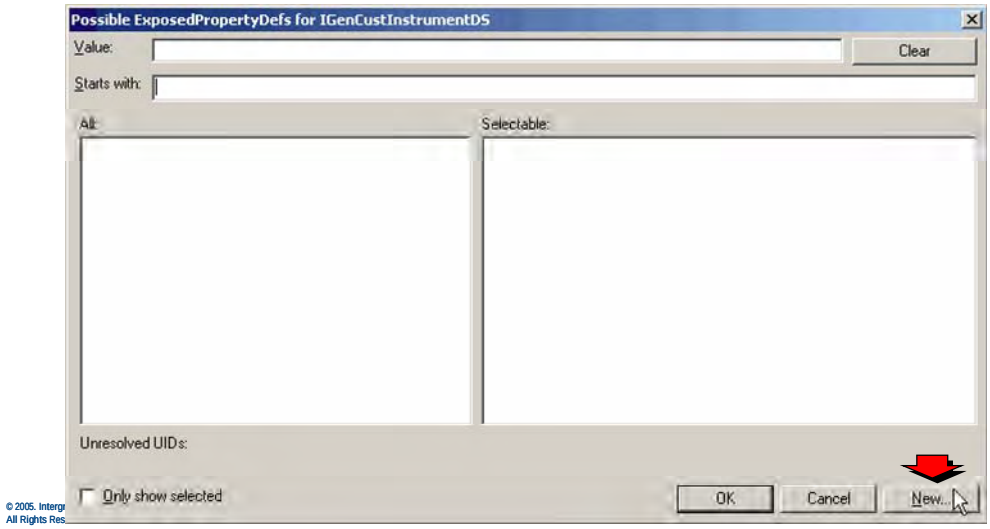
By clicking the *Exposed property definitions* ellipsis button, a schema modeler can either select an existing property* to be exposed by this interface or define a new property.

***Note:** When mentioning an existing property, we mean a new custom property that was defined prior to defining the new custom interface.

Since the property to be exposed by this new interface does not yet exist, it will need to be defined.

Creating a Custom Property Definition

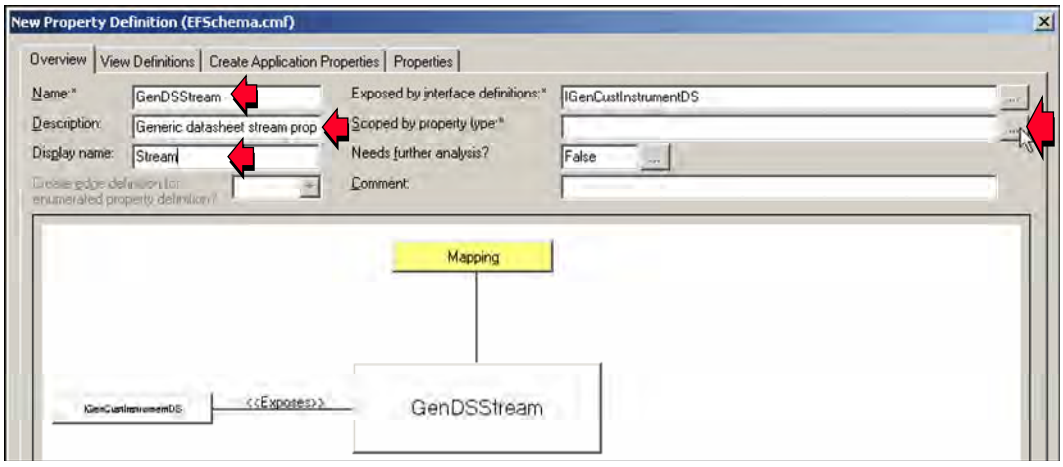
- **Click *New* to create a new custom property.**



The *New Property Definition* form will appear.

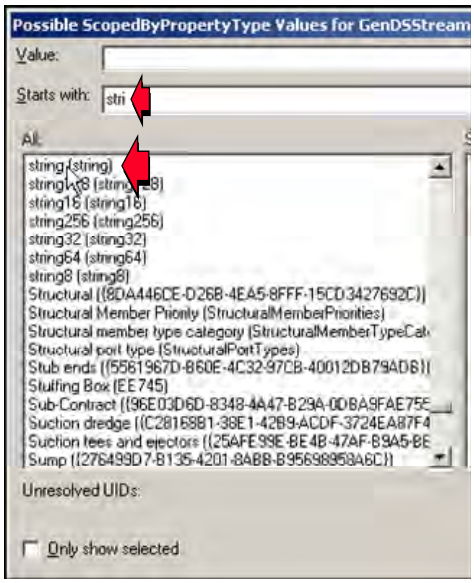
Creating a Custom Property Definition

- **Provide a name, description, and display name for the property, and then click the *Scoped by property type* ellipsis button.**



You can scroll and find the property type or use the search capability to locate the desired type.

Creating a Custom Property Definition

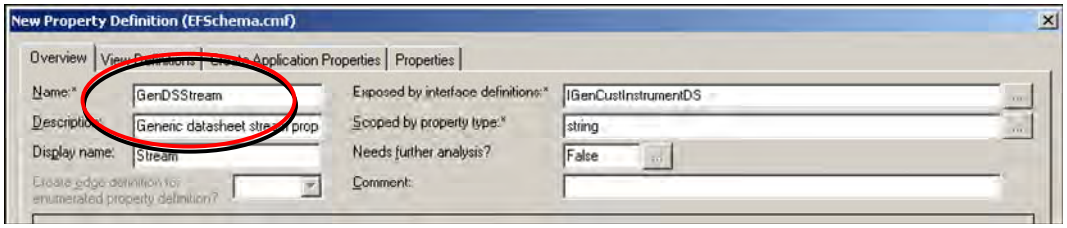


- **Enter the first several characters of the type, then select the type of data for the new property.**

Selecting a single property type will automatically dismiss the form.

Creating a Custom Property Definition

- **Click OK to add the new *GenDSStream* property.**

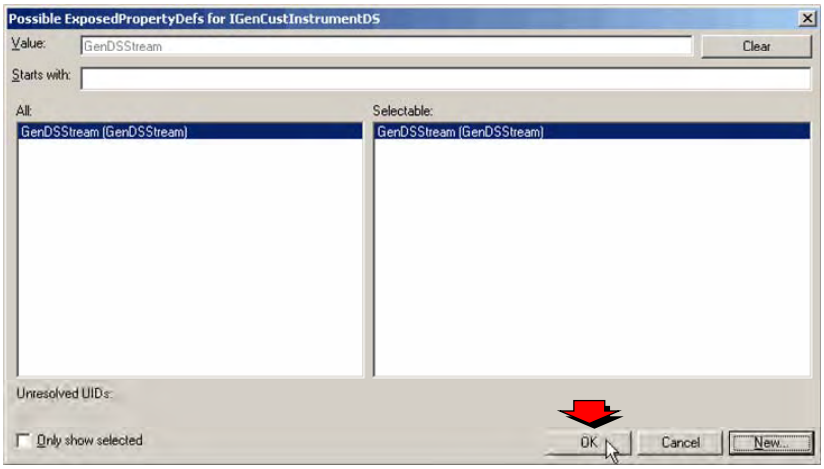


© 2005. Intergraph Corp.
All Rights Reserved.

The new property def will be listed on the *Possible ExposedPropertyDefs* form.

Creating a Custom Property Definition

- **Make sure all the new property is selected, and then click *OK* to associate it with the *IGenCustInstrumentDS* interface.**

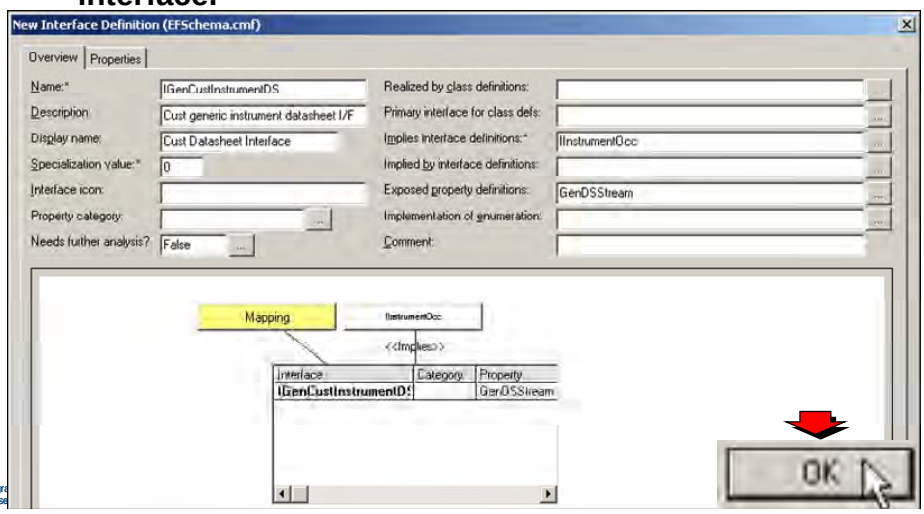


© 2005. Intergraph Corp.
All Rights Reserved.

The new property def will display in the *Exposed property definitions* field.

Creating a Custom Property Definition

- **Click OK to create the new *IGenCustInstrumentDS* interface.**

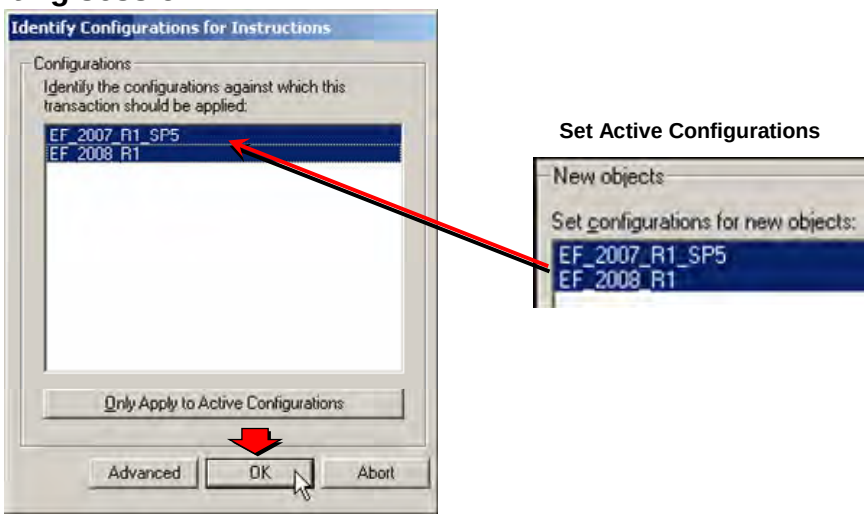


© 2005. Intergra
All Rights Rese

Because of the original "**Set Active Configurations**" enabled when the Schema Editor was launched (see picture below), both configurations will be highlighted in the *Indentify Configurations for Instructions* form.

Creating a Graph Definition

- **Choose the OK button to continue with the schema editing session.**



© 2005. Intergraph Corp.
All Rights Reserved.

10.3.6 Creating a Datasheet Graph Definition

Graph definitions (Graph Def) are a connected network of edge definitions starting at a particular interface definition and are used to build View Definitions. Viewdefs are the mechanism used to map property defs to database fields for use by datasheets.

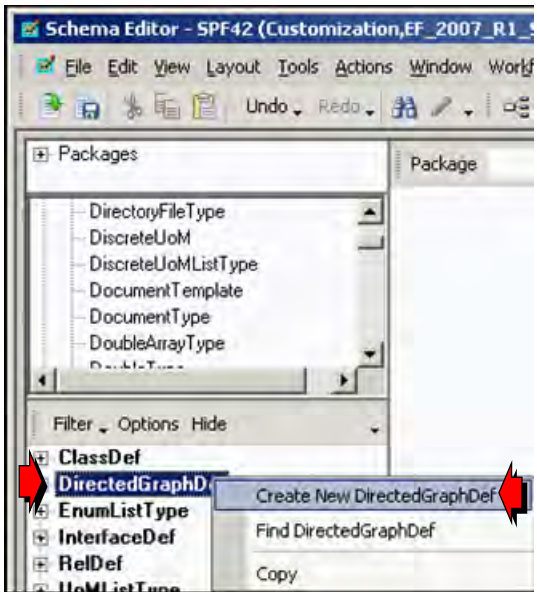
Since a custom interface def and property def has been defined, a new graph def must also be defined in order to expose the new property to the datasheet.

The proper name for a graph def is **DirectedGraphDef**.

INTERGRAPH

Creating a Graph Definition

- **Right click on *DirectedGraphDef* in the tree and select *Create New DirectedGraphDef* from the dynamic menu.**

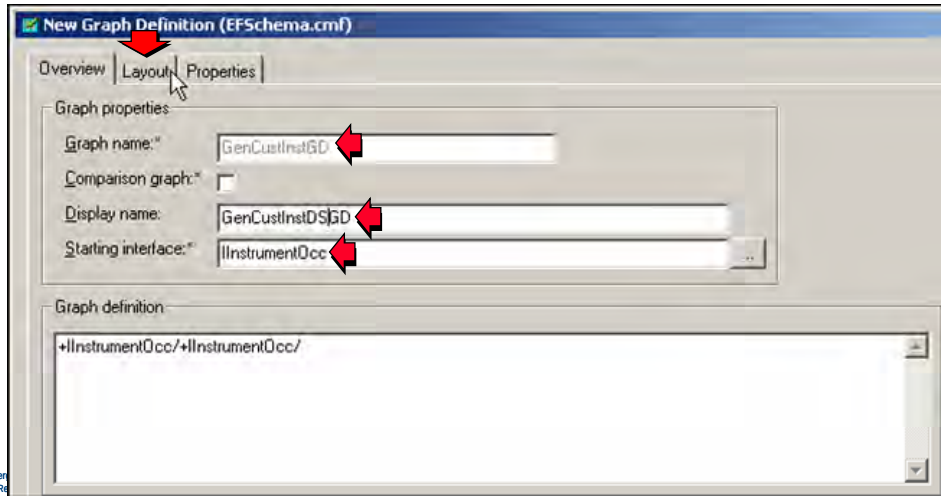


© 2005. Intergraph Corp.
All Rights Reserved.

The *New Graph Definition* form will appear.

Creating a Graph Definition

- **Enter a *Graph Name*, a *Display name*, and choose a *Starting interface*, then click the *Layout* tab.**

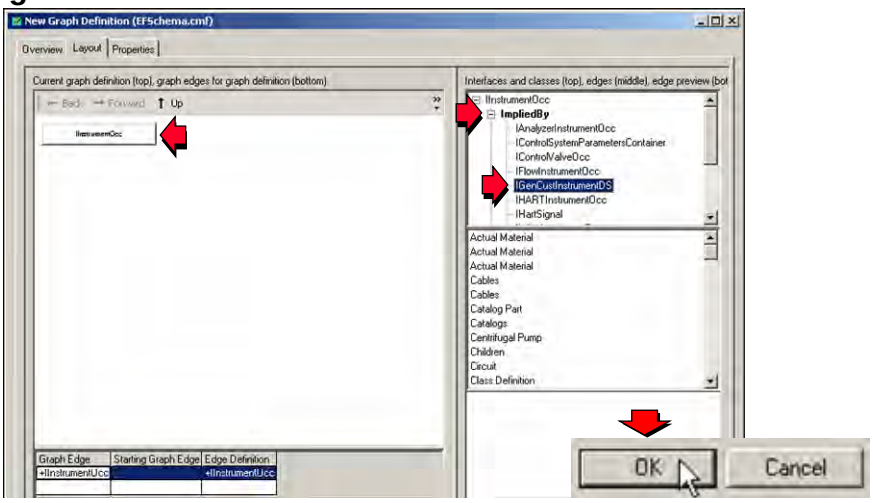


© 2005. Inter
All Rights Re

The new interface definition, **IGenCustInstrumentDS**, is implied by the delivered interface *IInstrumentOcc*.

Creating a Graph Definition

- **Expand the *ImpliedBy* definitions in the middle pane of the right-hand side to view the included interfaces.**



© 2005. Intergraph Corp.
All Rights Reserved.

Click OK to finish the definition of the graph def.

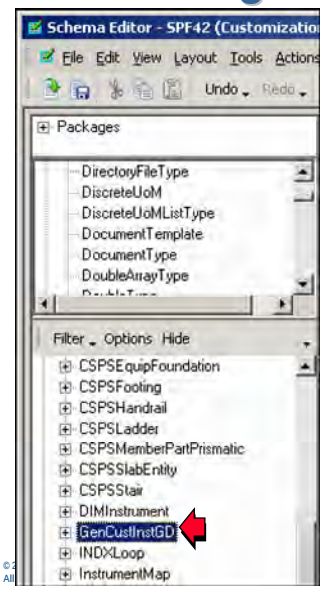
Creating a Graph Definition

- **Choose the OK button to continue with the schema editing session.**

© 2005. Intergraph Corp.
All Rights Reserved.

Verify that the new graph definition was defined successfully.

Creating a Graph Definition

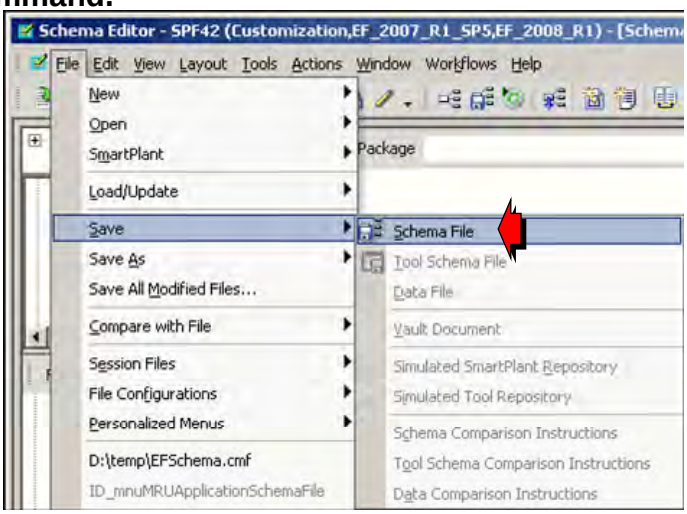


- **Expand the list of DirectedGraphDefs to see the newly created GraphDef.**

Since schema changes are written in memory and not immediately to the schema file, it is recommended that changes be saved periodically.

Saving the Modifications

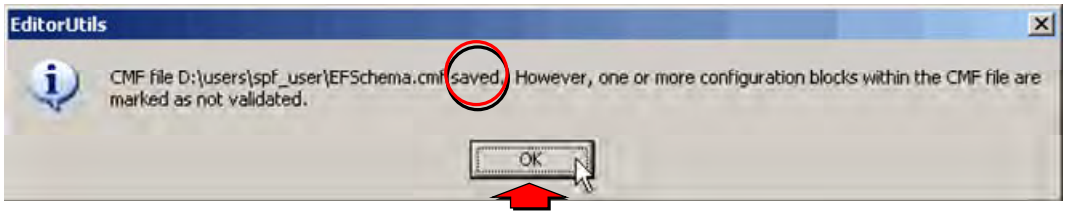
- **From the menu bar, click the *File > Save > Schema File* command.**



© 2005. Intergraph Corp.
All Rights Reserved.

Saving the Modifications

- **Click *OK* to save the changes to the checked out schema file.**

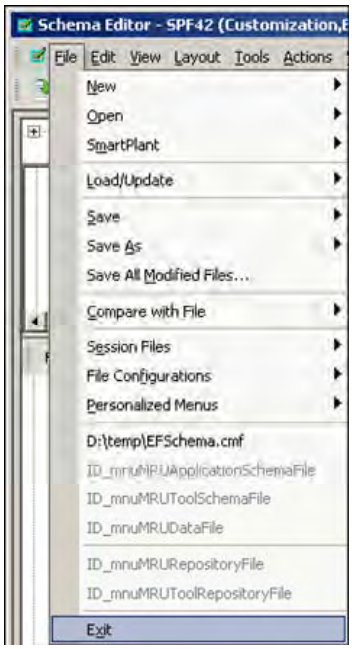


© 2005. Intergraph Corp.
All Rights Reserved.

Exit and close the *Schema Editor* in order to release the memory.

Saving the Modifications

- **From the menu bar, click the *File > Exit* command.**



© 2005. Intergraph Corp.
All Rights Reserved.

Note: By saving the schema changes and exiting, the Schema Editor is forced to re-read the updated schema when defining the datasheet view definitions. This is because the Schema Editor will be launched again in order to define the needed view definitions.

10.3.7 Creating a Datasheet View Definition

View definitions (ViewDef) are a subset of properties extracted from a list of possible properties that are exposed by a graph definition. A view definition is used to provide a different view of data (*view* property names verses *original* property names) from that provided by the underlying schema.

In the Desktop Client, find the checked out CMF file, right-click on it, and choose the ***Launch Schema Editor*** command. This will start the Schema Editor and read the schema into memory (including the changes that have already been made).

Creating a View Definition

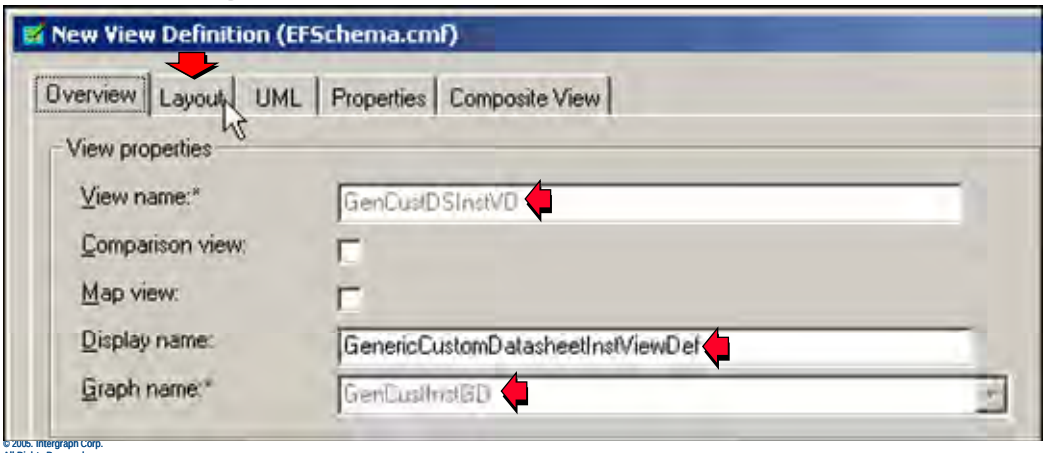
- **Right click on *ViewDef* in the tree and select *Create New ViewDef* from the dynamic menu.**

© 2005. Intergraph Corp.
All Rights Reserved.

The *New View Definition* form will appear.

Creating a View Definition

- **Enter a *View Name*, a *Display name*, and choose the graph def that will be used to define the new view def, then select the *Layout* tab.**



© 2005. Intergraph Corp.
All Rights Reserved.

Next, display the custom interface to be used in defining this view def.

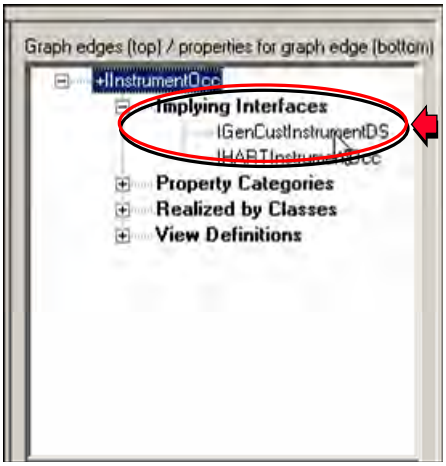
Creating a View Definition

- **Expand the list of interfaces, rel defs, and edge defs to find the properties to be added to this view def.**

© 2005. Intergraph Corp.
All Rights Reserved.

Creating a View Definition

- **Drill down under *IInstrumentOcc > Implying Interfaces*, and find the new custom interface, IGenCustInstrumentDS, which exposes the custom property.**

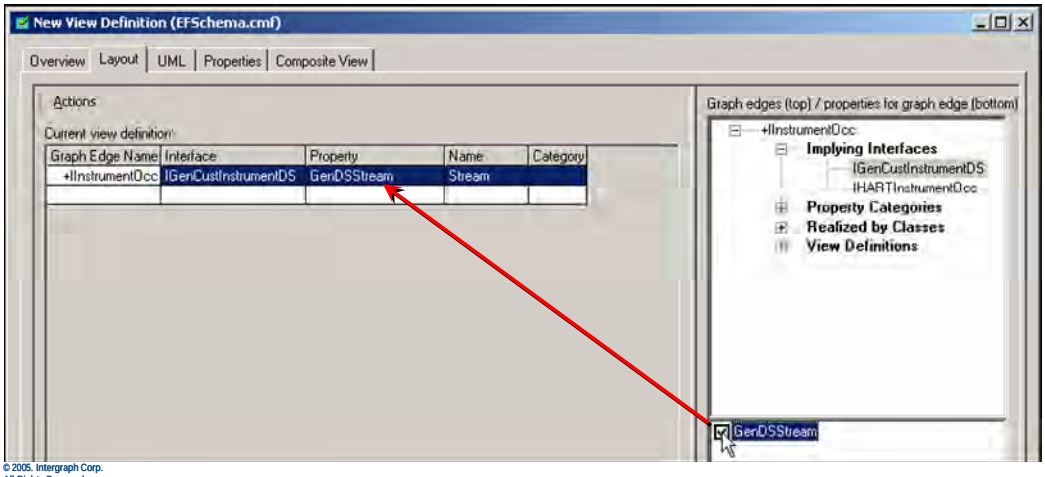


© 2005. Intergraph Corp.
All Rights Reserved.

Selecting the interface from the *Implying Interfaces* list will display the exposed properties in the bottom pane.

Creating a View Definition

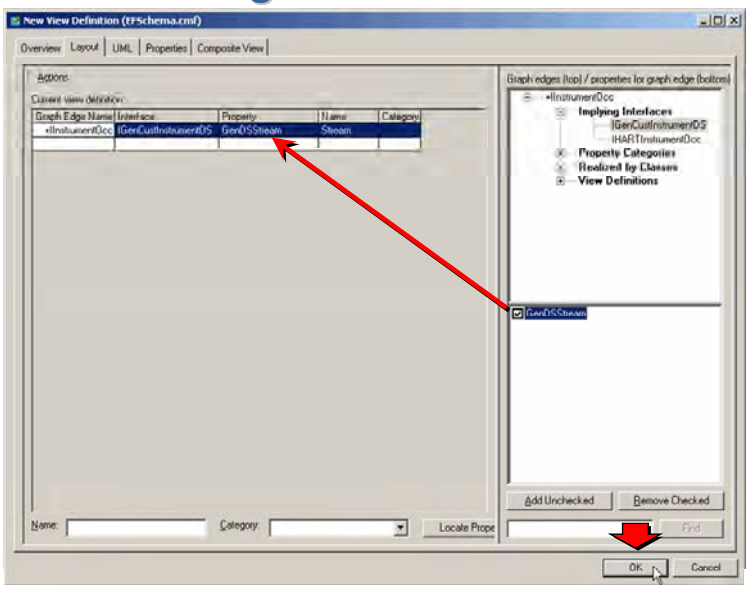
- **Select *GenDSStream* in the bottom-right pane to add the *Stream* property to the view def.**



© 2005. Intergraph Corp.
All Rights Reserved.

If the view property name needs to be changed, do so before completing this view definition. This is unnecessary since the datasheet label will correctly identify this field regardless of the view property name.

Creating a View Definition



- **Click *OK* to create the view def.**

Creating a View Definition

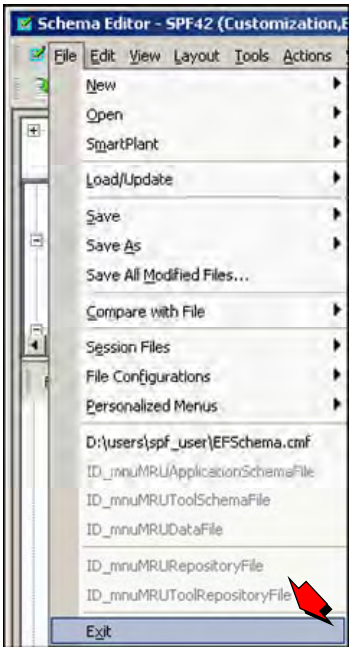
- **Choose the OK button to continue with the schema editing session.**

© 2005. Intergraph Corp.
All Rights Reserved.

Now that the schema modeling to support datasheets is complete, exit from the Schema Editor.

Exiting the Schema Editor

- **From the menu bar, click the *File* > *Exit* command.**

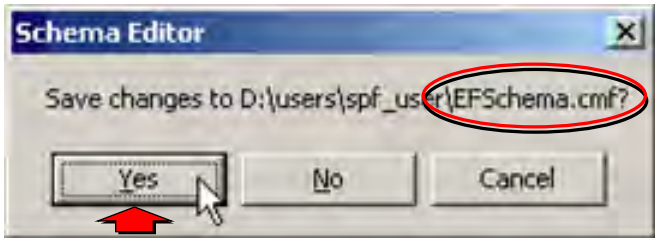


© 2005. Intergraph Corp.
All Rights Reserved.

If the schema was not saved prior to the exit, you will be prompted to do so now.

Exiting the Schema Editor

- **Click *Yes* to save the changes to the checked out schema file.**



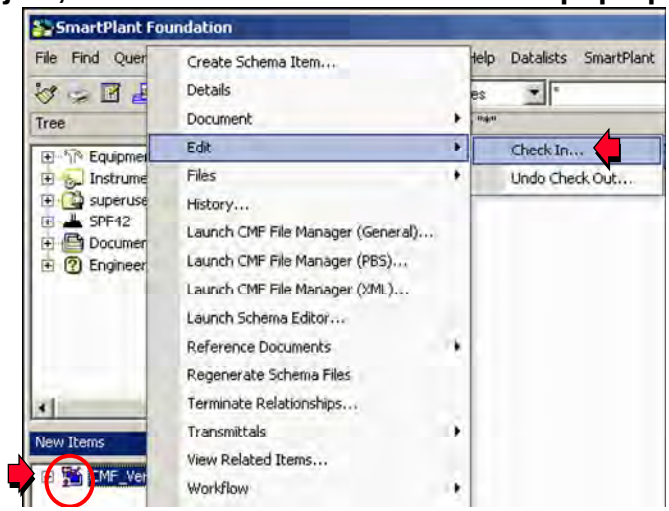
© 2005. Intergraph Corp.
All Rights Reserved.

10.3.8 Check In Modified Schema

The saved schema still resides on the Desktop Client machine and needs to be returned the to SPF server. This is accomplished by performing a ***Check In*** command

Check In Modified Schema

- **Right-click on the checked out version of the CMF_Ver object, and click *Edit > Check In* on the pop-up menu.**

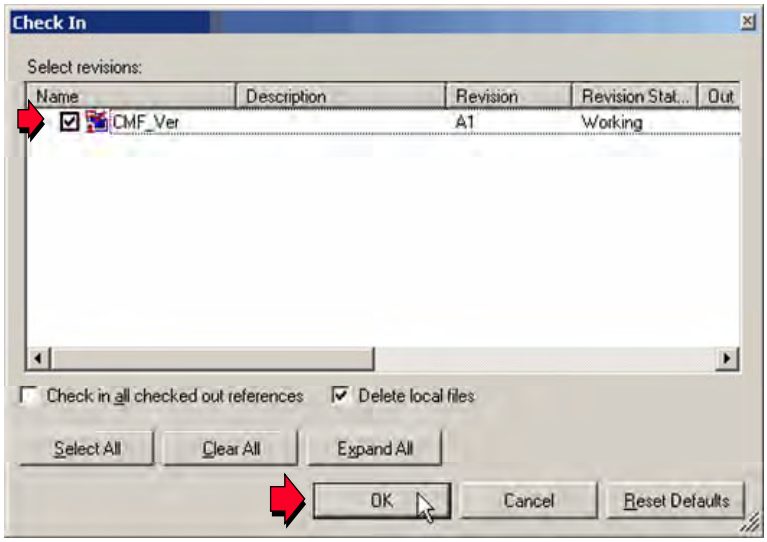


© 2006. Intergraph Corp.
All Rights Reserved.

The *Check In* form will appear.

Check In Modified Schema

- **Select the schema to be checked in, and click *OK*.**



© 2006. Intergraph Corp.
All Rights Reserved.

The SmartPlant schema file will be returned to the SPF database (stored as a BLOB).

10.4 CMF File Manager

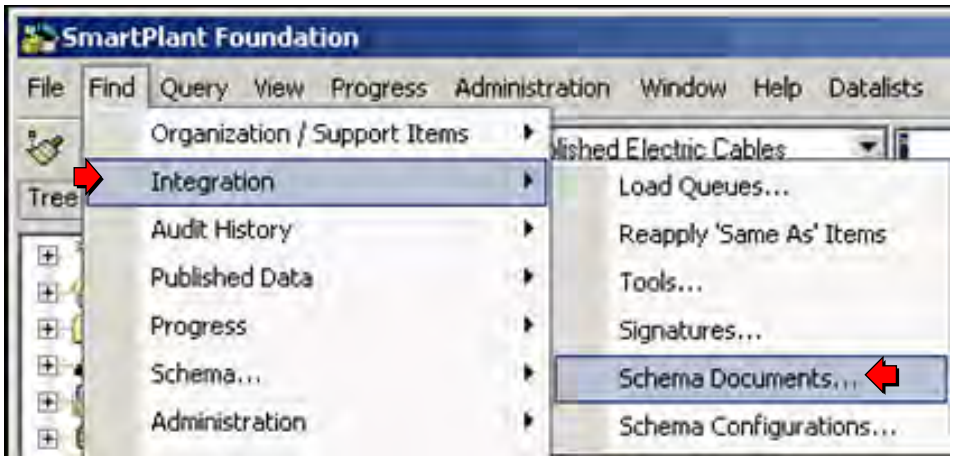
The SmartPlant schema is stored and managed as a CMF (Configuration Managed File). A configuration is named collection of schema objects typically grouped by schema release version. Configuration managed files (CMFs) allow the Schema Editor to manage multiple schema configurations at one time to support forward and backward compatibility of schema versions. CMF files make this possible by storing identical objects across configurations only once and storing the differences in different configuration blocks. User customizations to the schema and metaschema information are also stored in their own configuration blocks.

Perform a search to locate the updated (checked in) schema file.

INTERGRAPH

CMF File Manager

- **Find the modified schema by clicking *Find > Integration > Schema Documents*.**



© 2005. Intergraph Corp.
All Rights Reserved.

The *Find Schema Documents* quick search will appear.

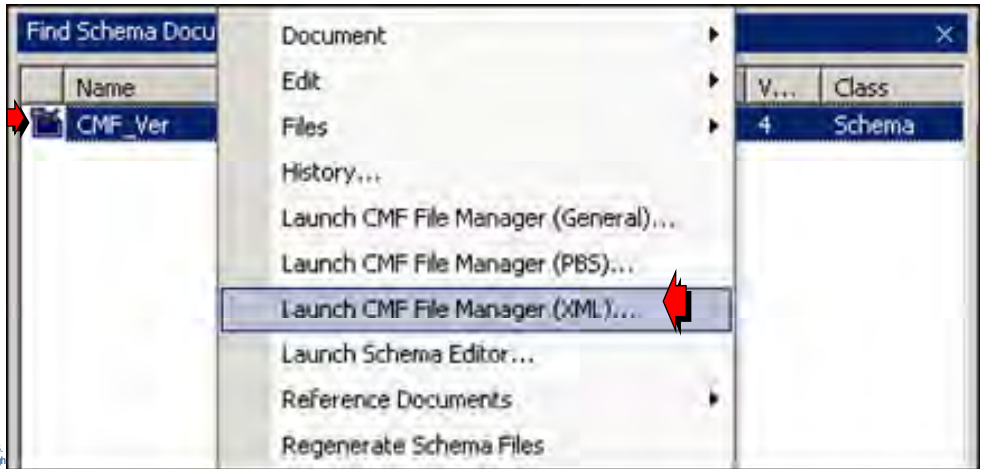
CMF File Manager

- **Enter the search criterion and click OK.**

© 2005. Intergraph Corp.
All Rights Reserved.

CMF File Manager

- **Right-click on the SmartPlant Schema (CMF_Ver) and select *Launch CMF File Manager (XML)* from the pop-up menu.**

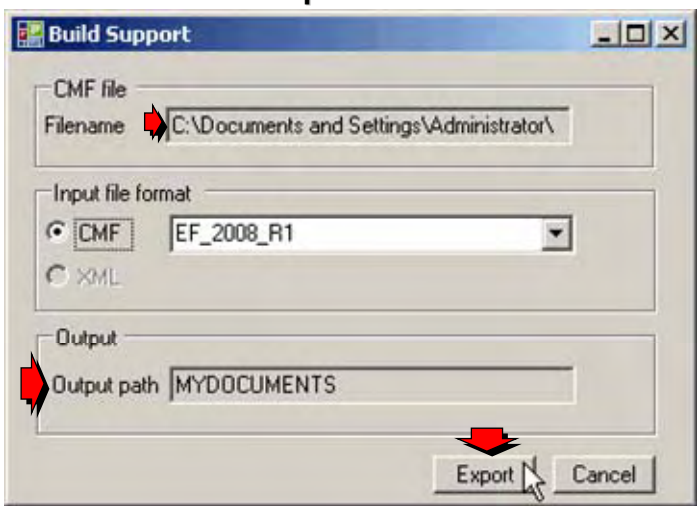


© 2005.
All Righ

The **CMF File Manager** allows you to generate a base map schema from a previously-defined schema. To use the CMF File Manager, the integration schema must already define the definitions that you want to copy.

CMF File Manager

- **Note the folder path and location for the XML file to be generated and click Export.**



© 2005. Intergraph Corp.
All Rights Reserved.

The following explains the fields on the *Build Support* dialog of the CMF File Manager:

CMF file

- Filename - Displays the path and filename of the schema.

Input file format

- Prefix - Assigns a prefix to the new classes generated for the new schema
- CMF - Lists the schemas available to be copied
- XML - Lists the XML files available to be copied.

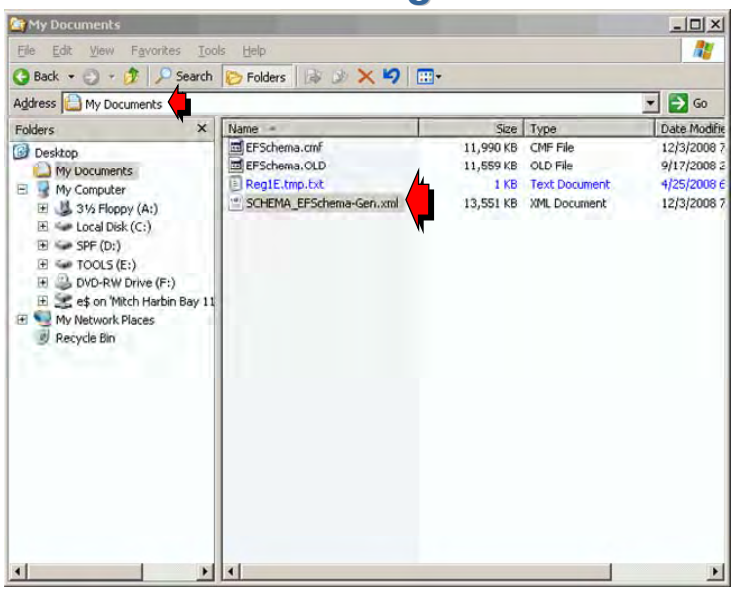
Output

- Output path - Specifies the directory to which you want to copy the new schema.

Export button - Exports the schema component files in XML format

Based on the values in the *Build Support* dialog, the generated XML file will be put in the MYDOCUMENTS folder and named **SCHEMA_EFSchema-Gen.xml**.

CMF File Manager



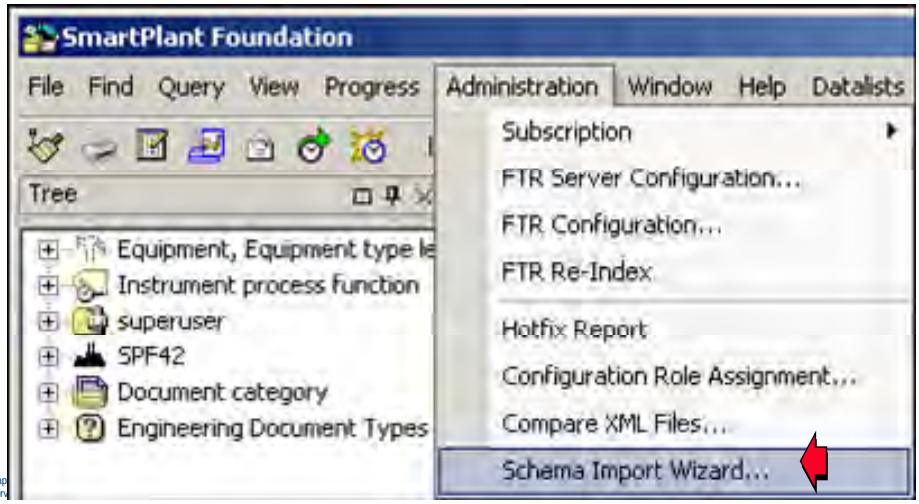
The CMF File Manager will generate an XML file containing the modifications made using the Schema Editor.

10.5 Importing Datasheet Schema Additions

The schema changes that have been made have been exported to an XML file using the CMF File Manager. The **Schema Import Wizard** will be used to load the schema changes into the SPF database.

Importing Schema Additions

- **In the SmartPlant Foundation Desktop Client, choose *Administration > Schema Import Wizard*.**

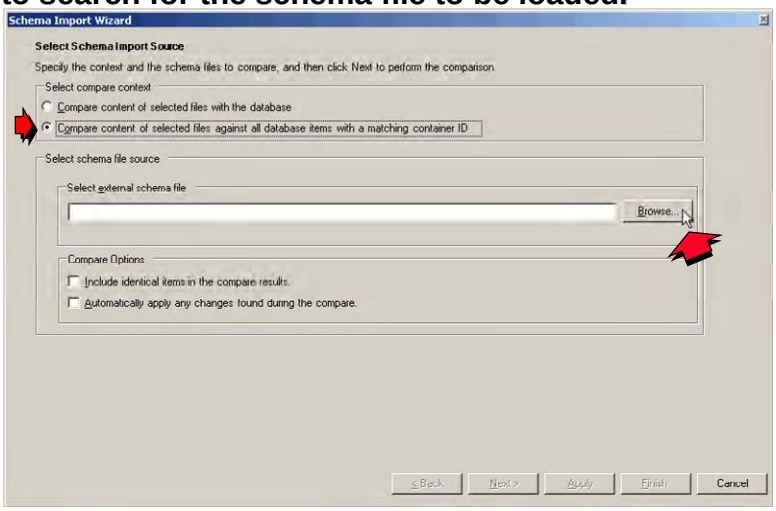


© 2005. Intergrap
All Rights Reserv

The import *Wizard* form will appear.

Importing Schema Additions

- **In the *Schema Import Wizard*, click the *Browse* button to search for the schema file to be loaded.**

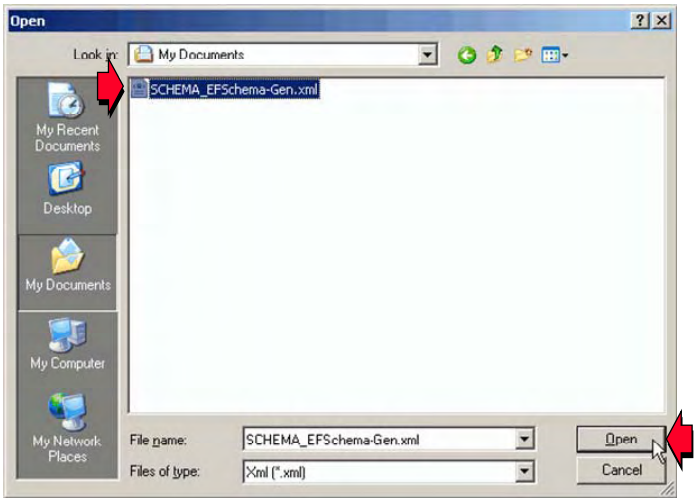


© 2005. Intergraph Corp.
All Rights Reserved.

When the browser dialog appears, select the exported schema file to be imported.

Importing Schema Additions

- **Select the *SCHEMA_EFSchema-Gen.xml* file and click Open.**

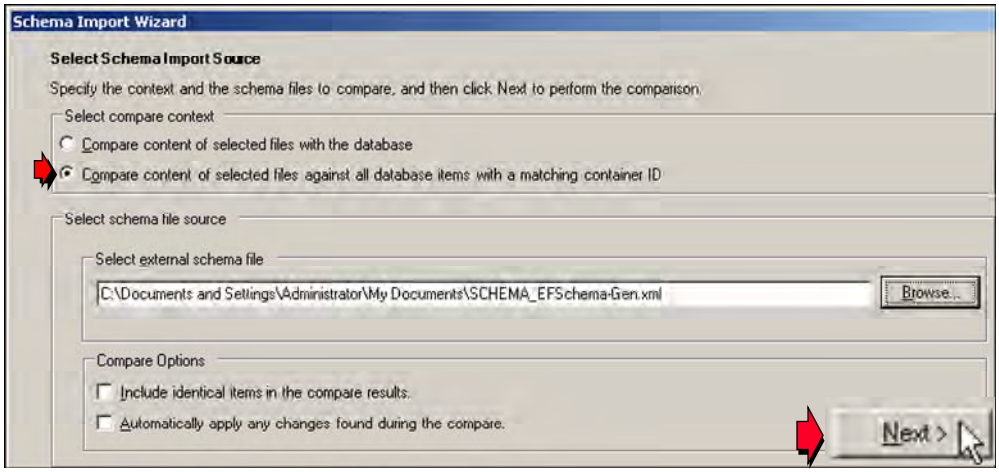


© 2005. Intergraph Corp.
All Rights Reserved.

Since this exported schema file contains all of the delivered definitions plus new definitions, choose the *Compare content of selected files against all database items with a matching container ID* option.

Importing Schema Additions

- **Click Next to compare schema file content against the database items with a matching container.**

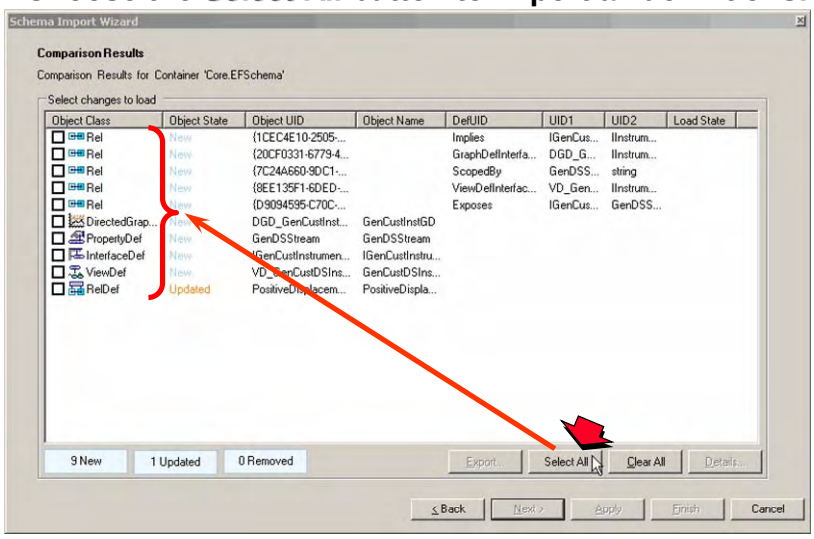


© 2005. Intergraph Corp.
All Rights Reserved.

This option will generate a set of differences instructions based on what is already instantiated in the SPF database and what is defined in the exported schema file.

Importing Schema Additions

- **Choose the Select All button to import all definitions.**

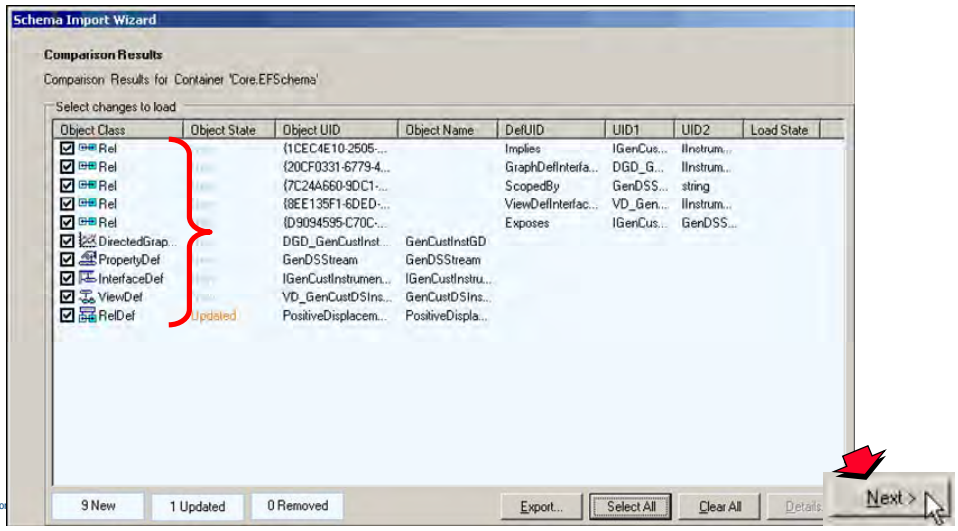


© 2005. Intergraph Corp.
All Rights Reserved.

The toggle next to each change will be enabled and that modification performed when the ***Next*** button is selected.

Importing Schema Additions

- **Click the Next button to start the import.**

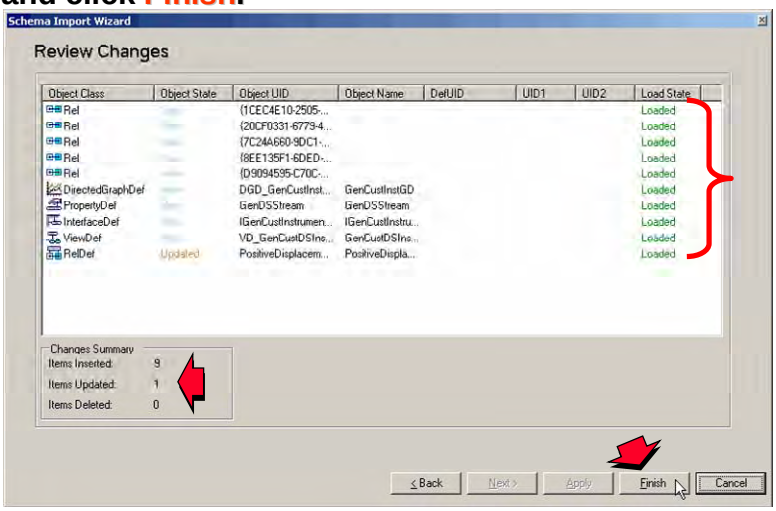


© 2005. Intergraph Corp.
All Rights Reserved.

A *Review Changes* screen will appear when the import has completed.

Importing Schema Additions

- **Verify that the new objects are loaded to the database and click Finish.**



© 2005. Intergraph Corp.
All Rights Reserved.

10.5.1 Loading Additional Relationships

In order to instantiate objects with the new custom property using the datasheet, the class def must realize the new interface def. Schema modeling rules state that "If an interface def implies another interface def, then any class def that realizes the first interface def must also realize the implied interface def".

What this means is that the **IGenCustInstrumentDS** interface implies **IInstrumentOcc**. *IInstrumentOcc* is realized by the **PRCProcessInstrument** class def. Therefore, the *PRCProcessInstrument* class def must also realize *IGenCustInstrumentDS***.**

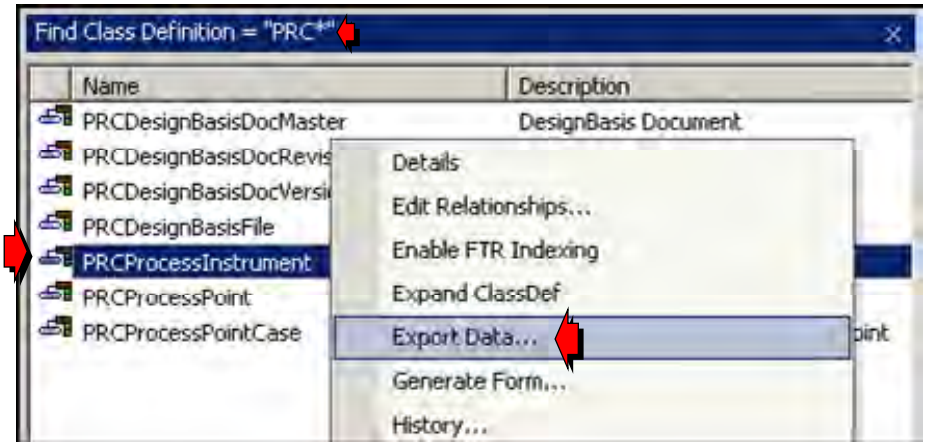
With the delivered SmartPlant Schema, there is a small problem. IInstrumentOcc is included in the delivered schema but PRCProcessInstrument is not. It gets loaded into the SPF database via a load file as part of the installation process. So, in order to relate these two objects, a load file must be created containing a *realizes* relationship.

Start by locating the **PRCProcessInstrument** class def by using the ***Find*** > ***Schema*** > ***Class Definition*** command.

INTERGRAPH

Loading a Realizes Relationship

- **Right-click on the PRCProcessInstrument class and select *Export Data* from the dynamic menu.**

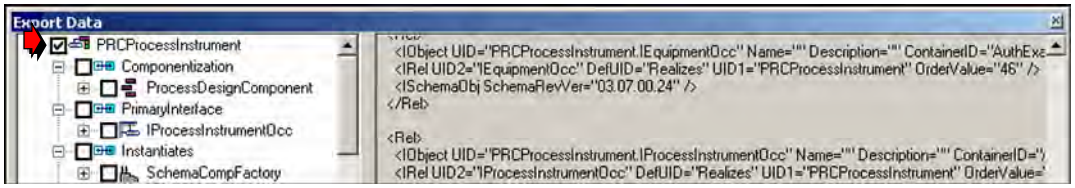


© 2005. Intergraph Corp.
All Rights Reserved.

The *Export Data* form will appear.

Loading a Realizes Relationship

- **Enable the toggle box for the *PRCProcessInstrument* class and click the Export button.**



© 2005. Intergraph Corp.
All Rights Reserved.

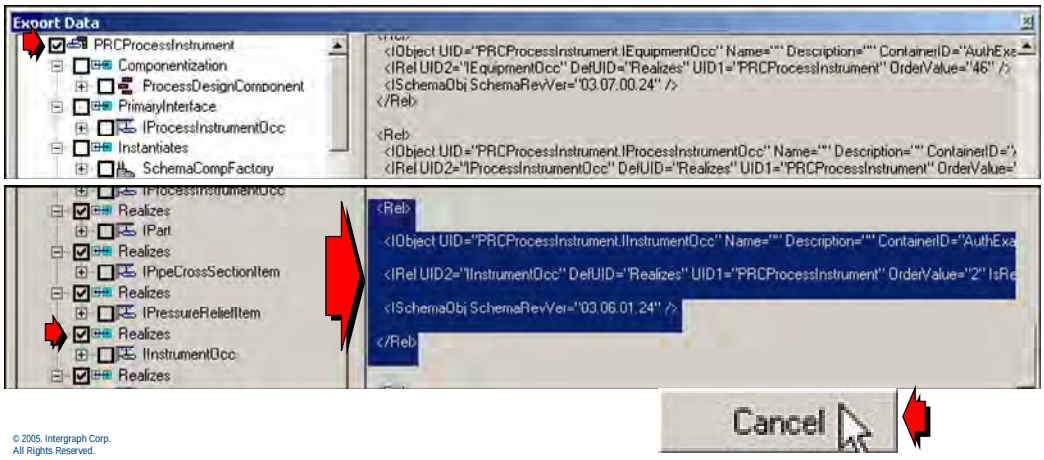
This will create a file called **SCHEMA_IPD_Schema.xml** containing the schema statements to create a new class called *PRCProcessInstrument*.

Don't close the *Export Data* form because additional statements will be needed to build a new load file.

Expand the list of objects related to the *PRCProcessInstrument* class and scroll down in the left side of the form to locate the **IInstrumentOcc** interface.

Loading a Realizes Relationship

- **Enable the toggle for the *IInstrumentOcc* realizes relationship, then highlight and copy the relationship statements.**

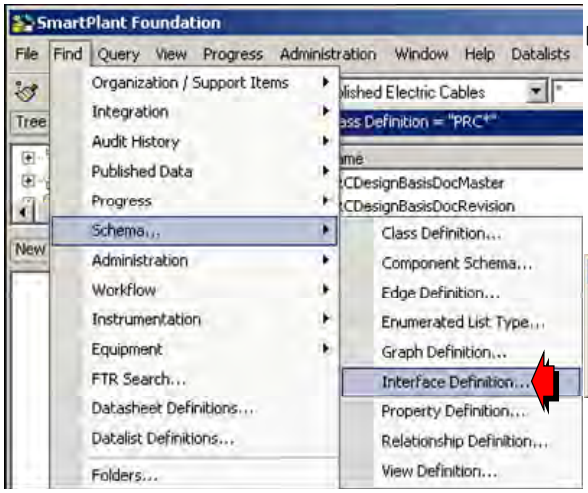


© 2005. Intergraph Corp.
All Rights Reserved.

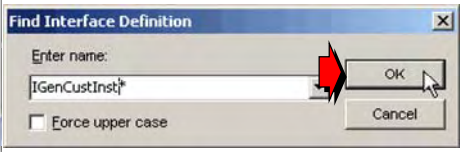
The copied statements will be used to build a new load file. The next two steps are optional but can be used as a shortcut to assist in building the load file.

Loading a Realizes Relationship

- **From the menu, select *Find > Schema > Interface Definition.***



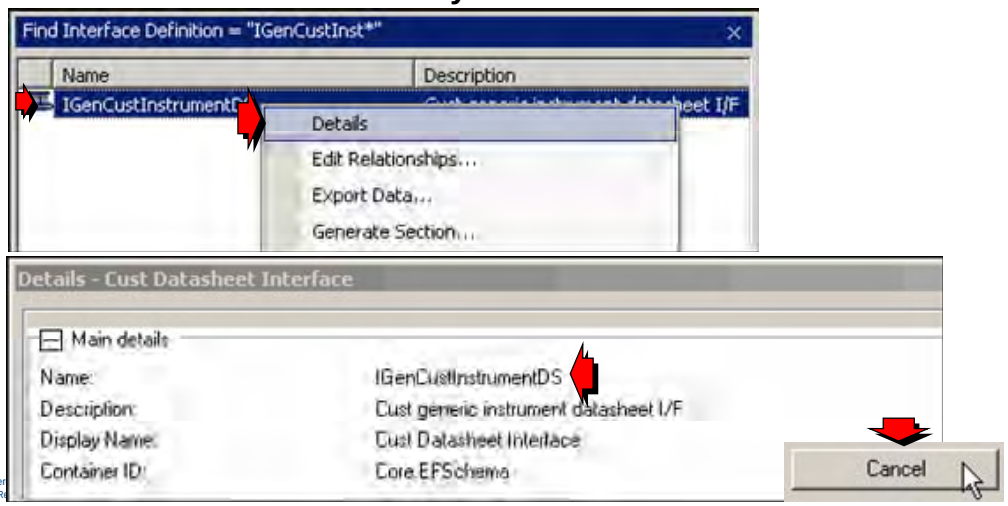
- **Enter *IGenCustInst** to find and display the generic custom instrument interface that was imported and click OK.**



© 2005. Intergraph Corp.
All Rights Reserved.

Loading a Realizes Relationship

- **Right-click on the IGenCustInstrumentDS interface and select *Details* from the dynamic menu.**

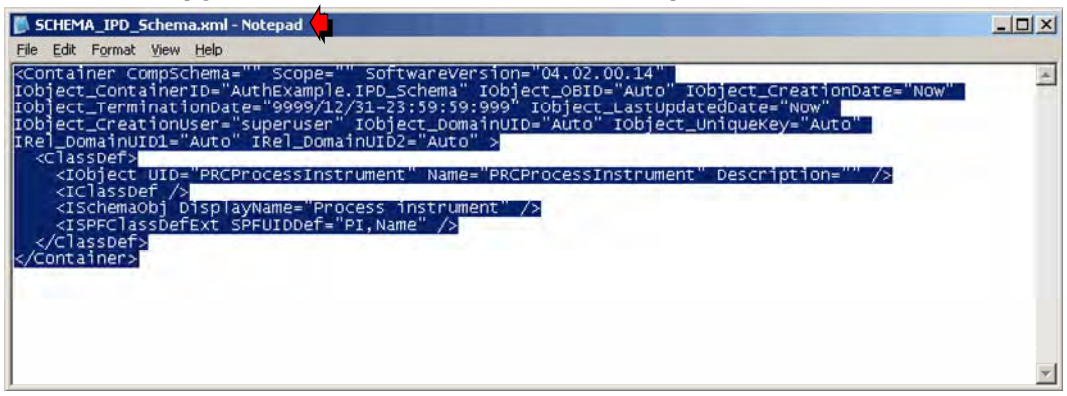


© 2005. Inter
All Rights Re

Highlight and copy the custom interface name from the *Details* form into a text file.

Loading a Realizes Relationship

- **Open the file generated by the Export then highlight and copy all of the statements to the clipboard.**

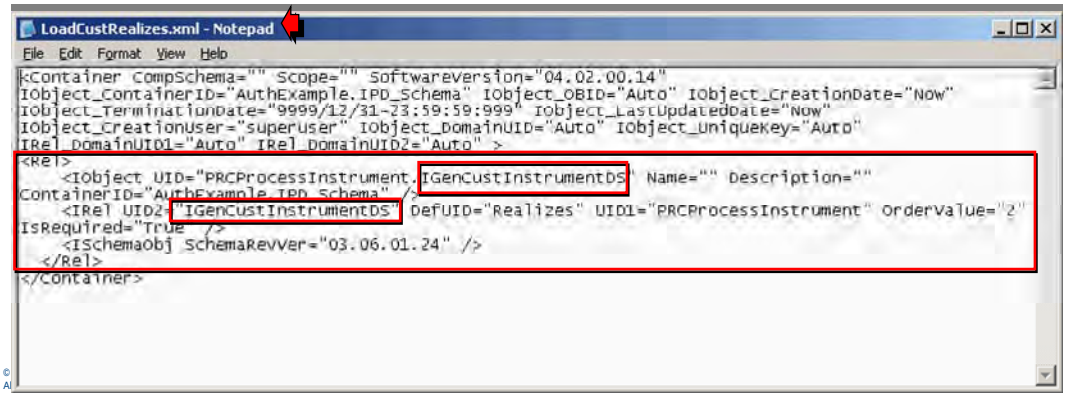


© 2005. Intergraph Corp.
All Rights Reserved.

The statements needed from this file are the **<Container…"Auto">** and **</Container>** statements.

Loading a Realizes Relationship

- **Paste the copied statements from both the export file and the *Export Data* dialog in order to create a new load file for loading a realizes relationship between the PRCProcessInstrument class and the custom IGenCustInstrumentDS interface.**



Remove the statements beginning with **<ClassDef>** through **</ClassDef>** and replace them with the statements copied from the *Export Data* dialog. Finally, replace *IInstrumentOcc* with the copied custom interface name, **IGenCustInstrumentDS**. Save the file giving it an XML extension.

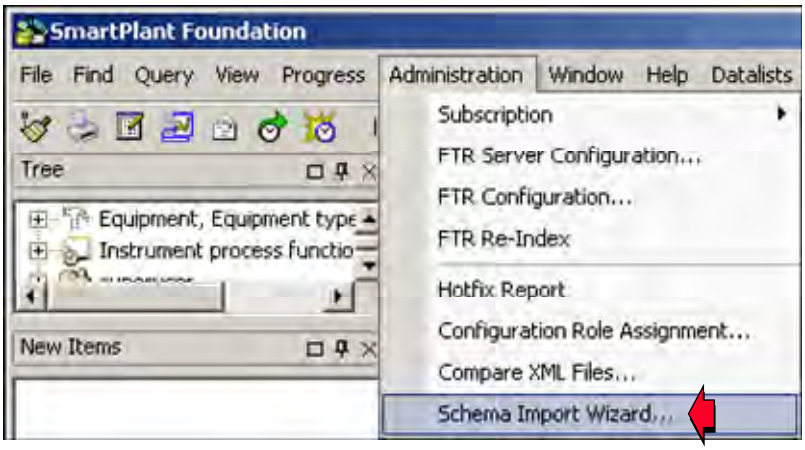
Once the modifications are completed, the edited load file will look like this:

```
<Container CompSchema="" Scope="" SoftwareVersion="04.02.00.14"
IObject_ContainerID="AuthExample.IPD_Schema" IObject_OBID="Auto"
IObject_CreationDate="Now" IObject_TerminationDate="9999/12/31-
23:59:59:999" IObject_LastUpdatedDate="Now"
IObject_CreationUser="superuser" IObject_DomainUID="Auto"
IObject_UniqueKey="Auto" IRel_DomainUID1="Auto"
IRel_DomainUID2="Auto" >

<Rel>

  <IObject UID="PRCProcessInstrument.IGenCustInstrumentDS" Name=""
  Description="" ContainerID="AuthExample.IPD_Schema" />

  <IRel UID2="IGenCustInstrumentDS" DefUID="Realizes"
  UID1="PRCProcessInstrument" OrderValue="2" IsRequired="True" />

  <ISchemaObj SchemaRevVer="03.06.01.24" />

 </Rel>

</Container>
```

Launch the *Schema Import Wizard* once more in order to load the realizes relationship.

Loading a Realizes Relationship

- **In the SmartPlant Foundation Desktop Client, choose *Administration > Schema Import Wizard*.**

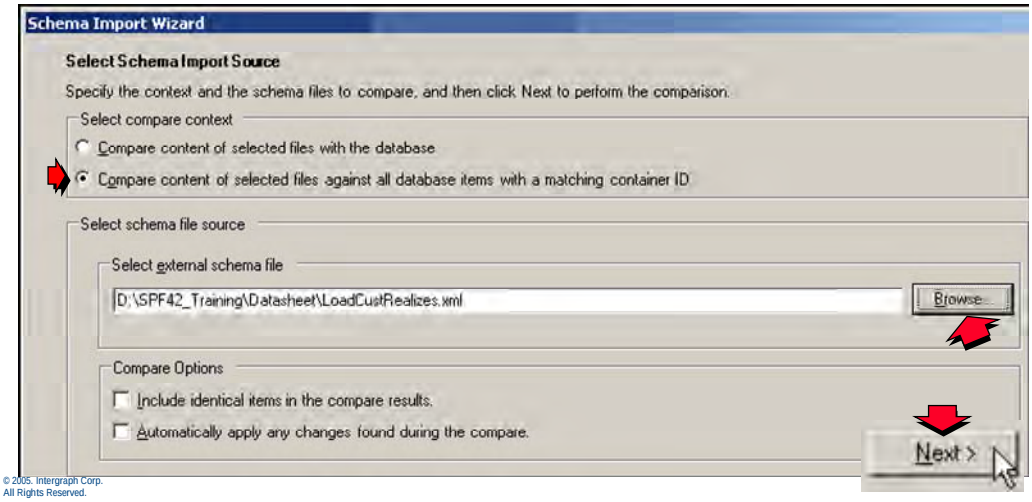


© 2005. Intergraph Corp.
All Rights Reserved.

Use the ***Browse*** button to select the load file containing the realizes relationship.

Loading a Realizes Relationship

- **In the *Schema Import Wizard*, click the *Browse* button to search for the schema file to be loaded.**

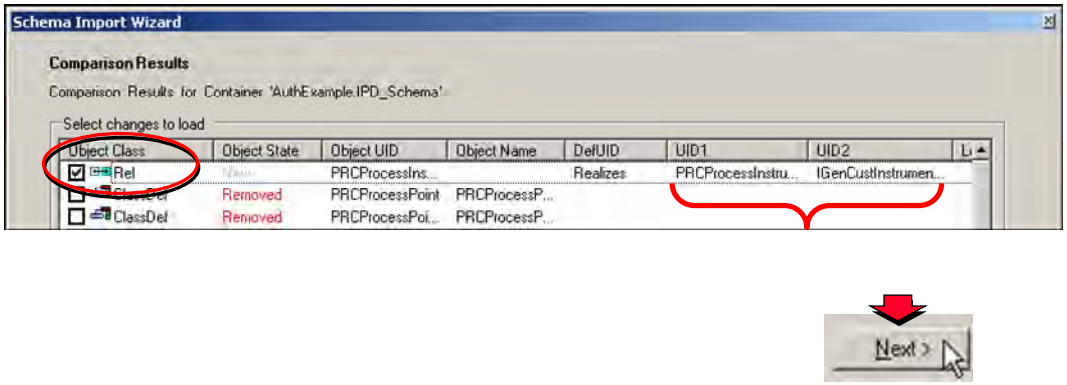


© 2005. Intergraph Corp.
All Rights Reserved.

The *Comparison Results* form will appear. To selectively load instructions, enable the corresponding checkboxes next to the object to be loaded.

Loading a Realizes Relationship

- **Enable the toggle to import the realizes relationship definition, then click Next.**

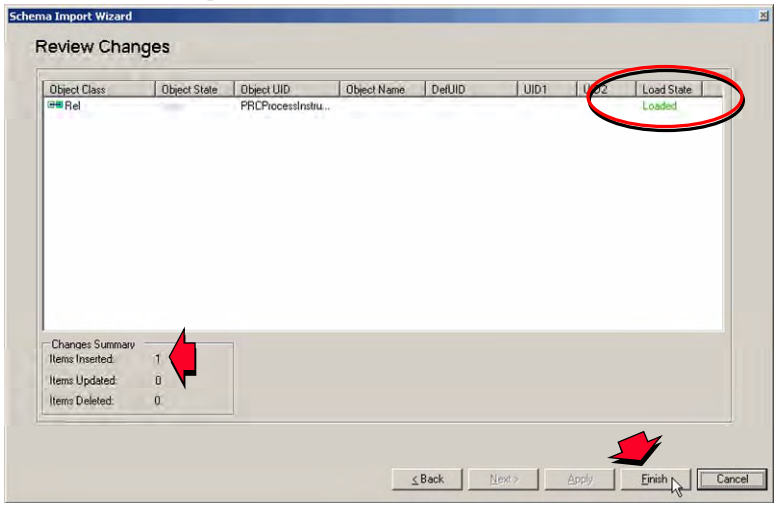


© 2005. Intergraph Corp.
All Rights Reserved.

Upon completion, the wizard displays the status in the *Review Changes* form.

Loading a Realizes Relationship

- **Verify that the new objects are loaded to the database and click Finish.**

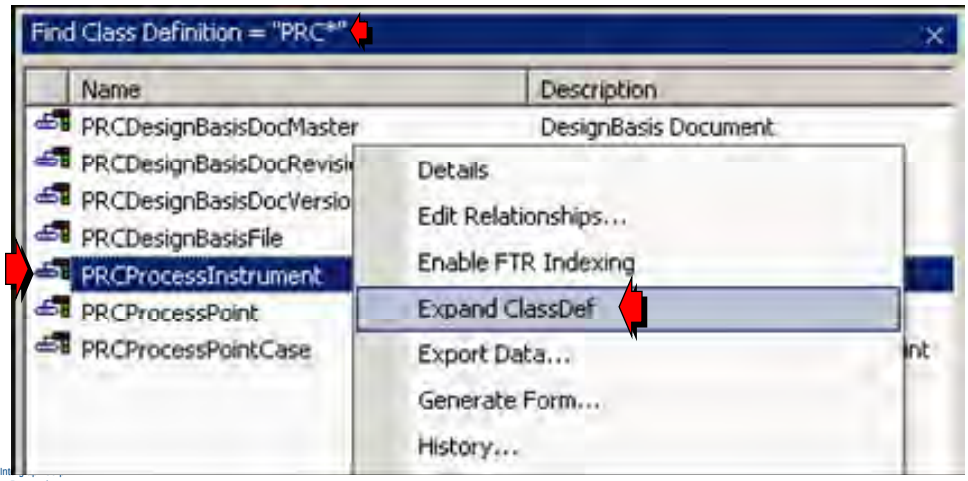


© 2005. Intergraph Corp.
All Rights Reserved.

Verify that the new class -> interface relationship was loaded successfully.

Loading a Realizes Relationship

- **Right-click on the PRCProcessInstrument class and select *Expand ClassDef* from the dynamic menu.**

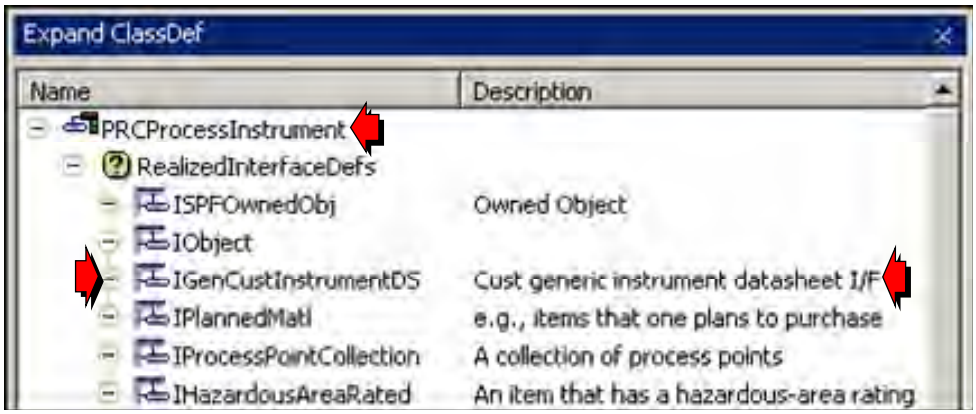


© 2005. Int
All Rights Reserved.

An *Expand ClassDef* results browser will appear.

Loading a Realizes Relationship

- **Verify that the *PRCProcessInstrument* class now realizes the *IGenCustInstrumentDS* interface.**



© 2005. Intergraph Corp.
All Rights Reserved.

10.6 Activity 1 – Schema Modeling to Support Datasheets

Complete **Chapter 10** - **Activity 1** in the SPF Configuration and Administration II activity workbook.

10.7 Creating New Datasheet Templates

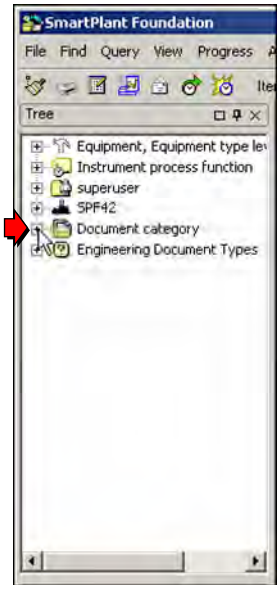
The datasheet uses an Excel file as the template for manipulating data. Since SPF is a document management system, a document object must be created in order to manage the Excel spreadsheet.

Template document objects are then created to represent datasheet templates that are used by the SmartPlant Foundation software. The datasheet Excel file attached to the template document is not stored in a vault, but in the SPF database as a BLOB.

The first step is to create the new datasheet template document.

Creating New Datasheet Templates

- **In the *Tree window*, expand *Document category* to display the available document categories.**



© 2005. Intergraph Corp.
All Rights Reserved.

The *Document category* list will expand to show the different document categories.

Creating New Datasheet Templates

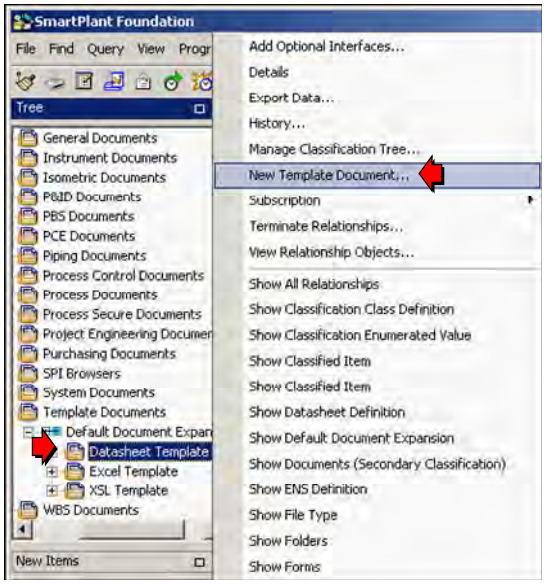
- **In *Document category* list, locate and expand the entry for Template Documents.**

© 2005. Intergraph Corp.
All Rights Reserved.

Once you have located the applicable classification, right-click on it and select the appropriate command from the dynamic menu.

Creating New Datasheet Templates

- **After selecting the entry for Datasheet Template, right click and select the *New Template Document* command from the pop-up menu.**

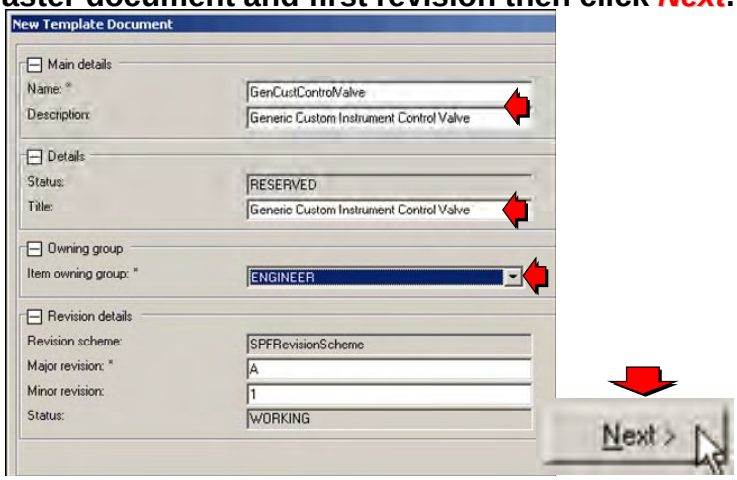


© 2005. Intergraph Corp.
All Rights Reserved.

On the first screen of the ***New Template Document*** wizard, provide metadata about the datasheet template you are adding.

Creating New Datasheet Templates

- **Creation of new template documents uses a wizard that includes 2 screens. On the first, provide information about the master document and first revision then click *Next*.**

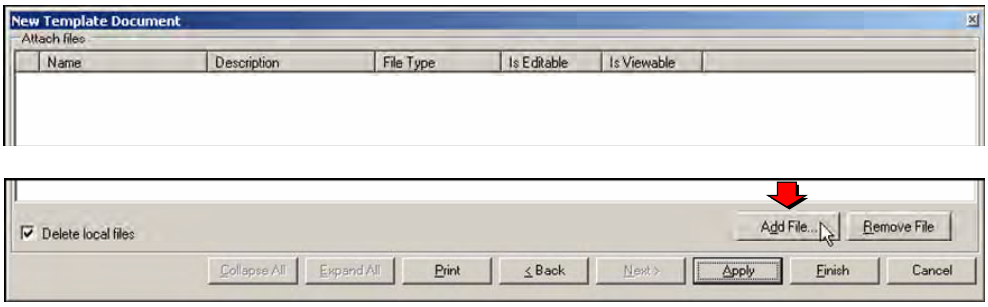


© 2005. Intergraph Corp.
All Rights Reserved.

Click the ***Add File*** button to open a standard Microsoft ***Open*** window where you can find the excel file to add as the datasheet template.

Creating New Datasheet Templates

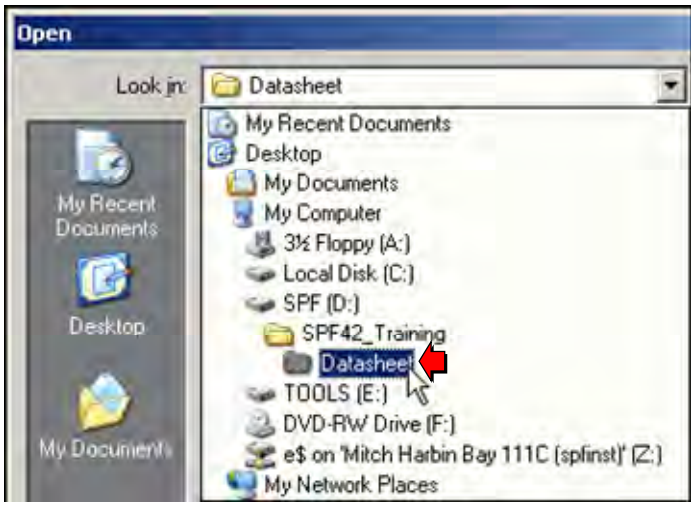
- **From the second screen of the *New Template Document* wizard, you can attach files to the first revision of the template document. Click *Add File*.**



© 2005. Intergraph Corp.
All Rights Reserved.

Creating New Datasheet Templates

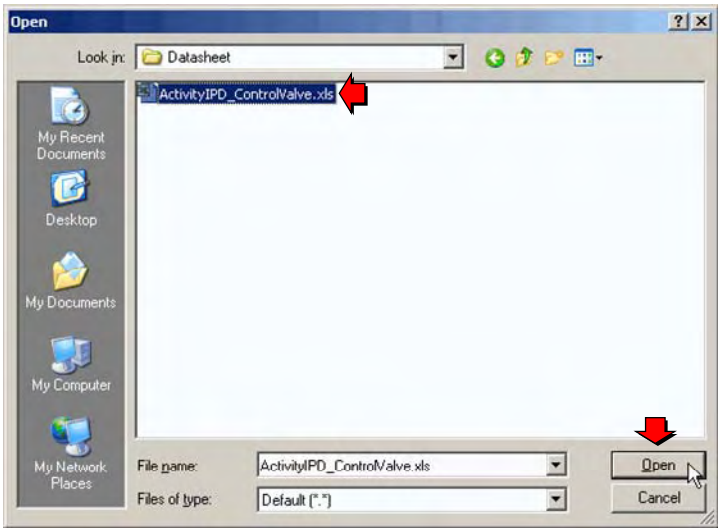
- **The spreadsheet file is located in the *D:\SPF42_Training\Datasheet* folder.**



© 2005. Intergraph Corp.
All Rights Reserved.

Creating New Datasheet Templates

- **Select *ActivityIPD_ControlValve.xls* and click *Open*.**

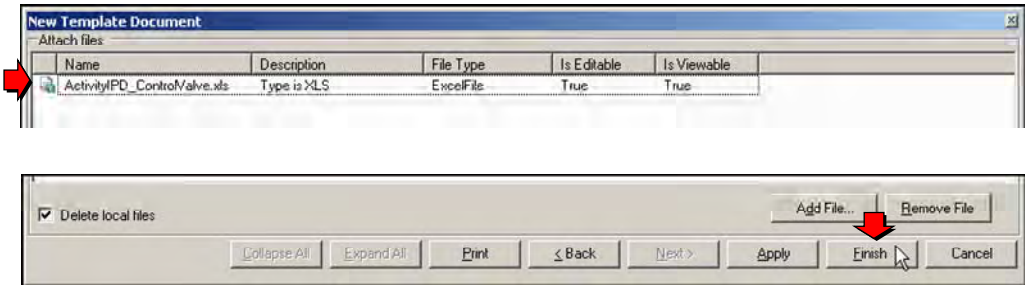


© 2005. Intergraph Corp.
All Rights Reserved.

Confirm the selected file, and then click the ***Finish*** button.

Creating New Datasheet Templates

- **Once you have selected the file or files to attach, click the *Finish* button to create the relationship between the files and the document revision. The file is stored in the database rather than in the vault.**



© 2005. Intergraph Corp.
All Rights Reserved.

10.8 Creating a Datasheet Definition

To use datasheets in SPF, you must first define a Datasheet Definition object. The datasheet definition identifies the view definitions associated with the datasheet. Remember, view definitions determine which properties out of the possible properties that a graph definition exposes will be displayed in the datasheet.

For example, for instrument process datasheets, the *IPD_ControlValve* view definitions are associated with the **IInstrumentOcc** interface. Currently, all the instrument process datasheet definitions are associated with the **IInstrumentOcc** interface definition via view definitions.

INTERGRAPH

Creating a Datasheet Definition

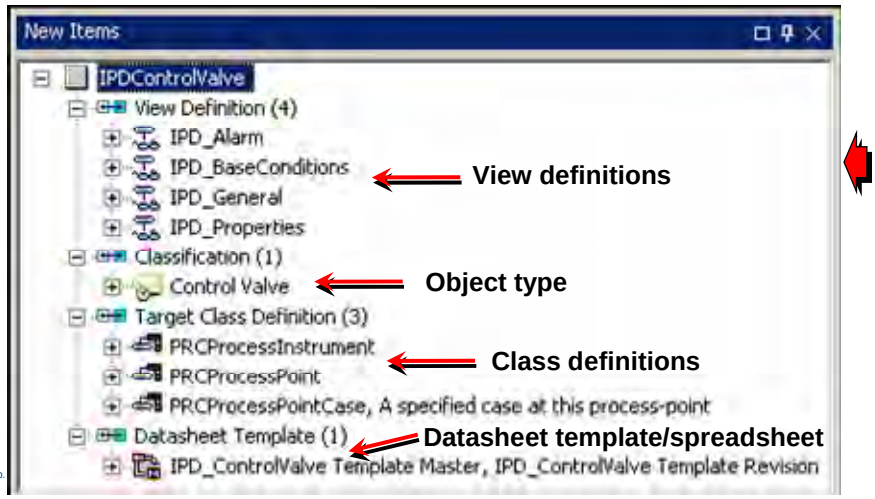
- **You can create Datasheet Definitions to access datasheet templates in SmartPlant Foundation.**
- **The templates must exist in the SPF database and the datasheet definition must identify which objects to use for the datasheet.**
- **Relate the datasheet definition with the *view definitions*, *classification*, *target class definitions*, and *datasheet template* for which you want to use the datasheet spreadsheet.**
- **View Definitions in SmartPlant Foundation are used to identify what objects, relationships, and properties are to be included in the datasheet**

© 2005. Intergraph Corp.
All Rights Reserved.

To review the needed relationships between a datasheet definition and the other required objects, perform a search to locate the delivered *IPDControlValve* datasheet definition.

Creating a Datasheet Definition

- **Use the delivered IPDControlValve *datasheet definition* object to view the related objects as an example.**



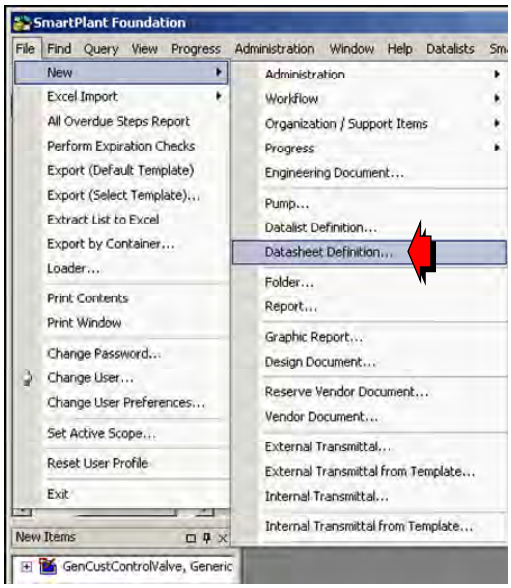
© 2005. Intergraph Corp. All Rights Reserved.

The datasheet template document, which attaches the Excel spreadsheet, is related to the datasheet definition object. This object in turn is related to view definitions which will define the database fields that can be manipulated. The datasheet definition object also specifies which classes (class defs) can be manipulated by the datasheet. And finally, the classes are defined as a specific type (classification), which in this example is a **Control Valve**.

Since you created a new custom datasheet template document, you will also need a new datasheet definition object.

Creating a Datasheet Definition

- **Select *File > New > Datasheet Definition* from the menu.**

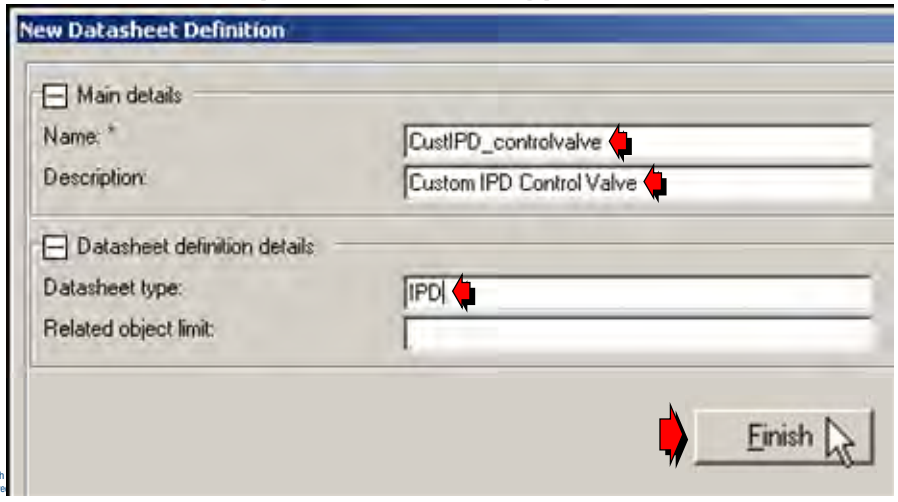


© 2005. Intergraph Corp.
All Rights Reserved.

The *New Datasheet Definition* form will appear.

Creating a Datasheet Definition

- **Enter the information to define a new Datasheet Definition - *Name*, *Description*, Datasheet type and click Finish.**



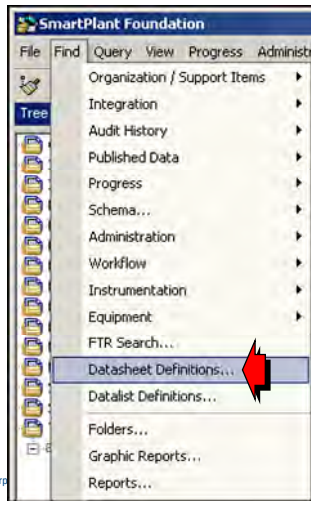
© 2005. Intergraph
All Rights Reserve

The new datasheet definition will relate to some of the same objects as the delivered *IPDControlValve* datasheet definition. Therefore, it will be quicker to perform a search for this object and use it to create relationships to the new datasheet definition.

INTERGRAPH

Creating Datasheet Definition Relationships

- **Select *Find > Datasheet Definition* from the menu and enter the search criterion.**

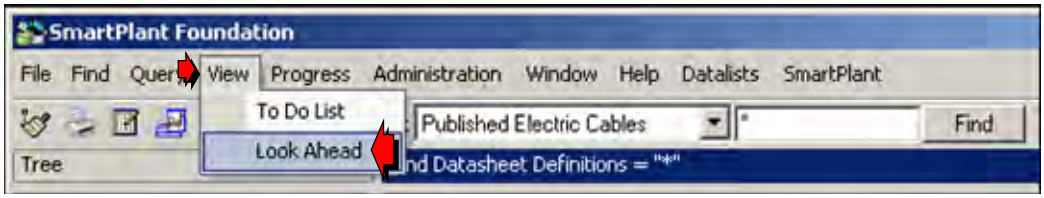


© 2005. Intergraph Corp.
All Rights Reserved.

INTERGRAPH

Creating Datasheet Definition Relationships

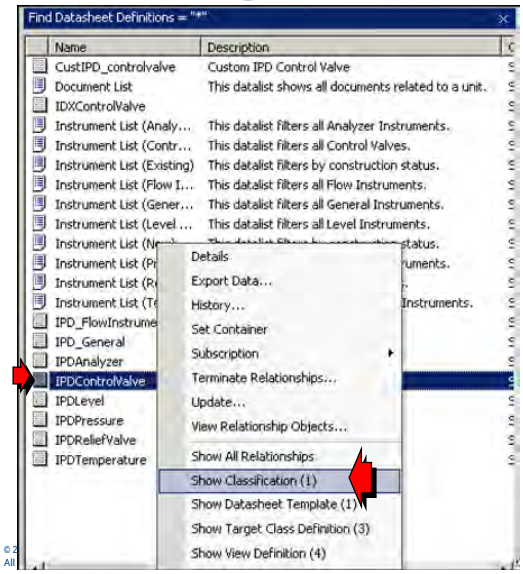
- **Choose *View > Look Ahead* to turn on the look ahead feature in order to filter the menu options to only those that have relationships.**



© 2005. Intergraph Corp.
All Rights Reserved.

Review the classification relationship for the delivered *IPDControlValve* datasheet definition.

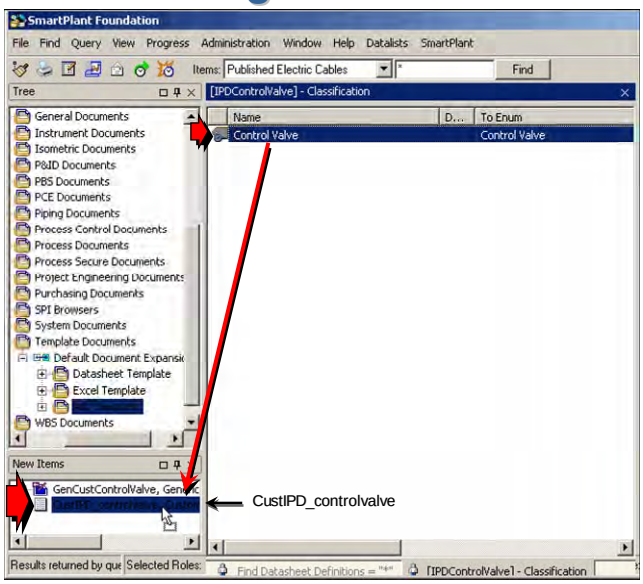
Creating Datasheet Definition Relationships



- **Right-click on the delivered IPDControlValve datasheet definition and select *Show Classification (1)* from the pop-up menu.**

Use the same classification from the delivered datasheet definition for the custom datasheet definition since they are both similar in functionality.

Creating Datasheet Definition Relationships

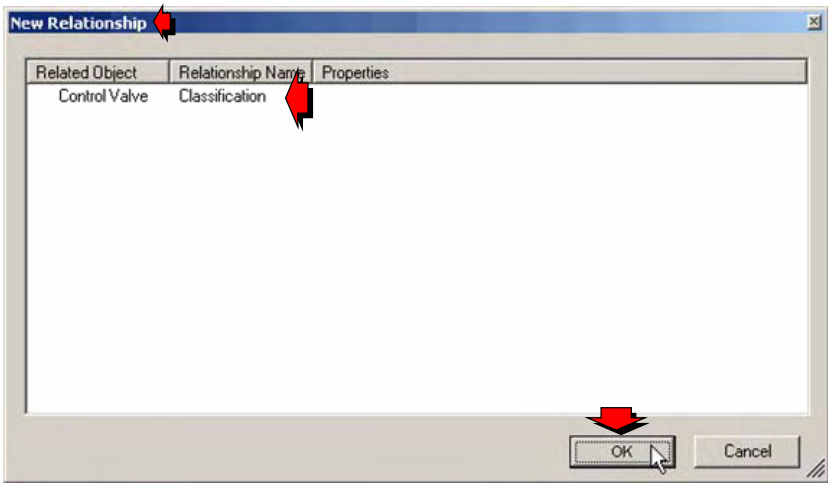


- **Drag and drop the same *Classification*, Control Valve, onto the new *Datasheet Definition* (CustIPD_controlvalve).**

The *New Relationship* form will appear.

Creating Datasheet Definition Relationships

- **To associate a classification with a datasheet definition, click OK to confirm the new relationship.**

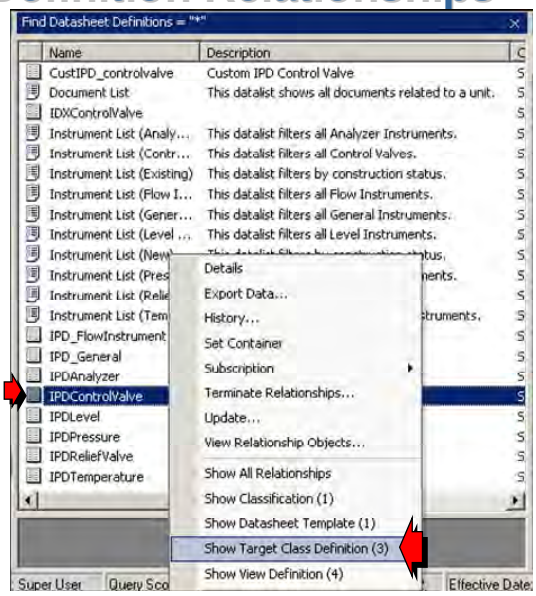


© 2005. Intergraph Corp.
All Rights Reserved.

Next, review the class definition relationships for the delivered *IPDControlValve* datasheet definition.

Creating Datasheet Definition Relationships

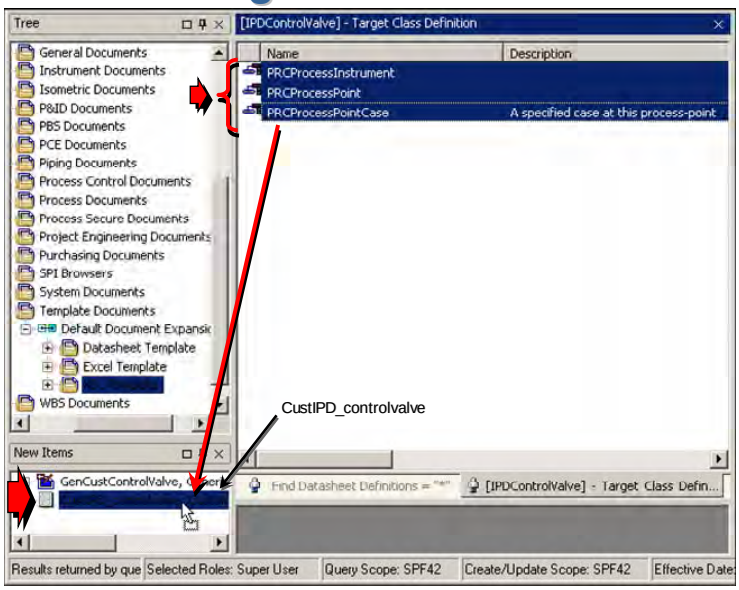
- **Right-click on the delivered IPDControlValve datasheet definition and select *Show Target Class Definition (3)* from the pop-up menu.**



© 2005. Intergraph Corp.
All Rights Reserved.

Again, use the same classes from the delivered datasheet definition for the custom datasheet definition.

Creating Datasheet Definition Relationships

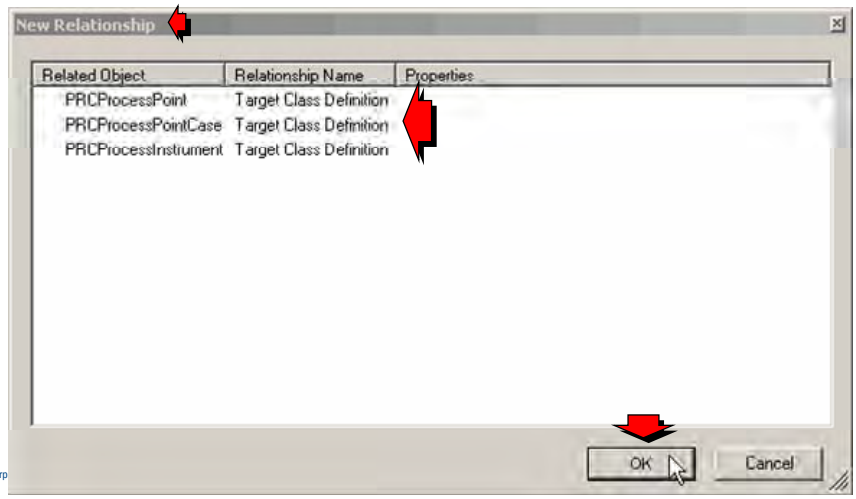


- **Drag and drop the same *Target Class Definitions* (3) onto the new *Datasheet Definition* (CustIPD_control valve).**

The *New Relationship* form will appear.

Creating Datasheet Definition Relationships

- **To associate target class definitions with a datasheet definition, click OK to confirm the new relationships.**

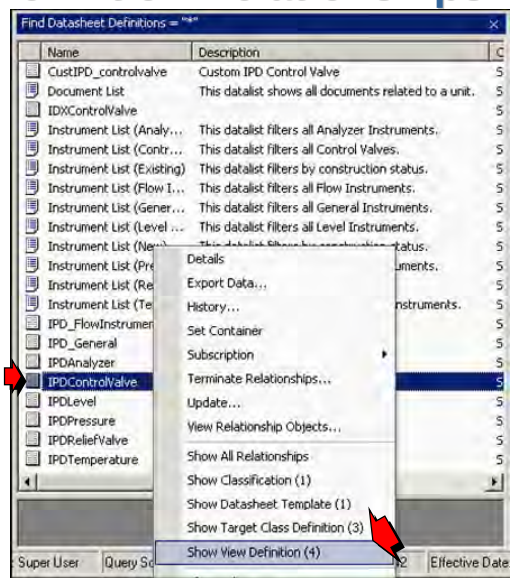


© 2005. Intergraph Corp
All Rights Reserved.

Finally, review the view definition relationships for the delivered *IPDControlValve* datasheet definition.

Creating Datasheet Definition Relationships

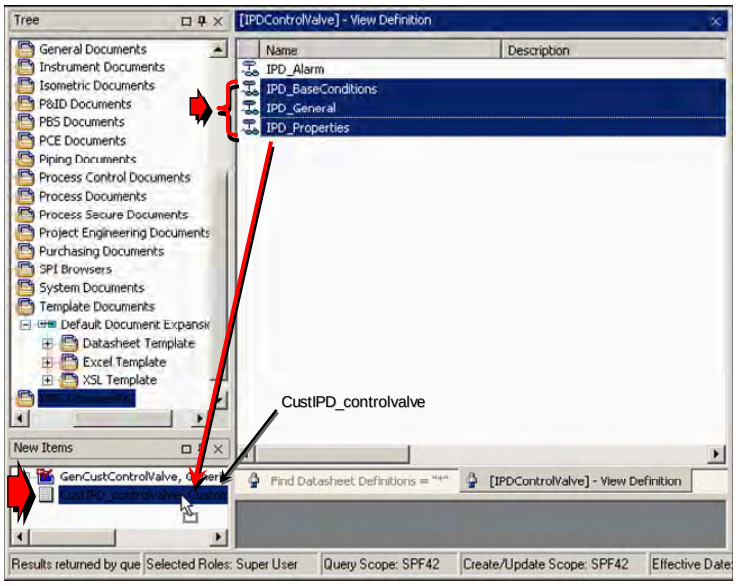
- **Right-click on the delivered IPDControlValve datasheet definition and select *Show View Definition (4)* from the pop-up menu.**



© 2005. Intergraph Corp.
All Rights Reserved.

And use some of the same view defs from the delivered datasheet definition for the custom datasheet definition.

Creating Datasheet Definition Relationships

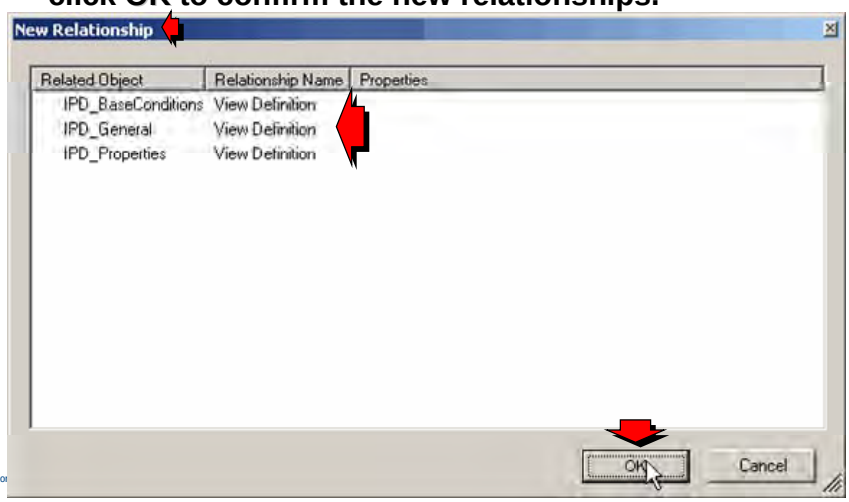


- **Drag and drop 3 of the same *View Definitions* onto the new *Datasheet Definition* (CustIPD_control valve).**

The *New Relationship* form will appear.

Creating Datasheet Definition Relationships

- **To associate view definitions with a datasheet definition, click OK to confirm the new relationships.**

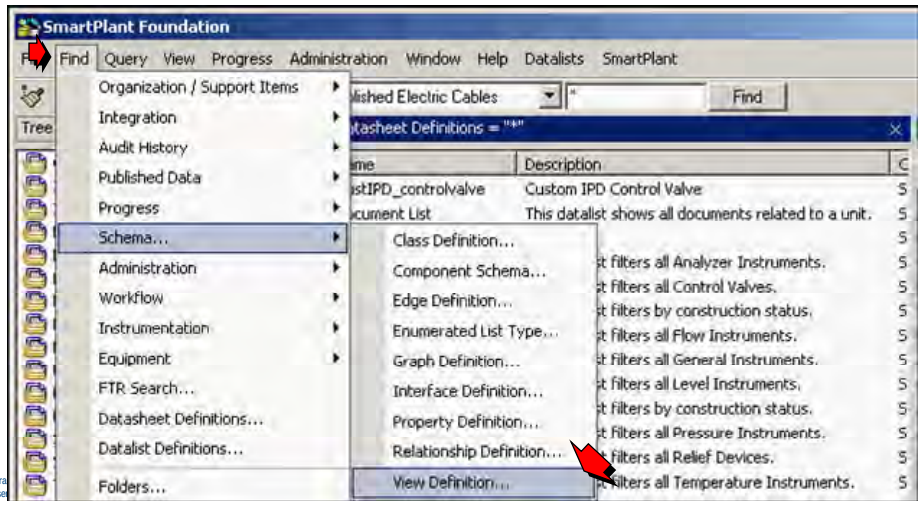


© 2005. Intergraph Co
All Rights Reserved.

One difference between our custom datasheet and the delivered datasheet is the addition of a custom property and thus the addition of a custom view definition.

Creating Datasheet Definition Relationships

- **From the menu, select the *Find > Schema > View Definition* command.**



© 2005. Intergra
All Rights Rese

This will let you search for the custom view def in order to relate it to the new datasheet definition.

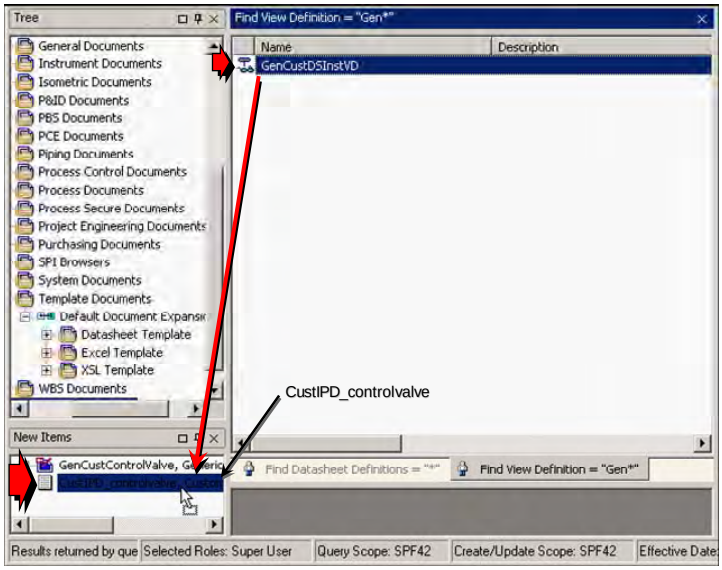
Creating Datasheet Definition Relationships

- **Enter the search criteria to find the new custom View Definition, *Gen**** **(GenCustDSInstVD).**

© 2005. Intergraph Corp.
All Rights Reserved.

Now relate the custom view def to the datasheet definition the same way as the other view defs.

Creating Datasheet Definition Relationships

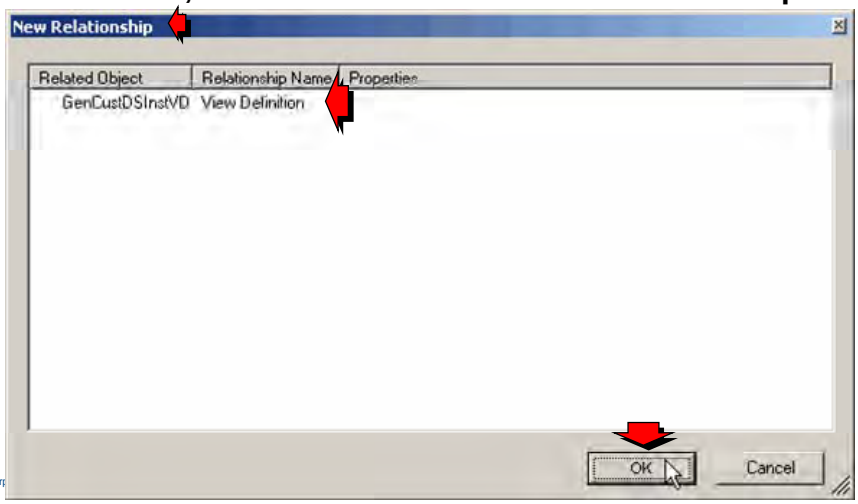


- **Drag and drop the custom View Def, GenCustDSInstVD, onto the new *Datasheet Definition* (CustIPD_control valve).**

Once more, the *New Relationship* form will appear.

Creating Datasheet Definition Relationships

- **To associate the view definition with the datasheet definition, click OK to confirm the new relationship.**



© 2005. Intergraph Corp.
All Rights Reserved.

The final step is to relate the new datasheet template document to the new datasheet definition object.

Creating Datasheet Definition Relationships

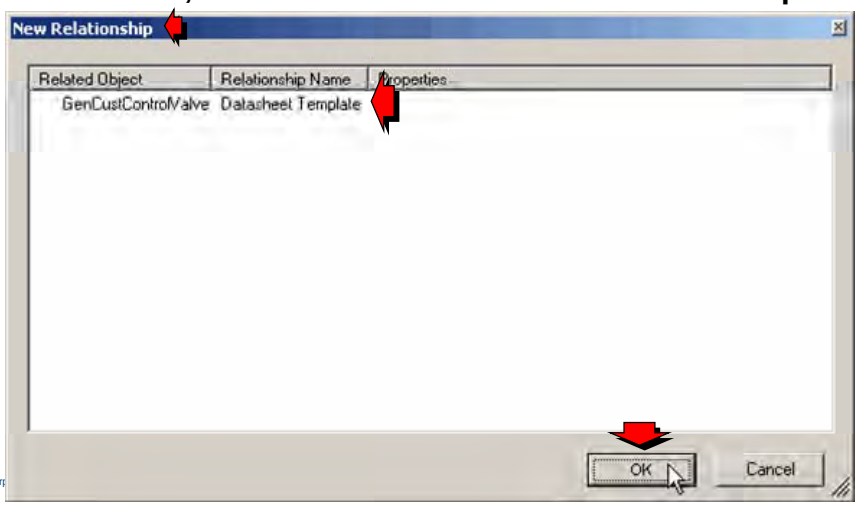
- **Drag and drop the new custom datasheet template, GenCustControlValve, onto the new *Datasheet Definition* (CustIPD_controlvalve).**

© 2005. Intergraph Corp.
All Rights Reserved.

The *New Relationship* form will appear.

Creating Datasheet Definition Relationships

- **To associate the datasheet template with the datasheet definition, click OK to confirm the new relationship.**

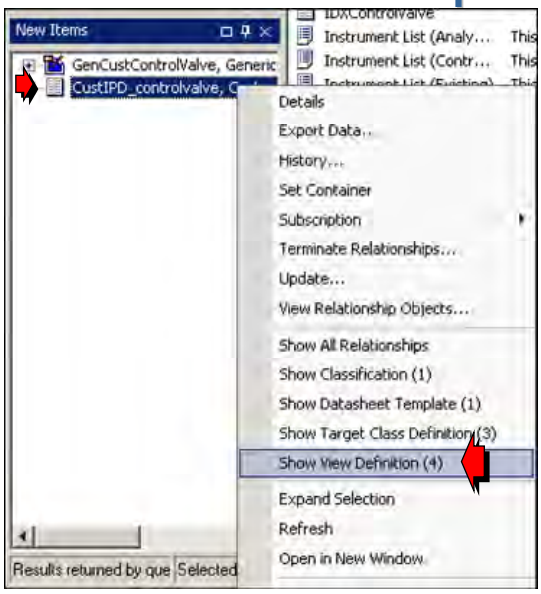


© 2005. Intergraph Corp.
All Rights Reserved.

Verify that the new datasheet definition is now related to the correct objects.

Creating Datasheet Definition Relationships

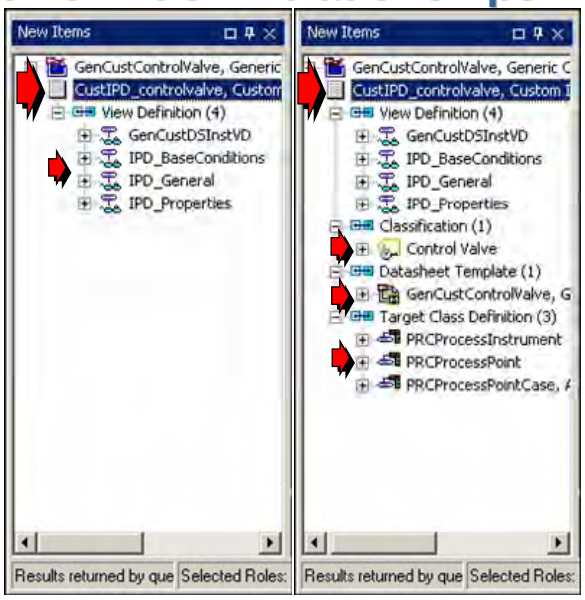
- **Right-click on the custom CustIPD_controlvalve datasheet definition and select *Show View Definition (4)* from the pop-up menu.**



© 2005. Intergraph Corp.
All Rights Reserved.

Creating Datasheet Definition Relationships

- **Verify that all of the relationships for the new custom *CustIPD_controlvalve* datasheet definition have been defined.**



© 2005. Intergraph Corp.
All Rights Reserved.

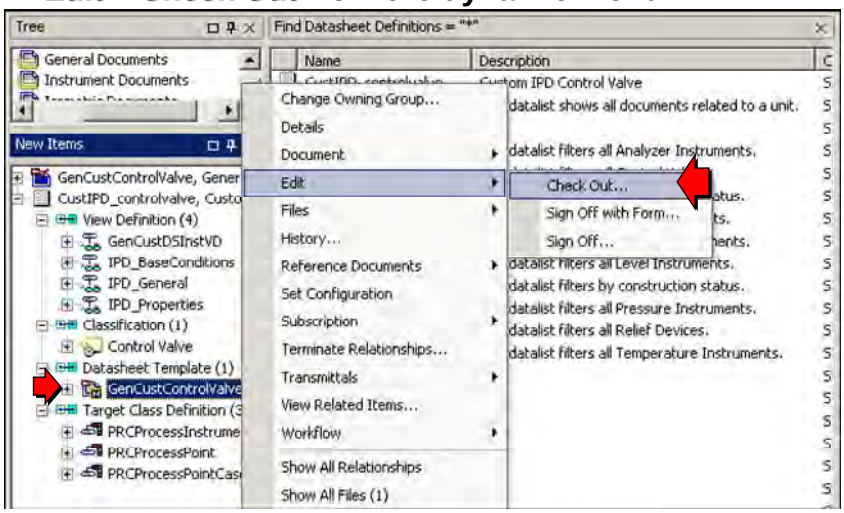
10.9 Using the Datasheet Definer

The Datasheet Definer is used to map the properties to the cells in the Excel spreadsheet. The Datasheet Definer will display both the Excel spreadsheet and the related view definitions. In order to launch the datasheet definer, the Excel spreadsheet related to the datasheet template must first be checked out.

INTERGRAPH

Launching the DataSheet Definer

- **Right click on the custom Datasheet template and select *Edit > Check Out* from the dynamic menu.**

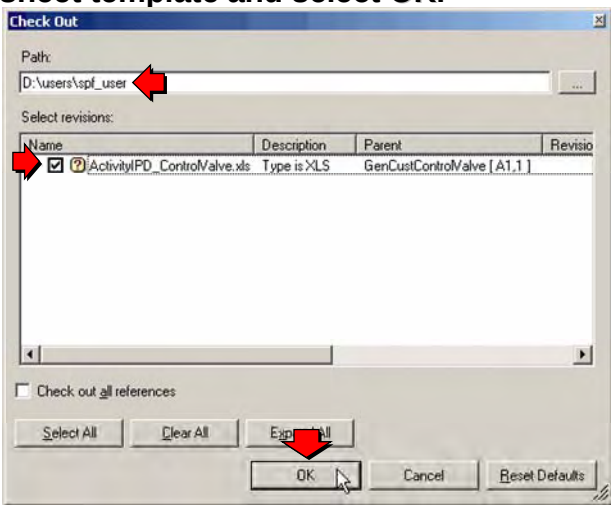


© 2005. Intergraph Corp.
All Rights Reserved.

The *Check Out* dialog will appear.

Launching the DataSheet Definer

- **Verify the check out folder location for editing the Datasheet template and select OK.**

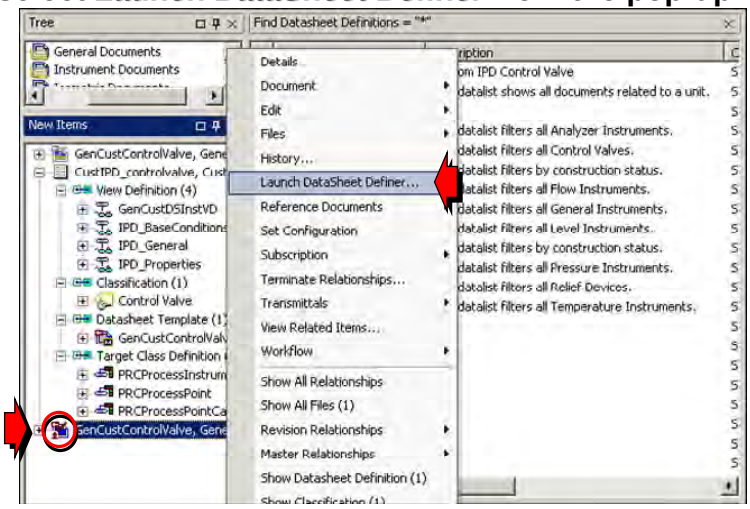


© 2005. Intergraph Corp.
All Rights Reserved.

When the datasheet template has been checked out, start the datasheet definer.

Launching the DataSheet Definer

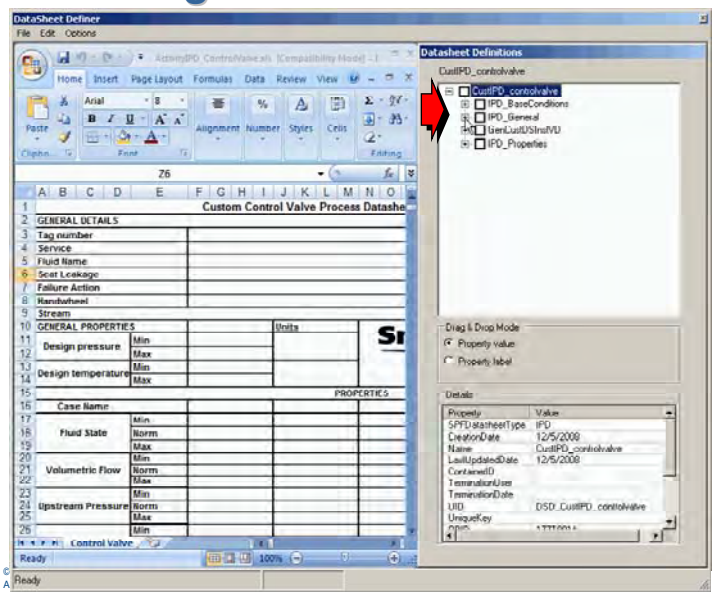
- **Right click on the checked out Datasheet template and select *Launch DataSheet Definer* from the pop-up menu.**



© 2005. Intergraph Corp.
All Rights Reserved.

Notice that the *DataSheet Definer* form is divided into three major panes. The left ¾ of the form is devoted to the **Excel template**. The top-right pane is the list of **ViewDefs** related to this datasheet template and the **properties** of the ViewDef selected. The bottom-right pane will show the **properties** of the datasheet template document.

Using the DataSheet Definer

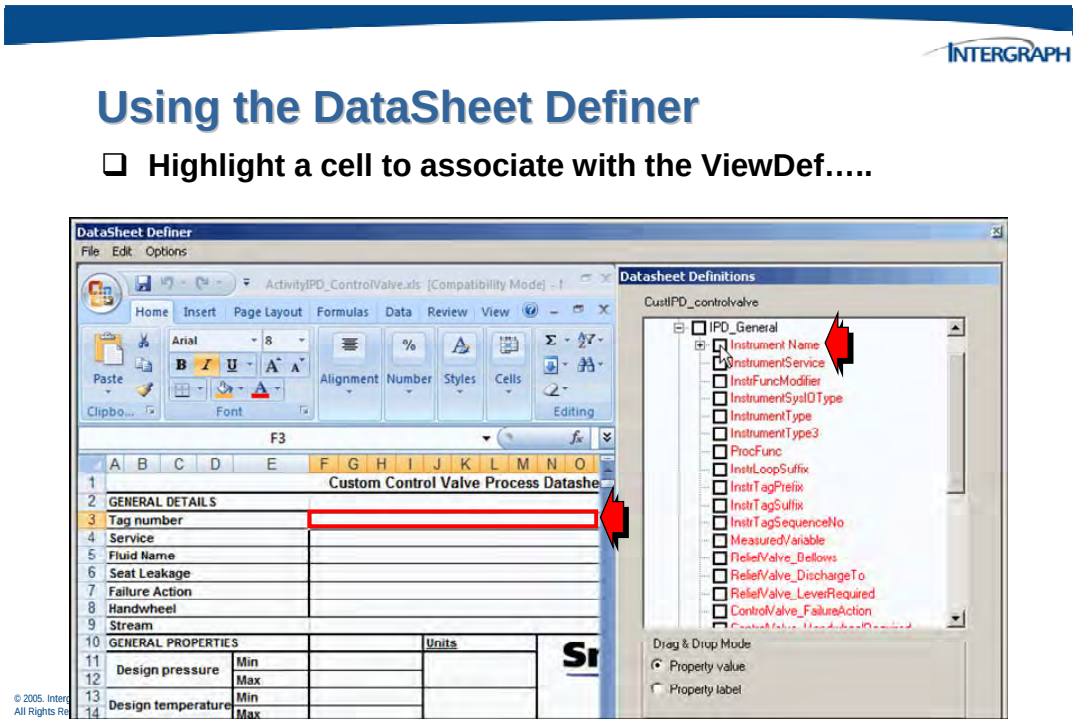


- **Expand the IPD_General ViewDef to display the available properties.**

There may be two aspects to mapping string properties to the template: mapping the value and actually placing the *Display As* text on the template. If you are starting from a pre-defined template, you will use the **Property label** option infrequently.

10.9.1 Mapping a String Property Value

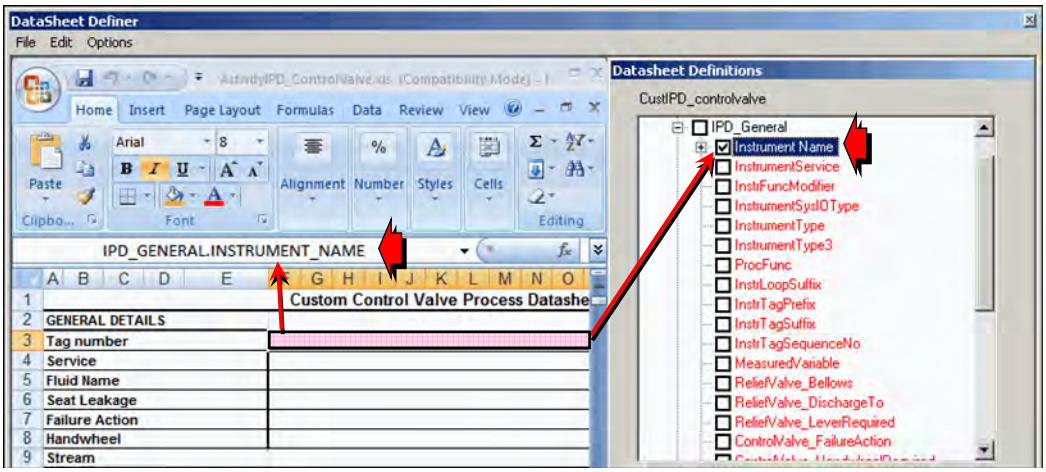
To map a string property to a cell on the template, first select the range of cells in the template to be mapped. As an example, in the top section of the template, select the cell to the right of the text *Tag number*.



To map the value to the selected cell, merely click the check box to the left of the property.

Using the DataSheet Definer

- ❑ **…and enable the check box to the left of the property.**



© 2005. Intergraph Corp.
All Rights Reserved.

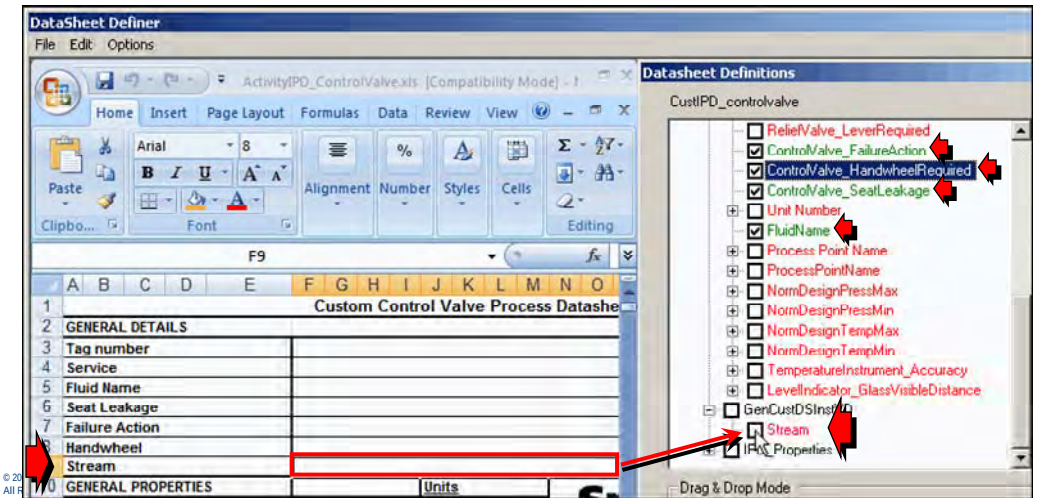
This will create a range name in the spreadsheet consisting of the **<view def name>.<property name>**.

At this time, you can use the Excel formatting toolbar to set fonts, justification, colors, or show borders. For more information on this, refer to the delivered document "*How to Configure the Data Sheet Model*".

Expand the custom view def that contains the custom property and map it to a cell in the datasheet spreadsheet.

Using the DataSheet Definer

- **Continue to highlight cells to associate with the ViewDef and enable the check box to the left of the property.**

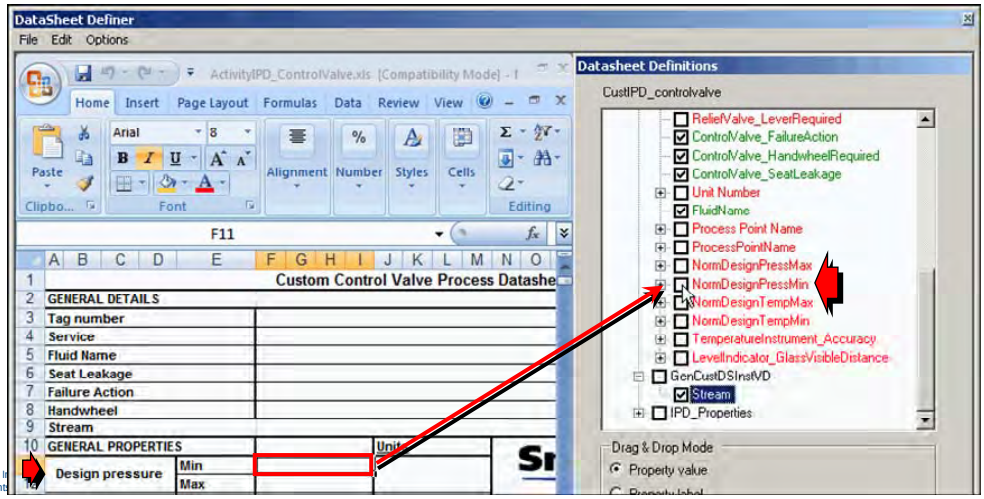


10.9.2 Mapping a UOM Property Value

This datasheet contains some properties that use the property type UOM (UnitofMeasure). These properties will be mapped a bit differently than the string properties.

Using the DataSheet Definer

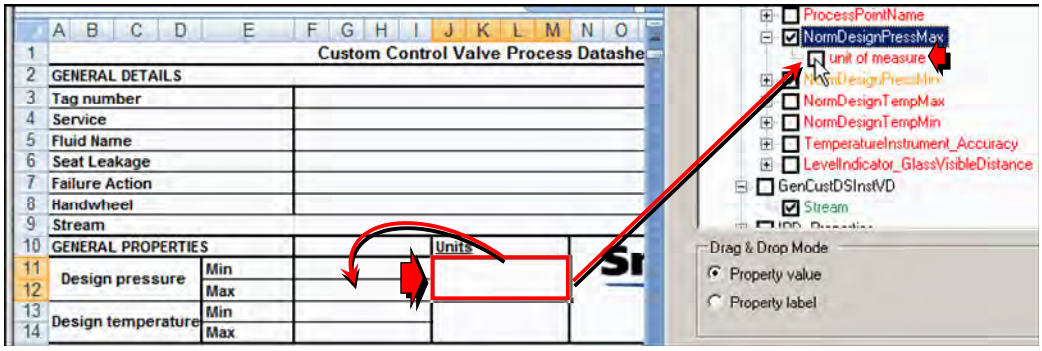
- **Highlight a UOM property cell (NormDesignPressureMin) and enable the check box to the left of the property.**



The same cell will be used to display the UOM value for both the **Min** and **Max** properties.

Using the DataSheet Definer

- **Expand the NormDesignPressureMax property to show the UOM, highlight the UOM cell and enable the check box to the left of the unit of measure.**

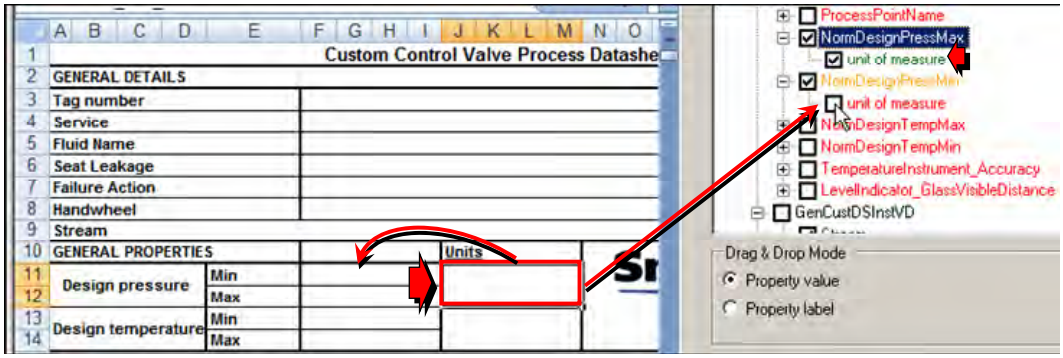


© 2005. Intergraph Corp.
All Rights Reserved.

Repeat the same procedure for the **Min** property. Until the UOM is mapped, the property cell will appear in an orange/yellow color.

Using the DataSheet Definer

- **Expand the NormDesignPressureMin property to show the UOM, highlight the UOM cell and enable the check box to the left of the unit of measure.**

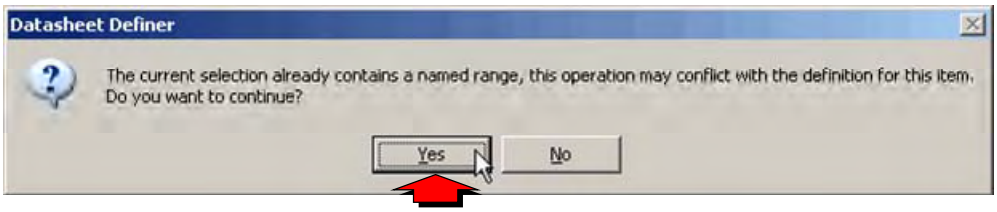


© 2005. Intergraph Corp.
All Rights Reserved.

The same UOM cell is being used for 2 different properties so an information message will appear.

Using the DataSheet Definer

- **Click Yes to use the same UOM cell for 2 different property cells (min and max).**

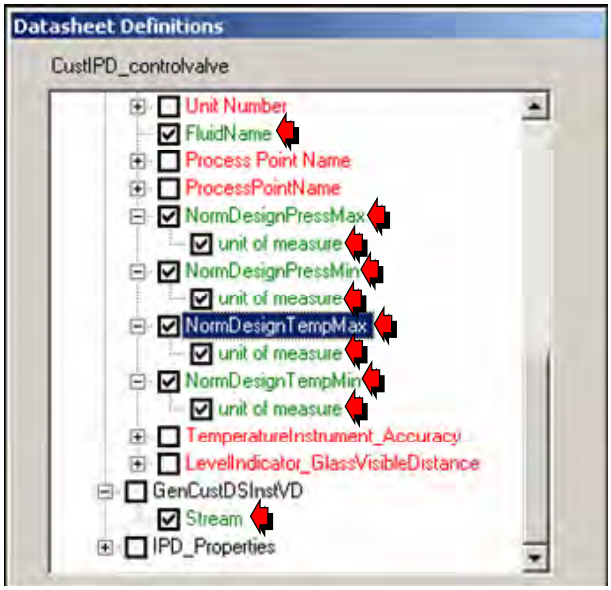


© 2005. Intergraph Corp.
All Rights Reserved.

Cells that **have not** been mapped will appear in a red color.

Using the DataSheet Definer

- **Cells that have been mapped successfully will be displayed in a green color.**



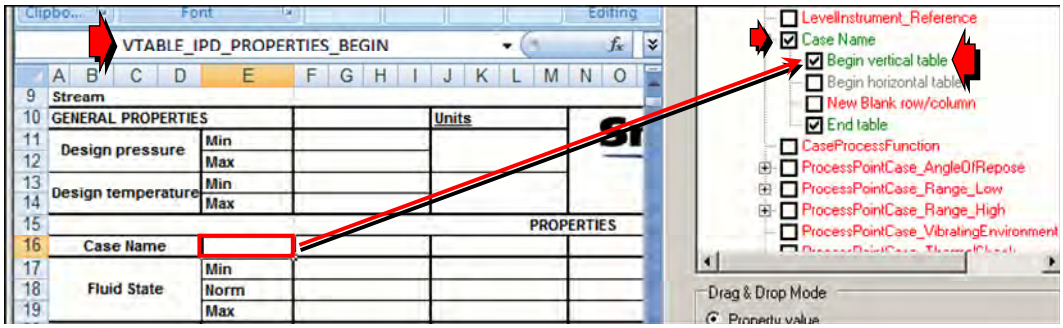
© 2005. Intergraph Corp.
All Rights Reserved.

This datasheet uses a special function called a **Process Case**. A *Process Case* is a set of process data at certain conditions such as **Normal**, **Operating**, **Shutdown**, **Winter**, **Summer**, and so forth. Before the datasheet is launched from the Desktop Client, one or more process cases must be defined. Then when the datasheet is displayed, multiple columns will be used for the different defined process cases. To support this, the system uses dynamic tables internally.

The **VTABLE** and **HTABLE** in the datasheet template will refer to *Vertical* and *Horizontal* dynamic tables respectively. These dynamic tables are a mechanism to allow the management of multiple instances of the same or similar objects on a datasheet. They are the mechanism by which datalists work, since datasheets and datalists are essentially the same thing. A datalist is simply a datasheet where the template has a Horizontal dynamic table that holds the data of many similar items. In this case, the dynamic table is a vertical one (the properties of the object descend vertically down the side of the worksheet) as is used to represent one or more process point case objects.

Using the DataSheet Definer

- **Expand the Case Name property, highlight a cell and enable the *Begin vertical table* toggle.**

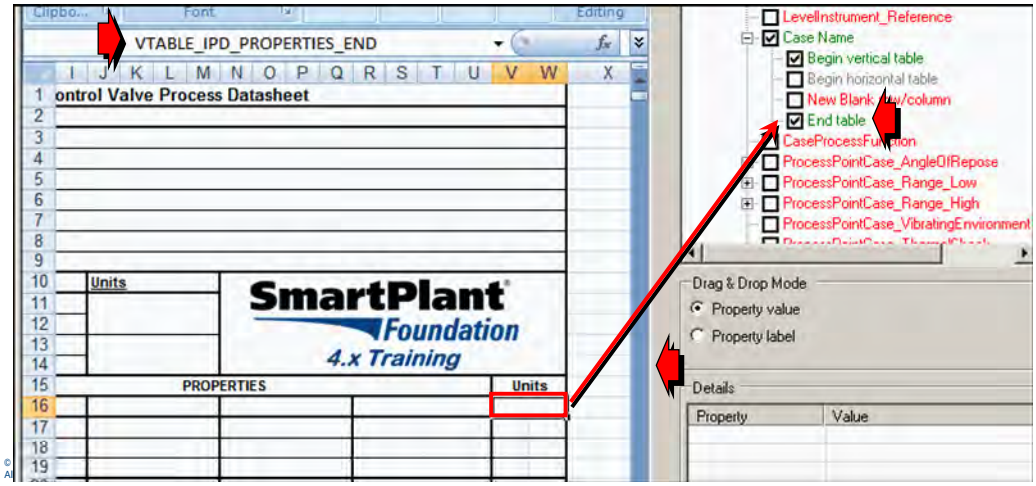


© 2005. Intergraph Corp.
All Rights Reserved.

Next, specify the end of the vertical dynamic table.

Using the DataSheet Definer

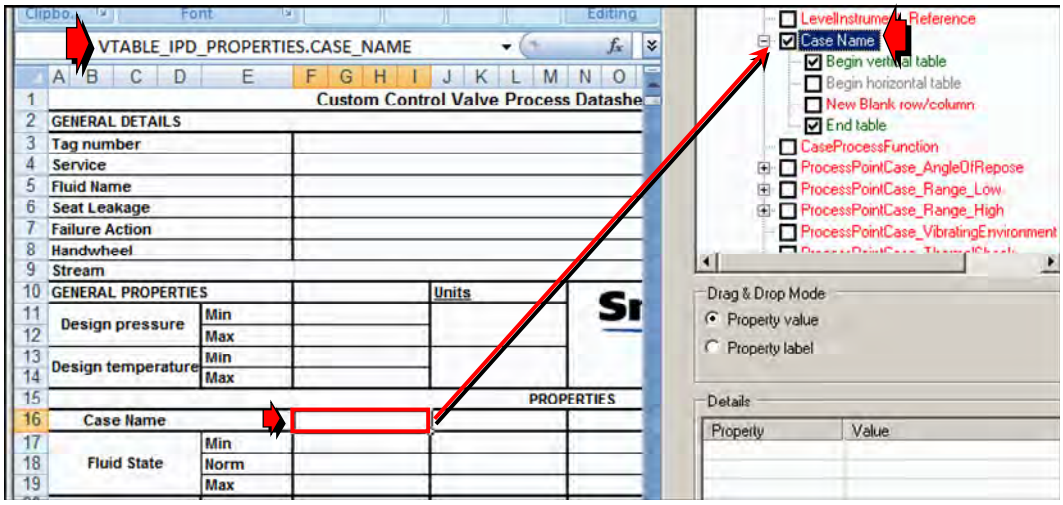
- **Highlight the next cell and enable the *End table* toggle.**



Even though the *Case Name* property may have the toggle enabled, you may have to clear this check box and then select it again after identifying the corresponding cell.

Using the DataSheet Definer

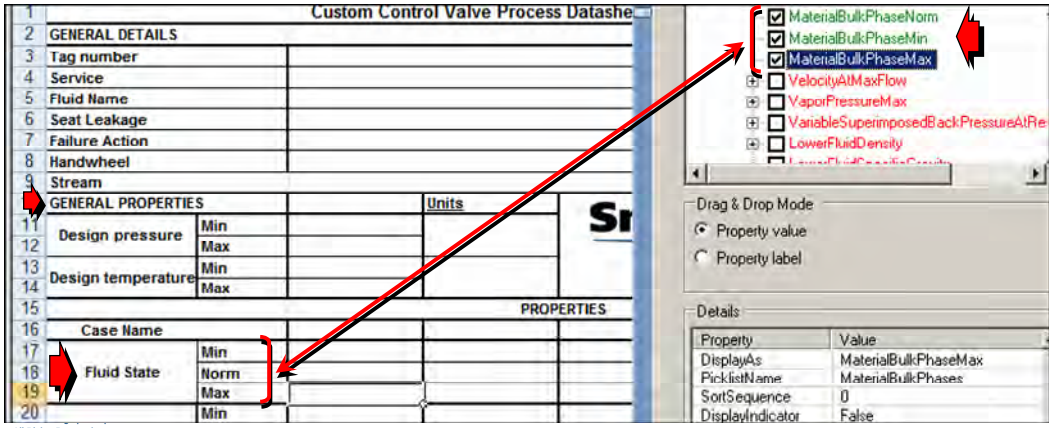
- **Highlight the next cell and enable the *Case Name* toggle.**



Finally, map each of the properties that will be associated with the Process Case to a cell in the spreadsheet.

Using the DataSheet Definer

- **Continue to highlight cells to associate with the ViewDef and enable the check box to the left of the property.**

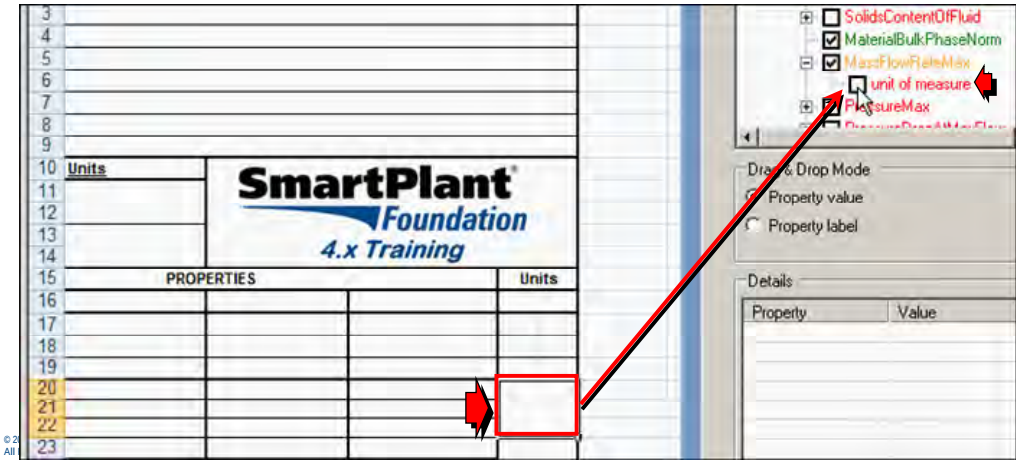


All Rights Reserved.

If a property uses a UOM, it must be mapped in the same manner as discussed earlier.

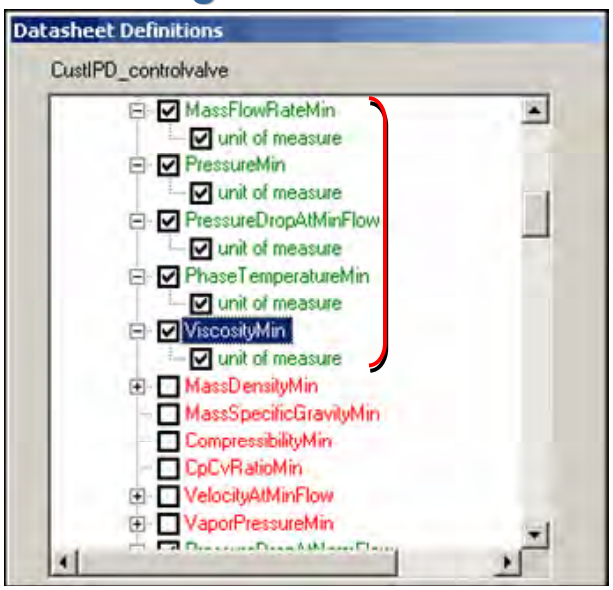
Using the DataSheet Definer

- **Select the Volumetric Flow UOM cell, expand the MassFlowRateMax property and enable the check box to the left of the unit of measure.**



INTERGRAPH

Using the DataSheet Definer



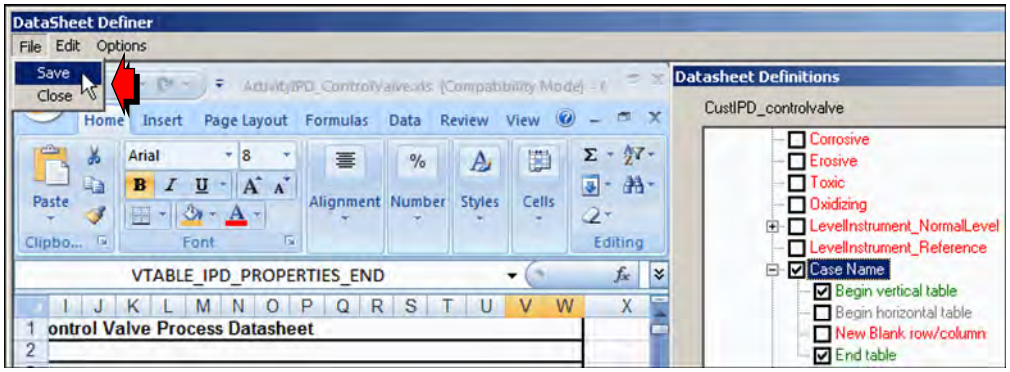
- **Continue to map all case properties and UOM cells.**

10.9.3 Saving the Datasheet Mapping

After all of the properties have been mapped, save and exit the *DataSheet Definer* form.

Using the DataSheet Definer

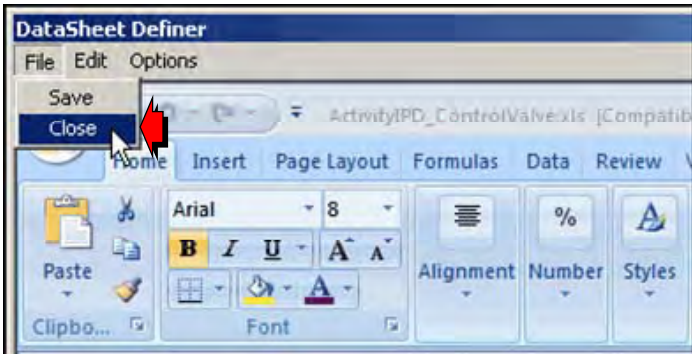
- **From the menu, select *File > Save* to save the Datasheet mapping.**



© 2005. Intergraph Corp.
All Rights Reserved.

Using the DataSheet Definer

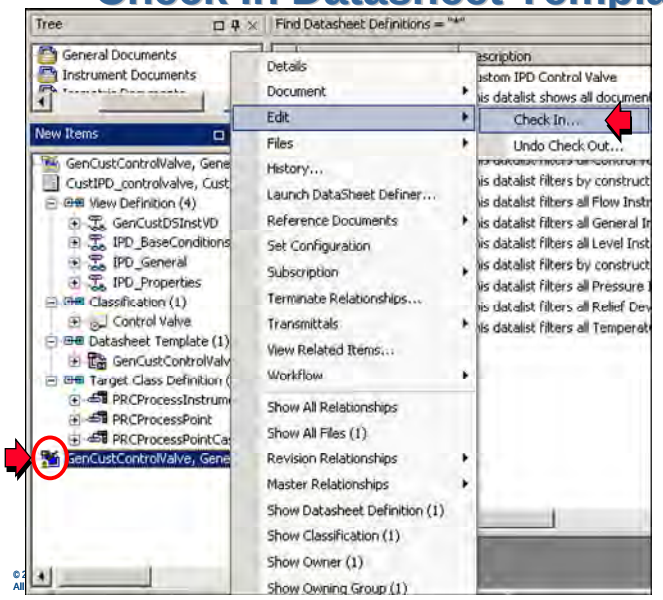
- **Select the *File* > *Close* command to exit the DataSheet Definer.**



© 2005. Intergraph Corp.
All Rights Reserved.

After the datasheet spreadsheet has been closed, the related datasheet template document must be checked back in.

Check In Datasheet Template

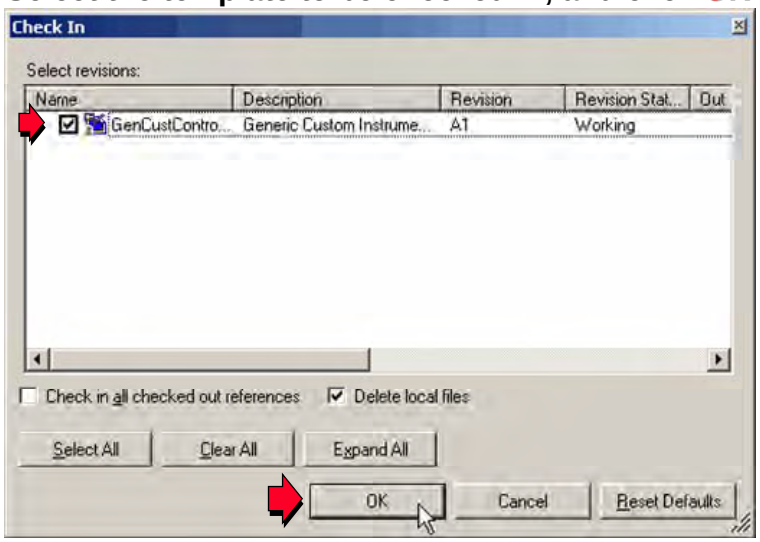


- **Right-click on the checked out version of the Datasheet template, and click *Edit* > *Check In* on the pop-up menu.**

The *Check In* form will appear.

Check In Datasheet Template

- **Select the template to be checked in, and click *OK*.**



© 2006. Intergraph Corp.
All Rights Reserved.

10.10 Activity 2 – Creating Datasheet Template Documents, Datasheet Definitions and Using Datasheet Definer

Complete **Chapter 10 - Activity 2** in the SPF Configuration and Administration II activity workbook.

10.11 Registering an Authoring Tool

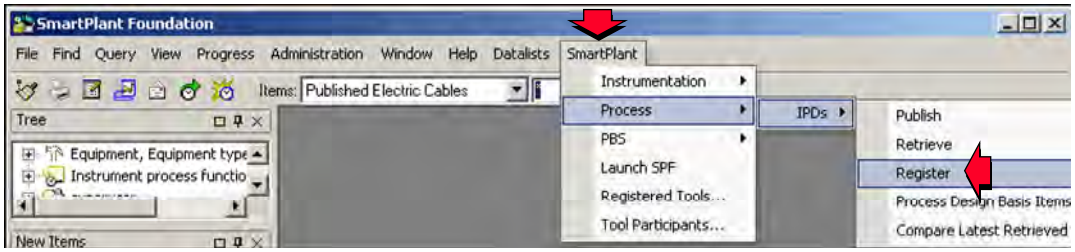
Before testing the datasheet, you must have access to some *Process Instrument* objects. IPD datasheets will manipulate Process Instruments, which are contained in the Process domain and this domain will need to be registered as an authoring tool.

The first step is to register the ProcessEnginnering tool in order to use the *Publish* and *Retrieve* commands on Process Instruments.

INTERGRAPH

Registering an Authoring Tool

- **Select *SmartPlant > Process > IPDs > Register* from the menu to register the *Instrument Process* authoring tool.**

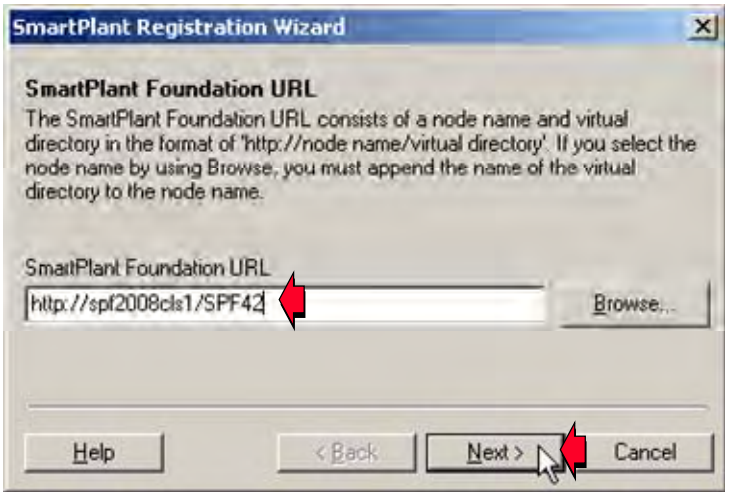


© 2005. Intergraph Corp.
All Rights Reserved.

Specify a URL so that when a user publishes and retrieves, the system knows exactly which site to connect to and retrieve or publish data.

Registering an Authoring Tool

- **Enter the URL for the server and the site then click Next.**



© 2005. Intergraph Corp.
All Rights Reserved.

The software will connect to the specified site, find and display all the possible plants that the user can use for the register operation. The plant of interest in this site is **SPF42**, so choose that selection from the list.

Registering an Authoring Tool

- **With the plant selected, click Finish.**

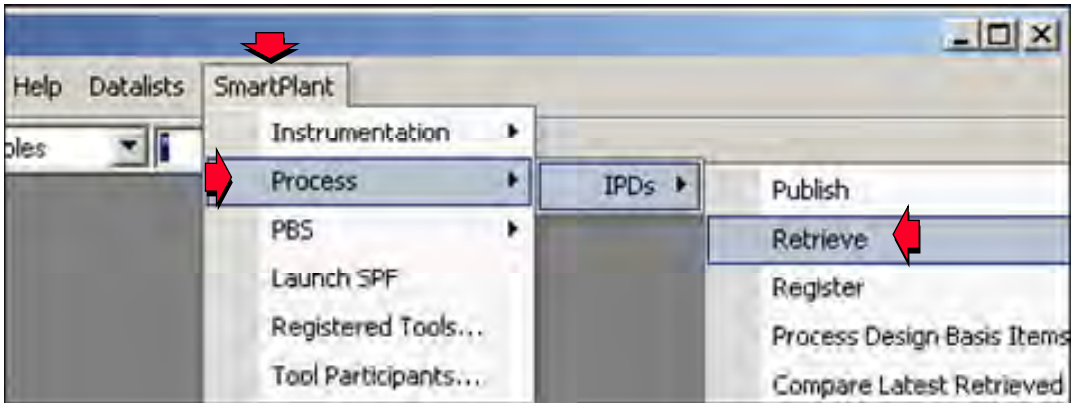
© 2005. Intergraph Corp.
All Rights Reserved.

10.11.1 Retrieving a Published Instrument

The authoring tool has now been registered, the security has been set for the authoring domain and now, the published data can be retrieved.

Retrieving into the Authoring Domain

- **Select *SmartPlant* > *Process* > *IPDs* > *Retrieve* from the menu.**

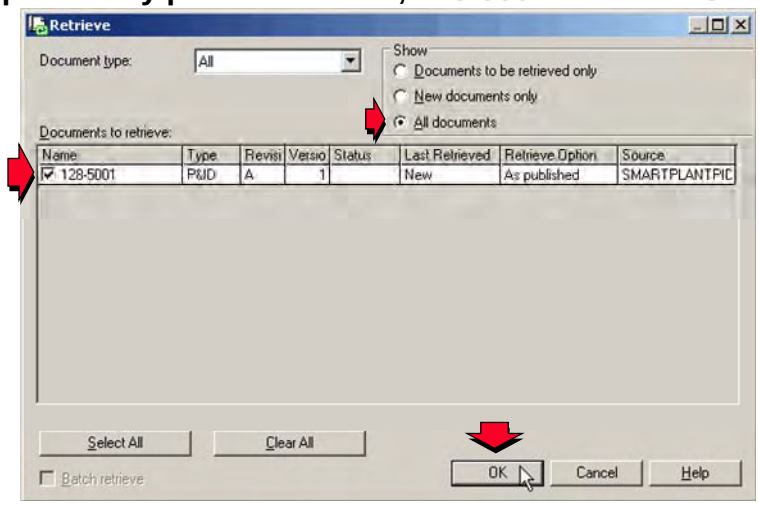


© 2005. Intergraph Corp.
All Rights Reserved.

When the SmartPlant client appears, the documents that are allowed to be retrieved are displayed.

Retrieving into the Authoring Domain

- **Select the *All documents* radio button, choose the previously published P&ID, 128-5001 and click OK.**



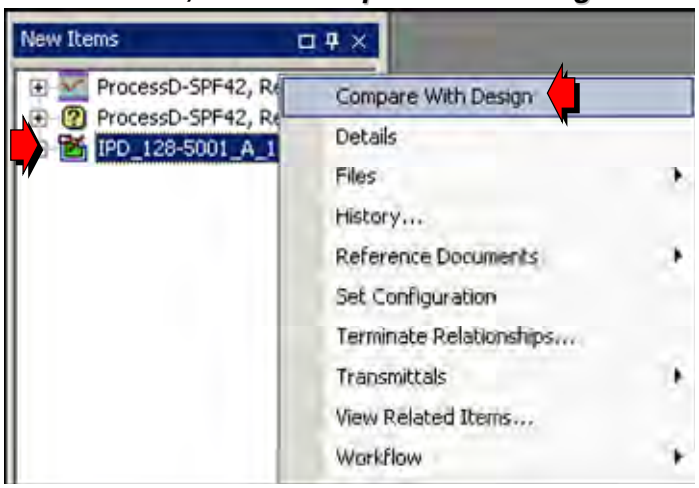
© 2005. Intergraph Corp.
All Rights Reserved.

This drawing is a P&ID drawing that was previously published and contains some instruments that can be pulled into the process domain.

The P&ID has now been retrieved into this design basis document, **IPD_128-5001**, and into a vaulted area. The attached file is used as a temporary storage that can be used to load into the *Compare* dialog.

Loading Retrieved Instruments

- **Right click on the retrieved P&ID document and from the shortcut menu, select *Compare With Design*.**

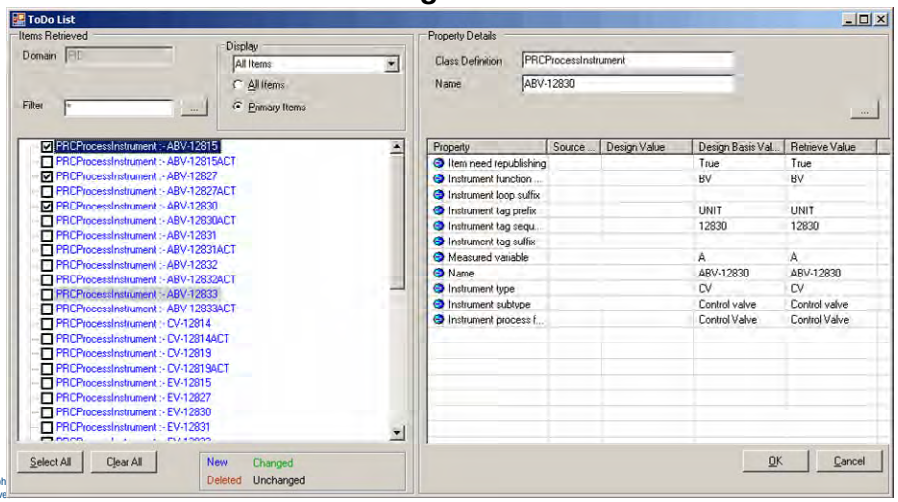


© 2005. Intergraph Corp.
All Rights Reserved.

The SPF *ToDo List* will appear.

Loading Retrieved Instruments

- **Enable the toggles for the retrieved instruments to be loaded into the authoring domain.**

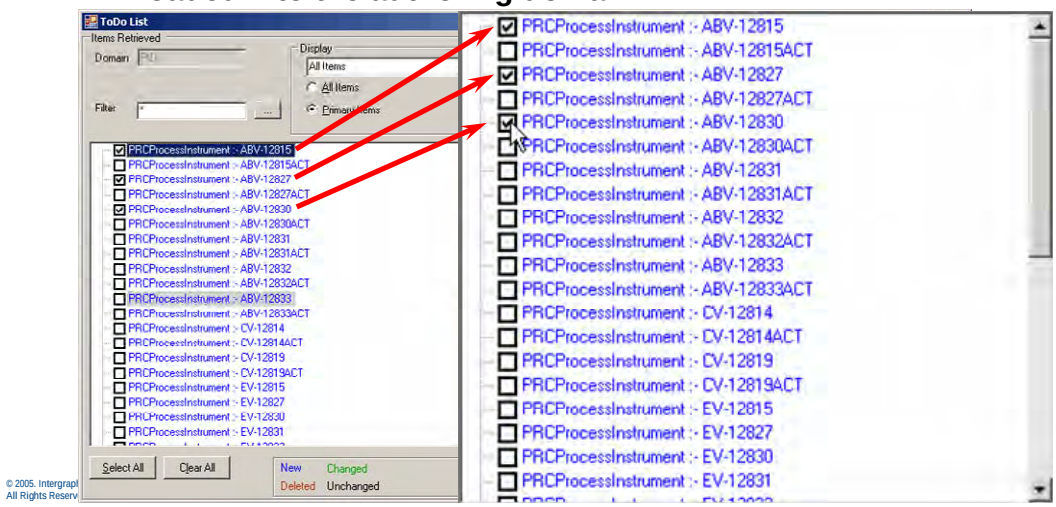


© 2005. Intergraph
All Rights Reserve

Select a few of these objects to be loaded into the authoring environment (domain).

Loading Retrieved Instruments

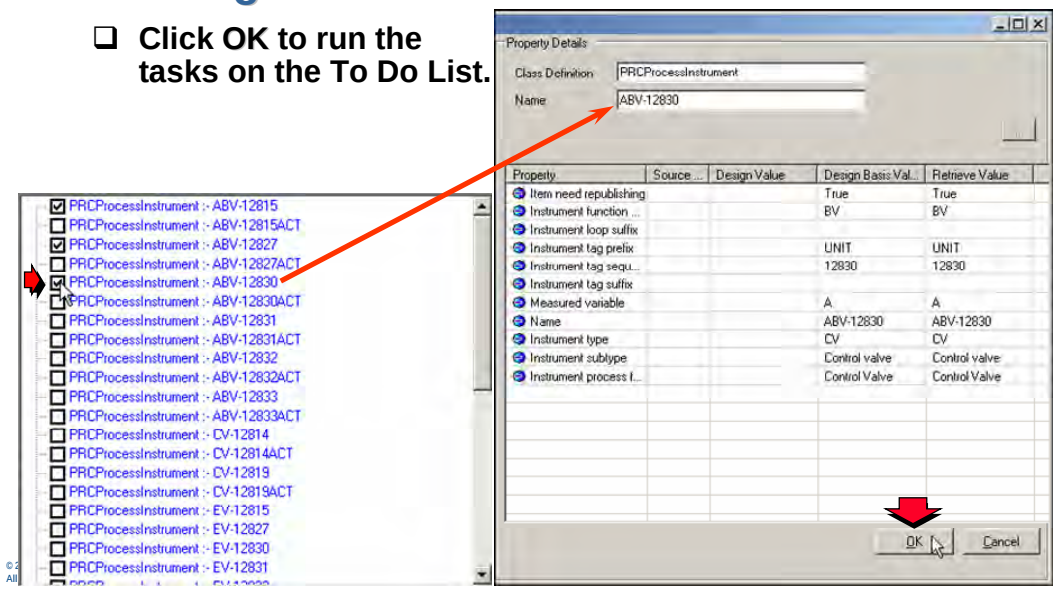
- **Enable the toggles for the retrieved instruments to be loaded into the authoring domain.**



When you click OK, the property, its design basis value and the value that will actually be retrieved for the selected instruments will be loaded.

Loading Retrieved Instruments

- **Click OK to run the tasks on the To Do List.**

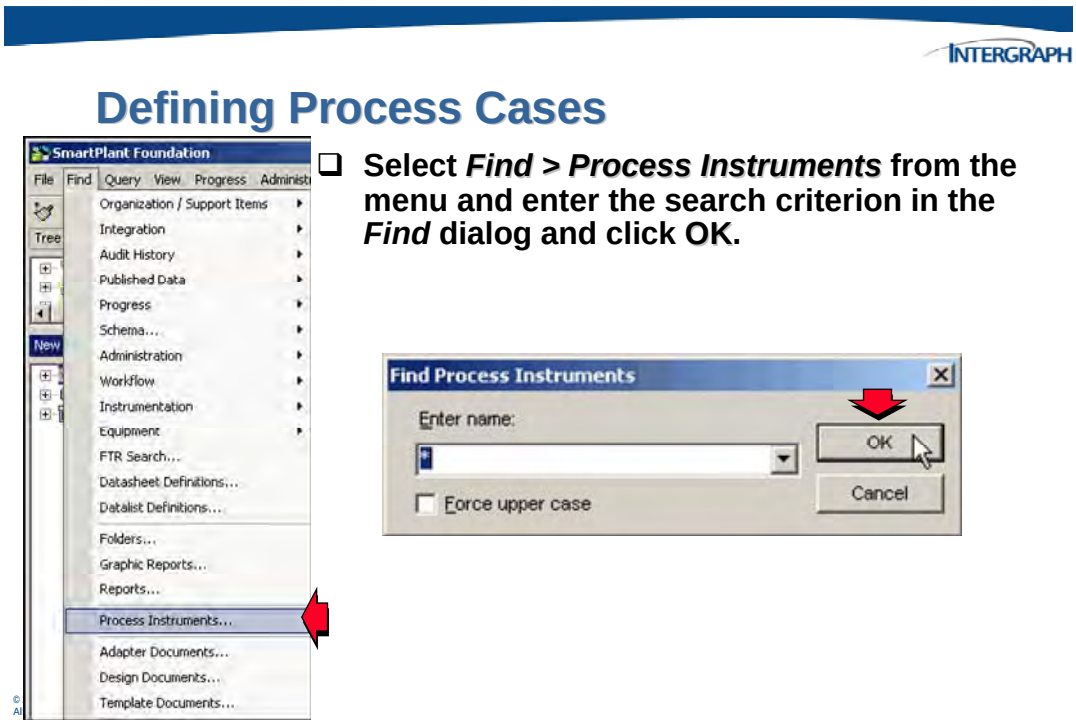


10.12 Defining Process Cases

The datasheet is ready to be tested and will be used to populate the retrieved data with more information.

However, before doing that, the data that will be instantiated is referred to as a **Structured Instrument** that includes a *Process Point*. A process point can have different process cases attached to it; *Startup*, *Winter*, *Shutdown* and *Summer* for example.

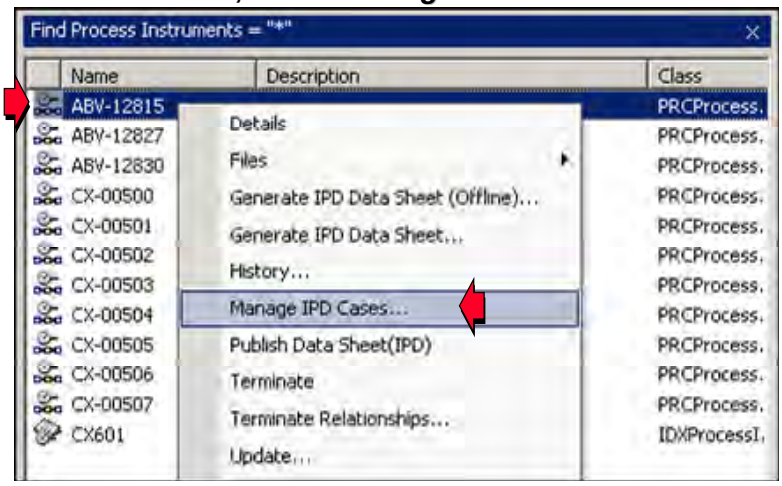
Perform a ***Find*** command to view the loaded instruments.



In the Find results *list view window* for *Process Instruments* three control valve objects will now be displayed. What will be viewed is the bare minimum information retrieved from the P&ID.

Defining Process Cases

- **Right click on one of the loaded instruments and from the shortcut menu, select *Manage IPD Cases.***

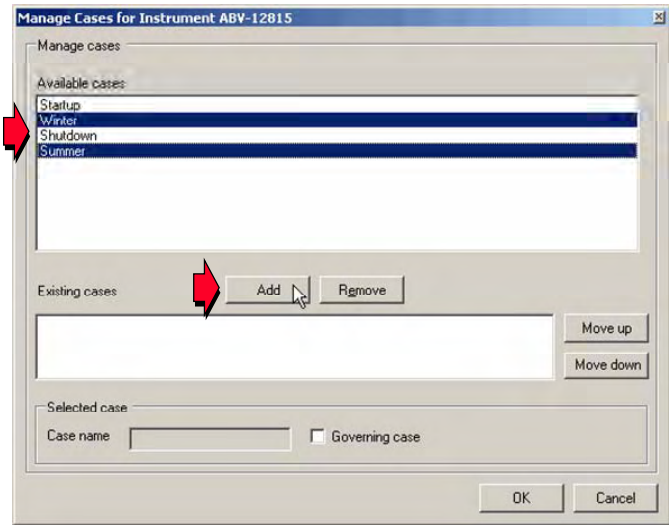


© 2005. Intergraph Corp.
All Rights Reserved.

In this example, two cases are selected and added to the *Existing cases*.

Defining Process Cases

- **Select one or more cases and then click Add.**

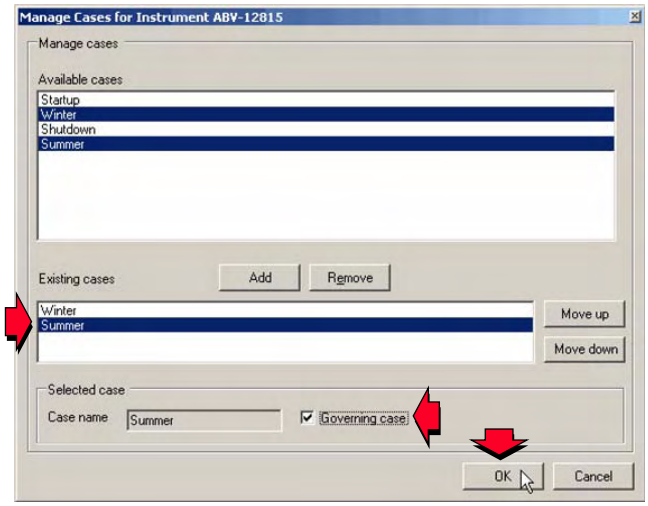


© 2005. Intergraph Corp.
All Rights Reserved.

Summer will be highlighted and set as the **governing case**.

Defining Process Cases

- **Choose one of the selected cases, enable the Governing case toggle and click *OK*.**



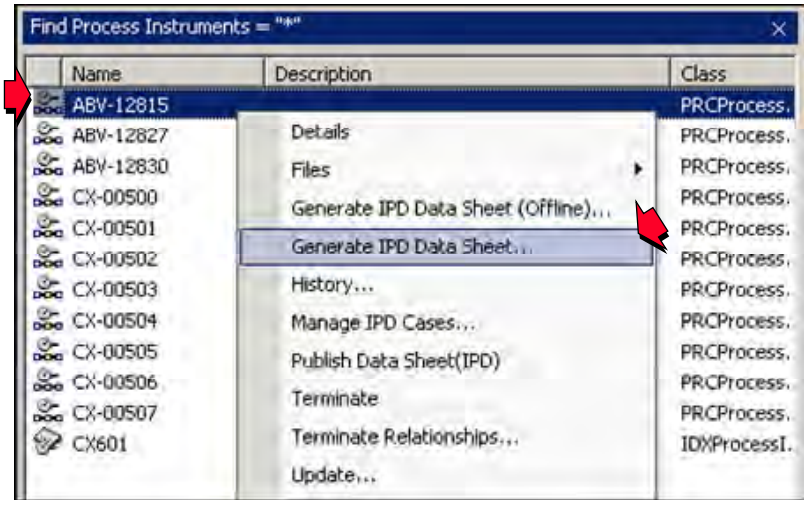
© 2005. Intergraph Corp.
All Rights Reserved.

10.13 Testing Datasheet Functionality

To test the datasheet functionality, locate an instance of a Process Instrument.

Launching the Datasheet

- **Next, right click on a Process Instrument and from the shortcut menu, select *Generate IPD Data Sheet.***



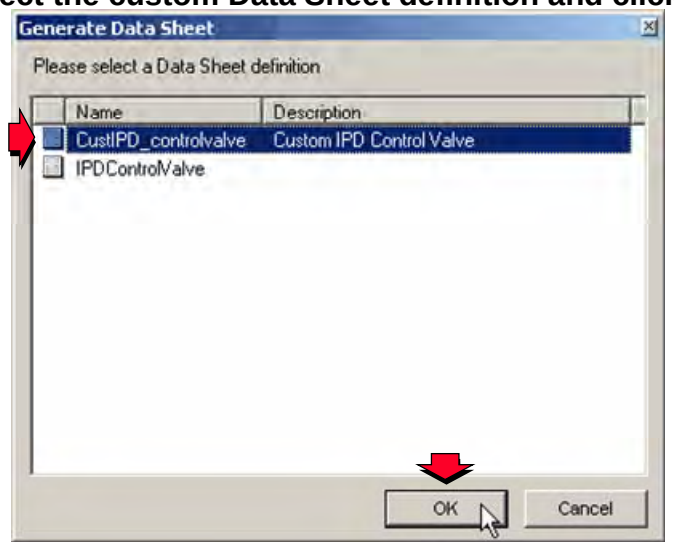
© 2005. Intergraph Corp.
All Rights Reserved.

The software will load the right datasheet based on the classification of object retrieved and selected. In this example, a *Control Valve* instrument has been selected.

If there is more than one datasheet template object associated with the instrument object via multiple relationships, you will be prompted to select the desired Data Sheet (datasheet definition).

Launching the Datasheet

- **Select the custom Data Sheet definition and click *OK*.**



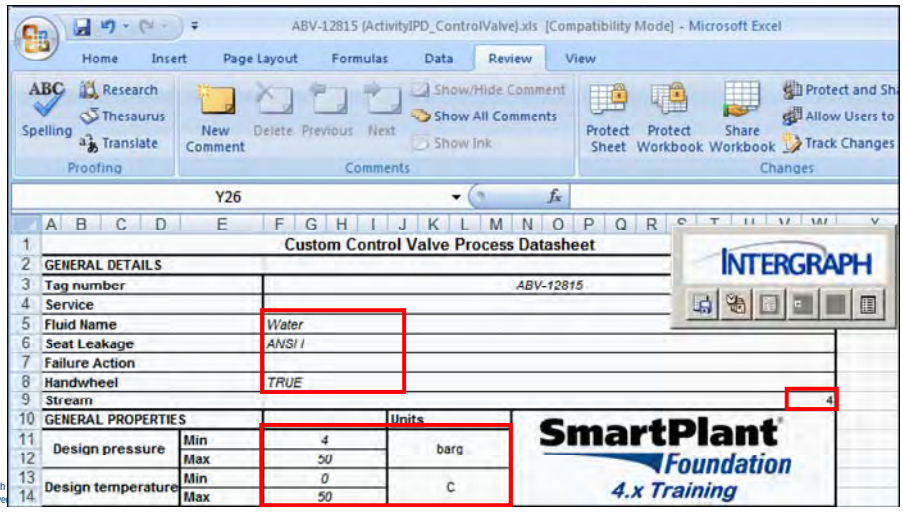
© 2005. Intergraph Corp.
All Rights Reserved.

Note: Excel macros control the editing session so you must select the *Enable Macro* button when the datasheet appears. If you choose not to enable the macros, no changes you make to the spreadsheet can be saved.

The software will then launch Microsoft *Excel* on the client machine to display information about the selected control valve and the related process cases.

Using the Datasheet

- **Enter the desired datasheet values in the appropriate cells.**



© 2005. Intergraph
All Rights Reserve

Some fields such as *Fluid Name*, *Seal Leakage* and *Failure Action* are on the process instrument itself. If a field has a picklist, allowed values will be populated from the schema and database which have been installed in the background of the datasheet.

Note that the custom property, **Stream**, will also be populated.

For a *Unit of Measure* field, select the appropriate UOM first and then enter the correct value.

Enter data for the different cases by populating information in the appropriate column in the datasheet.

Using the Datasheet

- **Enter the desired values for each defined process case.**

15				PROPERTIES			Units
16	Case Name		Winter	Summer			
17	Fluid State	Min					
18		Norm	L	L			
19		Max					
20	Volumetric Flow	Min	3	3			g/min
21		Norm	4	4			
22		Max	5	5			
23	Upstream Pressure	Min	25	25			psi
24		Norm	30	30			
25		Max	35	35			
26	Pressure Drop	Min	5	5			psi
27		Norm	6	7			
28		Max	7	9			
29	Temperature	Min	25	25			C
30		Norm	30	35			
31		Max	35	45			
32	Viscosity	Min	5	7			cP
33		Norm	10	15			
34		Max	15	19			
35		Min					

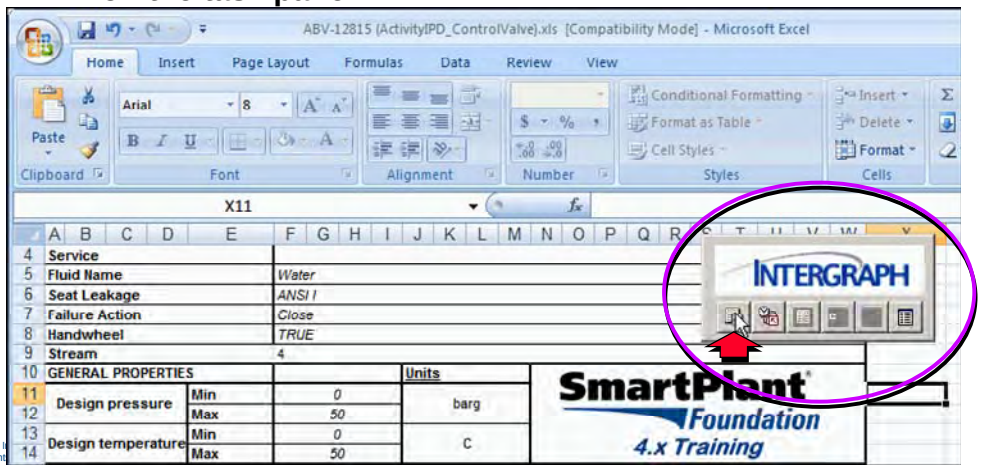
Control Valve

© 2005. Intergraph Corp.
All Rights Reserved.

The updated property values will then be saved back into the database. Remember to move the cursor out of the last cell that was updated before clicking the ***Save*** button.

Using the Datasheet

- **After completing the data sheet, save the changes to the SmartPlant Foundation database by clicking *Save* on the task pane.**



Using the Datasheet

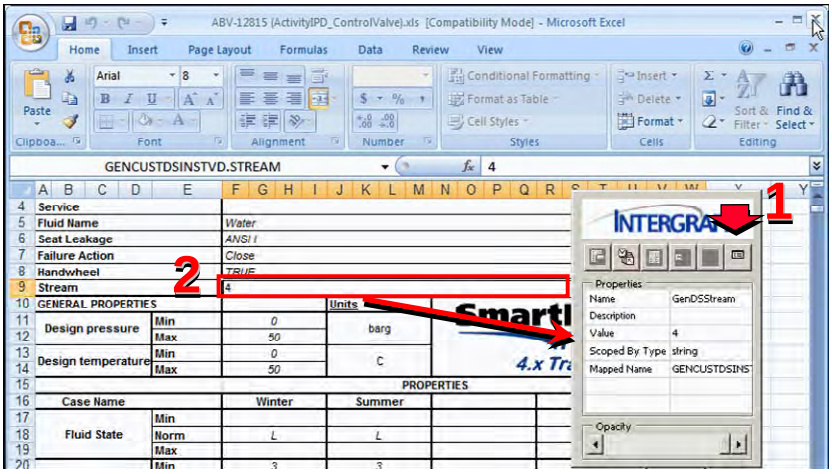
The task pane will expand to display the results of the save.

© 2005. Intergraph Corp.
All Rights Reserved.

The task pane can also be used to review information about properties mapped to the datasheet.

Using the Datasheet

- **Click the *Properties* button (1) or in a specific cell (2) to expand the task pane and display the property values for the active cell.**

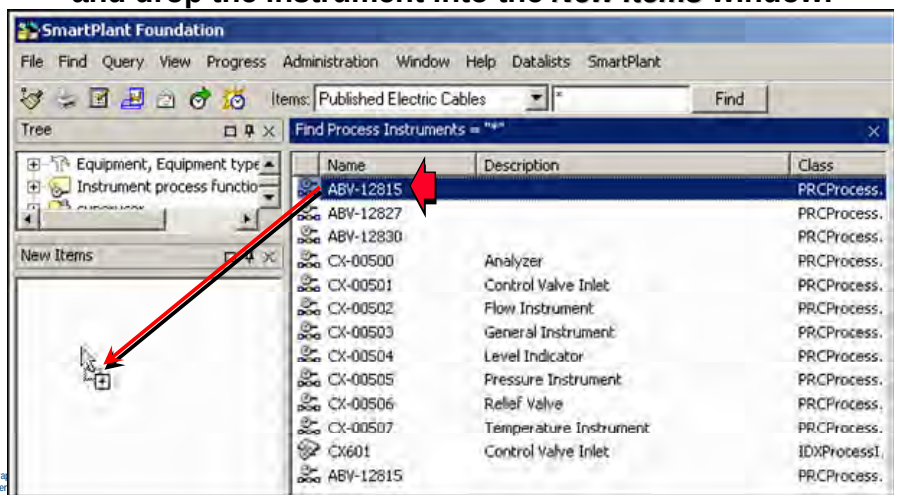


© 2005. Intergraph Corp.
All Rights Reserved.

The instrument manipulated with the datasheet had two process cases associated with it.

Viewing Datasheet Results

- **Click on the instrument, hold the control key and drag and drop the instrument into the *New Items* window.**

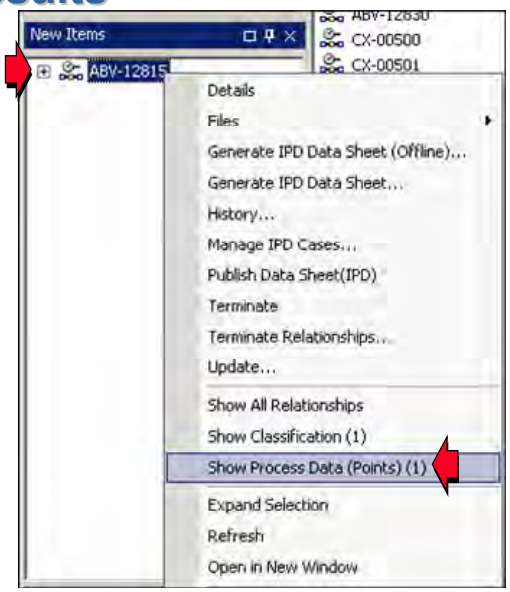


© 2005. Intergra
All Rights Reser

The New Items window can be used to show the instrument, its process data point and its process cases.

Viewing Datasheet Results

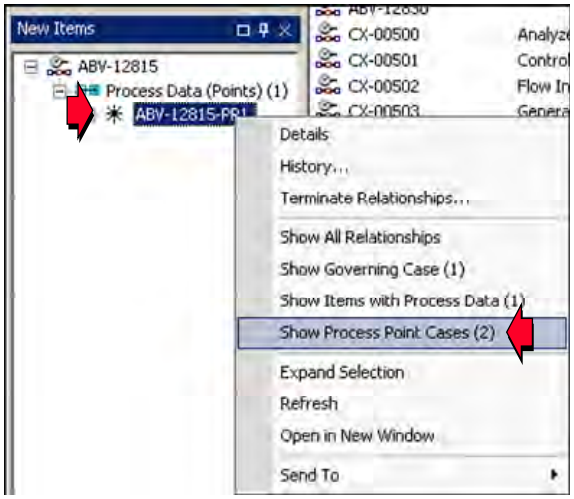
- **Right-click on the modified instrument and select *Show Process Data (Points) (1)* from the dynamic menu.**



© 2005. Intergraph Corp.
All Rights Reserved.

Viewing Datasheet Results

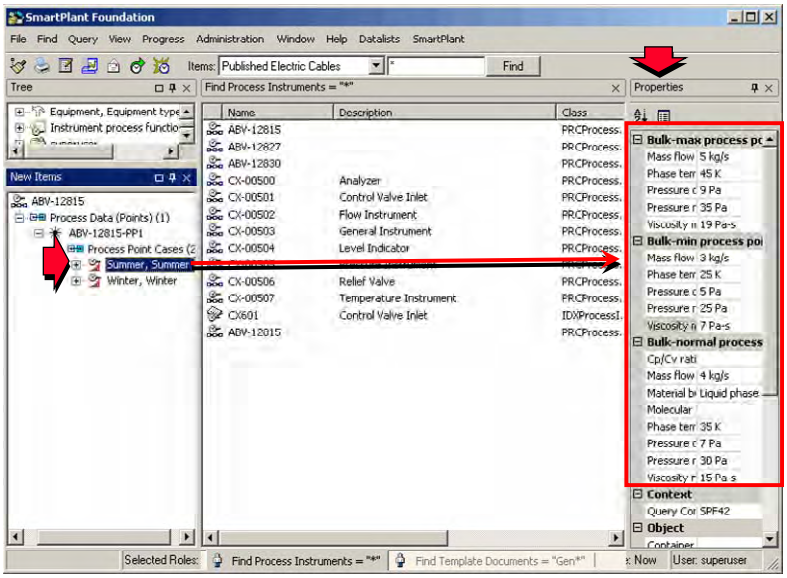
- **Right-click on the process data point and select *Show Process Point Cases (2)* from the dynamic menu.**



© 2005. Intergraph Corp.
All Rights Reserved.

Use the properties window to review the changes made during the datasheet editing session.

Viewing Datasheet Results



- **Click on one of the displayed cases to view the values updated by the datasheet in the properties window.**

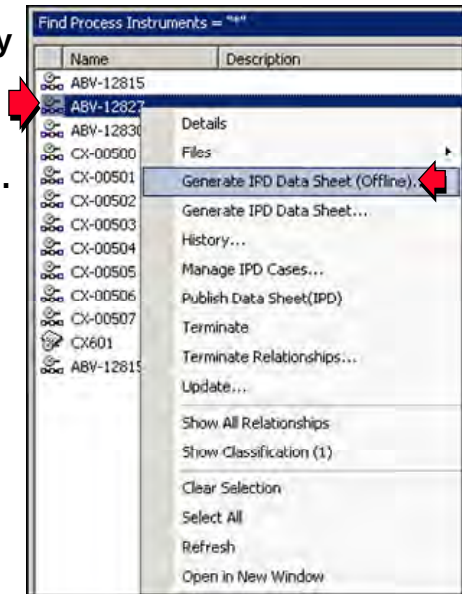
10.14 Using Datasheets Offline

The Generate IPD Data Sheet (Offline) command can be used to enable offline datasheet functionality. This allows you to generate the necessary datasheet files into a folder, send it to an offline user and then when the datasheet is sent back, the information can be loaded into SPF.

INTERGRAPH

Generating an Offline Datasheet

- **Launch the datasheet again by using the right mouse button on a *Process Instrument* and selecting the *Generate IPD Data Sheet (Offline)* command.**

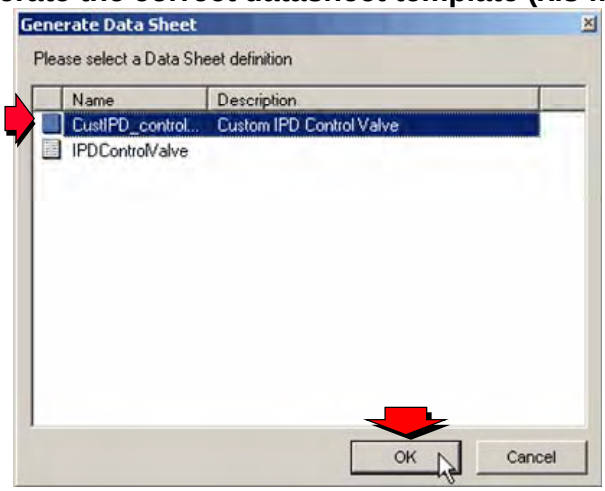


© 2005. Intergraph Corp.
All Rights Reserved.

Again, if there is more than one datasheet template object associated with the instrument object, you will be prompted to select the desired Data Sheet (datasheet definition).

Generating an Offline Datasheet

- **Select the desired *Datasheet Definition* in order to generate the correct datasheet template (xls file).**

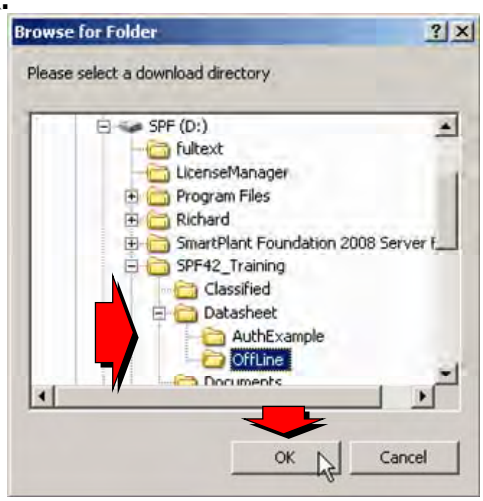


© 2005. Intergraph Corp.
All Rights Reserved.

You will be prompted to save the datasheet as an offline XLS file that can be used later.

Generating an Offline Datasheet

- **Select a folder from the *Browse for Folder* dialog box and click OK.**

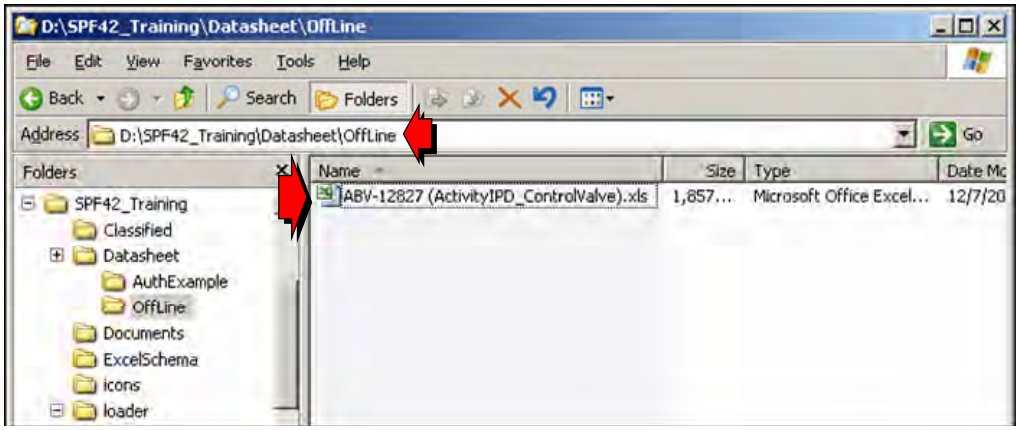


© 2005. Intergraph Corp.
All Rights Reserved.

The saved file can now be sent to an external user in order to perform datasheet manipulations.

Generating an Offline Datasheet

- **Verify that the datasheet template was saved to the *Offline* folder that was specified.**

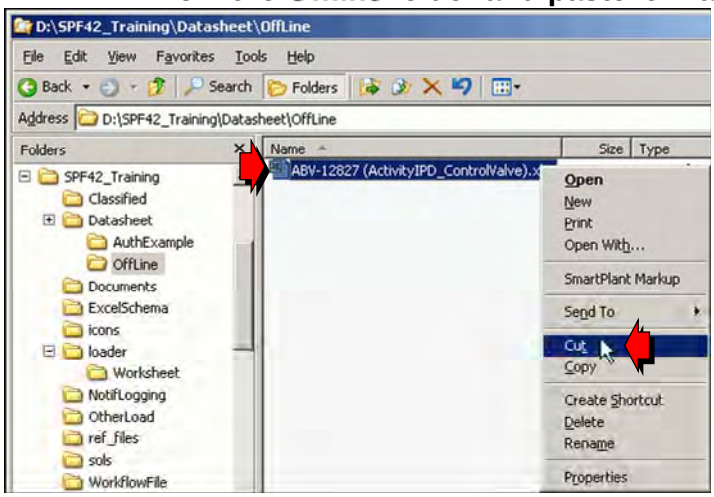


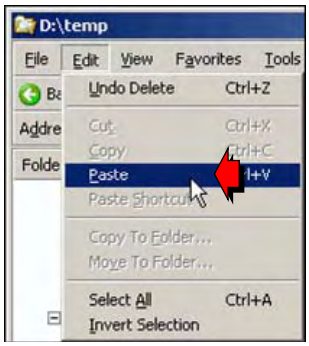
© 2005. Intergraph Corp.
All Rights Reserved.

Use a cut and paste option to simulate sending the datasheet to an outside user.

Generating an Offline Datasheet

- **For this example, cut the datasheet template (xls file) from the Offline folder and paste it in a different location.**

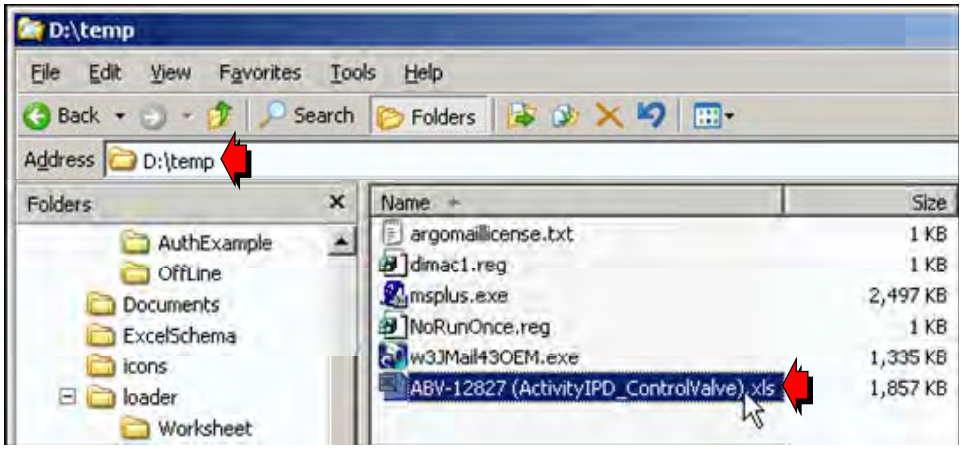




By removing the spreadsheet from the Offline folder, you set the SPF system not to access this file when it is opened by an "*offline user*".

Generating an Offline Datasheet

- **Double-click on the datasheet template (xls file) to launch the datasheet offline.**

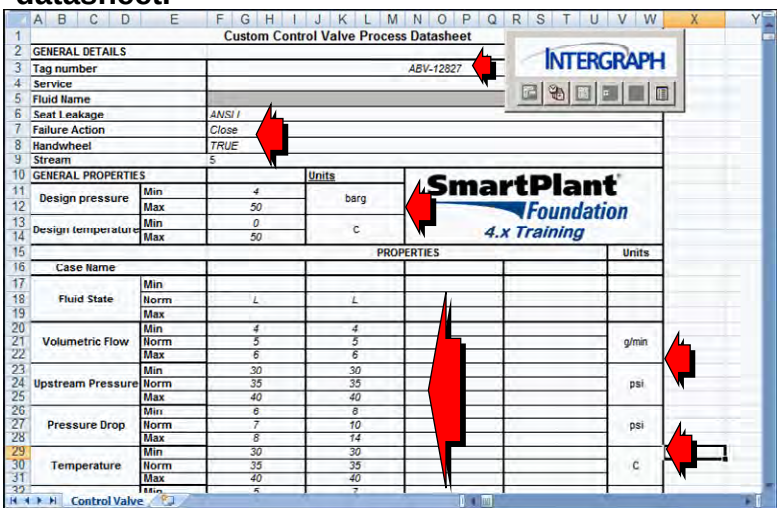


© 2005. Intergraph Corp.
All Rights Reserved.

This simulates running the datasheet as an offline user.

Generating an Offline Datasheet

- **Enter desired *new* property values in the fields of the datasheet.**

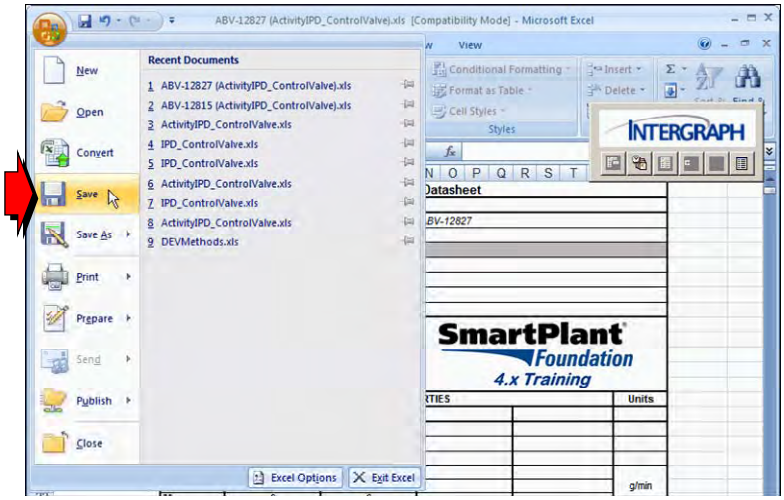


© 2005. Intergraph Corp.
All Rights Reserved.

Once the offline modifications are made, save the spreadsheet using the normal **Excel save** command.

Generating an Offline Datasheet

- **From the Excel menu, select the *Save* command to save this datasheet along with the changes.**



© 2005. Intergraph Corp.
All Rights Reserved.

The saved files will be placed in the folder where the spreadsheet resides. The files that should be in the *temp* folder are the Excel worksheet and an xml file.

In order to provide for enhanced datasheets, the spreadsheet macro will export the data from a datasheet to xml. The macro, *SavePropertiesAndReldataToXML*, writes "Properties" and "Reldata" to xml. The XML file name is extracted from the <workbook> name and saved in the same directory of the offline Excel file.

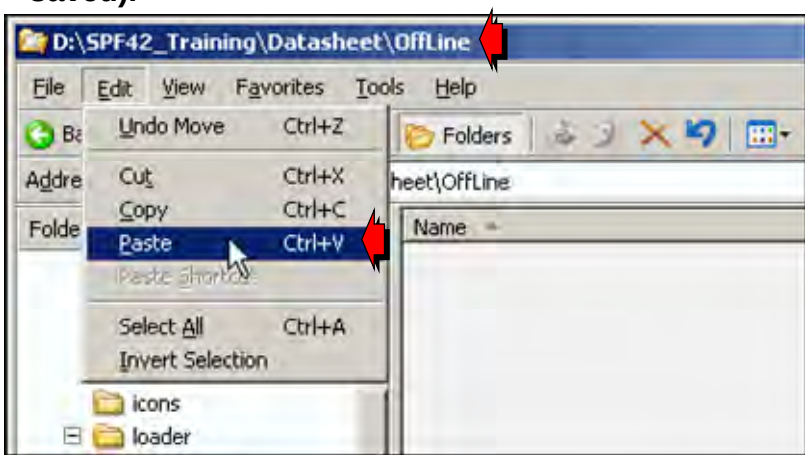
Generating an Offline Datasheet

- **For this example, cut the files created by the Excel save from the temp folder.**

© 2005. Intergraph
All Rights Reserved

Generating an Offline Datasheet

- **For this example, paste the cut files in the Offline folder (the location where the datasheet template was originally saved).**

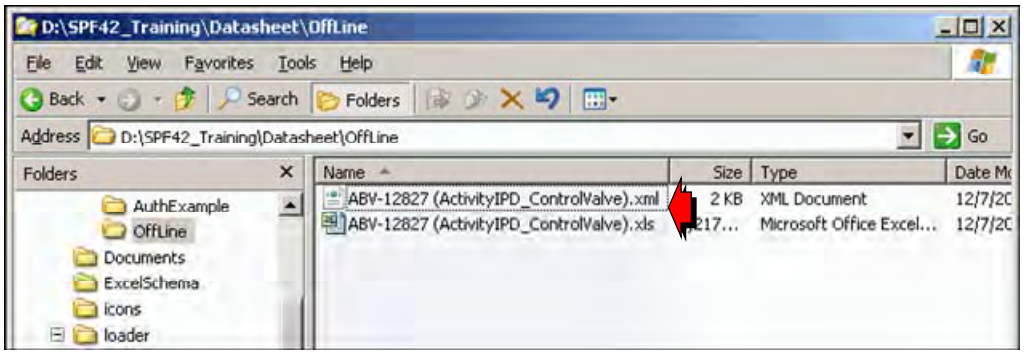


© 2005. Intergraph Corp.
All Rights Reserved.

Unless you are using enhanced datasheets, it is recommended that you ignore the XML file and only load the datasheet XLS.

Generating an Offline Datasheet

Even though two files are generated by the offline operation, the XLS file will be used to load the datasheet changes back into SPF.



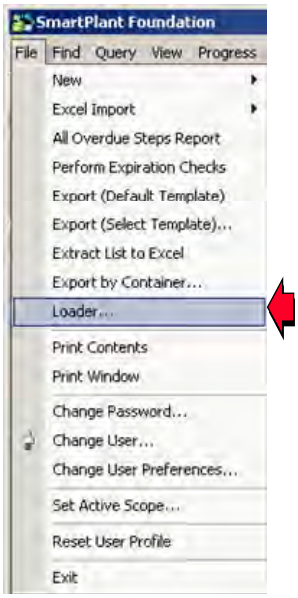
© 2005. Intergraph Corp.
All Rights Reserved.

10.14.1 Loading Offline Datasheet Updates

Once the offline user sends the datasheet files back, the Desktop Client can be used to load the datasheet information. This is accomplished by using the DTC Loader.

Generating an Offline Datasheet

- **Launch the Desktop client and from the menu bar, click *File > Loader*.**

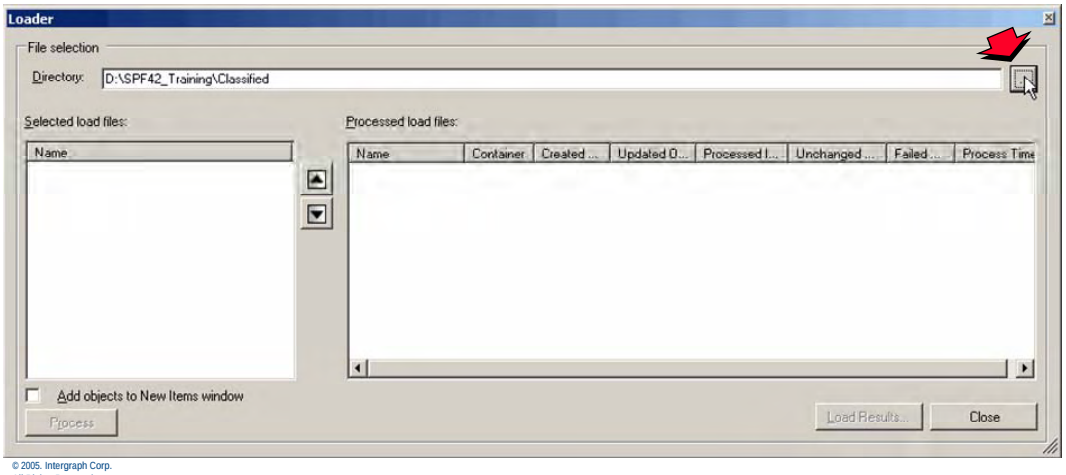


© 2005. Intergraph Corp.
All Rights Reserved.

To find the file that you want to process with the loader, click the ellipsis button at the top of the window.

Generating an Offline Datasheet

- **Use the ellipsis button to find the location of the offline datasheet files.**

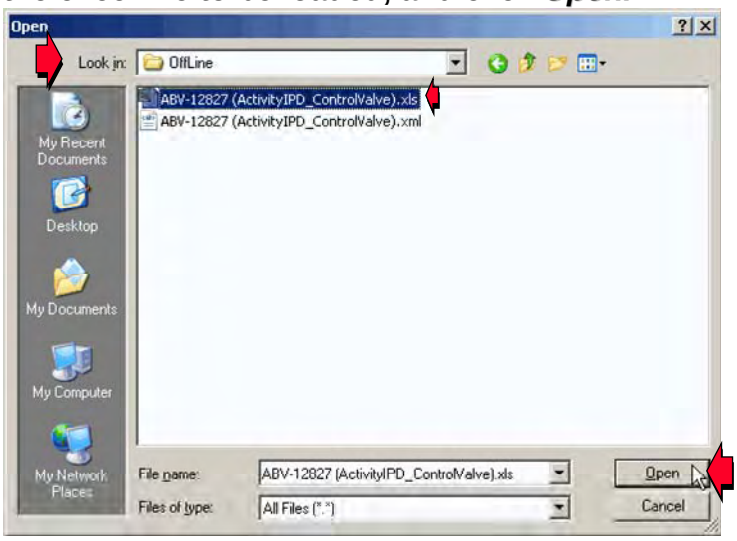


© 2005. Intergraph Corp.
All Rights Reserved.

Using the standard Microsoft ***Open*** dialog box, find the XLS file to load.

Generating an Offline Datasheet

- **Select the excel file to be loaded, and click *Open.***

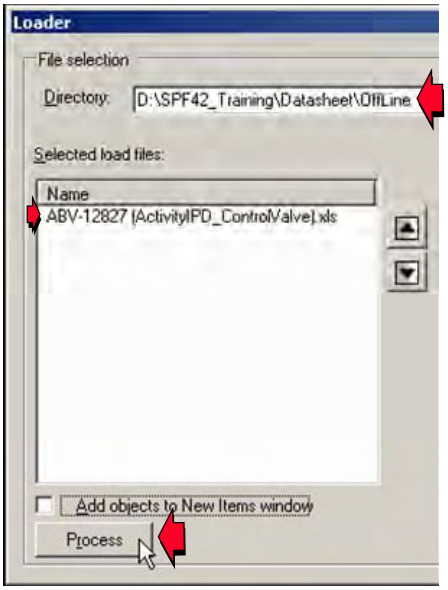


© 2005. Intergraph Corp.
All Rights Reserved.

When you are ready to begin the load process, click the ***Process*** button at the bottom of the window.

Generating an Offline Datasheet

- **Verify the load files and click *Process* to start the load.**

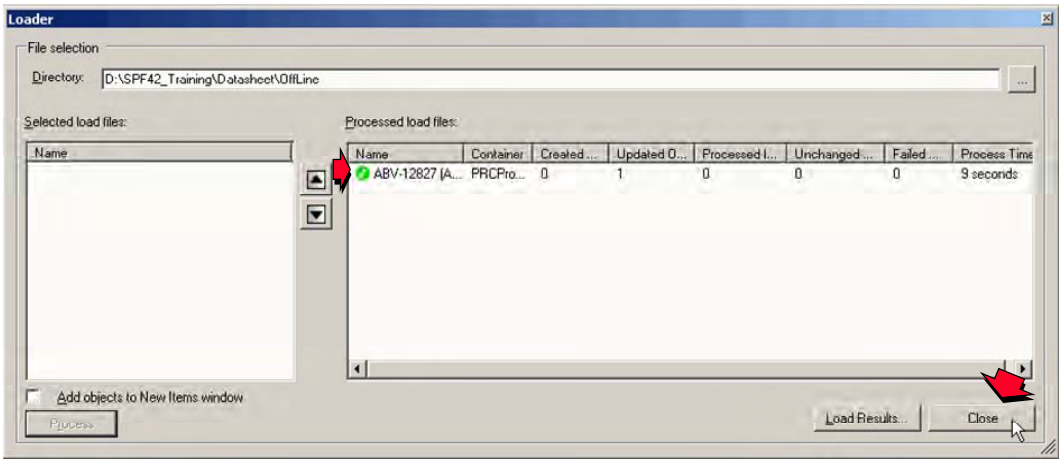


© 2005. Intergraph Corp.
All Rights Reserved.

A green icon indicates that the datasheet file was loaded successfully.

Generating an Offline Datasheet

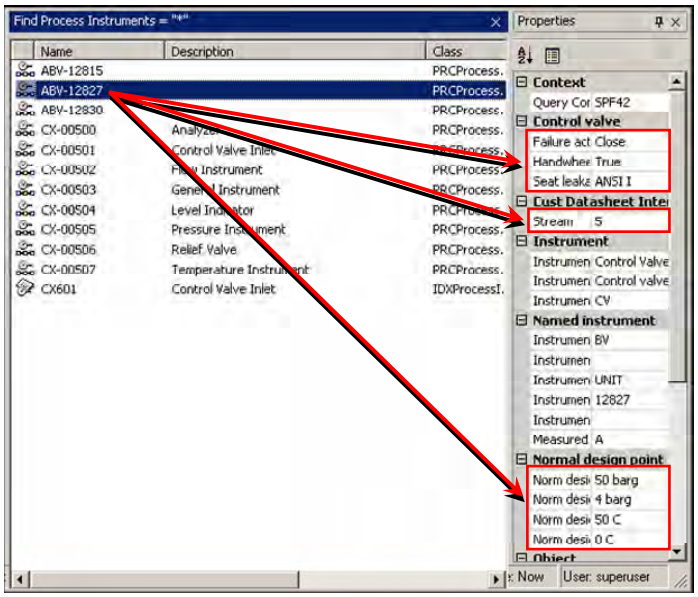
- **Click *Close* to dismiss the Desktop Client Loader.**



© 2005. Intergraph Corp.
All Rights Reserved.

Use the Desktop Client to find and view the values of the instrument manipulated by the offline datasheet.

Generate Datasheet Offline



- **Search for *Process Instruments* to see the results of the offline datasheet operation and the load.**

10.15 Activity 3 – Testing Custom Datasheets

Complete **Chapter 10 - Activity 3** in the SPF Configuration and Administration II activity workbook.

CHAPTER 11

Adhoc and Line List Reports

11. Adhoc Reporting

Adhoc reports provide a fast way to view objects and related object information. The format, or layout, of a report is fully customizable. You can save the layout definitions to create custom reports that you can reuse.

In order to provide Adhoc reporting for SPF it will be necessary to make use of the View Def /Graph Def concepts within SPF.

INTERGRAPH

Adhoc and Line List Reporting

In this chapter the steps necessary to create an Adhoc Report and a Line List (Adhoc) report will be covered.

These steps include:

- **Outline the objects (Interface Defs) and properties which will comprise the report**
- **Report content are derived from Graph Defs and View Defs**
- **Properties of InterfaceDefs are configured as the columns of the report.**
- **Adhoc reports have different options and filtering**
- **Report destinations include Desktop Client browser Window (default), Excel, Word, HTML**

© 2005. Intergraph Corp.
All Rights Reserved.

Before creating a report first outline the data you wish to display and how it will be presented on the report.

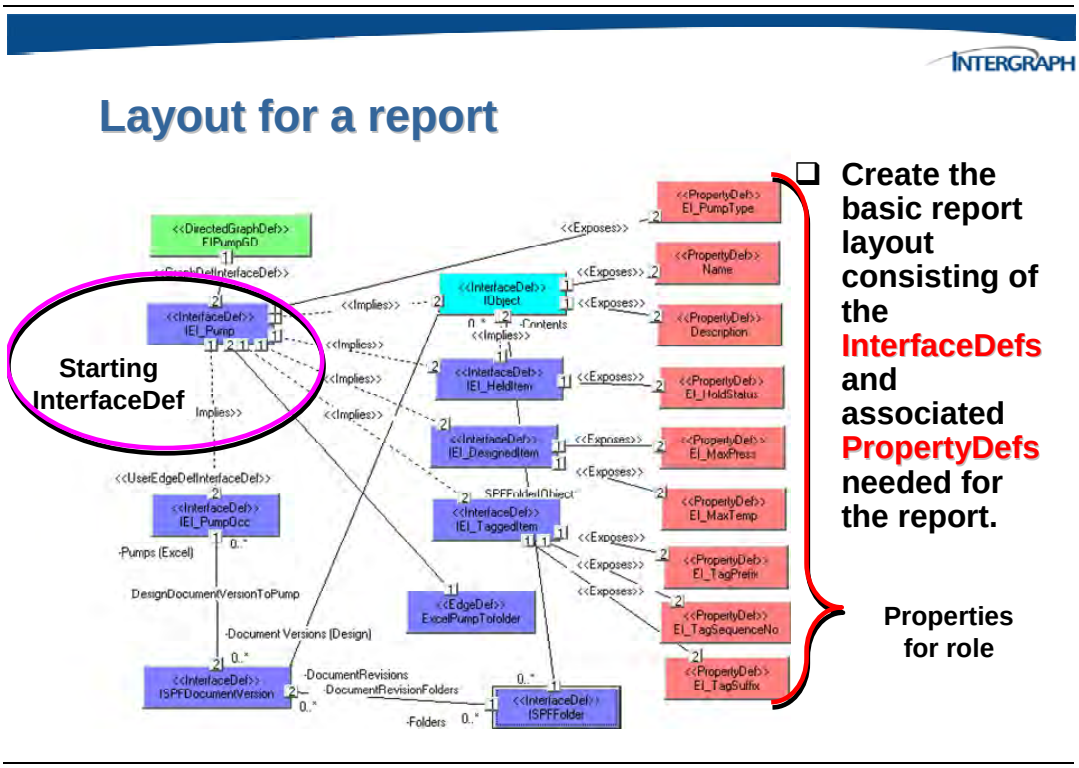
Example:

EIPump – Pump object

SPFFolder – Folders related to the pump.

SPFDocumentVersion – Document versions related to the pump.

Below is an example using the custom class EIPump and it's related objects.



After understanding the layout, start the report by creating the report's Graph Definition.

11.1 Creating a Report Graph Definition

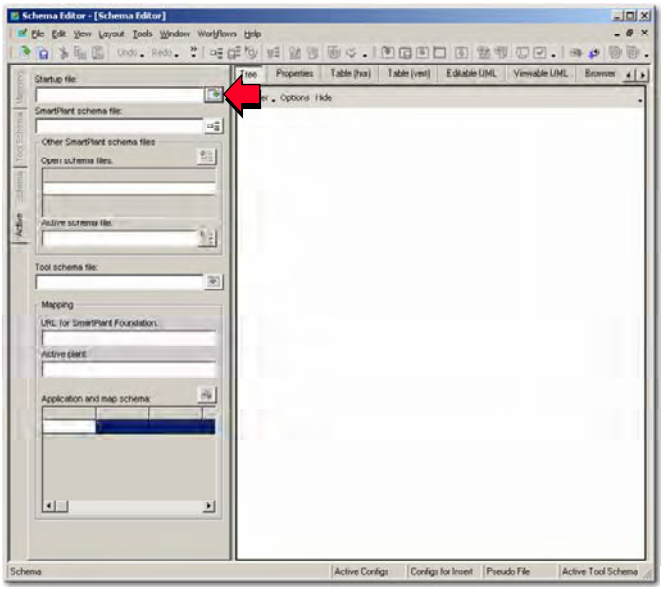
The contents of an Adhoc report are controlled by defining a Graph Def containing all of the properties that will be used in the report. The Graph Def is defined by an administrator and not the end user who will be generating the report.

To define the necessary Graph Def, open the *SmartPlant Schema Editor* utility in the *standard* mode. Then click the button beside the ***Startup file*** field.

INTERGRAPH

Create Graph Definition

- **Start the Schema Editor tool and click the *Startup* file button.**

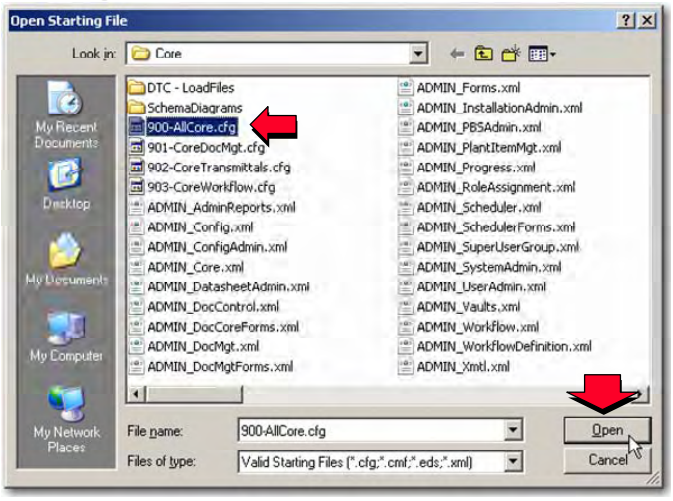


© 2005. Intergraph Corp.
All Rights Reserved.

Select the *900-AllCore.cfg* file from the \Program Files\SmartPlant\Foundation\2008\Models\Core folder.

Create Graph Definition

- **In the list of available files, click the configuration (900-AllCore.cfg) to open in the Schema Editor.**

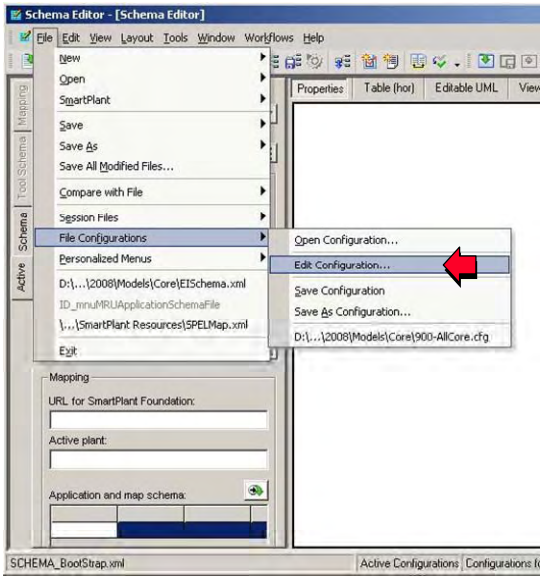


© 2005. Intergraph Corp.
All Rights Reserved.

Once you have opened the necessary files, you need to edit the configuration file that will control all these files and make the EISchema both editable and the active schema.

Create Graph Definition

- **From the menu bar, click *File > File Configurations > Edit Configuration*.**

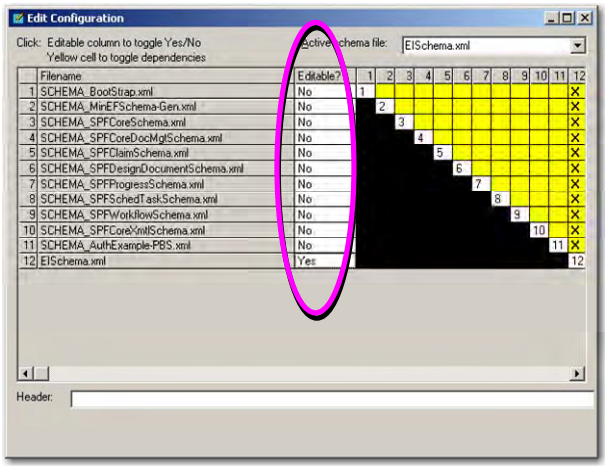


© 2005. Intergraph Corp.
All Rights Reserved.

First, make sure that only the EISchema has a **Yes** in the Editable column. That file is the only one that you should make any changes to.

Create Graph Definition

- **Use the *Editable* field to set the permissions on the schema files in this configuration. Only the EISchema should be editable.**

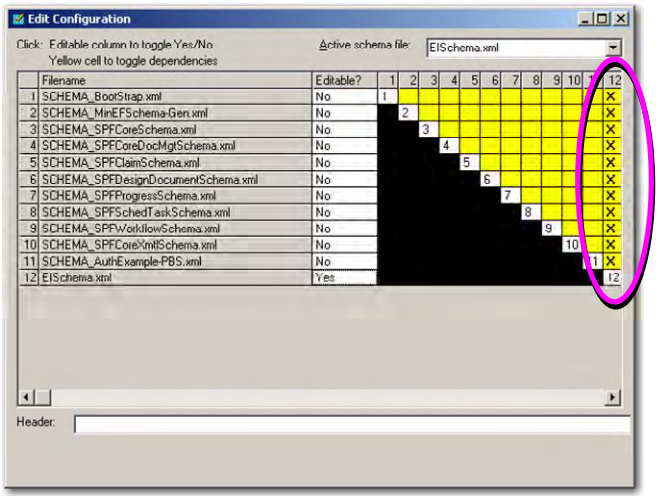


© 2005. Intergraph Corp.
All Rights Reserved.

Next, set your dependencies. The EISchema file is dependent on all the others in the list.

Create Graph Definition

- **Next make sure that the EISchema file is dependent on all the other files in the configuration.**

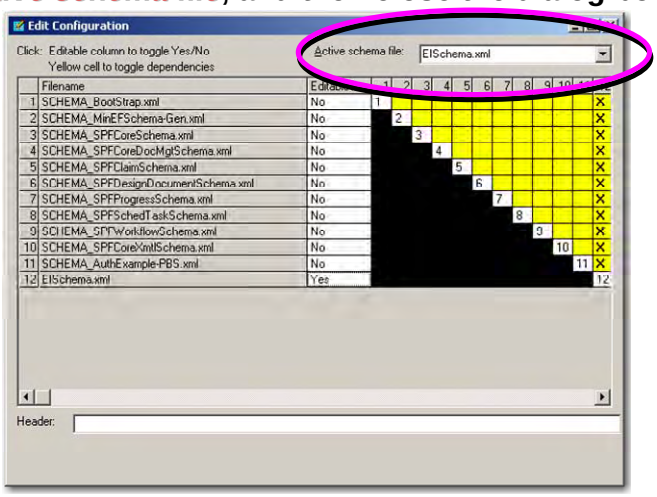


© 2005. Intergraph Corp.
All Rights Reserved.

Finally, make sure that the EISchema file is selected in the ***Active schema file*** field. This selection will tell the system that any new objects should be placed in the EISchema file.

Create Graph Definition

- **Finally, make sure that the *EISchema* file is selected as the *Active schema file*, and then close the dialog box.**

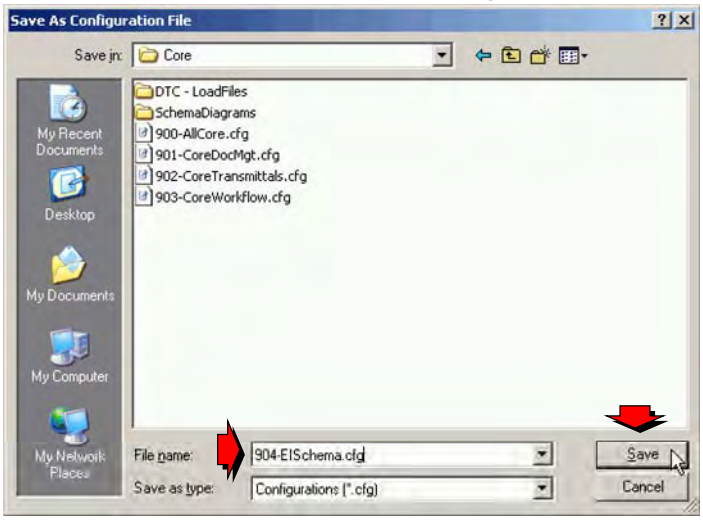


© 2005. Intergraph Corp.
All Rights Reserved.

Save the new configuration file. We don't want to change the 900-AllCore configuration file, so create a new one for our purposes. Name the new configuration file ***904-EISchema.cfg*** and save it into the same directory as the ***900-AllCore.cfg***.

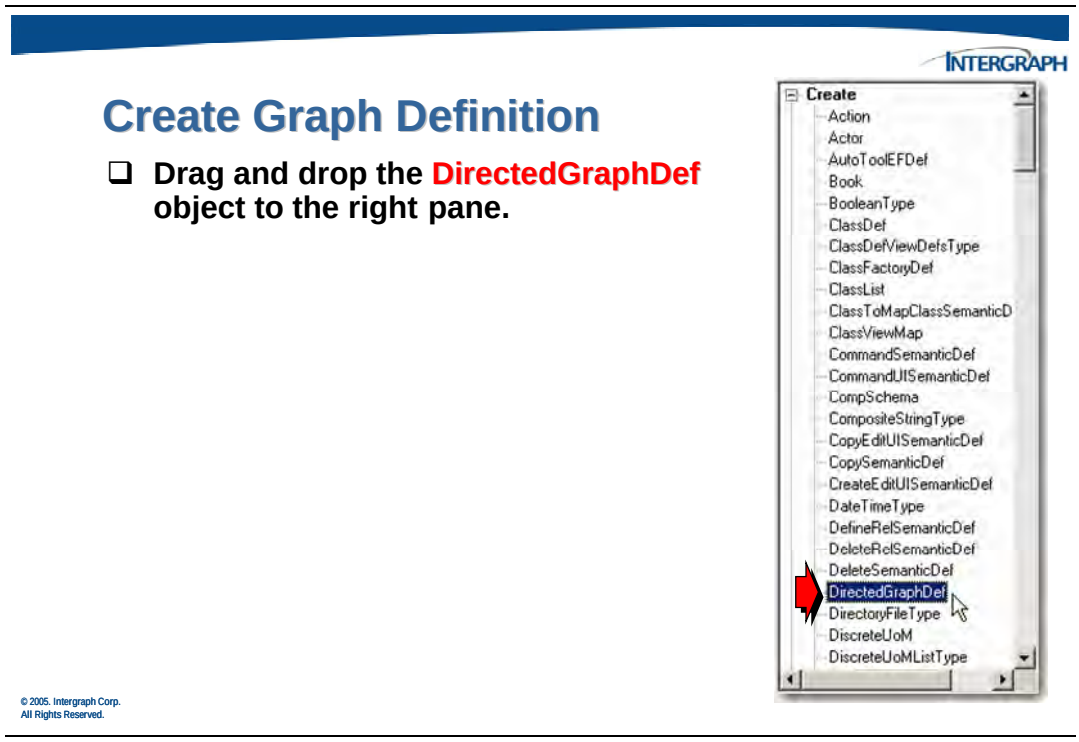
Create Graph Definition

- **Enter a name for the new file configuration, and click *Save*.**



© 2005. Intergraph Corp.
All Rights Reserved.

Now you are ready to use the Schema Editor to create the Graph Def for use with the new EIPump class definition.
To create a new graph definition, find the ***DirectedGraphDef*** option from the ***Create*** section of the ***Editor*** view, and drag and drop it into the UML window.

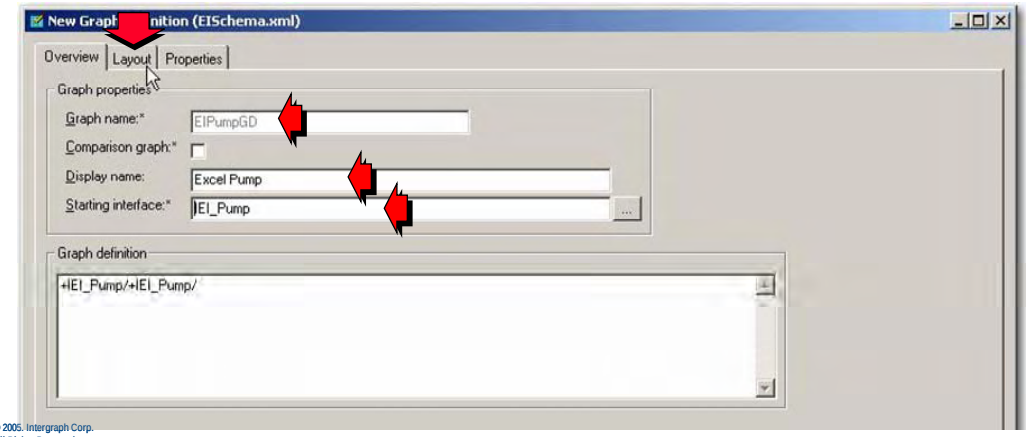


When the New Graph Definition form appears, provide the following information for the new Graph def:

- ***Graph name*** – EIPumpGD
- ***Display name*** – Excel Pump
- ***Starting interface*** – IEI_Pump

Create Graph Definition

- **Enter a *Graph Name*, a *Display name*, and choose a *Starting interface*. Then open the *Layout* tab.**

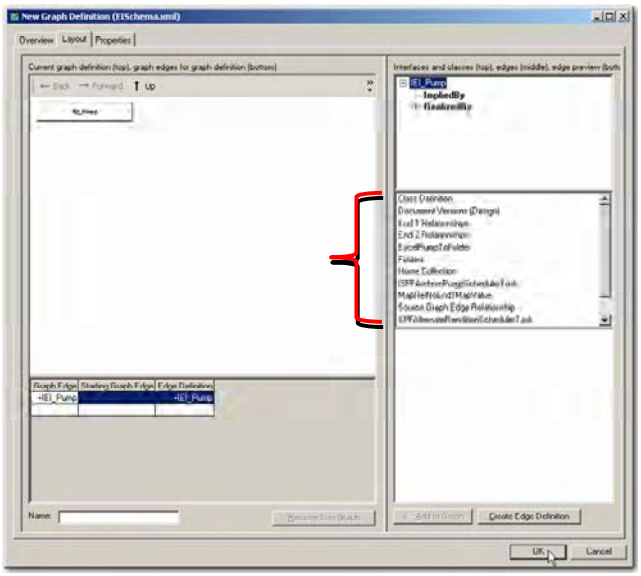


© 2005. Intergraph Corp.
All Rights Reserved.

When you have finished providing information about the new graph def, click the *Layout* tab.

Create Graph Definition

- **Use the roles and edge defs in the middle pane of the right-hand side to add paths to the Graph Def.**

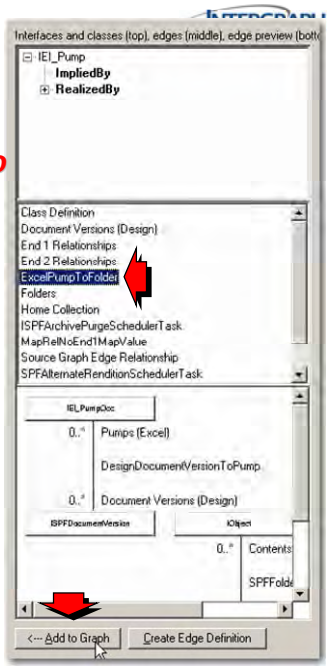


© 2005. Intergraph Corp.
All Rights Reserved.

Click the ***ExcelPumpToFolder*** edge def in the middle pane, and click the ***Add to Graph*** button.

Create Graph Definition

- **Select the *ExcelPumpToFolder* edge def in the middle pane, and click *Add to Graph* to add this edge to the GraphDef.**



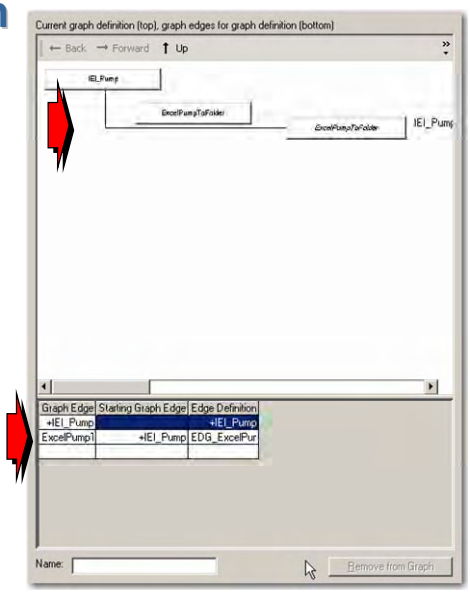
© 2005. Intergraph Corp.
All Rights Reserved.

The relationship or edge def will appear in both the top and bottom panes on the left-hand side of the menu.

INTERGRAPH

Create Graph Definition

- **The edge appears in both the graphical display at the top and the tabular display on the bottom of the right-hand side pane of the window.**

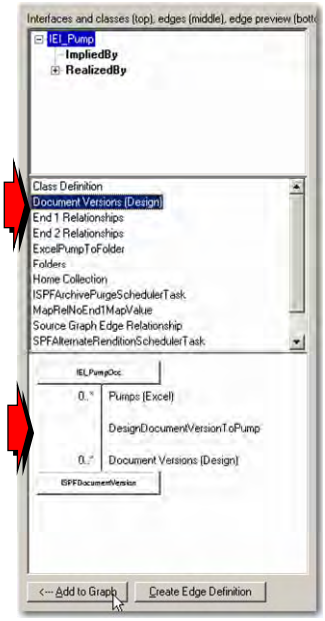


© 2005. Intergraph Corp.
All Rights Reserved.

From the middle pane, select the ***Document Versions (Design)*** role. Click the ***Add to Graph*** button to add to the path on the left.

Create Graph Definition

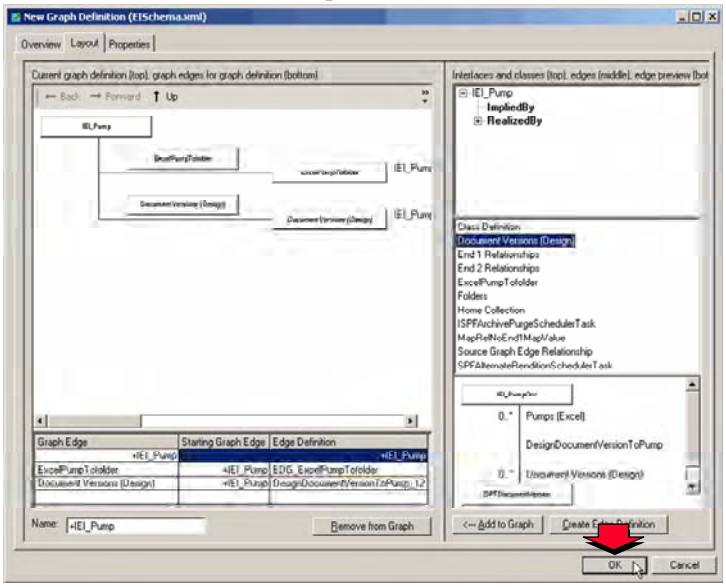
- **Next, find the *Document Versions (Design)* role from the middle pane of the left-hand window. Click *Add to Graph*.**



© 2005. Intergraph Corp.
All Rights Reserved.

Click ***OK*** to create the graph definition. Once the report *Graph Def* exists, the report *View Def* can be created.

Create Graph Definition

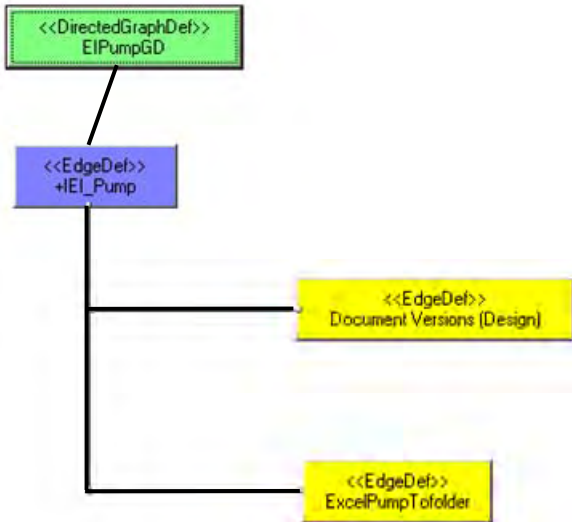


- **Review the edges and reldefs on the right-hand side of the window, and then click *OK*.**

The *Graph Definition* (shown below) is needed for the Excel Pump report is used collect the interfaces and properties that define the content of the report. The next step is to create the *View Definition*, which will specify the actual layout for the report.

Results of Report Graph Def

This UML diagram shows the report GraphDef contents that have been added to the schema.



© 2005. Intergraph Corp.
All Rights Reserved.

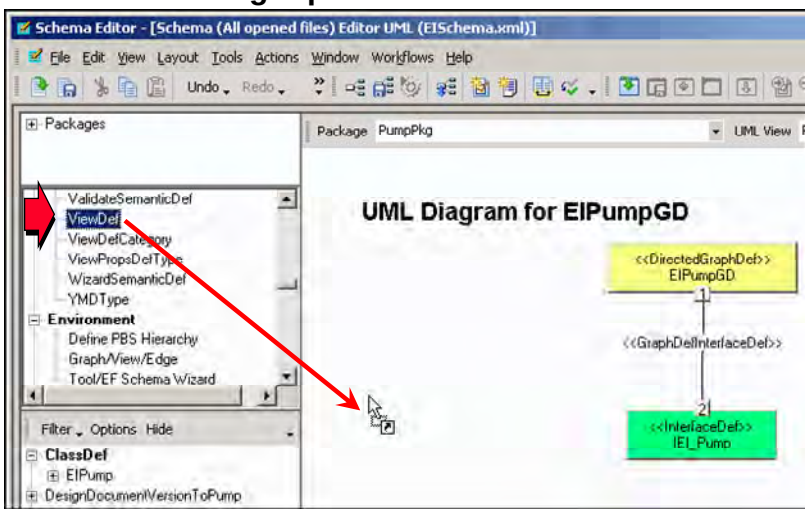
11.2 Creating a Report View Definition

A view definition is based on a directed graph definition and, therefore, like the directed graph definition, has a relationship to its starting interface definition. In actuality, this interface definition is always the same interface definition as that for its Directed Graph Definition. The *View Definition* will select the **Properties** from the Graph Def that will be displayed within the report.

INTERGRAPH

Create View Definition

- **Drag and drop the ViewDef object type from the *Create* section to the right pane.**

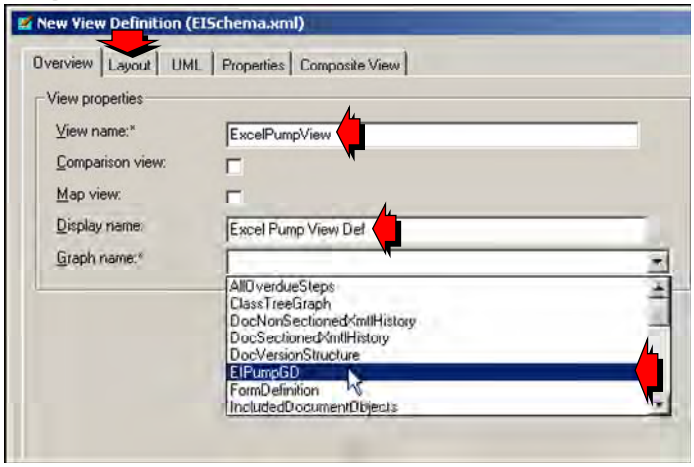


© 2005. Intergraph Corp.
All Rights Reserved.

The *New View Definition* dialog will display

Create View Definition

- **Enter a *View Name*, a *Display name*, and choose the graph def that will be used to define the new view def. Then open the *Layout* tab.**

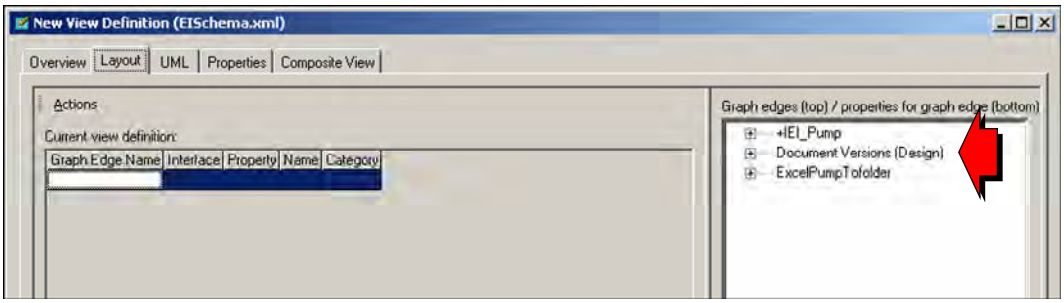


© 2005. Intergraph Corp.
All Rights Reserved.

Select the Graph Def to work with, in this example it is **EIPumpGD.**

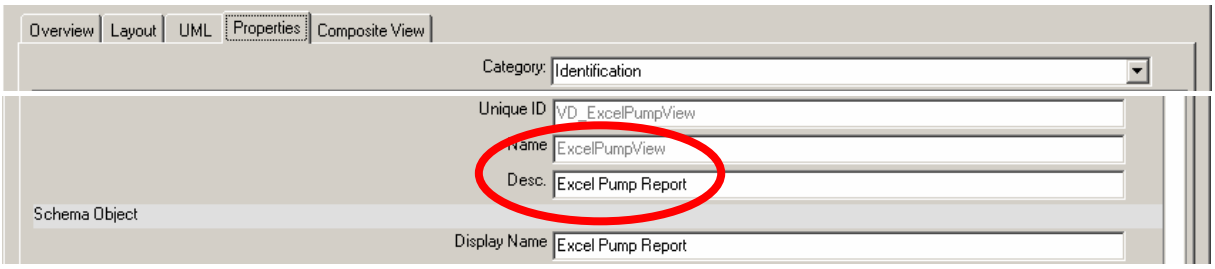
Create View Definition

- **Use the list of interfaces, rel defs, and edge def to find the properties you want to add to the view def.**

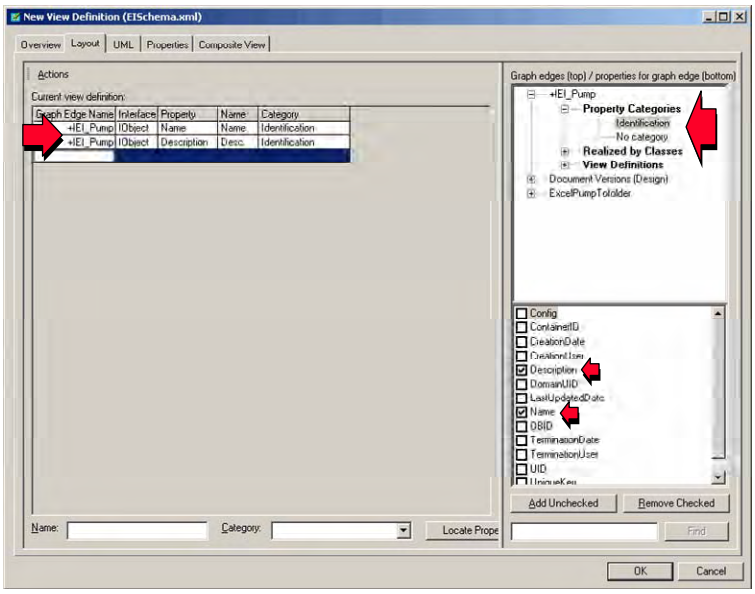


© 2005. Intergraph Corp.
All Rights Reserved.

Note: In order for the View Def to display in the *New Report* dialog within the SmartPlant Foundation Desktop Client, click the ***Properties*** tab and enter a **Desc.** value for the View Def as shown below.



Create View Definition

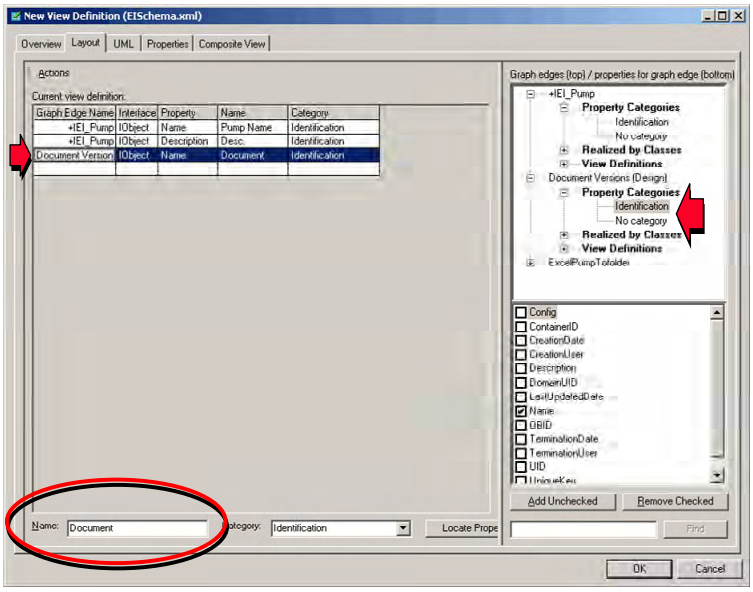


- **Drill down under *IEI_Pump > Property Categories > Identification*, and find the name and description properties for the pump.**

The word *Name* will display in this window by default. Edit the name in this field to make the property unique, for example use **Pump Name**.

Expand the ***Document Versions (Design)*** role in the top, right pane, and add the ***Name*** property. Modify the name of the property to reflect that this is the name of a document version associated with the pump.

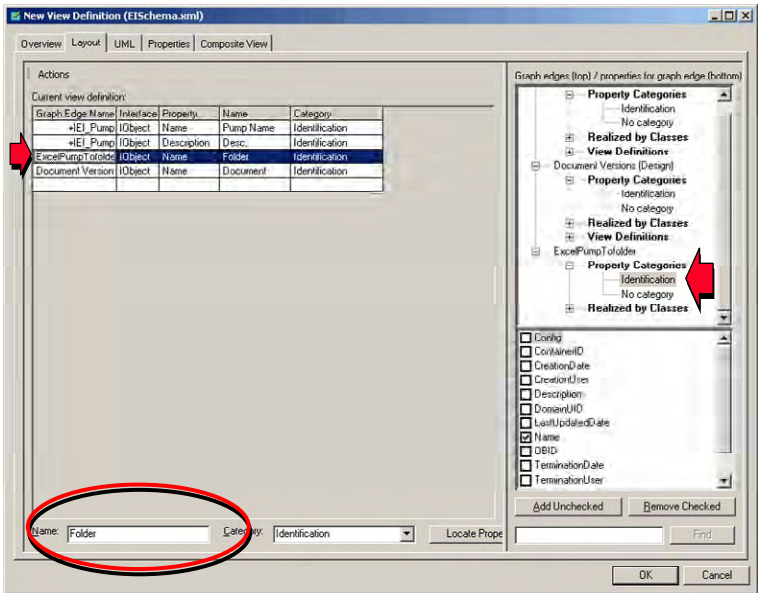
Create View Definition



- **Drill down under the *Document Versions (Design)* role, and add the *Name* property for the document to the view def. Then rename the property.**

Expand the ***ExcelPumpToFolder*** edge definition, and find the ***Name*** property to add to the view def. Modify the display name of the property to indicate that this is the name of the folder associated with the pump.

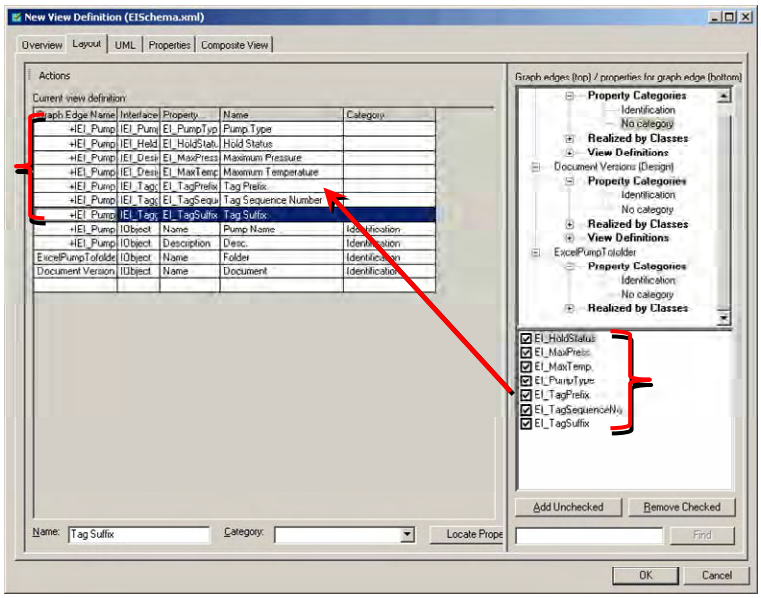
Create View Definition



- **Expand the *ExcelPumpTo Folder* edge def and find the *Name* property for the folder. Add it to the view def and rename it.**

From the ***No category*** property category under the ***IEI_Pump*** interface, find the custom properties you created to describe the new pumps. Add the custom properties to the view def and modify their names, as necessary.

Create View Definition

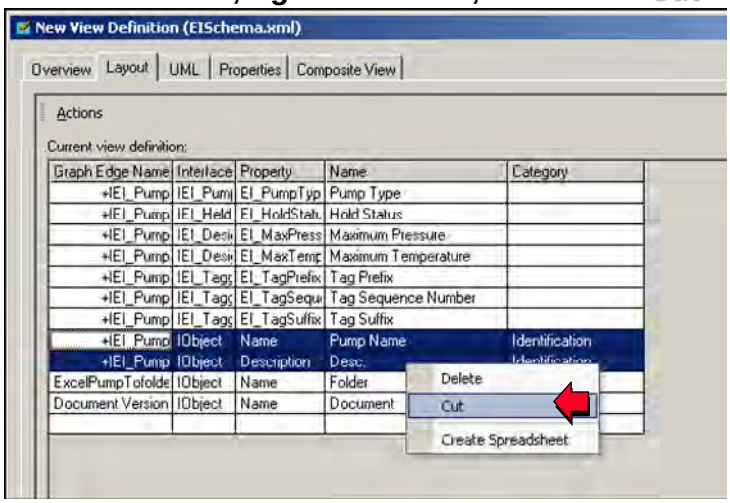


- **Under the *IEI_Pump* interface, find the custom properties and add them to the view.**

To change the order of the properties in this new def, select the row or rows that you want to move. Right-click on the selection, and use the ***Cut*** command.

Create View Definition

- **To change the order of the properties in the grid, select a row or rows then, right-click on it, and select *Cut*.**

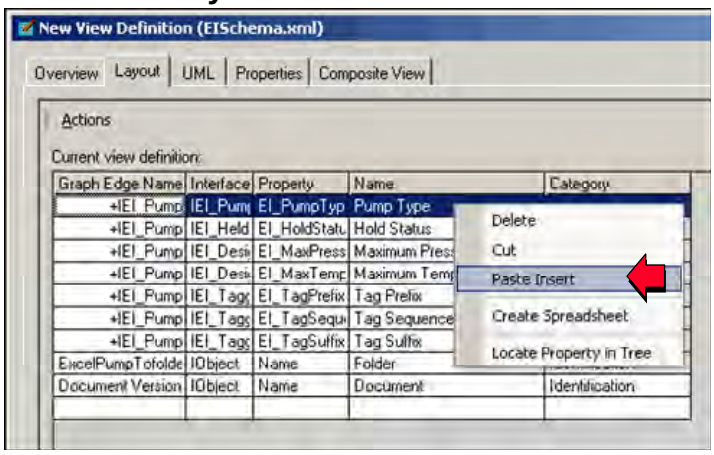


© 2005. Intergraph Corp.
All Rights Reserved.

Select the row above which you want to place the cut rows, right-click, and choose the ***Paste Insert*** command.

Create View Definition

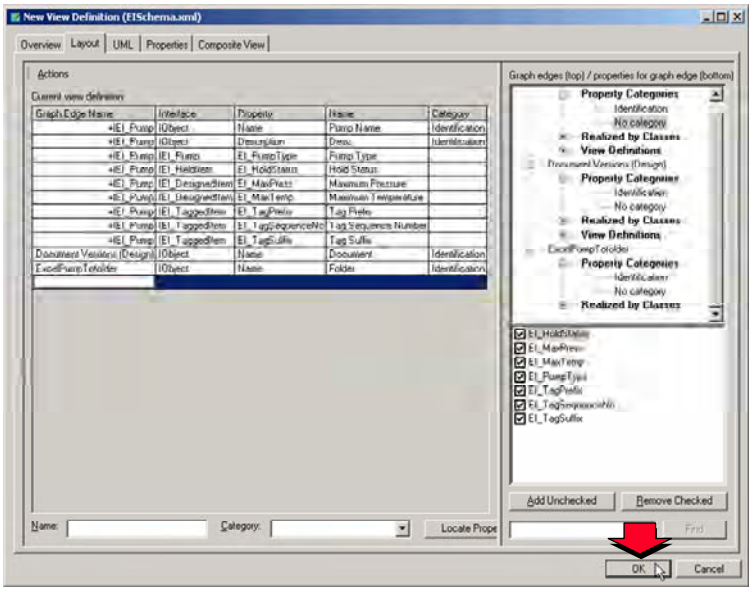
- **Select the row where you want to add the cut rows.**
- **Right-click and choose the *Paste Insert* option to add the cut rows above your current location.**



© 2005. Intergraph Corp.
All Rights Reserved.

At this point, you can click ***OK*** to create the view definition.

Create View Definition



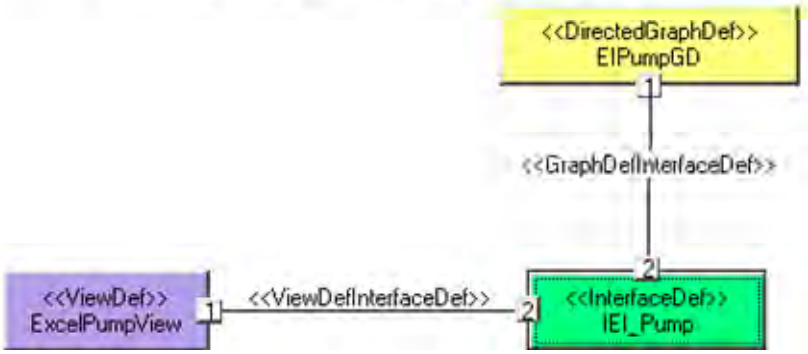
- **Click *OK* to create the view def.**

The *Graph Def* and *View Def* needed for the Excel Pump Report are now ready to be loaded into the SPF database.

Results of Report Graph and View

The UML diagram shows the report GraphDef and ViewDef that have been added to the schema.

UML Diagram for EIPumpGD



© 2005. Intergraph Corp.
All Rights Reserved.

11.3 Custom Line List Adhoc Report Contents

Line Lists can easily be created within the Adhoc configuration scheme. In the following section, a possible custom configuration for a Line List report will be shown.

Line List Adhoc Reports

An understanding of the Schema configuration is needed to configure the correct Line List report structure.

- **Line Lists can easily be created within the Adhoc configuration scheme.**
- **Use the Schema Editor and Adhoc rules to configure a Line List report.**

© 2005. Intergraph Corp.
All Rights Reserved.

Line List Adhoc Reports

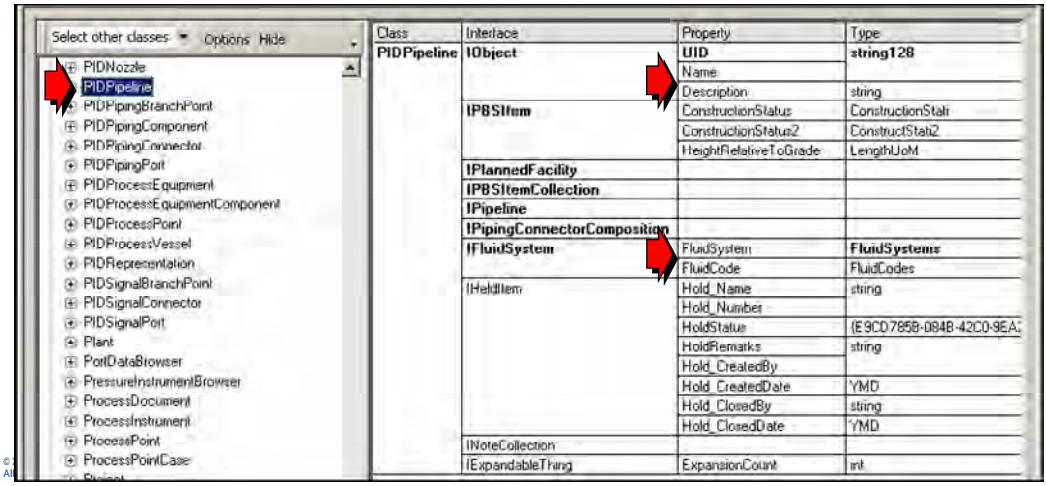
- **The first step is to create a Graph Definition using the Line information properties from the schema model.**
- **In this section, the example of the IPipeline interface and several relationships from this interface to collect the required properties will be used.**
- **In the Graph Def, start with the IPipeLine interface def.**
- **Relationships used are *FacilityPoints*, *PBSParent* and, *PipingConnections***
- **Once these object are configured, save the Graph Def by clicking OK.**

© 2005. Intergraph Corp.
All Rights Reserved.

The following example shows using the Schema Editor to view possible properties to be included in the Line List report.

Line List Adhoc Reports

Use the Schema Editor and a Tree/Table view to determine what properties will be used in a custom Line List report.



INTERGRAPH

Line List Adhoc Reports

Zoomed in view of the Tree/Table view

Class	Interface	Property	Type
PIDPipeline	**IObject**	**UID**	**string128**
		Name	
		Description	string
	IPBSItem	ConstructionStatus	ConstructionStati
		ConstructionStatus2	ConstructStati2
		HeightRelativeToGrade	LengthUoM
	IPlannedFacility		
	IPBSItemCollection		
	IPipeline		
	IPipingConnectorComposition		
	IFluidSystem	FluidSystem	**FluidSystems**
		FluidCode	FluidCodes
	IHeldItem	Hold_Name	string
		Hold_Number	
		HoldStatus	{E9CD7858-084B-42C0-9EA2
		HoldRemarks	string
		Hold_CreatedBy	
		Hold_CreatedDate	YMD
		Hold_ClosedBy	string
		Hold_ClosedDate	YMD
	INoteCollection		
	IExpandableThing	ExpansionCount	int

© 2005. Intergraph Corp.
All Rights Reserved.

INTERGRAPH

Line List Adhoc Reports

Tree/Table view (con't):

Class	Interface	Property
PIDPipingConnector	INormalDgnPoint	NormDesignTempMin
		NormDesignTempMax
		NormDesignPressMin
		NormDesignPressMax
		DesignCriteriaFluidState
		DesignCriteriaMassFlowRate
		DesignCriteriaMetalTemperature
		DesignCriteriaPower
		DesignCriteriaPressure
		DesignCriteriaShortTermDuration
		DesignCriteriaShortTermPressure
		DesignCriteriaShortTermTemperature
		DesignCriteriaSpecificGravityMassBasis
		DesignCriteriaSpeed
		DesignCriteriaSteamOutPressure
		DesignCriteriaSteamOutRequirement
		DesignCriteriaSteamOutTemperature
		DesignCriteriaTemperature
		DesignCriteriaVacuumPressure
		DesignCriteriaVacuumTemperature
		DesignCriteriaVapourPressure
		DesignCriteriaVentingTemperature
		DesignCriteriaViscosity
	IAltDgnPoint	AltDesignTempMin
		AltDesignTempMax
		AltDesignPressMin
		AltDesignPressMax
		DesignCriteriaPressure2
		DesignCriteriaTemperature2
	ITestedItem	TestingResponsibility

© 2005. Intergraph Corp.
All Rights Reserved.

Line List Adhoc Reports

Tree/Table view (con't):

Class	Interface	Property
PIDPipingConnector	IPressureRatedObject	PressureRating2
		PressureRating

Class	Interface	Property
PIDPipingConnector	INamedPipingConnector	**PipingConnectorPrefix**
		PipingConnectorSeqNo
		PipingConnectorSuff

© 2005. Intergraph Corp.
All Rights Reserved.

11.3.1 Creating a Graph Definition for the Line List Report

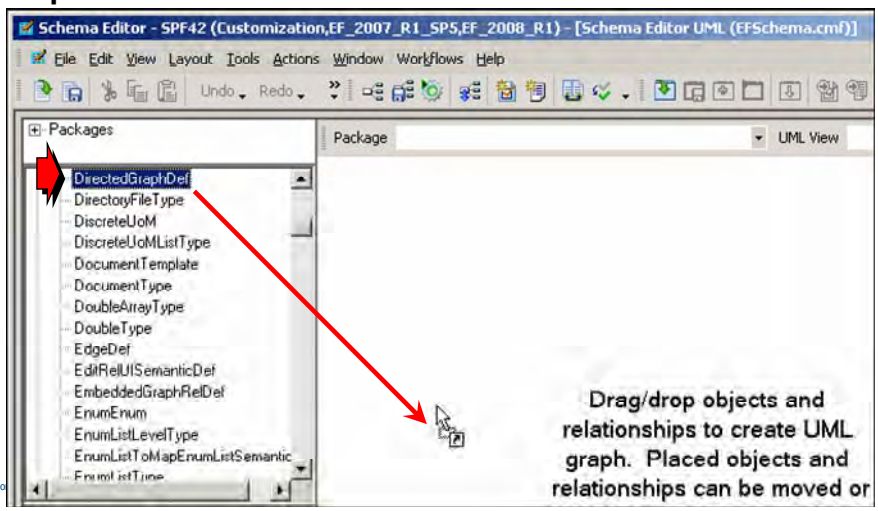
Create a Graph Definition using the Line information properties from the schema model you are using. In this example, we will use the *IPipeline* interface to collect the necessary property data.

Prior to using the schema editor to edit the SmartPlant Schema (EFSchema.cmf) file, the schema must first be checked out and the schema editor launched from within the Desktop Client.

INTERGRAPH

Create Graph Definition

- **Drag and drop the DirectedGraphDef object to the right pane.**

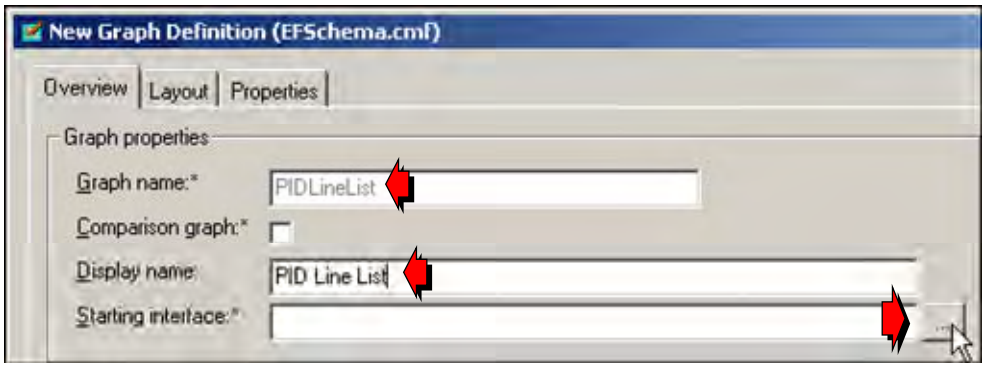


© 2005. Intergraph Co
All Rights Reserved.

Select the *IPipeline* interface def and relationships to the properties required for the report.

Create Graph Definition

- **Enter a Line List report *Graph Name*, a *Display name* and choose a *Starting interface*.**

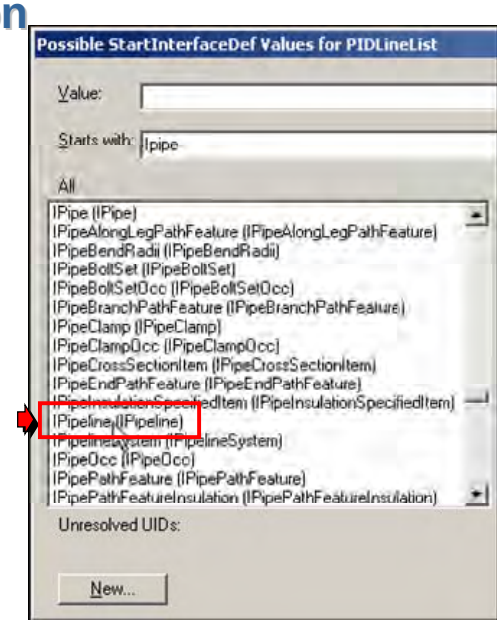


© 2005. Intergraph Corp.
All Rights Reserved.

The Possible StartInterfaceDef Values dialog will display.

Create Graph Definition

- **Click on IPipeline from the *Possible Start InterfaceDef for PIDLineList* dialog.**

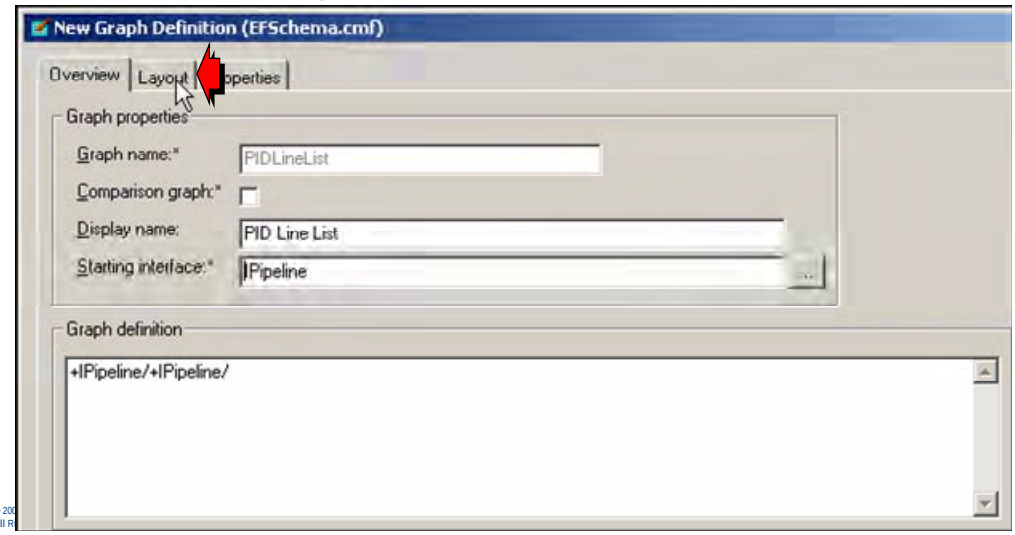


© 2005. Intergraph Corp.
All Rights Reserved.

Once the *Starting interface* has been set, add the related interfaces to this Graph Def structure.

Create Graph Definition

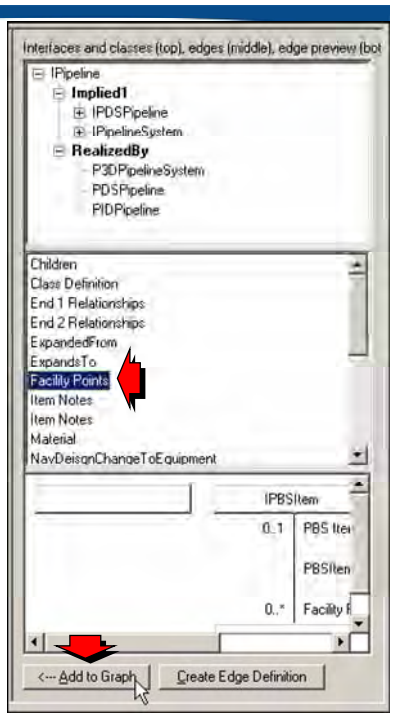
- **Select the *Layout* tab to add the edges to this GraphDef.**



Select the **IPipeline** starting interface and expand the tree to view the related interfaces in the middle pane.

Create Graph Definition

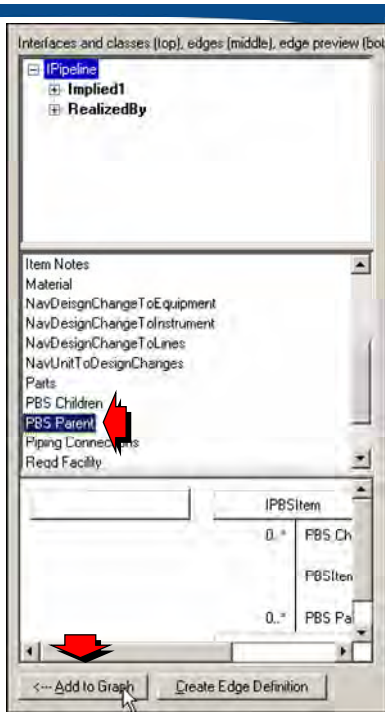
- **Select the Facility Points edge and click *Add to Graph* to add this edge to the GraphDef.**



© 2005. Intergraph Corp.
All Rights Reserved.

Create Graph Definition

- **Select the PBS Parent edge and click *Add to Graph* to add this edge to the GraphDef.**

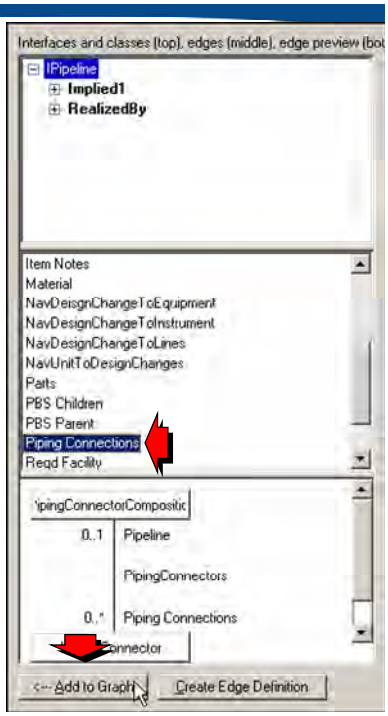


© 2005. Intergraph Corp.
All Rights Reserved.

Continue to add the needed edges (interfaces).

Create Graph Definition

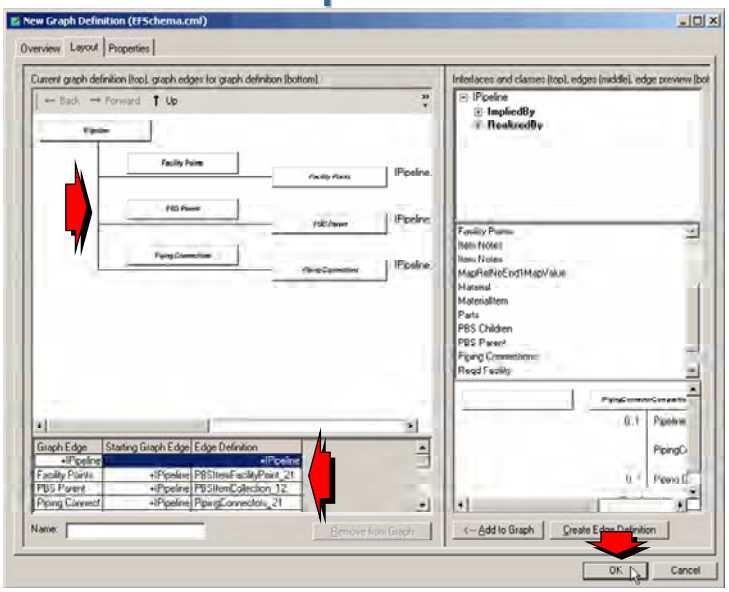
- **Select the Piping Connections edge and click *Add to Graph* to add this edge to the GraphDef.**



© 2005. Intergraph Corp.
All Rights Reserved.

The Graph Def structure is displayed in the left panes of the dialog.

Create Graph Definition



- **Click OK to create the new GraphDef.**

11.3.2 Creating a View Definition for the Line List Report

The View Definition will select the *Properties* from the Graph Def that will be displayed in the Line List Adhoc report.

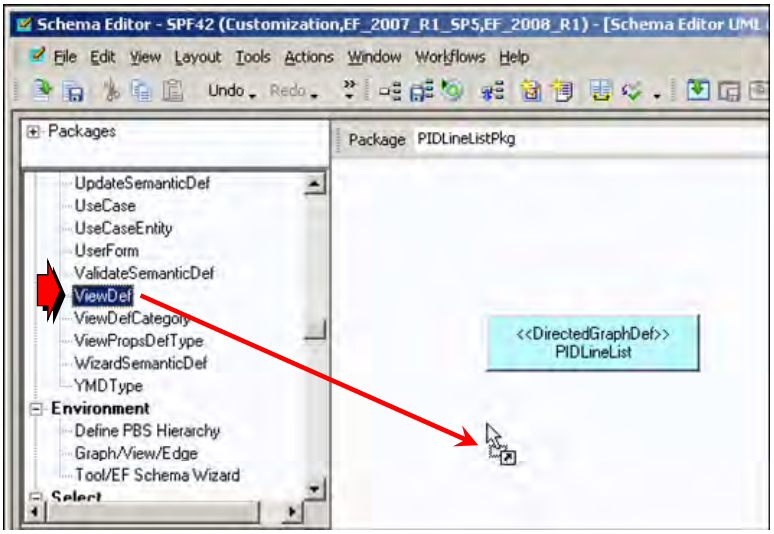
Creating a View Def for the Report

- **Within the View Definition select the properties required for the report.**
- **Start by naming the *ViewDef* and selecting the *GraphDef* just created (PIDLineList).**
- **Selecting a property you can rename the property to better reflect the purpose of the property.**
- **In the following example we renamed the property 'Name' for IPipeLine to 'PID PipeLine Name'.**
- **When complete click OK to save this View Def.**
- **Once created and loaded, you must drag and drop a User Group on the new View Def to grant access to the configuration when running a report.**

© 2005. Intergraph Corp.
All Rights Reserved.

Create View Definition

- **Drag and drop the ViewDef object type to the right pane.**

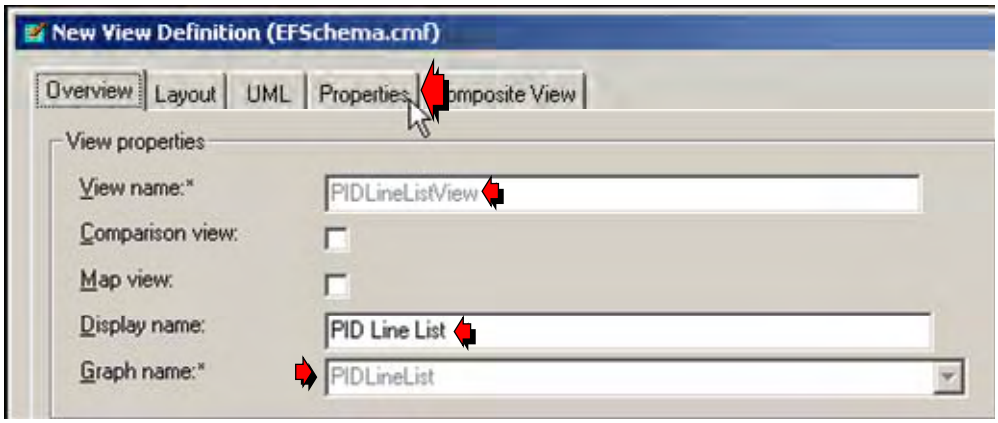


© 2005. Intergraph Corp.
All Rights Reserved.

The *New View Definition* dialog will display

Create View Definition

- **Enter a Line List report *View Name*, a *Display name* and choose a report *Graph Name*, then click the *Properties* tab.**

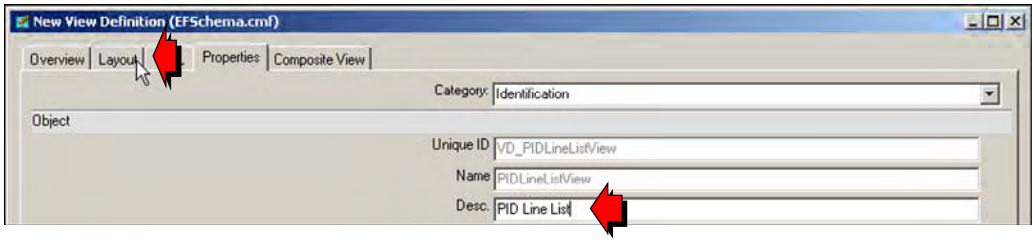


© 2005. Intergraph Corp.
All Rights Reserved.

Use the *Properties* tab to define a **Desc.** value for this view def.

Create View Definition

- **Enter a Line List report *Desc*, and select the *Layout* tab.**

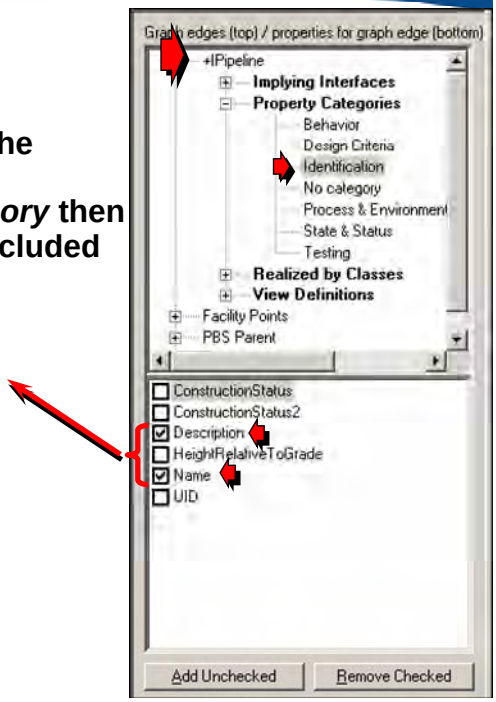


© 2005. Intergraph Corp.
All Rights Reserved.

Select the *Layout* tab to choose the properties for this view def.

Create View Definition

- **Click to expand IPipeline in the *Graph edges* field and the Identification *Property Category* then select the properties to be included in the view.**

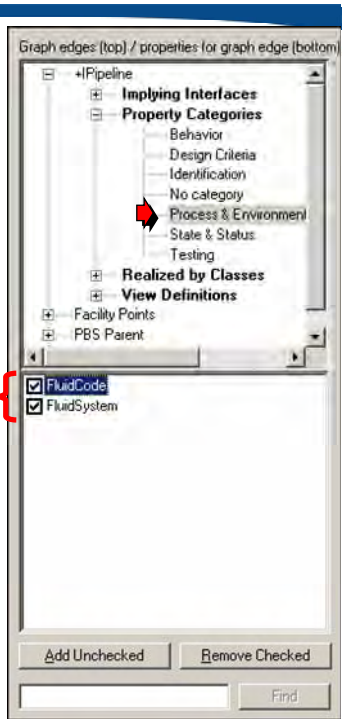


© 2005. Intergraph Corp.
All Rights Reserved.

Continue to choose the properties to be included in this Line List report.

Create View Definition

- **Click the IPipeline Process & Environment *Property Category* and select the additional properties to be included.**



© 2005. Intergraph Corp.
All Rights Reserved.

Create View Definition

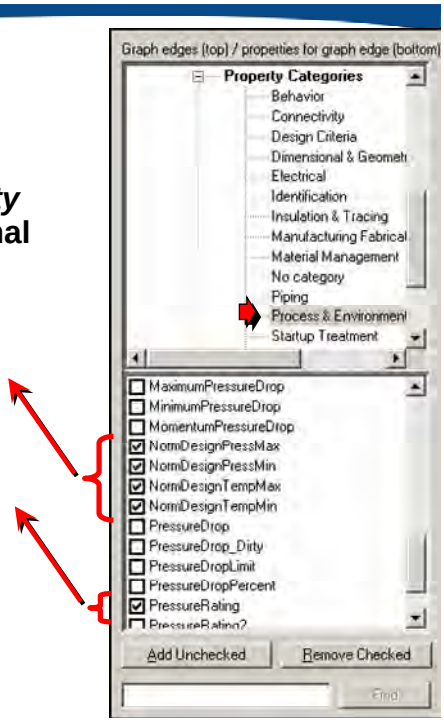
- **Click the Piping Connections Identification *Property Category* and select the additional properties to be included.**

© 2005. Intergraph Corp.
All Rights Reserved.

Continue to choose the properties to be included in this Line List report.

Create View Definition

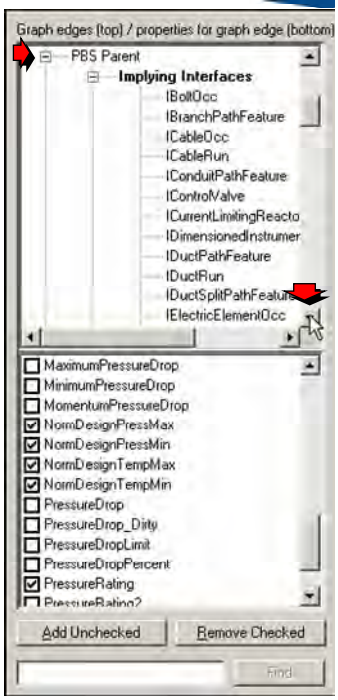
- **Click the Piping Connections Process & Environment *Property Category* and select the additional properties to be included.**



© 2005. Intergraph Corp.
All Rights Reserved.

Create View Definition

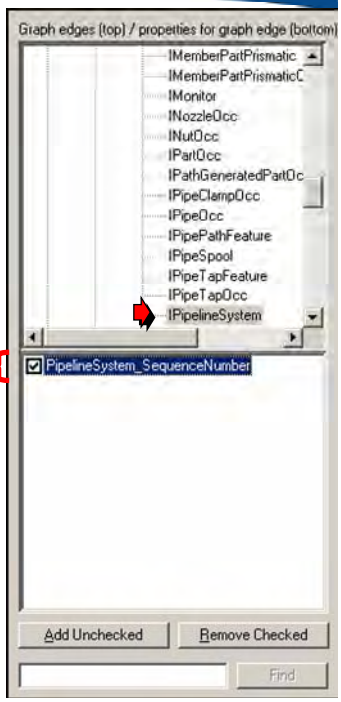
- **Expand PBS Parent and click the Implying Interfaces to see the list. Use the scroll bar to scroll down and see the desired information needed for the line list report.**



© 2005. Intergraph Corp.
All Rights Reserved.

Create View Definition

- **Click the IPipelineSystem *Interface* and select the available property, PipelineSystem_SequenceNumber.**



© 2005. Intergraph Corp.
All Rights Reserved.

Add the remaining fields so the list looks like the following:

Creating a View Definition

Zoomed in view of the *New View Definition Layout* dialog.

Actions

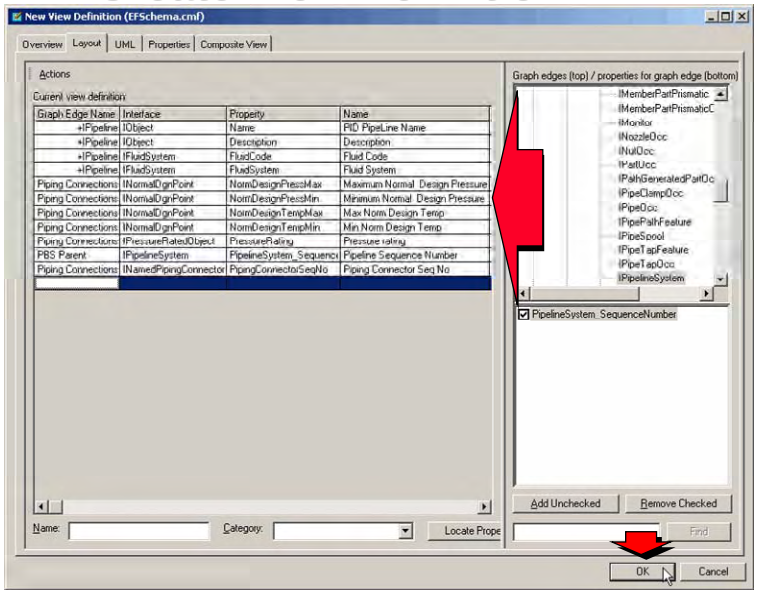
Current view definition:

Graph Edge Name	Interface	Property	Name
+IPipeline	IObject	Name	PID PipeLine Name
+IPipeline	IObject	Description	Description
+IPipeline	IFluidSystem	FluidCode	Fluid Code
+IPipeline	IFluidSystem	FluidSystem	Fluid System
Piping Connections	INormalDgnPoint	NormDesignPressMax	Maximum Normal Design Pressure
Piping Connections	INormalDgnPoint	NormDesignPressMin	Minimum Normal Design Pressure
Piping Connections	INormalDgnPoint	NormDesignTempMax	Max Norm Design Temp
Piping Connections	INormalDgnPoint	NormDesignTempMin	Min Norm Design Temp
Piping Connections	IPressureRatedObject	PressureRating	Pressure rating
PBS Parent	IPipelineSystem	PipelineSystem_Sequenc	Pipeline Sequence Number
Piping Connections	INamedPipingConnector	PipingConnectorSeqNo	Piping Connector Seq No

© 2005. Intergraph Corp.
All Rights Reserved.

You can rename a property to better reflect the purpose of that property. In this example, we renamed the property '**Name**' for *IPipeLine* to '**PID PipeLine Name**'.

Create View Definition

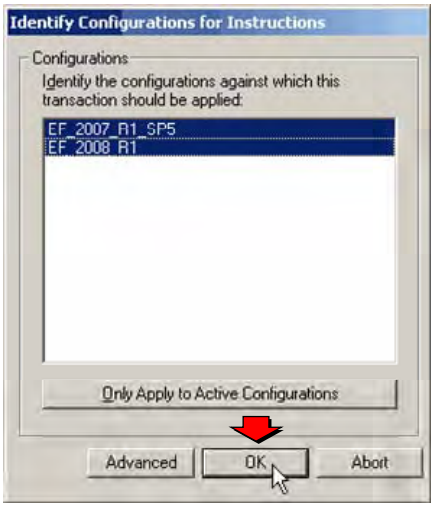


- **Click OK to create the new *ViewDef*.**

When complete click **OK** to save this *View Def* and save all the schema additions.

Create View Definition

- **Choose the OK button to continue with the schema editing session.**

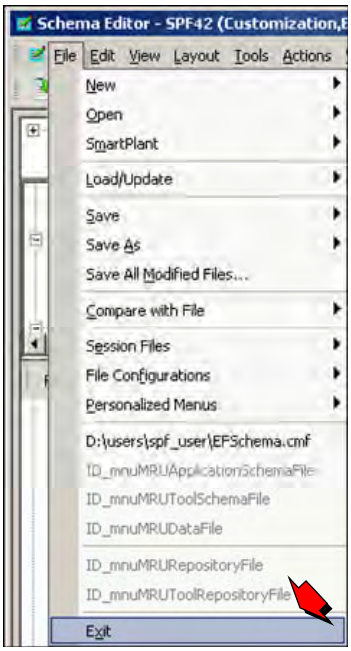


© 2005. Intergraph Corp.
All Rights Reserved.

Now that the schema modeling to support adhoc reports is complete, exit from the Schema Editor.

Exiting the Schema Editor

- **From the menu bar, click the *File* > *Exit* command.**

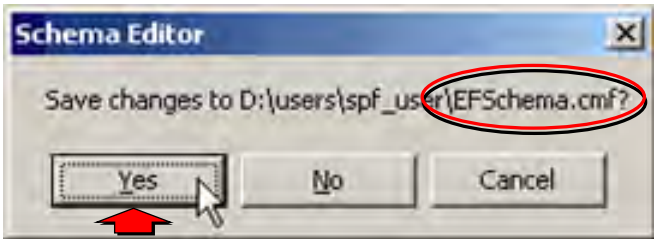


© 2005. Intergraph Corp.
All Rights Reserved.

If the schema was not saved prior to the exit, you will be prompted to do so now.

Exiting the Schema Editor

- **Click *Yes* to save the changes to the checked out schema file.**



© 2005. Intergraph Corp.
All Rights Reserved.

The saved schema still resides on the Desktop Client machine and needs to be returned the to SPF server. This is accomplished by performing a ***Check In*** command.

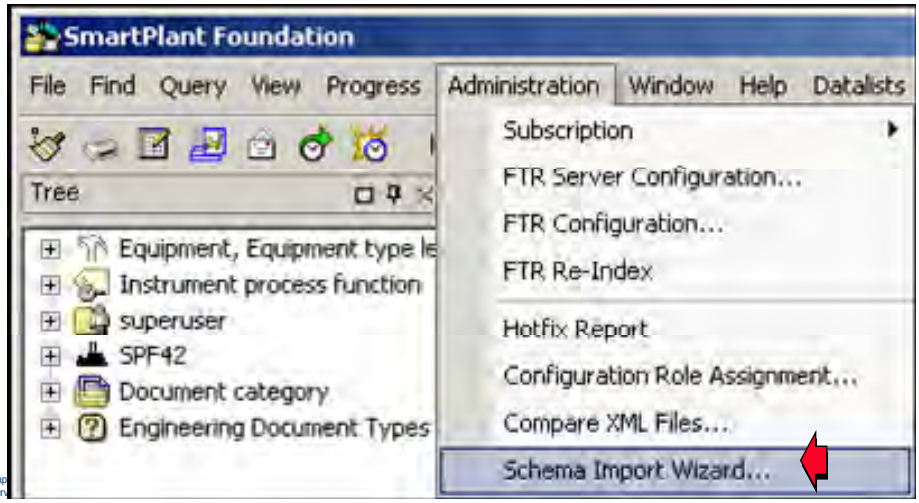
The Graph Def and View Def needed for the Line List report are now ready to be loaded into the SPF database.

11.4 Importing Report Schema Additions

The schema changes that have been made have been exported to an XML file using the CMF File Manager. The **Schema Import Wizard** will be used to load the schema changes into the SPF database.

Importing Schema Additions

- **In the SmartPlant Foundation Desktop Client, choose *Administration > Schema Import Wizard*.**



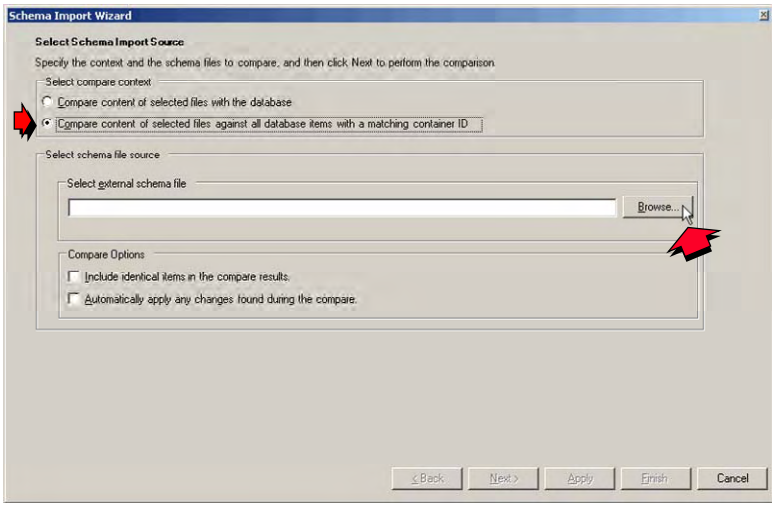
© 2005. Intergrap
All Rights Reserv

Note: In order to optimize class time, in this chapter the necessary load files will be provided in order to load the necessary graph defs and view defs for the pump report and the line list report. Under normal circumstances, you would have to use the CMF File Manager option to save the CMF file as an XML file and then use the Schema Import Wizard to perform a comparison. This will not be necessary in the hands on activity for this training chapter.

The import *Wizard* form will appear.

Importing Schema Additions

- **In the *Schema Import Wizard*, click the *Browse* button to search for the schema file to be loaded.**

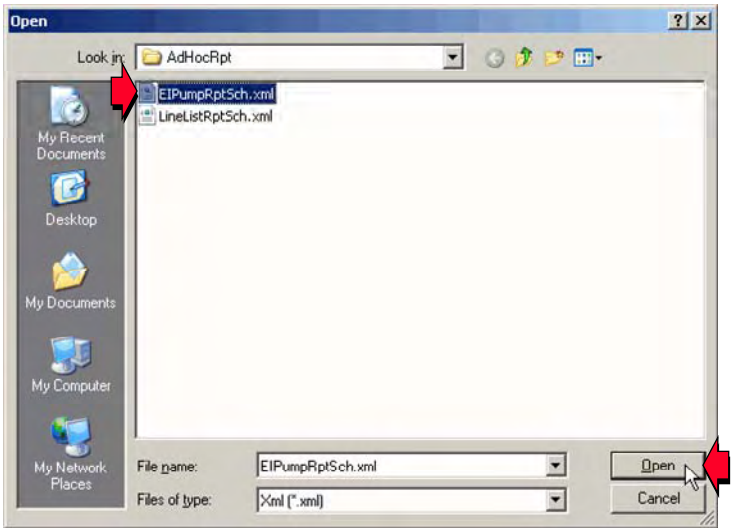


© 2005. Intergraph Corp.
All Rights Reserved.

When the browser dialog appears, select the exported schema file to be imported.

Importing Schema Additions

- **Select the *ElPumpRptSch.xml* file and click Open.**

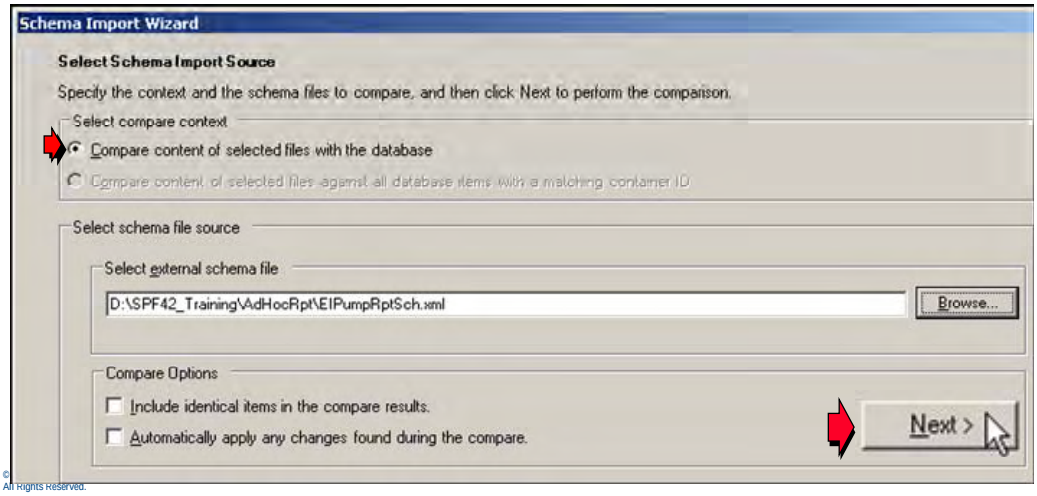


© 2005. Intergraph Corp.
All Rights Reserved.

The provided schema import xml files cannot be compared against database items using a container id (due to the way they were created). Therefore, the *Compare content of selected files against all database items with a matching container ID* option is not available.

Importing Schema Additions

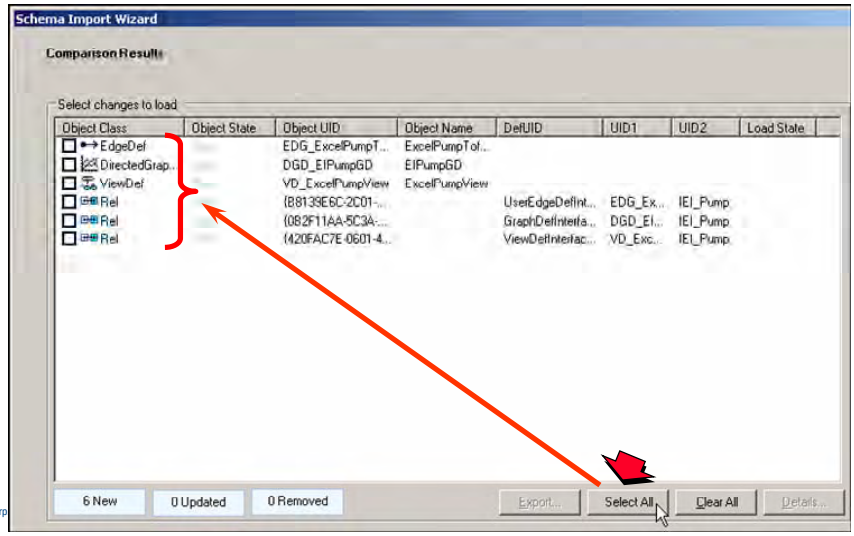
- **Click Next to compare schema file content with the database.**



This option will generate a set of differences instructions based on what is already instantiated in the SPF database and what is defined in the exported schema file.

Importing Schema Additions

- **Choose the Select All button to import all definitions.**

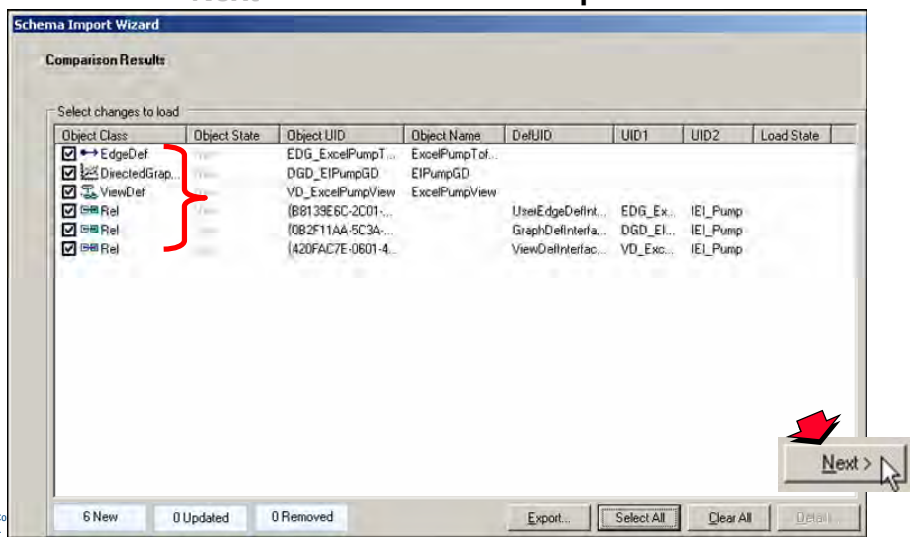


© 2005. Intergraph Corp
All Rights Reserved.

The toggle next to each change will be enabled and that modification performed when the ***Next*** button is selected.

Importing Schema Additions

- **Click the Next button to start the import.**

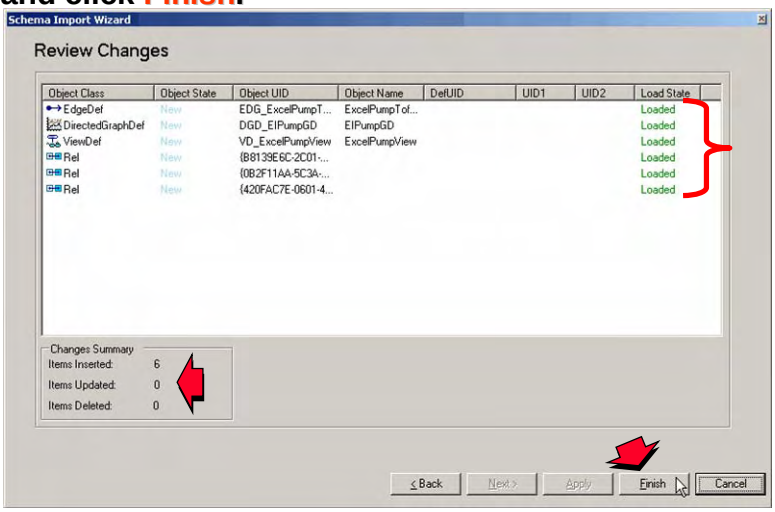


© 2005. Intergraph Co
All Rights Reserved.

A *Review Changes* screen will appear when the import has completed.

Importing Schema Additions

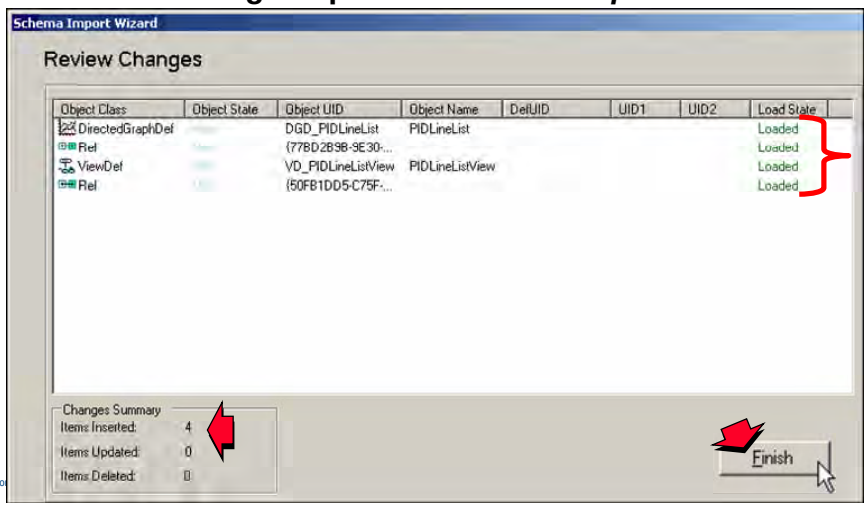
- **Verify that the new objects are loaded to the database and click Finish.**



© 2005. Intergraph Corp.
All Rights Reserved.

Importing Schema Additions

- **Repeat the import process for the line list graph def and view def using the provided *LineListRptSch.xml* file .**



© 2005. Intergraph Co
All Rights Reserved.

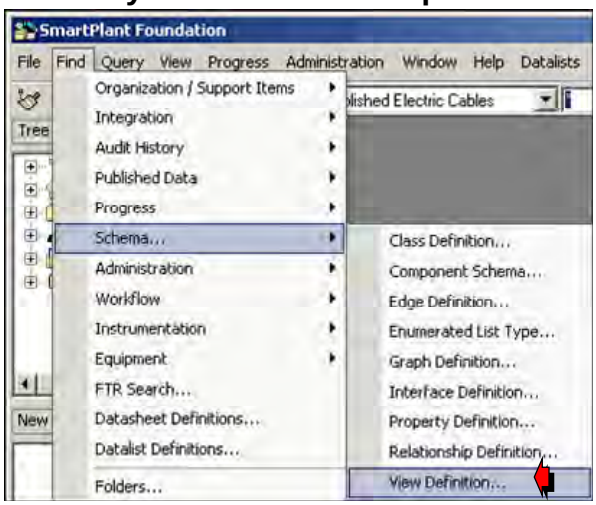
11.5 Adding View Definition Security

Once loaded into SPF, you must drag and drop an *Access Group* on to each new *View Def* to grant access to the configuration when running a report. Start by performing a find command to verify and view the loaded report views (view defs).

INTERGRAPH

Adding View Definition Security

- **Use the *Find Tool* to locate the view definitions that have been loaded by the SmartPlant Import Wizard.**



© 2005. Intergraph Corp.
All Rights Reserved.

Execute a find to locate and display both the **ExcelPumpView** and the **PIDLineListView**.

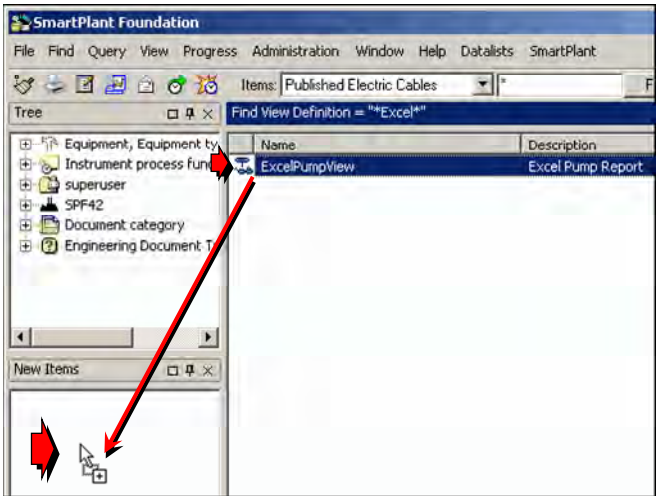
Adding View Definition Security

- **Enter the desired search criterion and click OK.**

© 2005. Intergraph Corp.
All Rights Reserved.

Adding View Definition Security

- **Drag and drop the view definition, ExcelPumpView, onto the *New Items* window.**

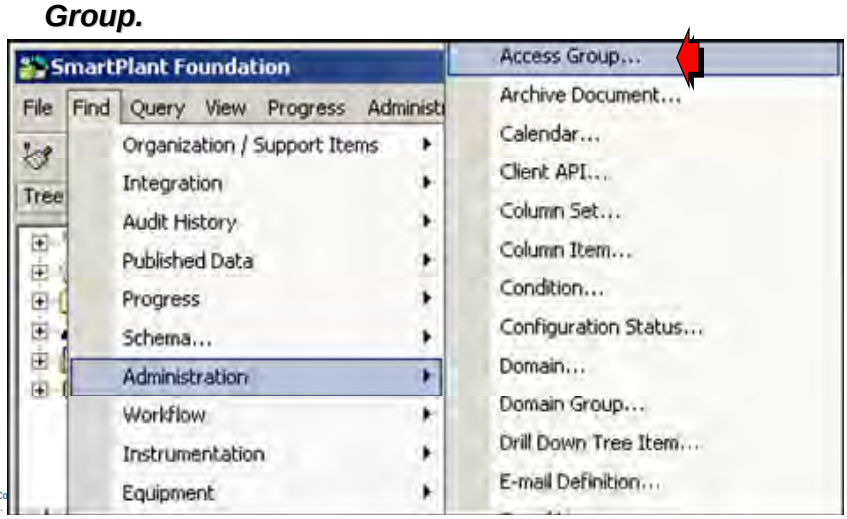


© 2005. Intergraph Corp.
All Rights Reserved.

Repeat the search to locate and display the line list view def. Relate an **Access Group** to the *View Def* to grant access to this definition. To add *View Definition security*, perform a search to find the appropriate user group.

Adding View Definition Security

- **From the menu, select *Find > Administration > Access Group.***



© 2005. Intergraph Co
All Rights Reserved.

Adding View Definition Security

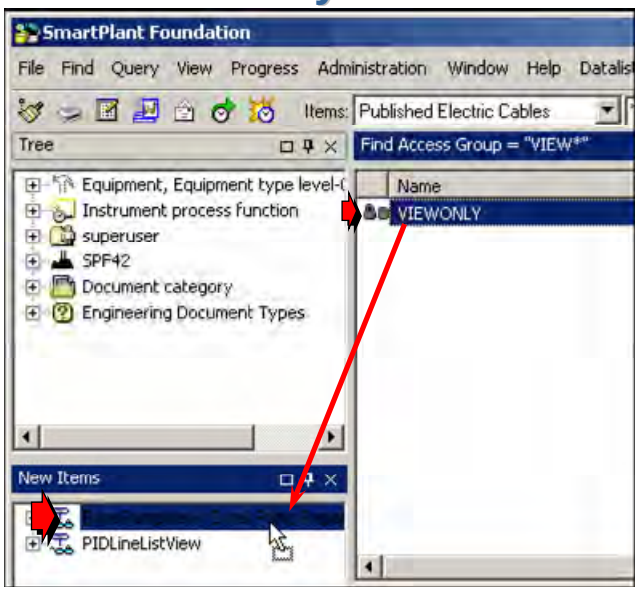
- **Enter the desired search criterion and click OK.**

© 2005. Intergraph Corp.
All Rights Reserved.

Finish adding the security by creating a new **Access Groups** relationship.

Adding View Definition Security

- **Drag and drop an Access Group onto the report view defs.**

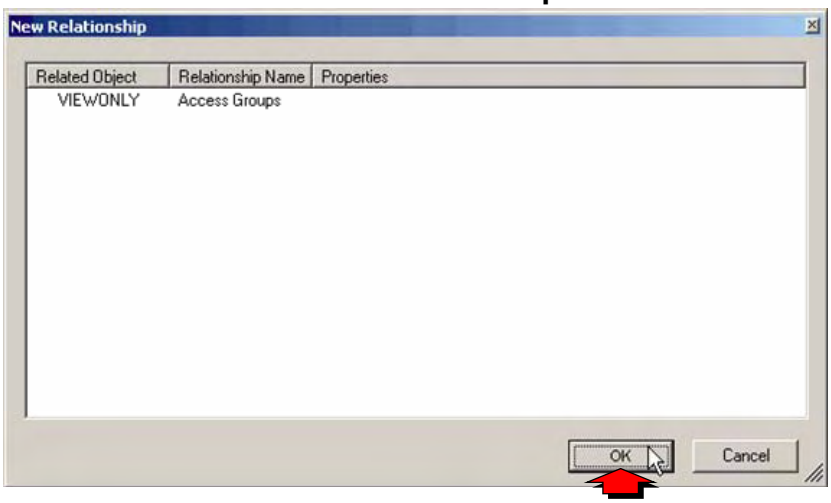


© 2005. Intergraph Corp.
All Rights Reserved.

Repeat the drag and drop to add access security for the line list view def.

Adding View Definition Security

- **To associate an Access Group with a view definition, click OK to confirm the new relationship.**



© 2005. Intergraph Corp.
All Rights Reserved.

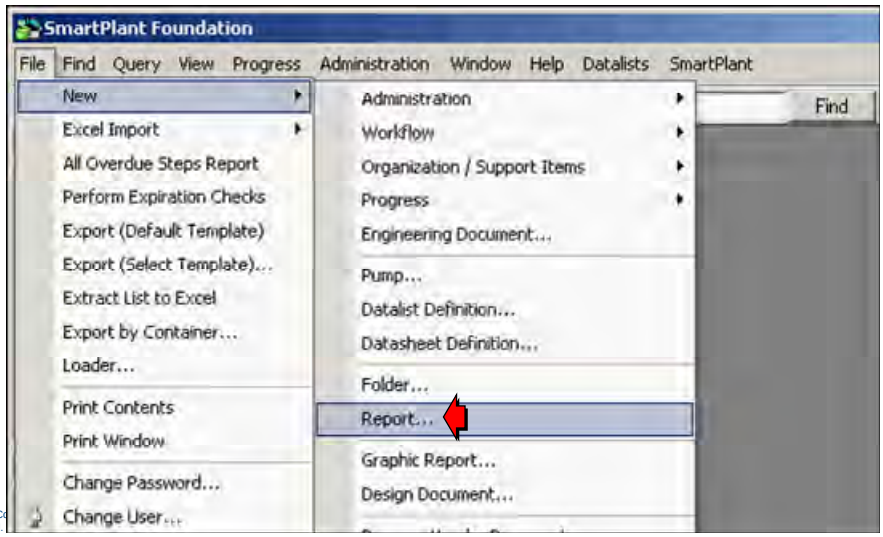
11.6 Generating a Report

Once the administrator has set up the necessary Graph Defs and View Defs, the user can login to the Desktop client to generate a report. The available properties to be reported on can't be changed, but the user can choose a subset of the properties from the View Definition to be included in each iteration of a report generated.

The procedures to generate an adhoc report was covered in detail in the *SPF 4.2 Introduction and Administration I* training course. The following examples are used to test the custom graphs and views and can be used as a good review for adhoc report generation.

Generating a Report

- **Select *File* > *New* > *Report* from the Desktop Client menu.**

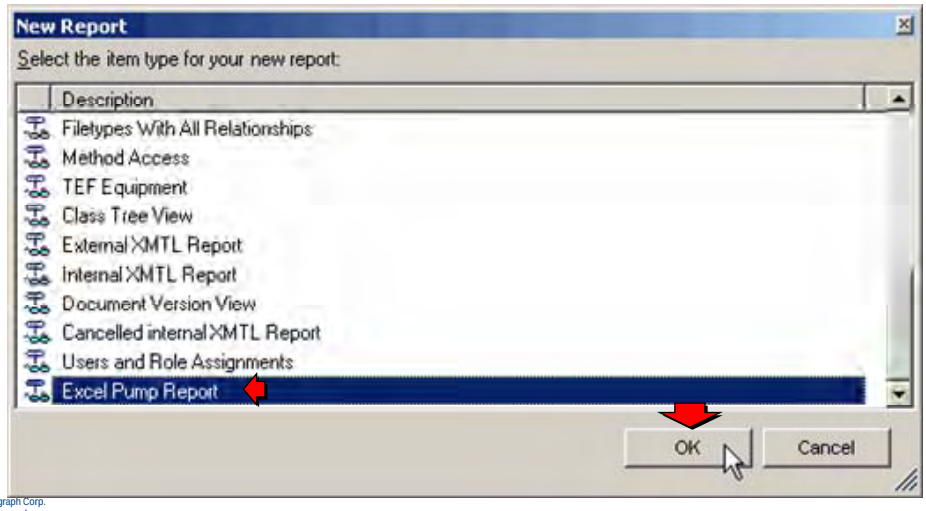


© 2005. Intergraph Co
All Rights Reserved.

The *New Report* dialog will display and list the available View Definitions.

Generating a Report

- **Select the View Def to be used to create the new report.**

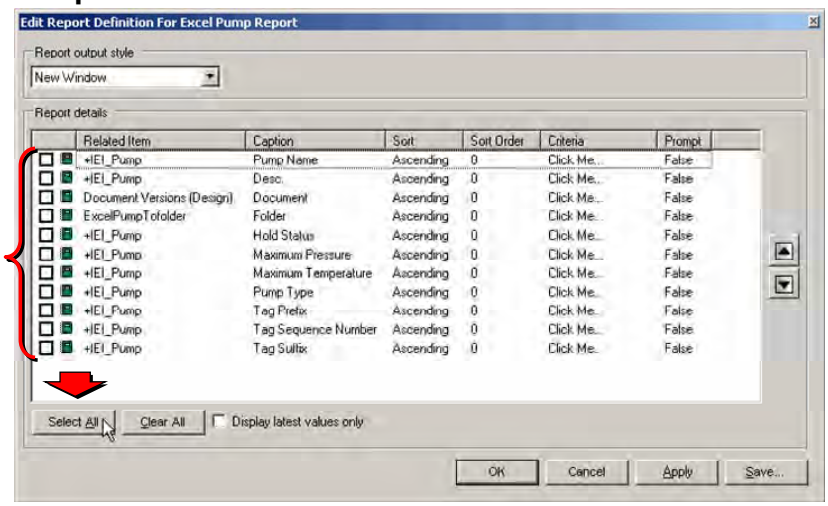


© 2005. Intergraph Corp.
All Rights Reserved.

Select the **Excel Pump Report** view and click **OK**. The *Edit Report Definition* dialog will display next.

Generating a Report

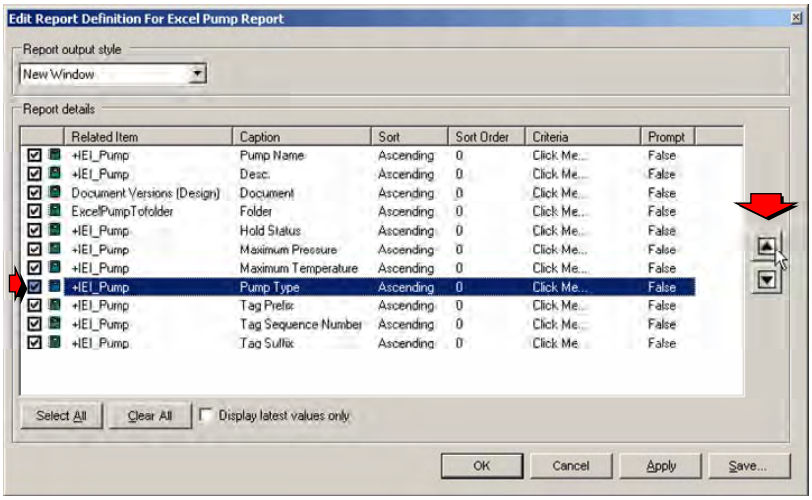
- **Enable the properties toggle boxes for inclusion on the report or click the Select All button.**



© 2005. Intergraph Corp.
All Rights Reserved.

Generating a Report

- **Highlight an edge and use the up arrow button to change the report column order.**



© 2005. Intergraph Corp.
All Rights Reserved.

Select the properties you wish to see on the report from this View Definition. The following action buttons are available on the *Edit Report* dialog.

Select All – selects ALL definitions

Clear All – clears ALL selected definitions

up arrow button – moves the highlighted selection up the list, which will change how the selection will be displayed on the output.

down arrow button – works the same as **up arrow button** with repositioning the selection.

OK – runs the report and closes the dialog.

Cancel – cancels the report

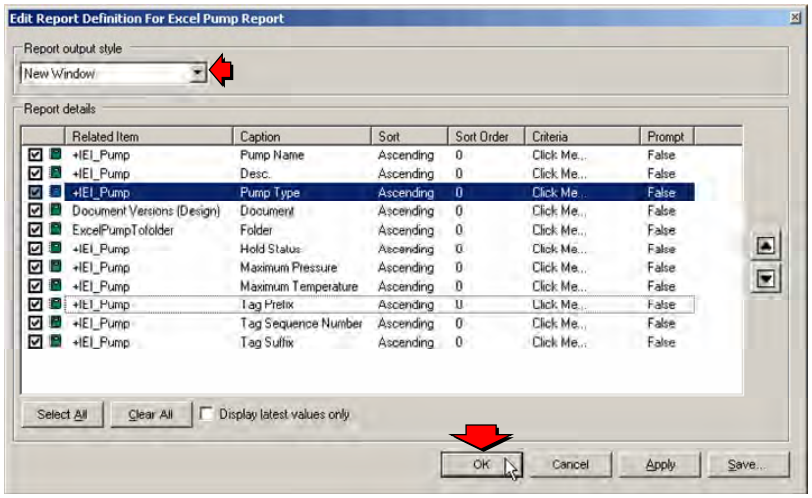
Apply – runs the report and does not close the dialog

Save – saves the report so it can be recalled.

The *Report output style* list selects the type of report output to be created.

Generating a Report

- **In the *Report output style* field, choose the destination for the report.**

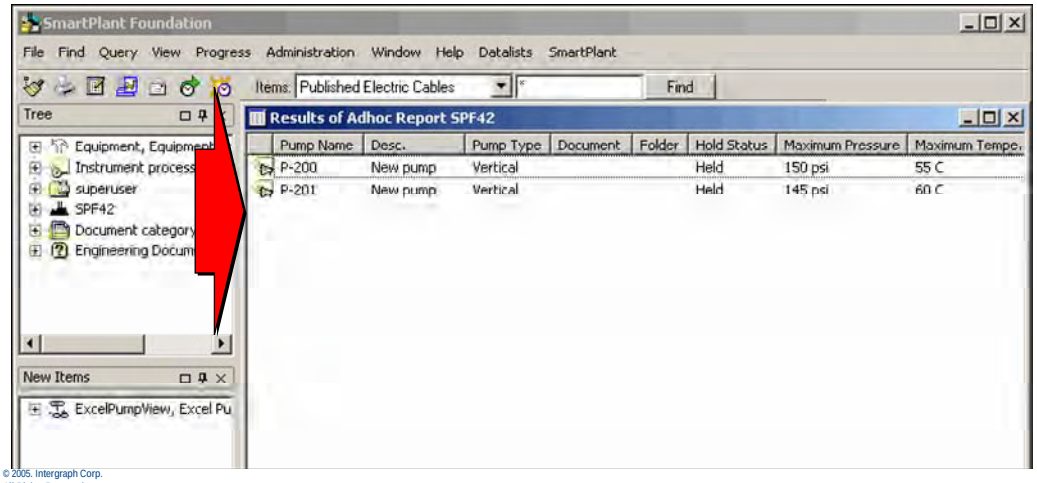


© 2005. Intergraph Corp.
All Rights Reserved.

This will generate a report and based on the destination selected, display it in a new window.

Generating a Report

The report output will display in a new window in the Desktop Client .

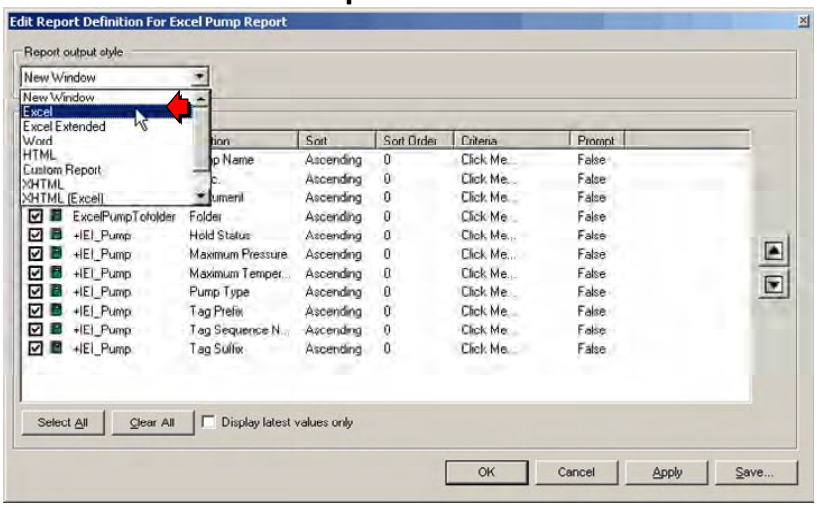


© 2005. Intergraph Corp.
All Rights Reserved.

The **Excel** option allows you to select an Excel Template to use for the report.

Adhoc Report Output to Excel

- **In the *Report output style* field, choose Excel as the destination for the report.**

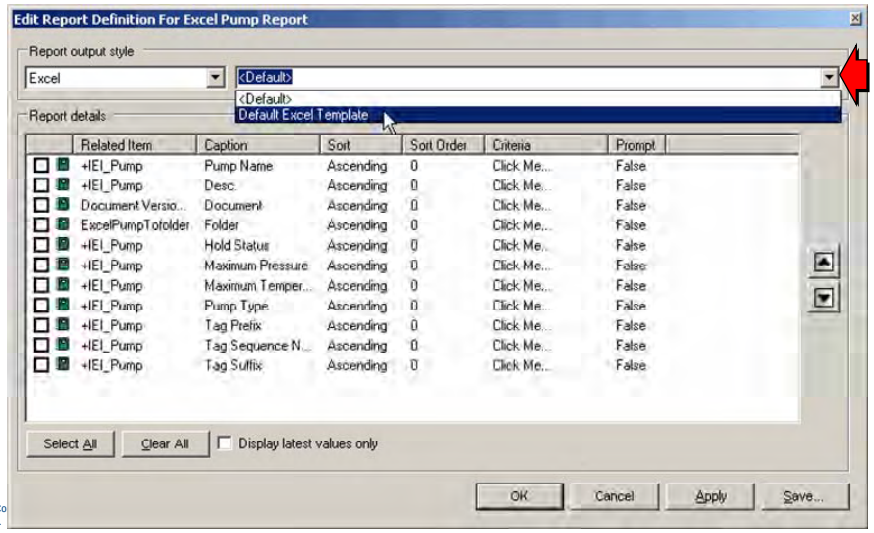


© 2005. Intergraph Corp.
All Rights Reserved.

The <Default> setting will not work, you **must** select a template.

Adhoc Report Output to Excel

- **Choose a template to be used for the Excel report.**

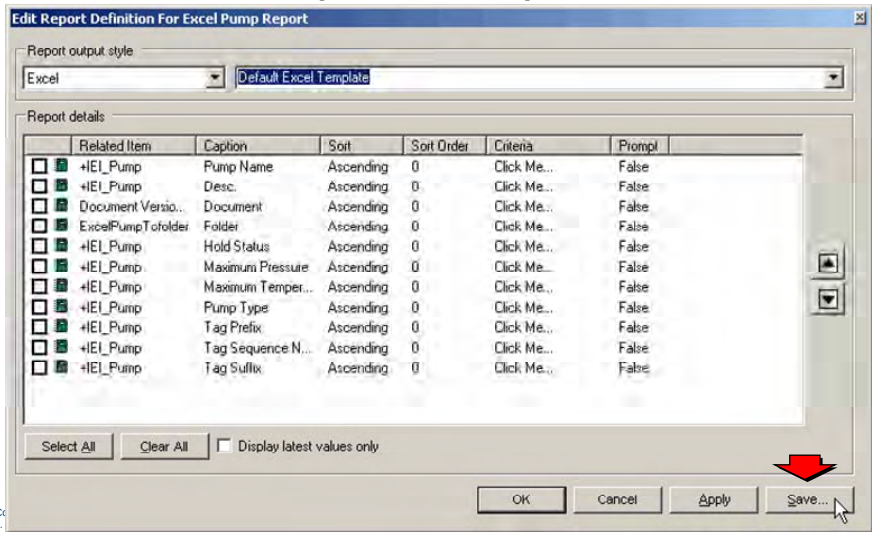


© 2005. Intergraph Co
All Rights Reserved.

The report set up can be saved as an adhoc query object for future use.

Saving an Adhoc Report Query

- **To save this setup for future report execution, select Save.**

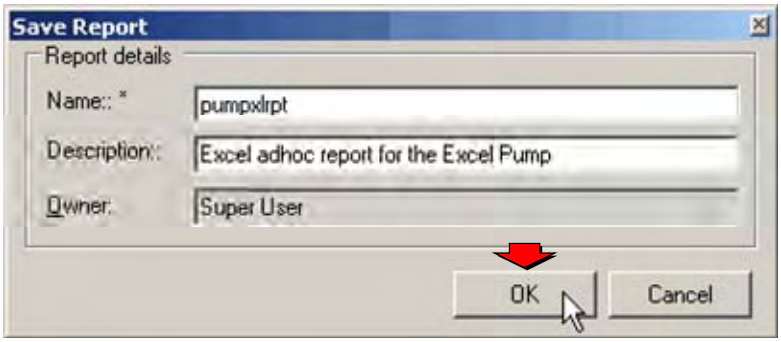


© 2005. Intergraph Co
All Rights Reserved.

A *Save Report* dialog window will be displayed.

Adhoc Report Output to Excel

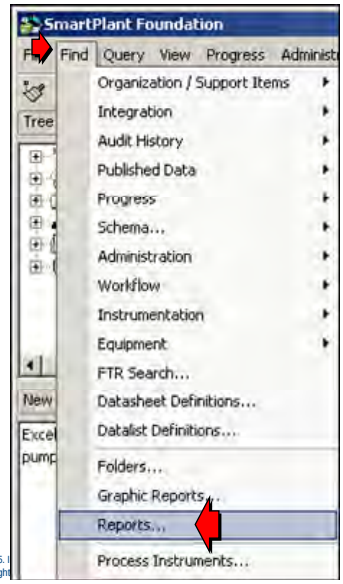
- **Enter the necessary report details information and click OK.**



© 2005. Intergraph Corp.
All Rights Reserved.

Choose the saved report (if displayed) or perform a search to find it using the ***Find*** command.

Adhoc Report Output to Excel

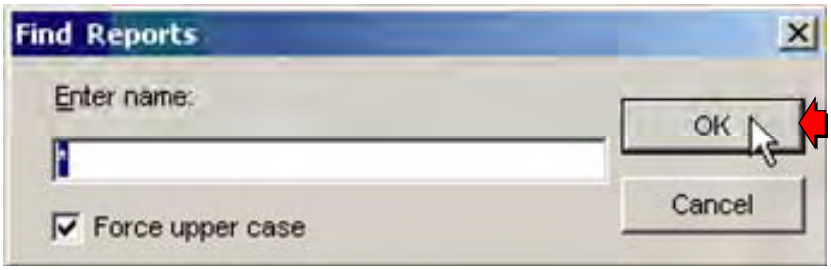


- **Select the *Find* > *Reports* command to locate any saved Adhoc reports**

The *Find Reports* dialog will be displayed.

Adhoc Report Output to Excel

- **Enter search criteria to locate any saved Adhoc reports**

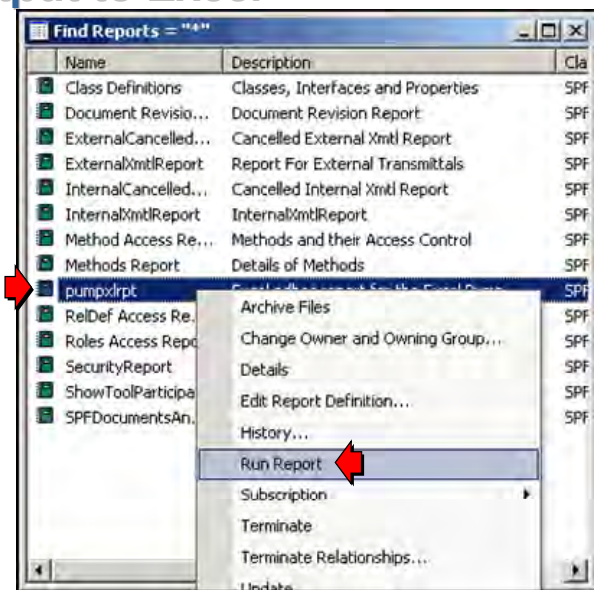


© 2005. Intergraph Corp.
All Rights Reserved.

Any saved reports will be displayed in a list view “results” window.

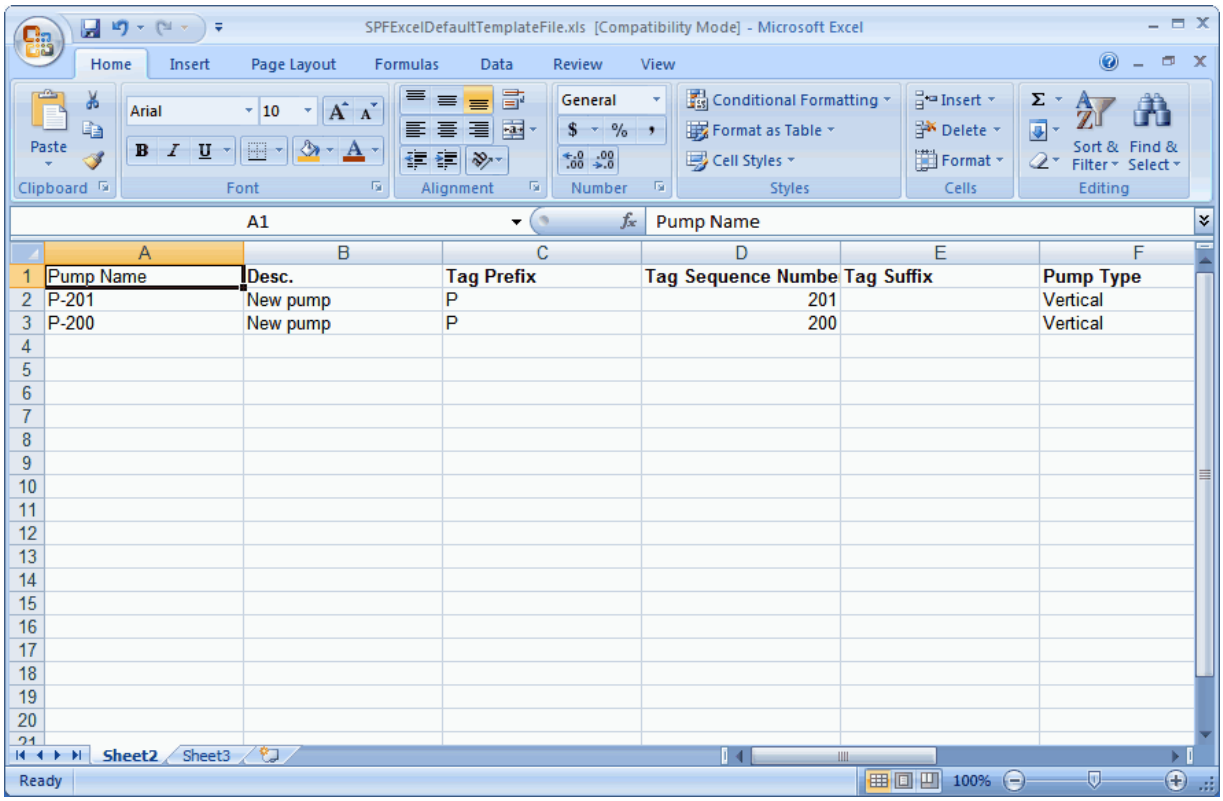
Adhoc Report Output to Excel

- **Right-click on pumpxlrpt in the browser results window and choose *Run Report* from the menu.**



© 2005. Intergraph Corp.
All Rights Reserved.

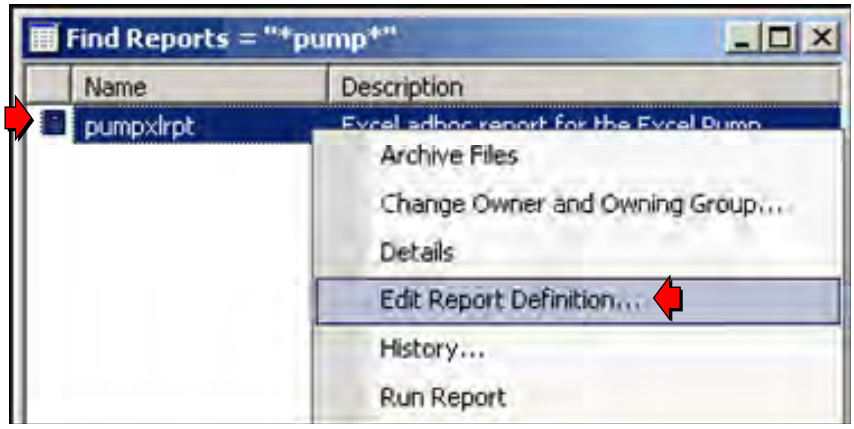
The Excel output will look like this:



As a reminder from the SPF Admin I class, saved report content and style can be modified using the edit command.

Modifying an Adhoc Report

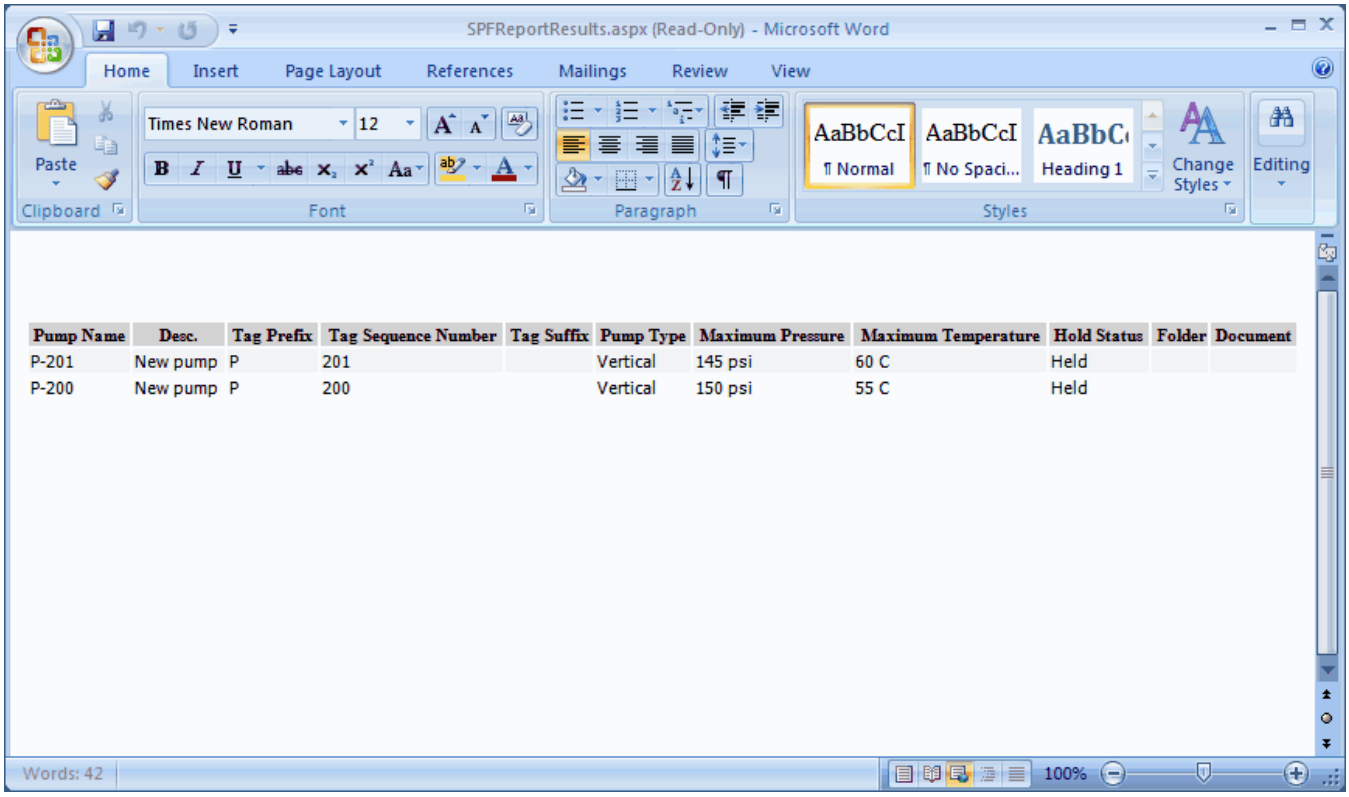
- **Right-click on pumpxlrpt in the browser results window and select *Edit Report Definition* from the menu**



© 2005. Intergraph Corp.
All Rights Reserved.

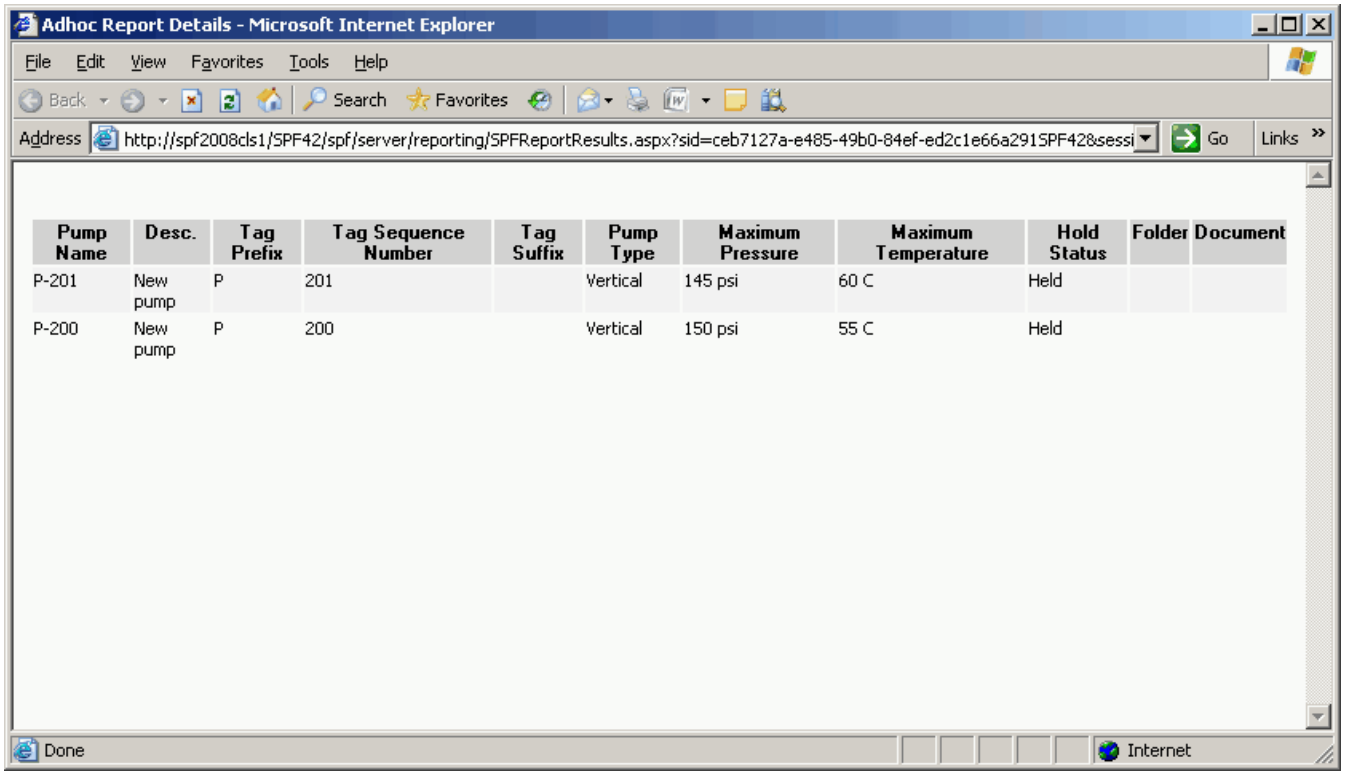
Examples of different kinds of report output are shown on the following pages.

The following is an example of a **Word** output.



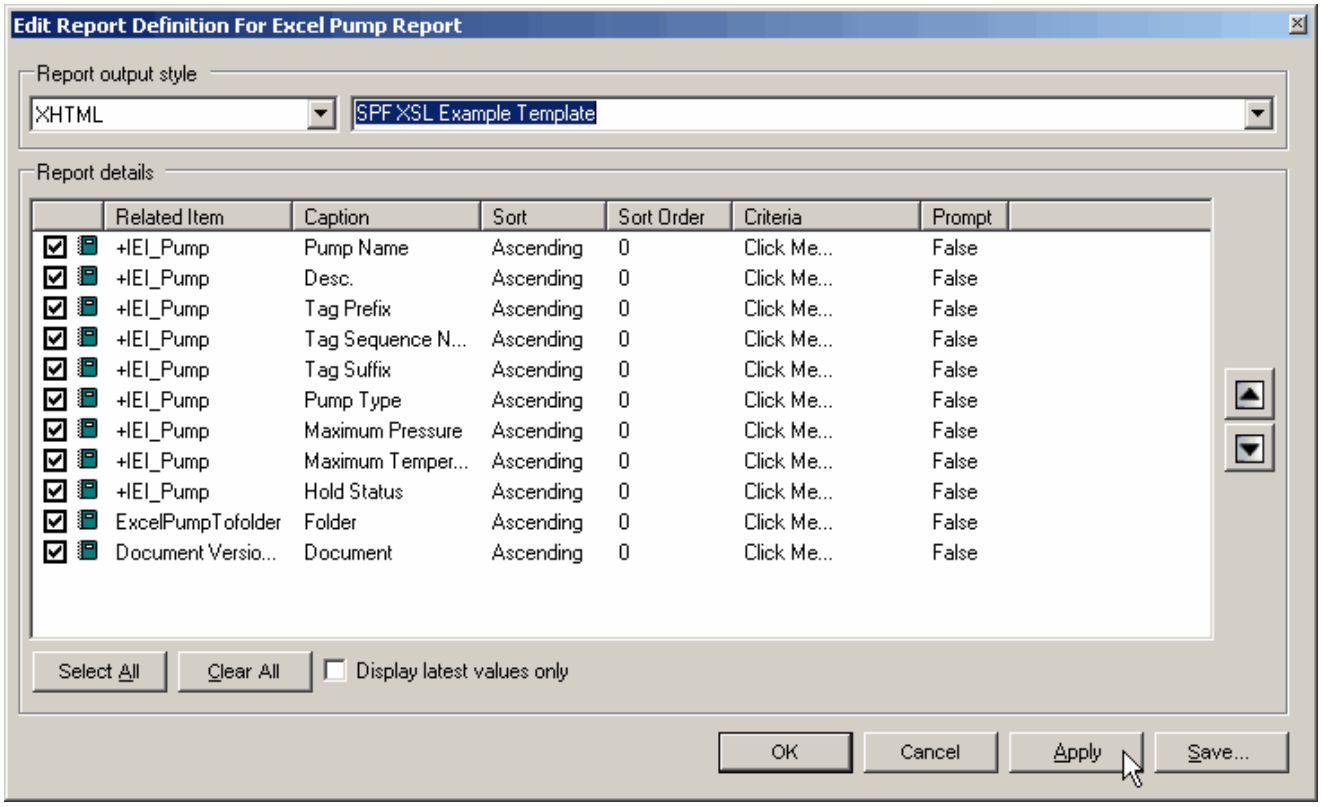
Pump Name	Desc.	Tag Prefix	Tag Sequence Number	Tag Suffix	Pump Type	Maximum Pressure	Maximum Temperature	Hold Status	Folder	Document
P-201	New pump	P	201		Vertical	145 psi	60 C	Held		
P-200	New pump	P	200		Vertical	150 psi	55 C	Held		

HTML – Creates a web based report

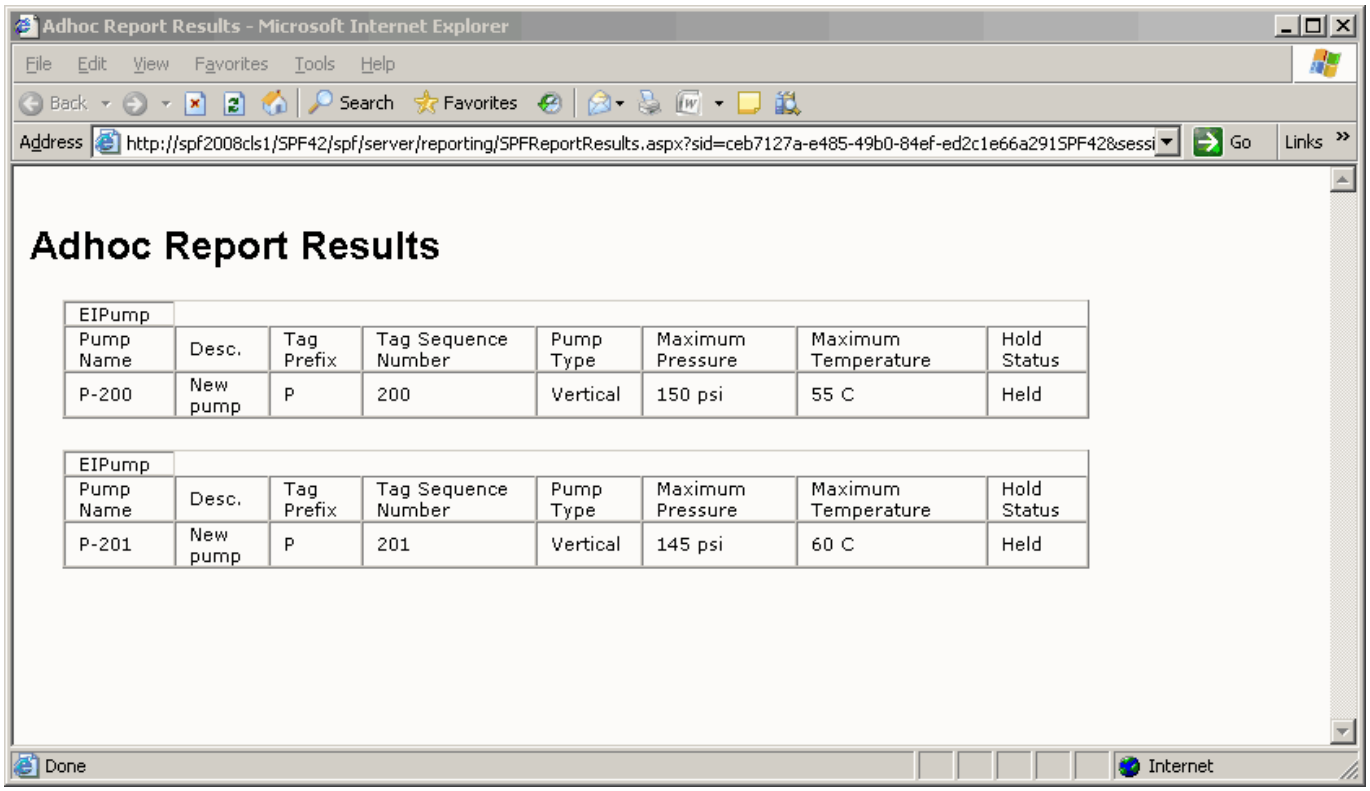


Pump Name	Desc.	Tag Prefix	Tag Sequence Number	Tag Suffix	Pump Type	Maximum Pressure	Maximum Temperature	Hold Status	Folder	Document
P-201	New pump	P	201		Vertical	145 psi	60 C	Held		
P-200	New pump	P	200		Vertical	150 psi	55 C	Held		

XHTML – This type is the result of an XSL transformation of an XML Document, and is a means of converting XML data into a more usable format.



The XSL Transformation is achieved by the combining of two XML-style documents to produce an HTML page.



EIPump							
Pump Name	Desc.	Tag Prefix	Tag Sequence Number	Pump Type	Maximum Pressure	Maximum Temperature	Hold Status
P-200	New pump	P	200	Vertical	150 psi	55 C	Held

EIPump							
Pump Name	Desc.	Tag Prefix	Tag Sequence Number	Pump Type	Maximum Pressure	Maximum Temperature	Hold Status
P-201	New pump	P	201	Vertical	145 psi	60 C	Held

11.6.1 Additional Adhoc Report Options

Users running adhoc reports can change any of the column captions, data sorting, as well as supply search criteria on a subset of data to be included in the report. The other options you have with the report dialog are:

Adhoc Report Options

Filter options on the Edit Report dialog are *Caption*, *Sort*, *Sort Order* and *Criteria*

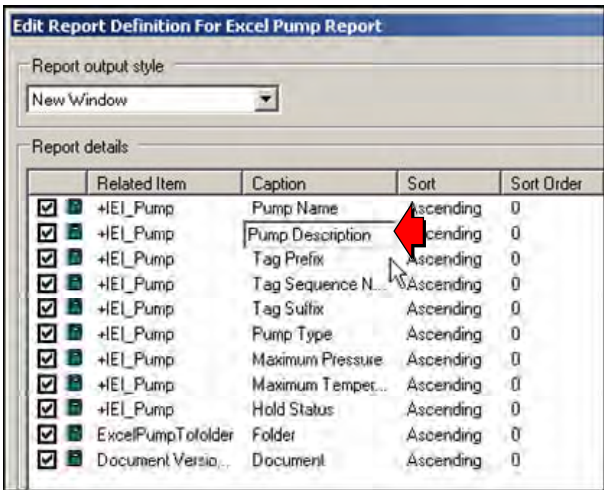
- **Caption – change the Caption of the column from the displayed as field**
- **Sort – sort a column *Ascending* or *Descending***
- **Sort Order - select the order to sort the columns**
- **Criteria – logical filters can be used on the data to filter output (Like * or Equals 04)**

© 2005. Intergraph Corp.
All Rights Reserved.

Default column headings can be changed to suit the preference of different users running the report.

Adhoc Report Options

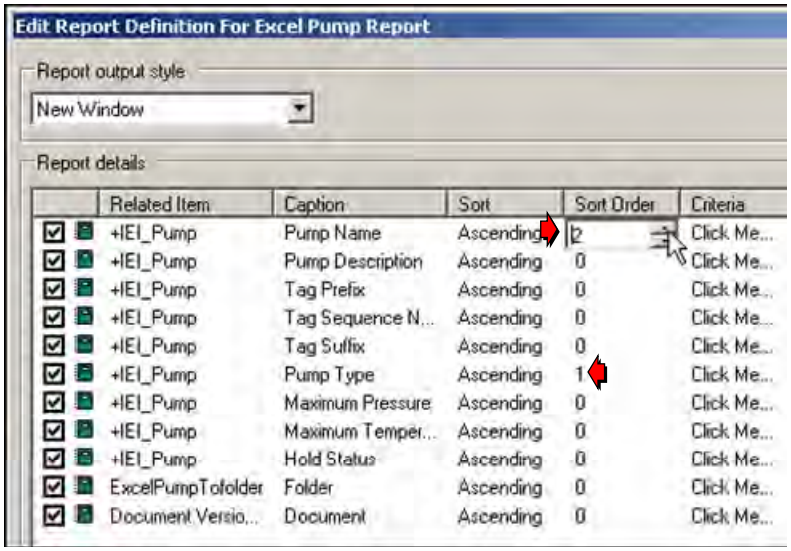
- **Change the Caption of the column from the displayed default to a user defined caption.**



© 2005. Intergraph Corp.
All Rights Reserved.

The sort order for report data can also be changed from the default "name" field.

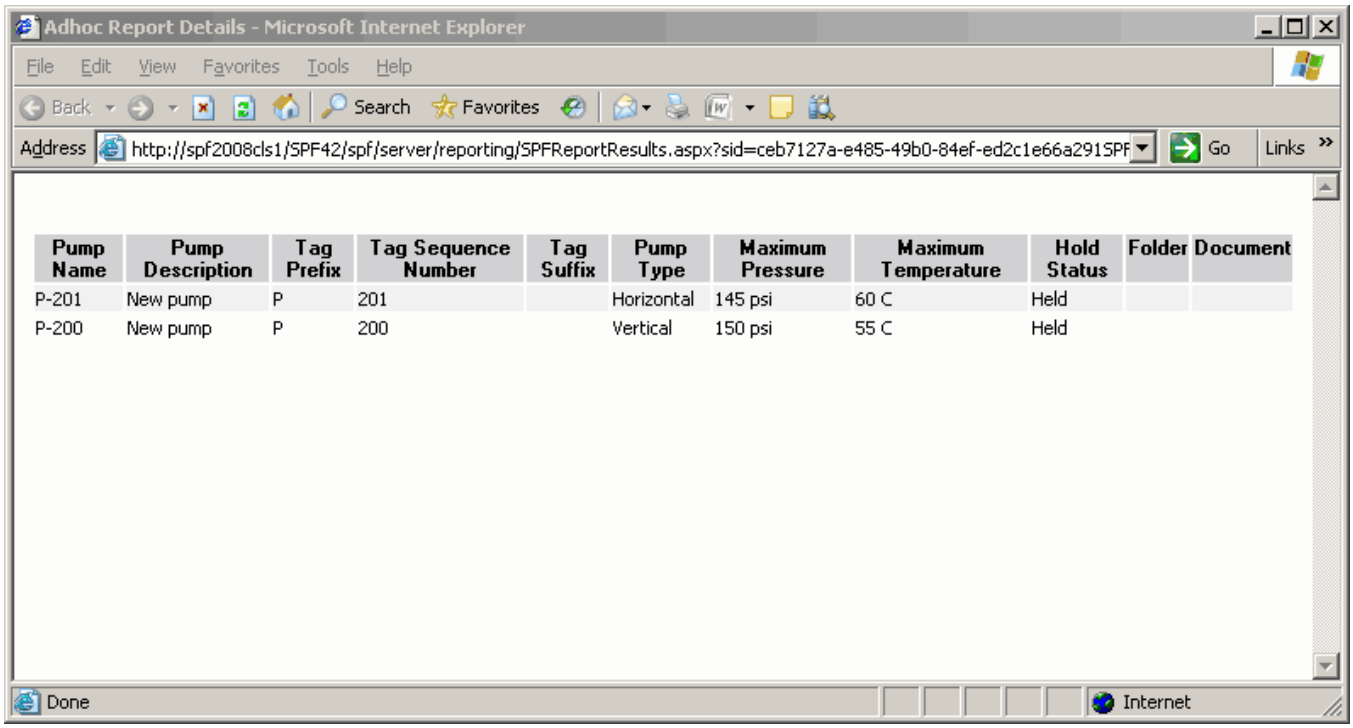
Adhoc Report Options



- **Select one or more sort orders to determine the order that rows will be sorted on the report output.**

© 2005. Intergraph Corp.
All Rights Reserved.

Below is an example of a report with the changed caption and sort order.

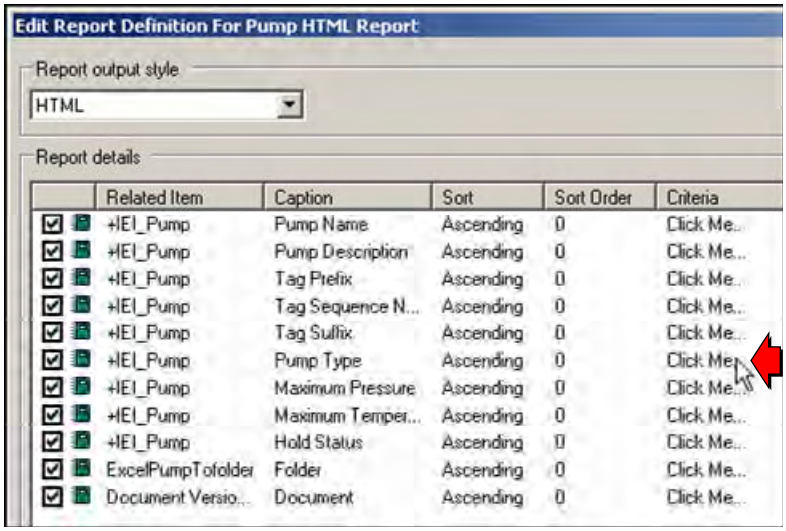


Pump Name	Pump Description	Tag Prefix	Tag Sequence Number	Tag Suffix	Pump Type	Maximum Pressure	Maximum Temperature	Hold Status	Folder	Document
P-201	New pump	P	201		Horizontal	145 psi	60 C	Held		
P-200	New pump	P	200		Vertical	150 psi	55 C	Held		

Each field in the view will allow for the definition of search criteria for the report.

Adhoc Report Options

- **Choose the Click Me… field to filter the report output.**

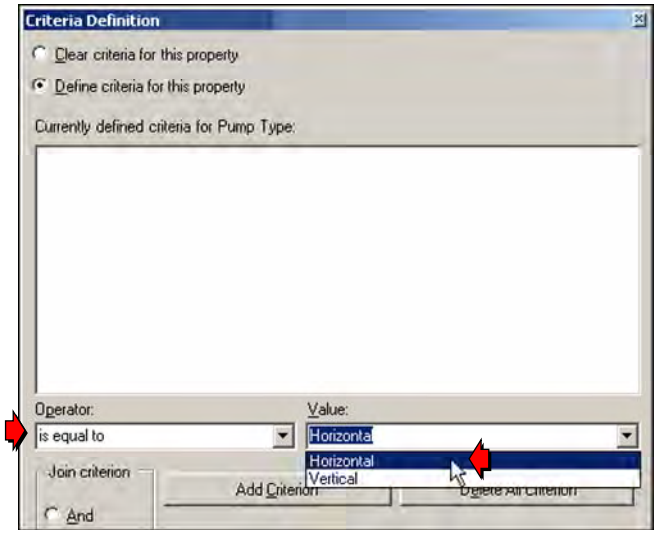


© 2005. Intergraph Corp.
All Rights Reserved.

The following criteria will apply to the **Pump Type** property from the *View Def*.

Adhoc Report Options

- **Select an Operator and key-in or choose a Value.**

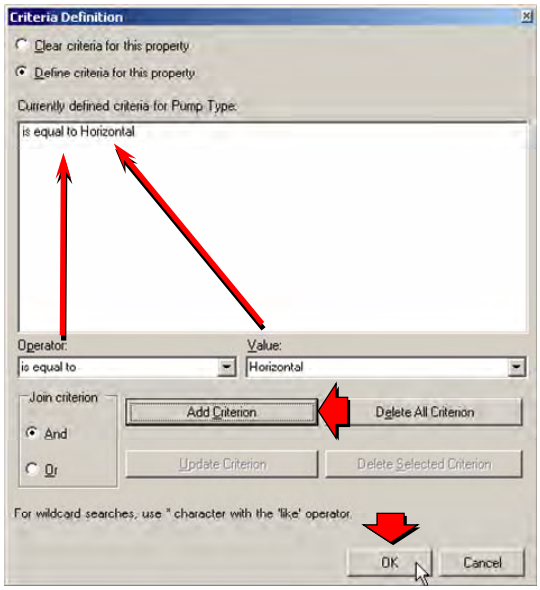


© 2005. Intergraph Corp.
All Rights Reserved.

Once the criteria has been specified, add it to the *Currently defined criteria* field. Select the ***Add Criterion*** button to define the report criteria.

Adhoc Report Options

- **Click OK to complete the report criteria definition.**

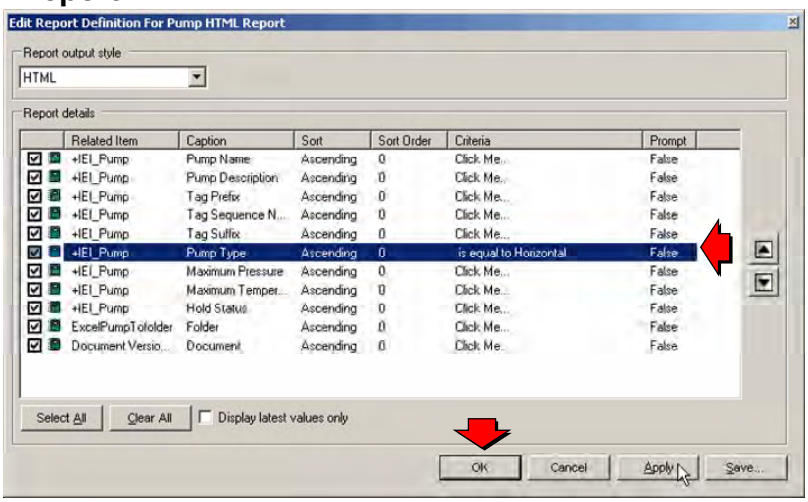


© 2005. Intergraph Corp.
All Rights Reserved.

Compound criteria can be specified for any of the view def properties. Now that all of the criteria has been defined, close the *Criteria Definition* dialog and run the report.

Adhoc Report Options

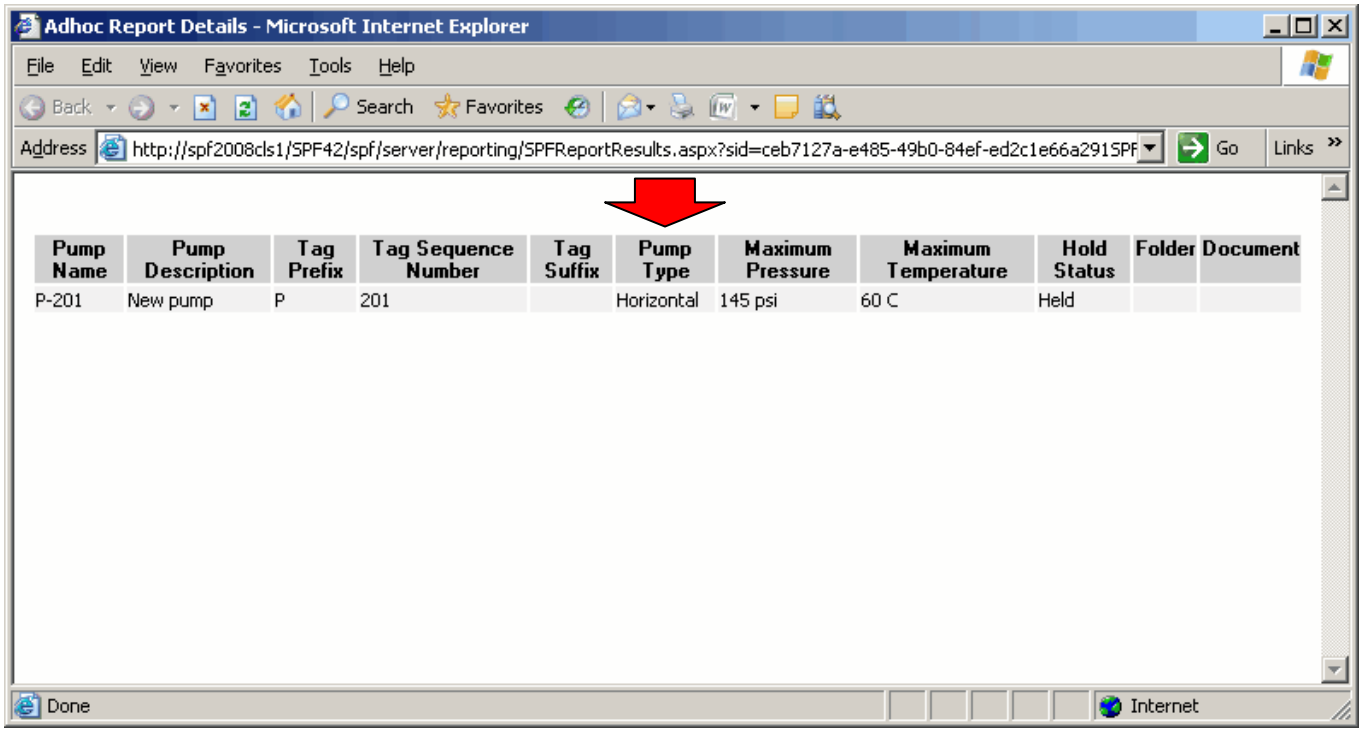
- **With the report criteria defined, click OK to generate a new report.**



© 2005. Intergraph Corp.
All Rights Reserved.

This criteria will return all *Pump* objects that have a Pump Type of **Horizontal**. Note the **Criteria** field in the *Edit Report* dialog.

The report example here reflects the applied search criteria.



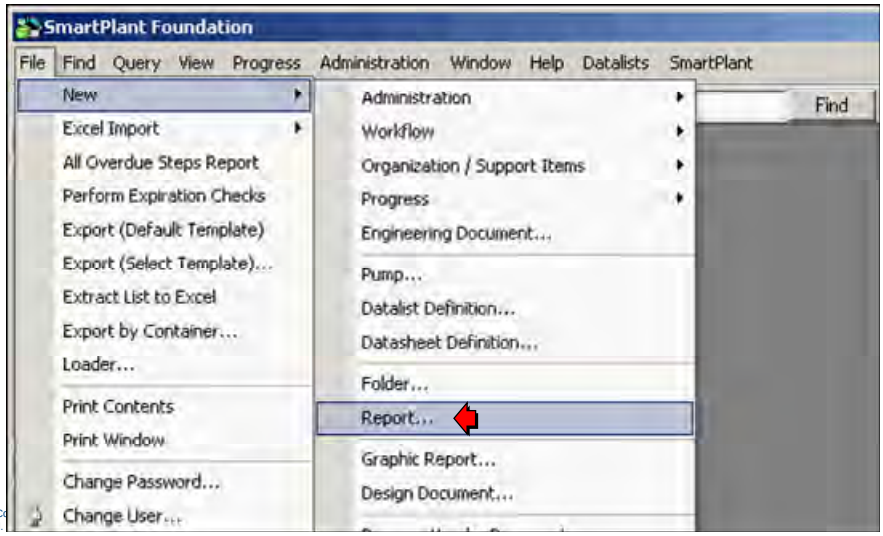
Pump Name	Pump Description	Tag Prefix	Tag Sequence Number	Tag Suffix	Pump Type	Maximum Pressure	Maximum Temperature	Hold Status	Folder	Document
P-201	New pump	P	201		Horizontal	145 psi	60 C	Held		

11.7 Generating a Line List Adhoc Report

With a Graph Def and View Def defined, use the SPF Desktop Client to generate the Line List report.

Generating a Line List Adhoc Report

- **Select *File > New > Report* from the Desktop Client menu.**

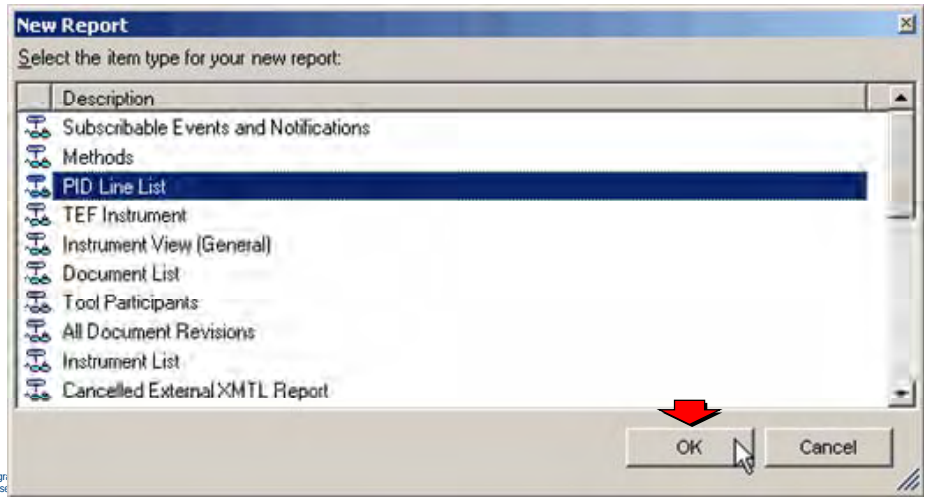


© 2005. Intergraph Co
All Rights Reserved.

The *New Report* dialog will be displayed.

Generating a Line List Adhoc Report

- **Select the View Def to be used to create the Line List report.**

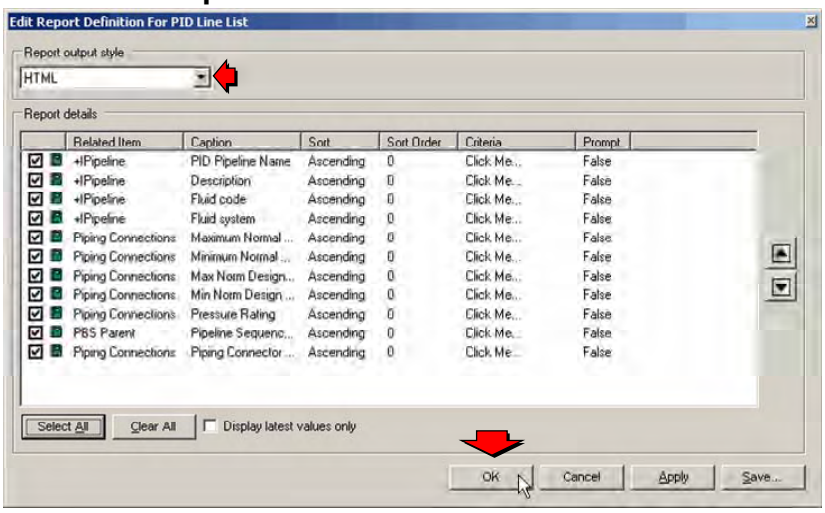


© 2005. Intergr
All Rights Res

Choose the desired report options and then click **OK** to generate the Line List report.

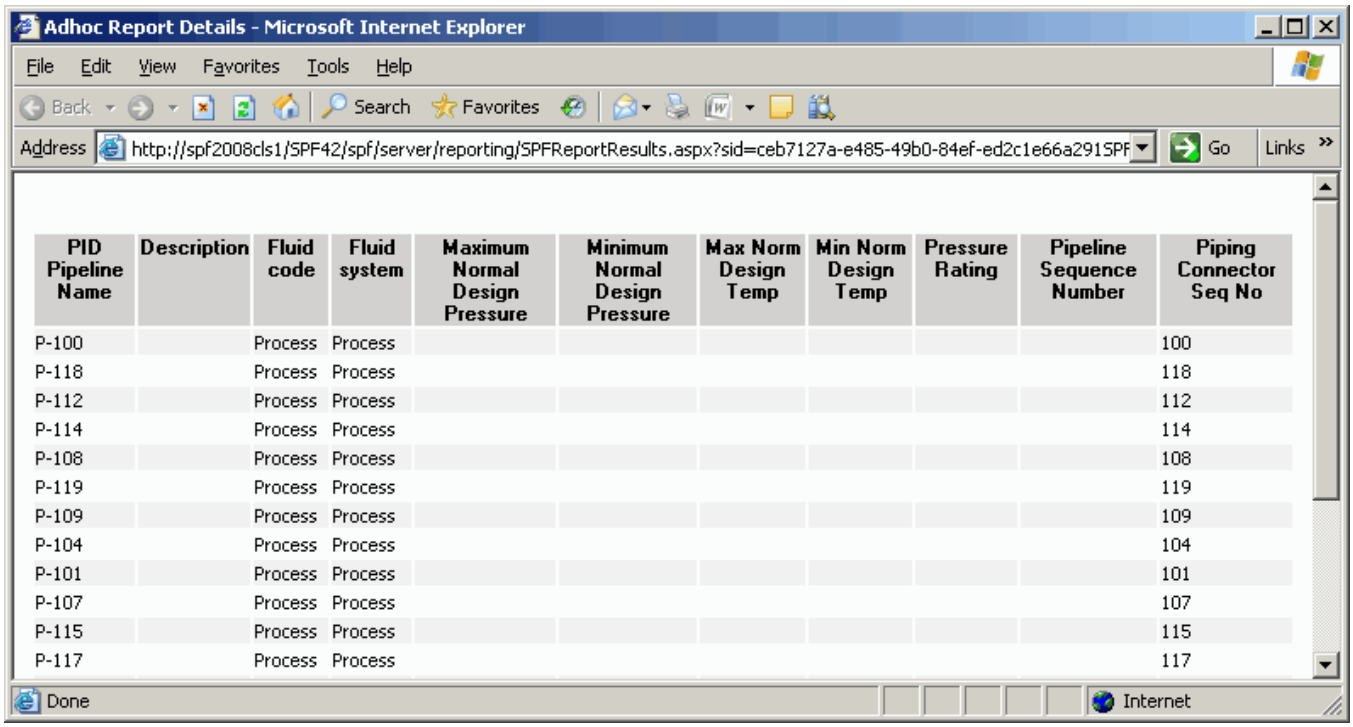
Generating a Line List Adhoc Report

- **In the *Output details to* field, choose the destination for the Line List report.**



© 2005. Intergraph Corp.
All Rights Reserved.

The following is an example of how the Line List report will look using out of the box output to HTML. If you need different output formats, custom programming (macro, asp,…) will be required for the output format.



PID Pipeline Name	Description	Fluid code	Fluid system	Maximum Normal Design Pressure	Minimum Normal Design Pressure	Max Norm Design Temp	Min Norm Design Temp	Pressure Rating	Pipeline Sequence Number	Piping Connector Seq No
P-100		Process	Process							100
P-118		Process	Process							118
P-112		Process	Process							112
P-114		Process	Process							114
P-108		Process	Process							108
P-119		Process	Process							119
P-109		Process	Process							109
P-104		Process	Process							104
P-101		Process	Process							101
P-107		Process	Process							107
P-115		Process	Process							115
P-117		Process	Process							117

Note: This report is based on any existing data that is currently in the SPF database.

11.8 Activity – Creating and Running Adhoc Reports

Complete the **Chapter 11 - Activity** in the SPF Configuration and Administration II activity workbook.

CHAPTER 12

Excel Import

12. Introduction to the Excel Import

Excel Import allows you to load data created or edited in a Microsoft Excel spreadsheet and compare the data with existing data.

Excel Import Setup

The Excel Import wizard:

- **Allows you to load data created or edited in a Microsoft Excel spreadsheet and compare the data with existing data.**
- **Uses the structure of the Excel file to describe the data.**
- **Provides the ability to attach files to the created objects.**
- **Provides the ability to add created objects to the new items window.**

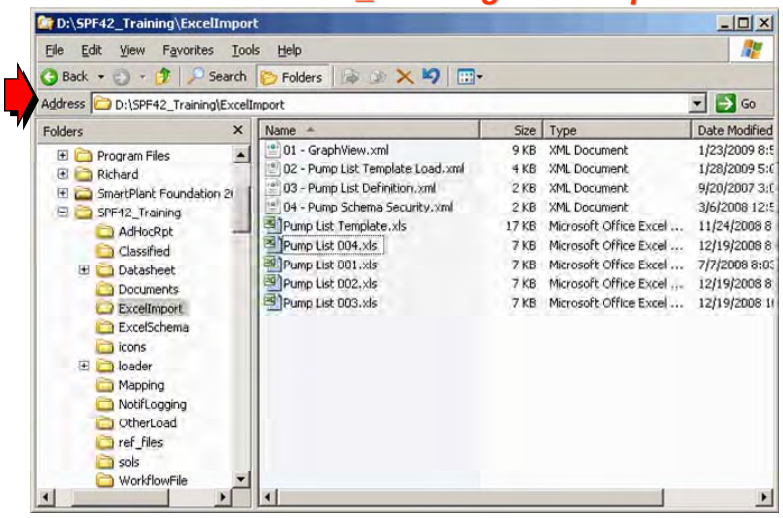
© 2008. Intergraph Corp.
All Rights Reserved.

12.1 Excel Import Setup

Excel Import is not designed to be used right out of the box. A certain level of configuration is required. Before using Excel Import, it is necessary to manually create/configure the necessary objects needed for Excel Import. Alternatively, use the loader to load a group of XML files to automatically create objects, relationships, access groups, and other configurations required to use the import functionality.

Excel Import Setup

- **Before using the Excel Import, load some additional XML files found in *D:\SPF42_Training\ExcelImport*.**



© 2008. Intergraph Corp.
All Rights Reserved.

There are additional objects needed for the excel import that could be loaded using load files. However, in this class, forms, display items, menus and methods have been created manually.

The load files can be used to create objects in the system for configuring excel import.

Excel Import Overview

Use the Loader to load the files in order 01 through 04.

The load files perform actions that include the following functions:

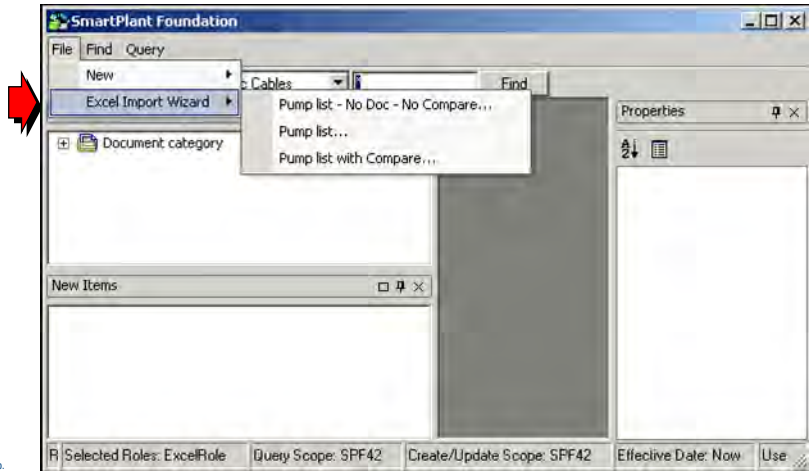
- **Modifies the schema with new or modified ViewDefs, InterfaceDefs, PropertyDefs, etc.**
- **Creates new templates and relationships**
- **Creates new List Definitions**

© 2008. Intergraph Corp.
All Rights Reserved.

After the XML files have been loaded, login as ***ExcelUser***. Notice the new import options that are available.

Excel Import Setup

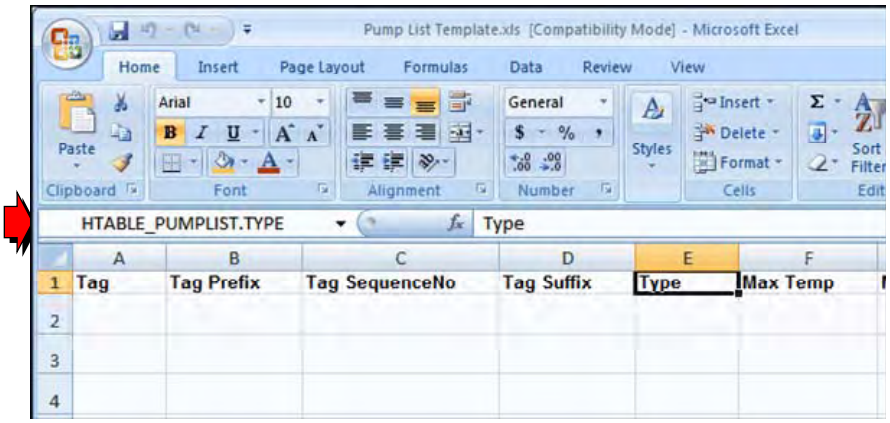
- **Following the load process, log into the system as ExcelUser to access the new functionality.**



© 2008. Intergraph Corp.
All Rights Reserved.

12.2 Preparing the Import File

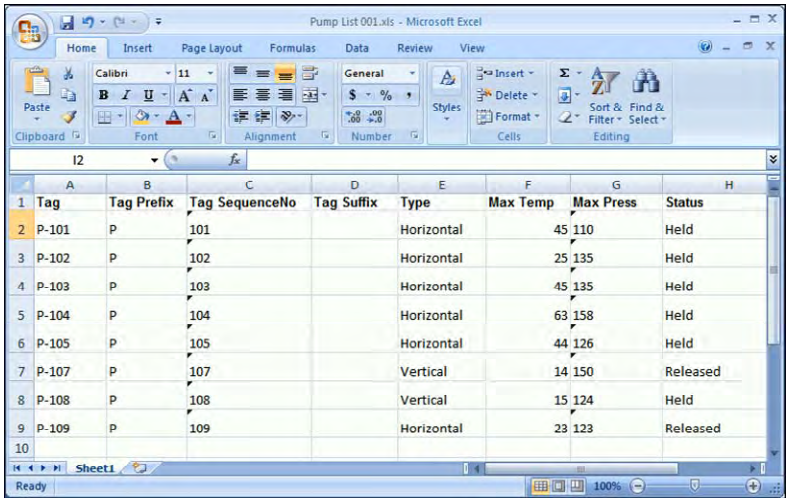
Use the *Datasheet Definer* (refer back to chapter 10 for information on Datasheet Definer) to create a template for the import file.



In this example, the load files have already performed the configuration done by the Datasheet Definer.

Prepare the import file

- **Use the new template to populate values for the pumps to be created.**



	Tag	Tag Prefix	Tag SequenceNo	Tag Suffix	Type	Max Temp	Max Press	Status
2	P-101	P	101		Horizontal	45	110	Held
3	P-102	P	102		Horizontal	25	135	Held
4	P-103	P	103		Horizontal	45	135	Held
5	P-104	P	104		Horizontal	63	158	Held
6	P-105	P	105		Horizontal	44	126	Held
7	P-107	P	107		Vertical	14	150	Released
8	P-108	P	108		Vertical	15	124	Held
9	P-109	P	109		Horizontal	23	123	Released

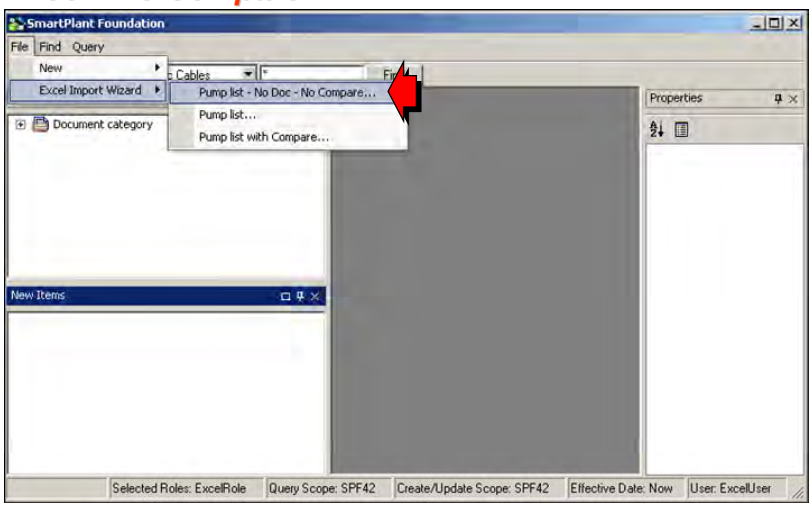
© 2008. Intergraph Corp.
All Rights Reserved.

12.3 Importing the Objects

Once the system has been configured and the import file setup is complete, import the pumps and pump list using the different options.

Importing the Objects

- **From the menu, click *Excel Import Wizard > Pump list – No Doc – No Compare*.**

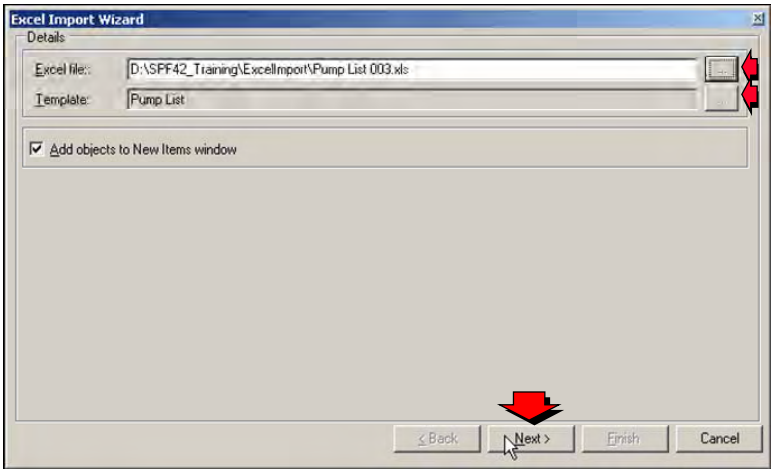


© 2008. Intergraph Corp.
All Rights Reserved.

This option creates new tag objects but no pump list document in SPF.

Importing the Objects

- **On the *Excel Import Wizard* dialog box, select the excel file to import. Click *Next*.**



© 2008. Intergraph Corp.
All Rights Reserved.

Option	Description
Excel file	Indicates the location of the Excel file to import.
Template	Indicates what template is used for the import.
Add objects to New Items window	Indicates whether created objects are to display in the New Items window.

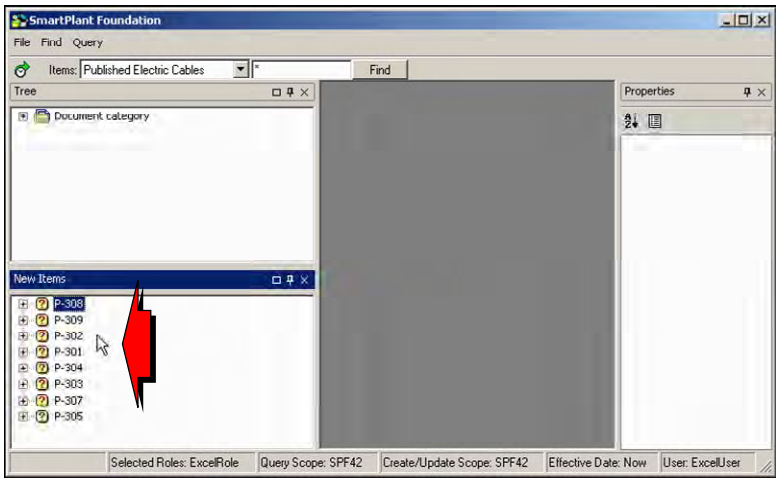
Importing the Objects

- **Once finish a summary displays. Click *Finish*.**

© 2008. Intergraph Corp.
All Rights Reserved.

Importing the Objects

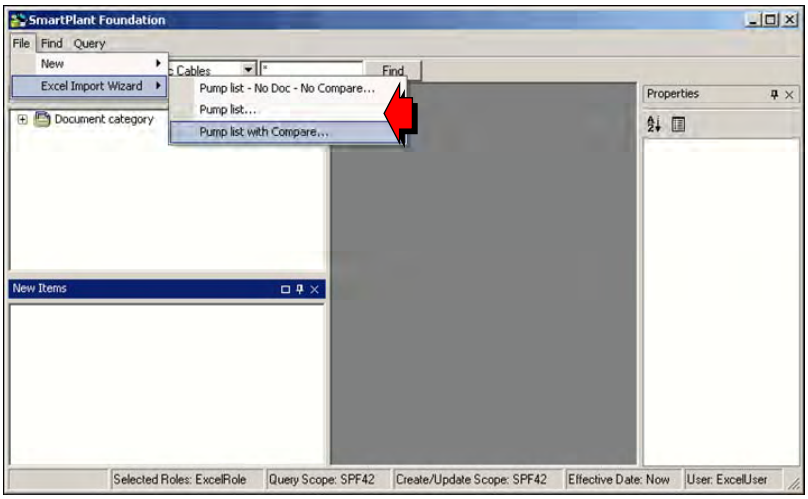
- **The pumps are loaded in to the system without the pump list.**



© 2008. Intergraph Corp.
All Rights Reserved.

Importing the Objects

- **From the menu, click *Excel Import Wizard > Pump list with Compare*.**

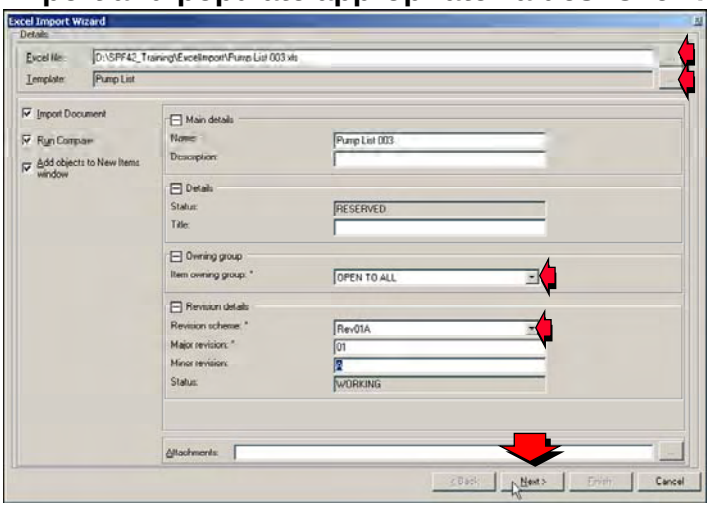


© 2008. Intergraph Corp.
All Rights Reserved.

This option creates new tag objects and a pump list document in SPF.

Importing the Objects

- **On the *Excel Import Wizard* dialog box, select the excel file to import and populate appropriate values. Click *Next*.**



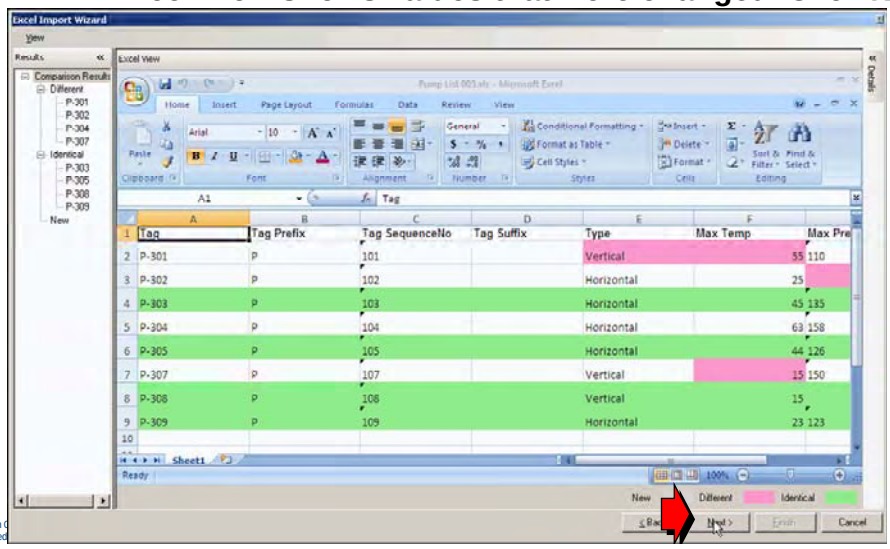
© 2008. Intergraph Corp.
All Rights Reserved.

Option	Description
Excel file	Indicates the location of the Excel file to import.

Option	Description
Template	Indicates what template is used for the import.
Import Document	Indicate whether or not to create the related document list.
Run Compare	Indicates whether or not to run a compare of new values against values already existing in the system.
Add objects to New Items window	Indicates whether created objects are to display in the New Items window.
Attachments	Indicates any additional file to attach to the import.

Importing the Objects

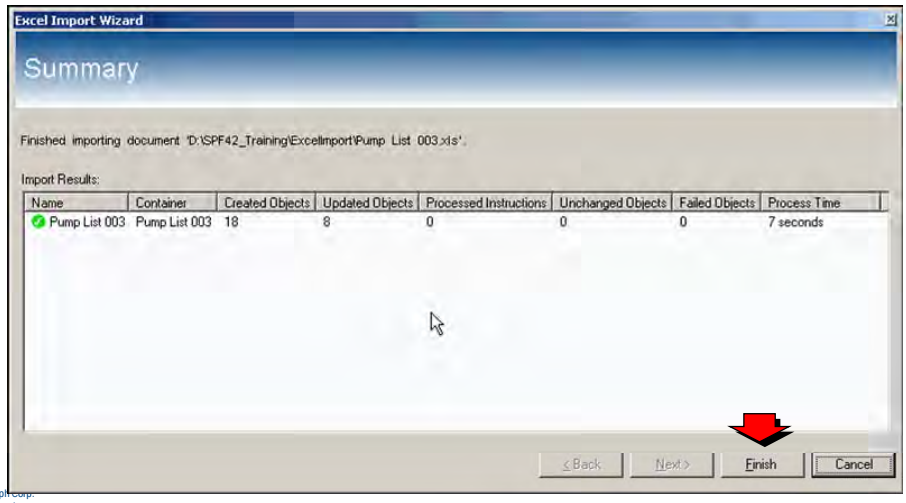
- **An Excel View shows values that were changed. Click *Next*.**



© 2008. Intergraph C
All Rights Reserved

Importing the Objects

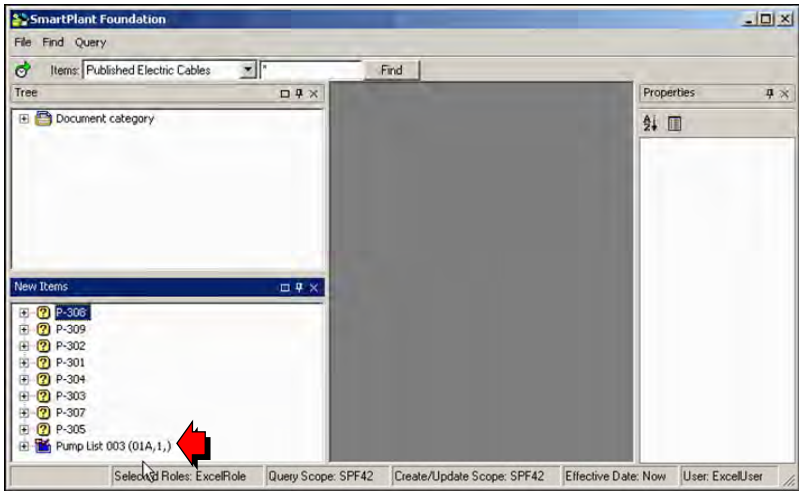
- **Once finished a summary displays. Click *Finish*.**



© 2008. Intergraph Corp.
All Rights Reserved.

Importing the Objects

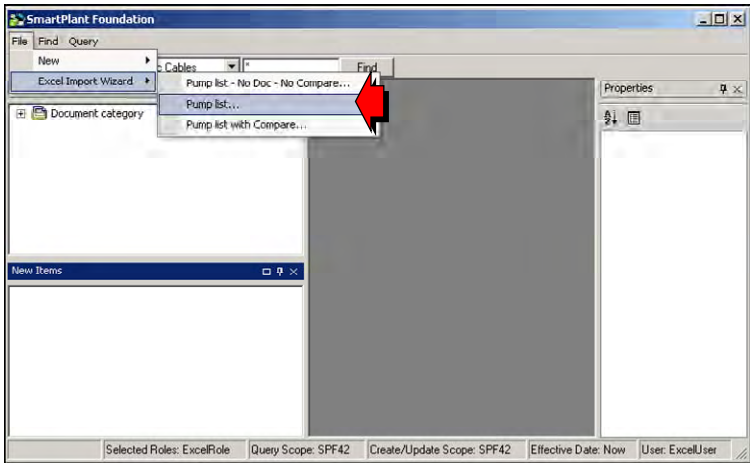
- **The pump list is created and the existing pumps updated.**



© 2008. Intergraph Corp.
All Rights Reserved.

Importing the Objects

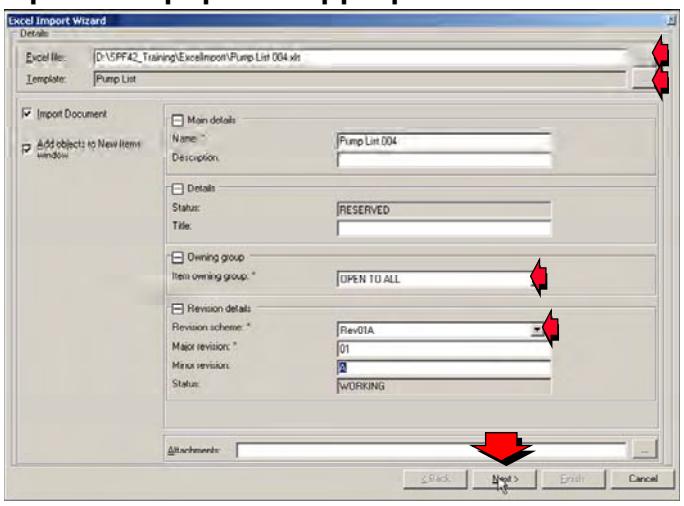
- **From the menu, click *Excel Import Wizard > Pump list* to import a pump list without a compare.**



© 2008. Intergraph Corp.
All Rights Reserved.

Importing the Objects

- **On the *Excel Import Wizard* dialog box, select the excel file to import and populate appropriate values. Click *Next*.**



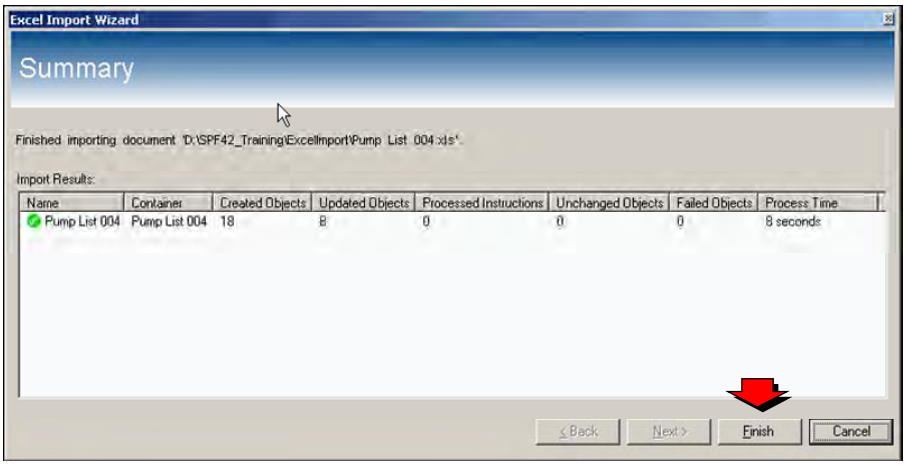
© 2008. Intergraph Corp.
All Rights Reserved.

Option	Description
Excel file	Indicates the location of the Excel file to import.

Option	Description
Template	Indicates what template is used for the import.
Import Document	Indicate whether or not to create the related document list.
Add objects to New Items window	Indicates whether created objects are to display in the New Items window.
Attachments	Indicates any additional file to attach to the import.

Importing the Objects

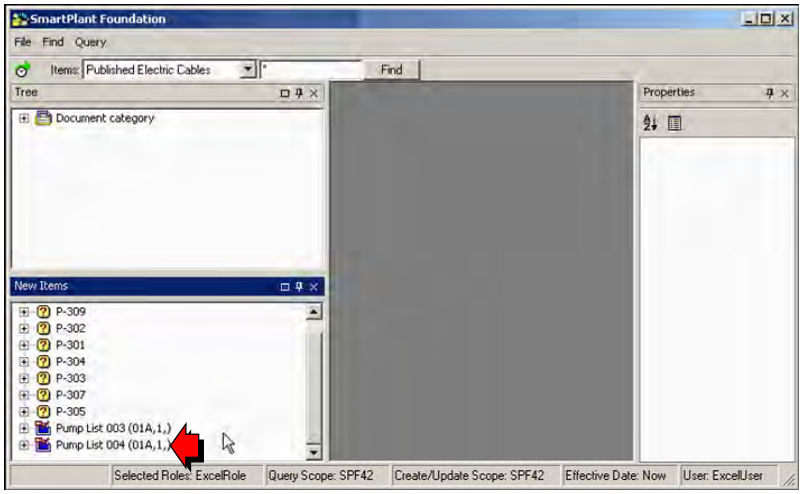
- **Once finished a summary displays. Click *Finish*.**



© 2008. Intergraph Corp.
All Rights Reserved.

Importing the Objects

- **The new pump list is created.**



© 2008. Intergraph Corp.
All Rights Reserved.

CHAPTER 13

Creating Custom Plant Hierarchies

13. Creating Plant Hierarchies

The default plant breakdown hierarchy is ***Plant***, ***Area,*** and ***Unit***. However, different projects may require a different hierarchy. This chapter will demonstrate the process used to configure a custom plant hierarchy.

In SmartPlant Foundation and the authoring tools that are integrated with it, engineering data is organized using a plant breakdown structure (PBS). A plant breakdown structure is a classified hierarchy with superiors, or roots, and subordinates, or dependents. For example, a PBS for organizing plant data might be plant/area/system/subsystem or plant/area/unit.

The PBS hierarchy defined in the SmartPlant schema is used to create the PBS hierarchy in SmartPlant Foundation. This hierarchy is communicated to integrated authoring tools when SmartPlant Foundation publishes the plant breakdown structure and the tools retrieve it.

In previous releases, the plant breakdown structure for integrated authoring tools was restricted to plant/area/unit. By default, the PBS for SmartPlant is still plant/area/unit in the schema. However, a customized hierarchy can be created in the schema to meet project requirements.

Note: With SmartPlant Enterprise, all projects must use the same PBS hierarchy. Once a new hierarchy is created for a plant in SmartPlant Foundation and published, all tools must use that same hierarchy.

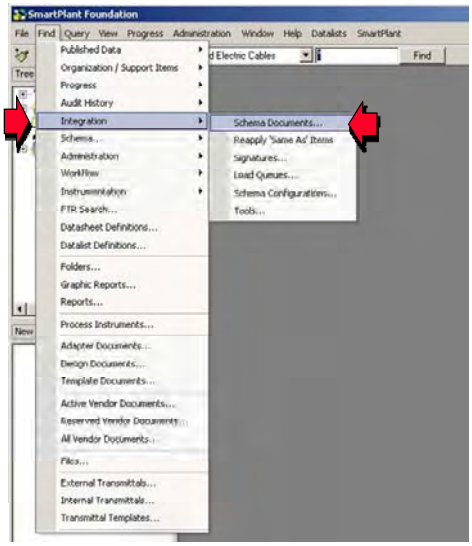
13.1 Creating the Custom Hierarchy in the Schema Editor

The process for defining a custom PBS hierarchy for SmartPlant begins in the schema using the Schema Editor. However, we must first get the CMF file, in which we will be creating the new hierarchy, from the SmartPlant Foundation Desktop Client where is it store in document management.

Open the Desktop Client and log in as a user with administrative rights, like superuser. Find the CMF file that contains the schema used for integration.

Custom Plant Hierarchy

- **From the Desktop Client, find the CMF file for your site. Use the *Find > Integration > Schema Documents* command.**

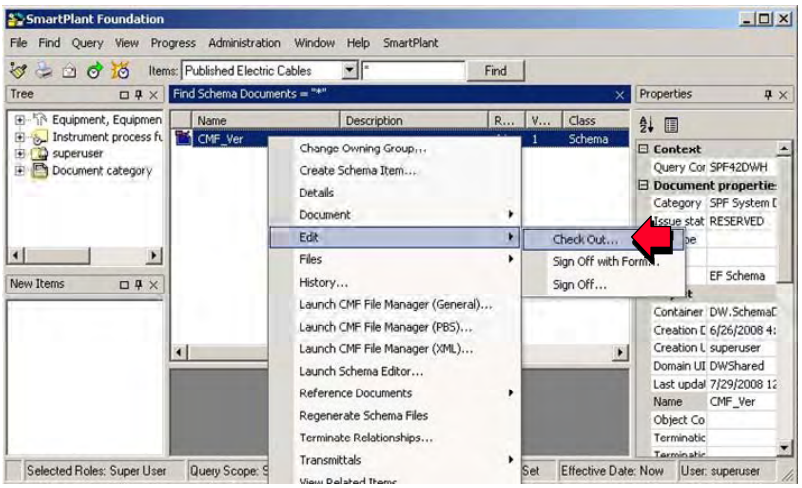


© 2005. Intergraph Corp.
All Rights Reserved.

Find the CMF file, and use the commands on its shortcut menu to check it out.

Custom Plant Hierarchy

- **Right-click on the CMF file, and use the *Edit > Check Out* command to check the CMF file out of SPF.**

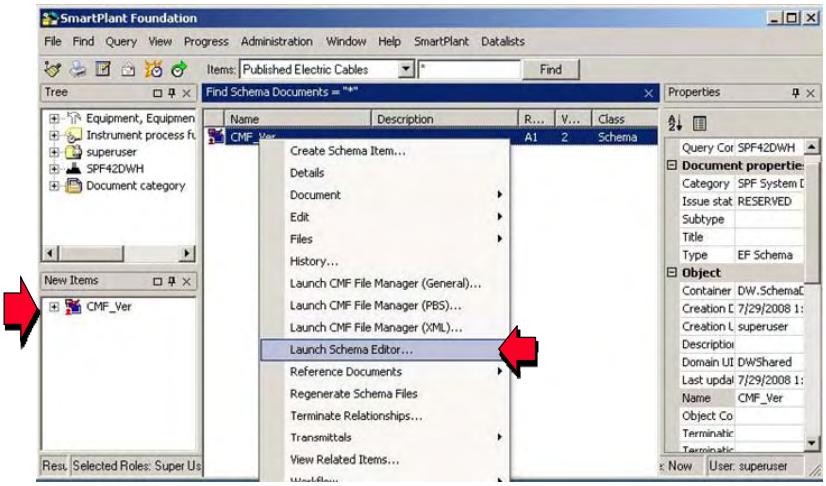


© 2005. Intergraph Corp.
All Rights Reserved.

Once the CMF file is checked out, right-click on the new, checked-out version of the document, and launch it in the Schema Editor tool.

Custom Plant Hierarchy

- **Right-click on the checked out version of the CMF file, and use the shortcut menu to launch the Schema Editor.**

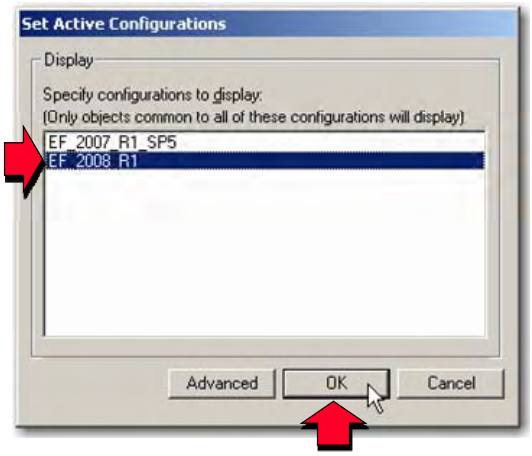


© 2005. Intergraph Corp.
All Rights Reserved.

When prompted, choose to set the 2008 version of the schema as the active configuration.

Custom Plant Hierarchy

- **When prompted, choose an active schema.**

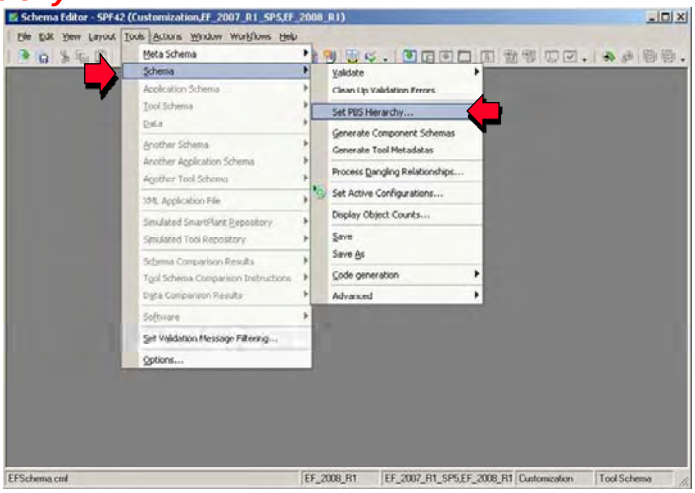


© 2005. Intergraph Corp.
All Rights Reserved.

In the Schema Editor application, use the ***Tools*** > ***Schema*** > ***Set PBS Hierarchy*** command to open a tool for defining the PBS.

Custom Plant Hierarchy

- **From the Schema Editor, click *Tools > Schema > Set PBS Hierarchy*.**

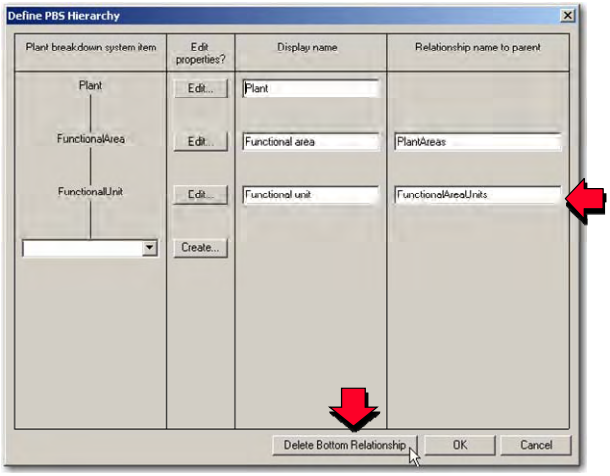


© 2005. Intergraph Corp.
All Rights Reserved.

The first step is to remove the current default **plant/area/unit**.

Custom Plant Hierarchy

- **Click the *Delete Bottom Relationship* button to remove the *Functional unit* from the hierarchy.**

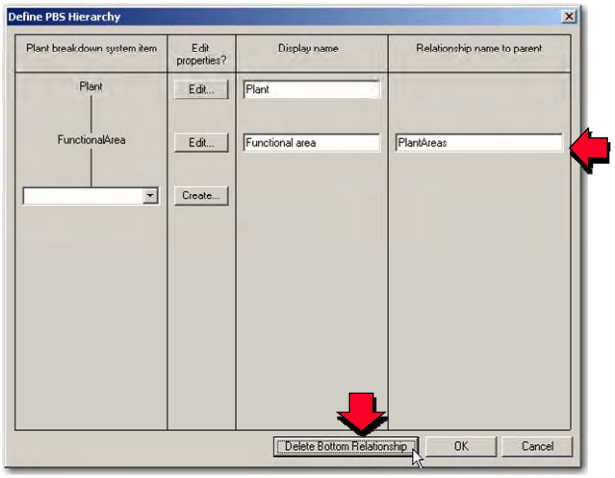


© 2005. Intergraph Corp.
All Rights Reserved.

Once the *Functional unit* has been deleted from this hierarchy, remove the **Functional area** the same way. This process removes the relationships between functional areas and units from the PBS hierarchy, but does not remove the objects from the schema.

Custom Plant Hierarchy

- **Click the *Delete Bottom Relationship* button to remove the *Functional area* from the hierarchy.**

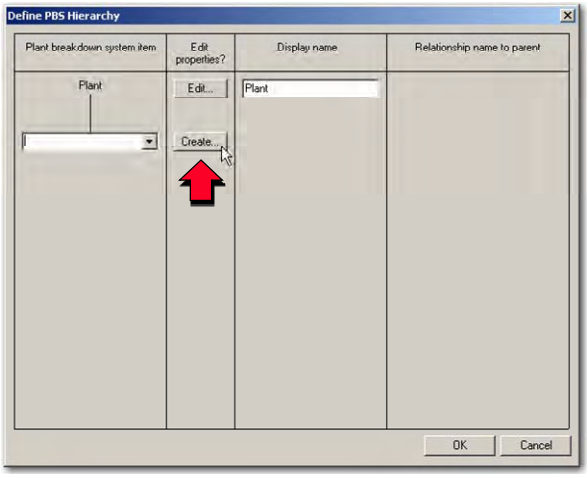


© 2005. Intergraph Corp.
All Rights Reserved.

The Plant must be at the top of every hierarchy in SmartPlant and **can not** be deleted. Begin the creation of the new desired PBS hierarchy. To change the display name for the **plant**, type a new name in the text box in the *Display name* column.

Custom Plant Hierarchy

- **Click the *Create* button to define the next level of the new PBS hierarchy.**

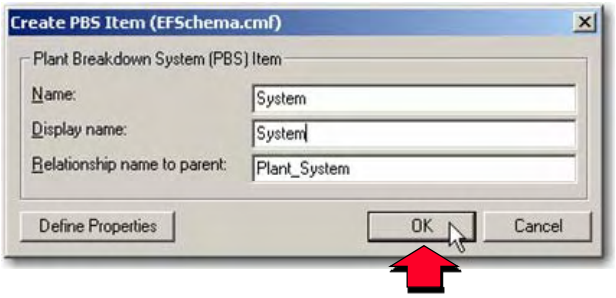


© 2005. Intergraph Corp.
All Rights Reserved.

The ***Create PBS Item*** dialog will appear.

Custom Plant Hierarchy

- **Enter the necessary information to define the *second* level of the new PBS hierarchy, and click *OK*.**

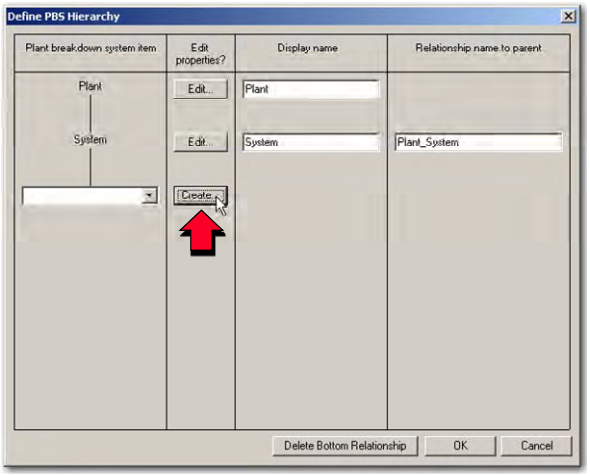


© 2005. Intergraph Corp.
All Rights Reserved.

This hierarchy level will be right below plant. Click the ***Create*** button to define the third level of the hierarchy.

Custom Plant Hierarchy

- **Choose the *Create* button to define the next level of the new PBS hierarchy.**

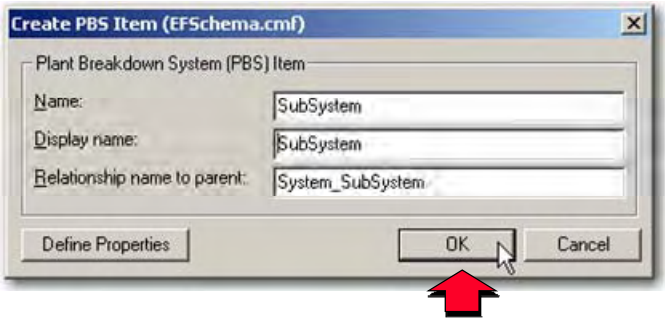


© 2005. Intergraph Corp.
All Rights Reserved.

The PBS hierarchy must include at least **3 levels**.

Custom Plant Hierarchy

- **Enter the necessary information to define the *third* level of the new PBS hierarchy, and click OK.**

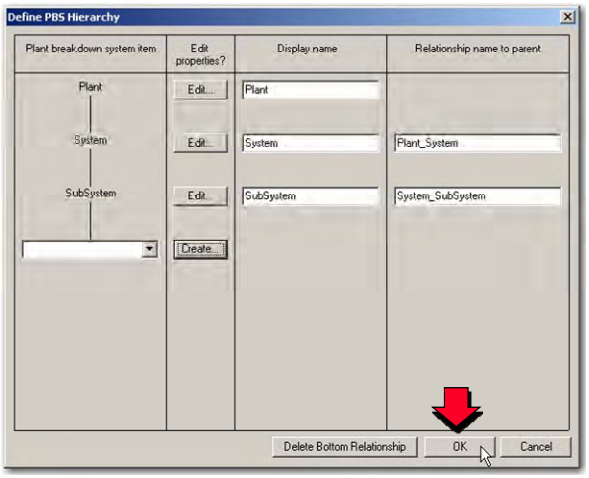


© 2005. Intergraph Corp.
All Rights Reserved.

The recommended naming convention for the relationship between an item and its parent is <*Parent*>_<*Item*>, for example, **System_SubSystem**. However, you can name this relationship any name that you want.

Custom Plant Hierarchy

- **When the new PBS hierarchy is complete, click *OK* to save the new *PBS Hierarchy*.**

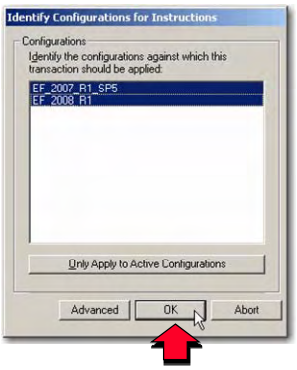


© 2005. Intergraph Corp.
All Rights Reserved.

When you click ***OK*** on the ***Define PBS Hierarchy*** dialog box, you will be prompted to indicate which schema you want to save the changes to. Both schemas should already be selected. Click ***OK*** to continue.

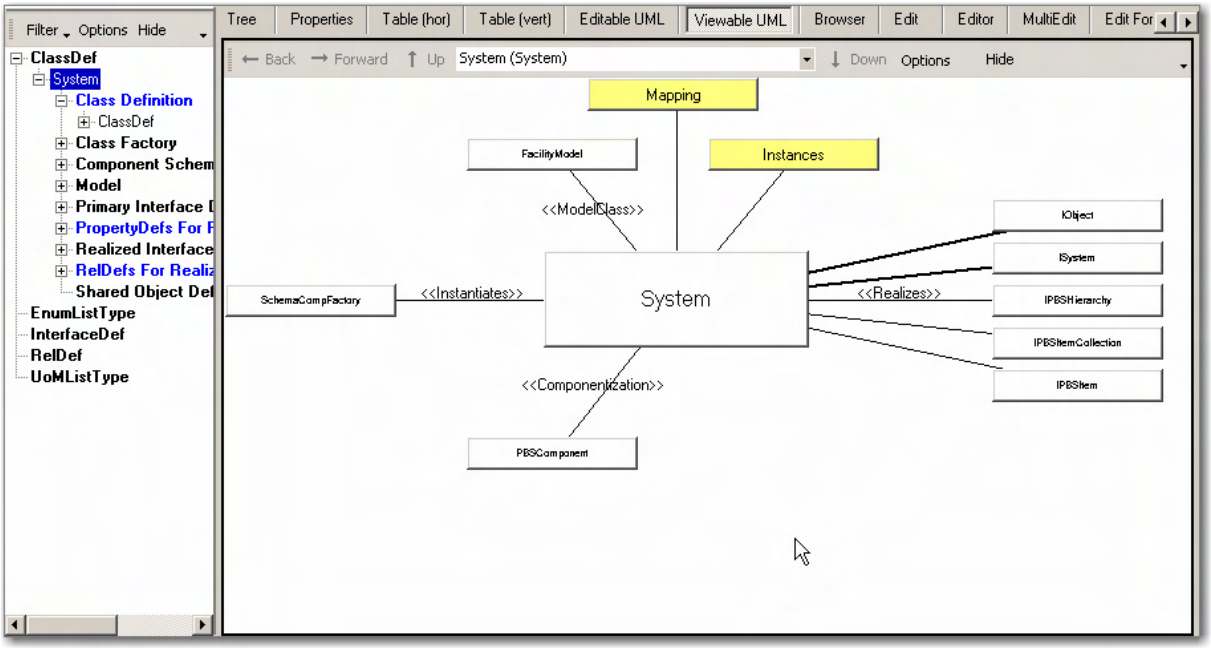
Custom Plant Hierarchy

- **When prompted, save your changes to both the 2007 and 2008 schemas.**

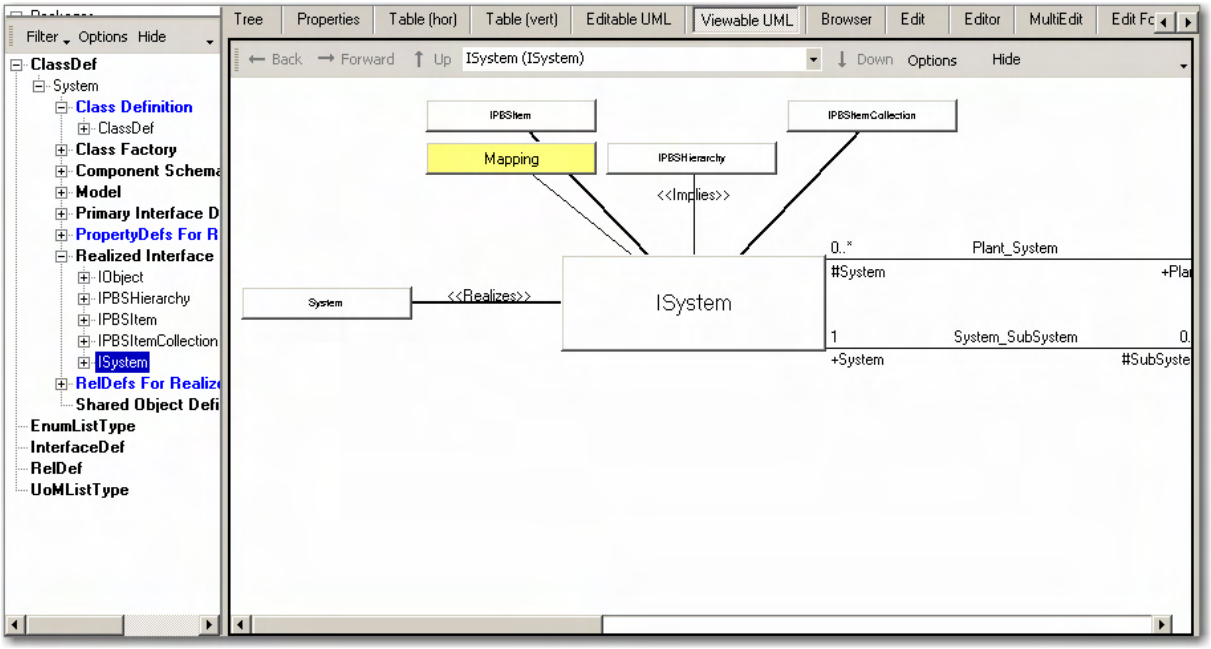


© 2005. Intergraph Corp.
All Rights Reserved.

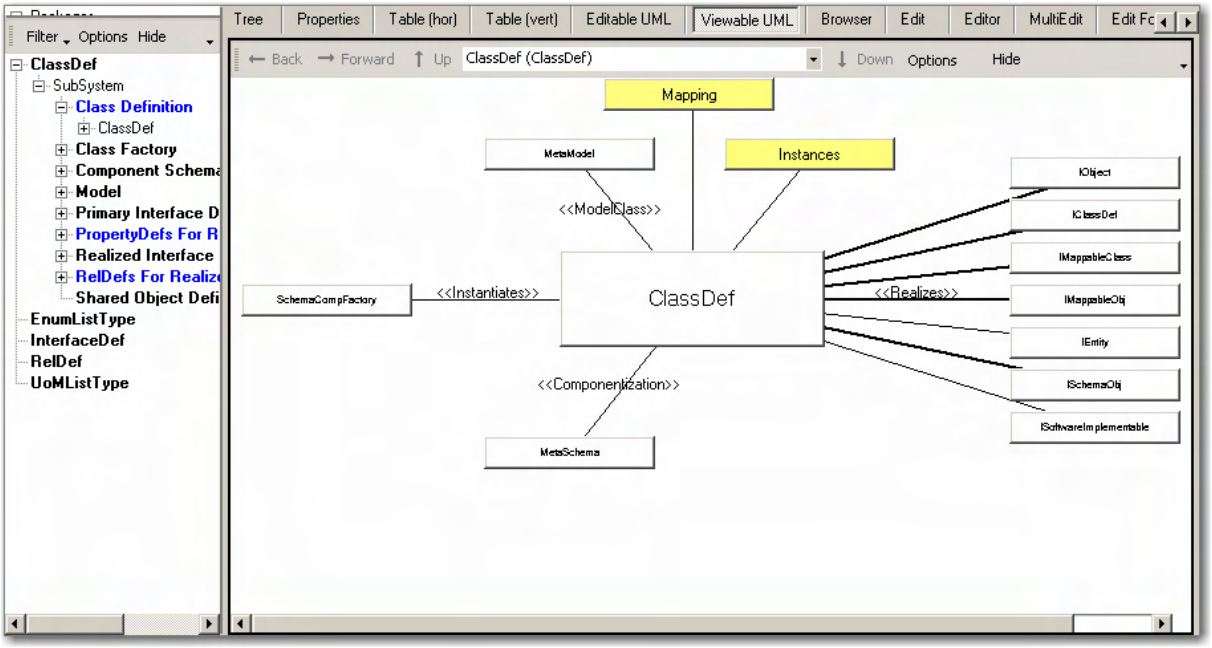
For each PBS item you created, the software will create a class definition with the same name. Below is the **System** class def.



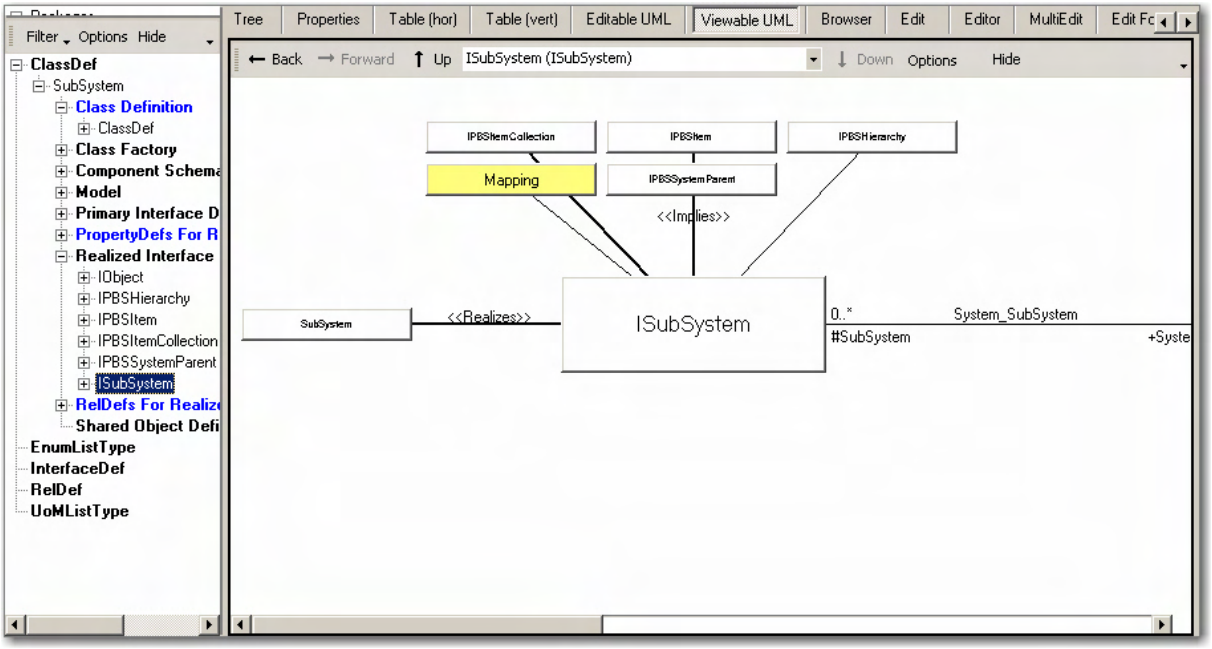
In addition to the class definition, a primary interface for the class will be created using the class name as part of the interface name. Below is the **ISystem** interface def.



Below is the **SubSystem** class def.



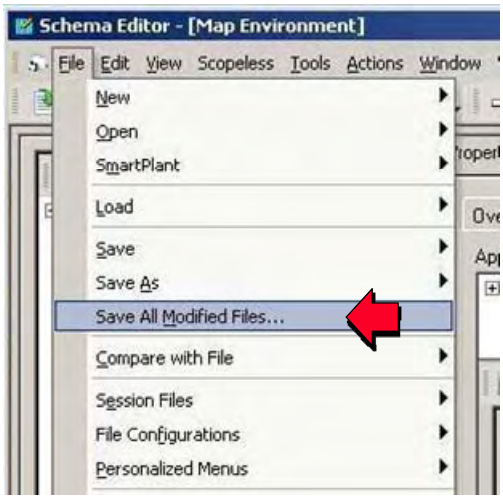
And finally, the **ISubSystem** interface def.



Now, save the schema file to save the new custom PBS hierarchy just created.

Custom Plant Hierarchy

- **On the menu, click *File > Save All Modified Files* to save the changes to the CMF file.**

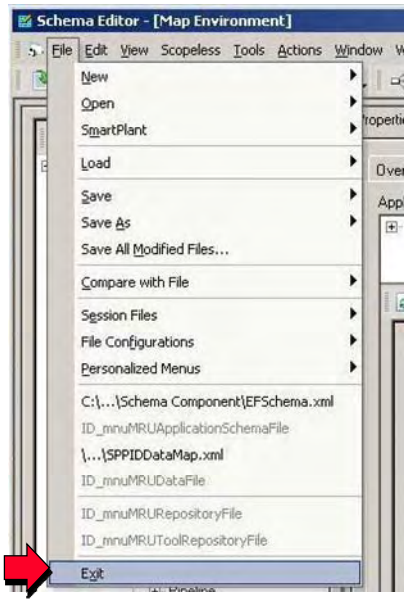


© 2005. Intergraph Corp.
All Rights Reserved.

You can then close the Schema Editor.

Custom Plant Hierarchy

- **Use the *File > Exit* command to close the Schema Editor.**



© 2005. Intergraph Corp.
All Rights Reserved.

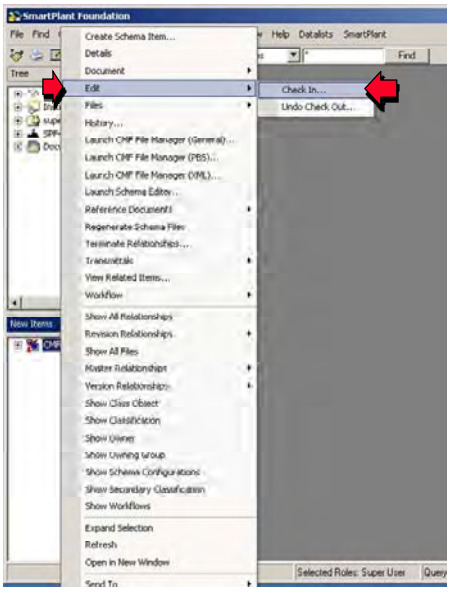
13.2 Loading the New Hierarchy into the Database

Once the custom hierarchy has been created in the Schema Editor, you must load the changes into the SPF database. Check the modified CMF file back into the Desktop Client using the commands on the shortcut menu of the latest version of the CMF file.

INTERGRAPH

Custom Plant Hierarchy

- **Return to the Desktop Client, and find the checked out version of the CMF file. Using the shortcut menu, check in the file.**

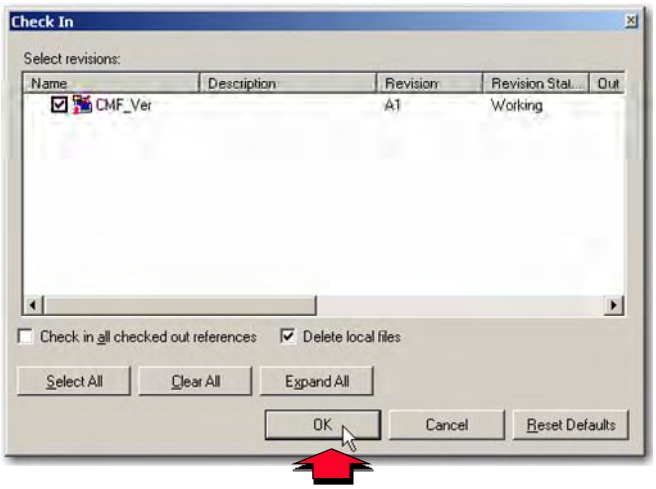


© 2005. Intergraph Corp.
All Rights Reserved.

Confirm that you want to check in the CMF file.

Custom Plant Hierarchy

- **Check in the CMF file.**

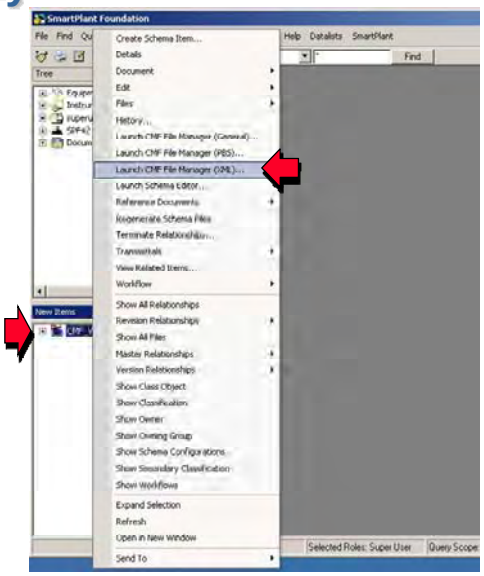


© 2005. Intergraph Corp.
All Rights Reserved.

Once the check-in process is complete, right-click on the CMF file, and choose the ***Launch CMF File Manager (XML)*** command.

Custom Plant Hierarchy

- **Right-click on the latest version of the CMF file, and use the *Launch CMF File Manager (XML)* command.**

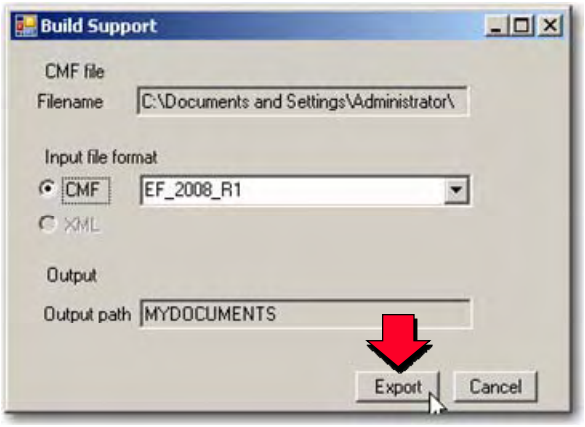


© 2005. Intergraph Corp.
All Rights Reserved.

Make sure that the CMF option and the 2008 version of the schema are selected, and then click the ***Export*** button.

Custom Plant Hierarchy

- **From the *Build Support* dialog box, note the location where the software will place the XML file to be generated, and click *Export*.**

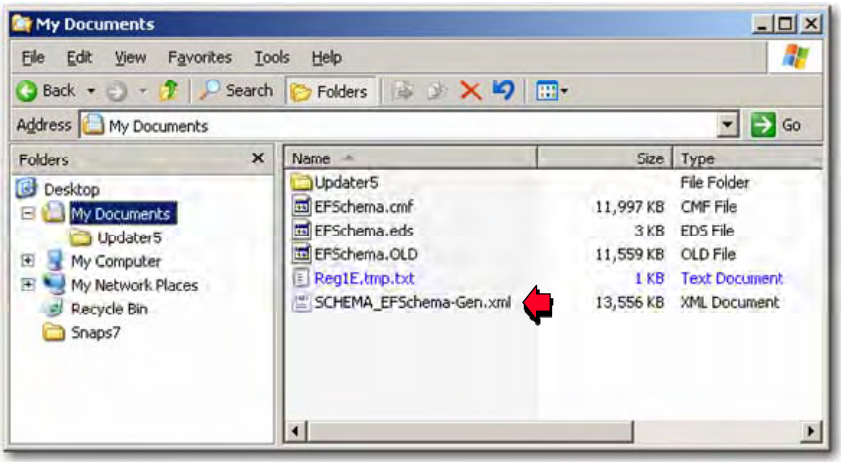


© 2005. Intergraph Corp.
All Rights Reserved.

As shown below, the utility creates a new XML file in the specified location.

Custom Plant Hierarchy

- **A new file, *SCHEMA_EFSchema-Gen.xml*, will be created in your My Documents folder.**

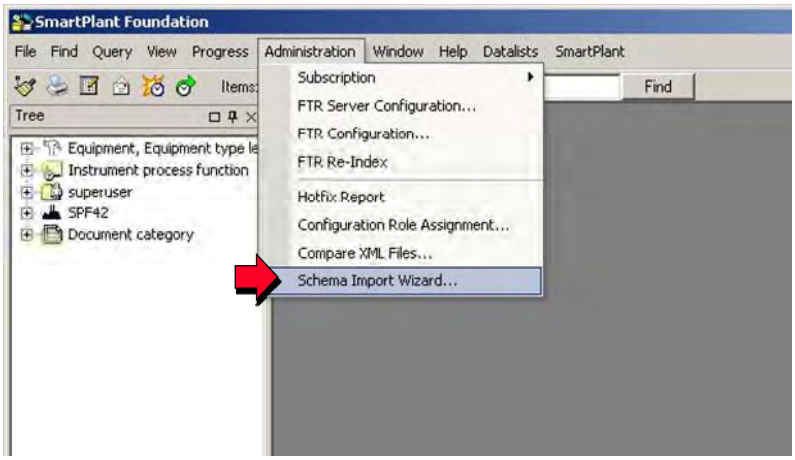


© 2005. Intergraph Corp.
All Rights Reserved.

From the Desktop Client, open the Schema Import Wizard.

Custom Plant Hierarchy

- **From the *Administration* menu, launch the *Schema Import Wizard*.**



© 2005. Intergraph Corp.
All Rights Reserved.

Using the ***Browse*** button, find the new XML file you just created.

Custom Plant Hierarchy

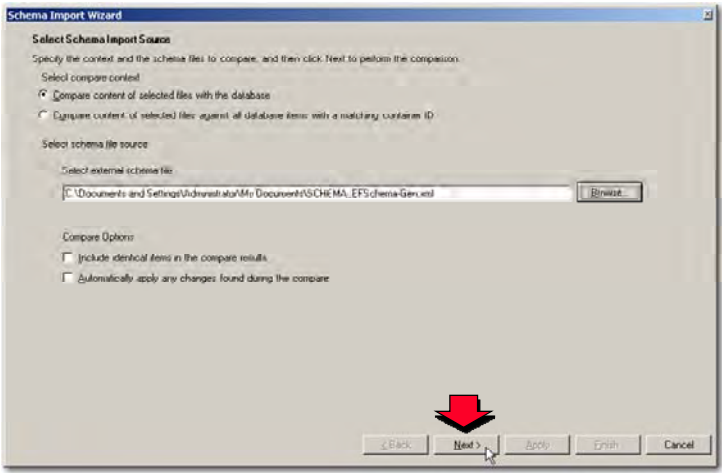
- **Choose to compare the content of the selected files with the database, and click *Browse* to find the XML file.**

© 2005. Intergraph Corp.
All Rights Reserved.

Once you have found and selected the new xml file, click ***Next***.

Custom Plant Hierarchy

- **Find the XML file just created, SCHEMA_EFSchema-Gen.xml, and then click *Next*.**

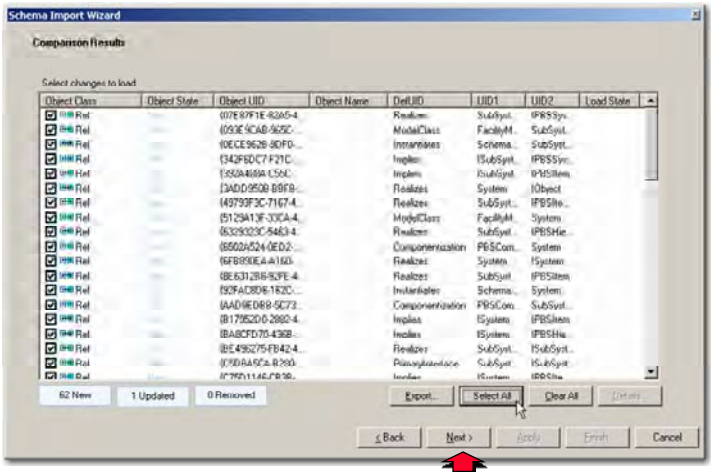


© 2005. Intergraph Corp.
All Rights Reserved.

The system returns a list of the changes to be incorporated into the database. Select the changes to incorporate, and then click ***Next***.

Custom Plant Hierarchy

- **Review the changes to be made to the database, and select all the changes using the *Select All* button.**

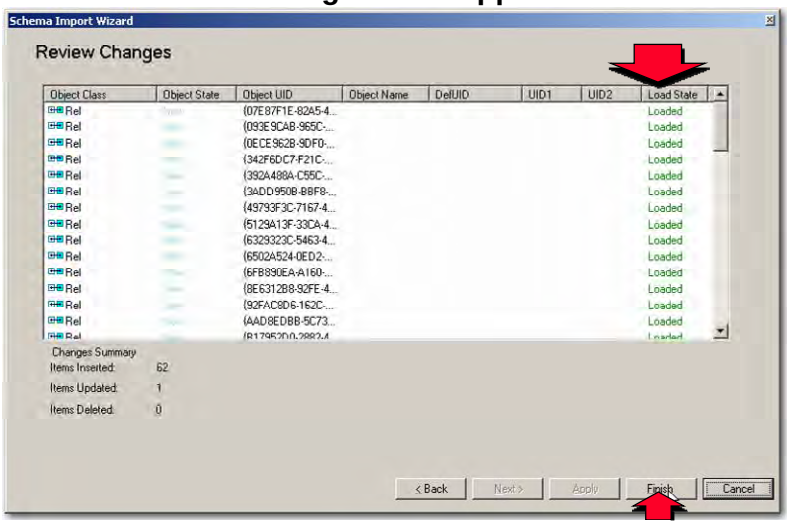


© 2005. Intergraph Corp.
All Rights Reserved.

Make sure all the changes were loaded, and then click the ***Finish*** button.

Custom Plant Hierarchy

- **Make sure all the changes were applied to the database.**

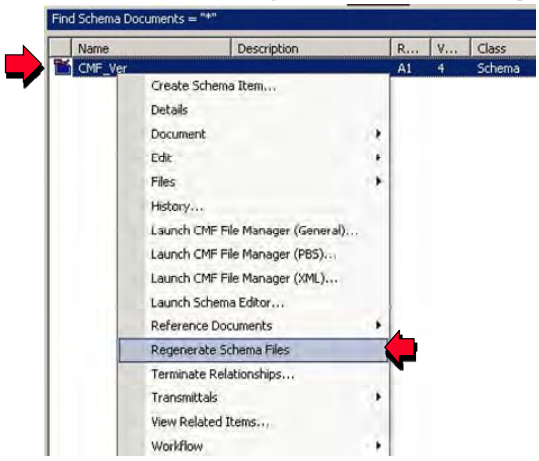


© 2005. Intergraph Corp.
All Rights Reserved.

From the short-cut menu of the CMF file, use the ***Regenerate Schema Files*** command to initiate the process of regenerating the component schemas.

Custom Plant Hierarchy

- **Right-click on the CMF file, and click the *Regenerate Schema Files* command to regenerate the component schemas.**



© 2005. Intergraph Corp.
All Rights Reserved.

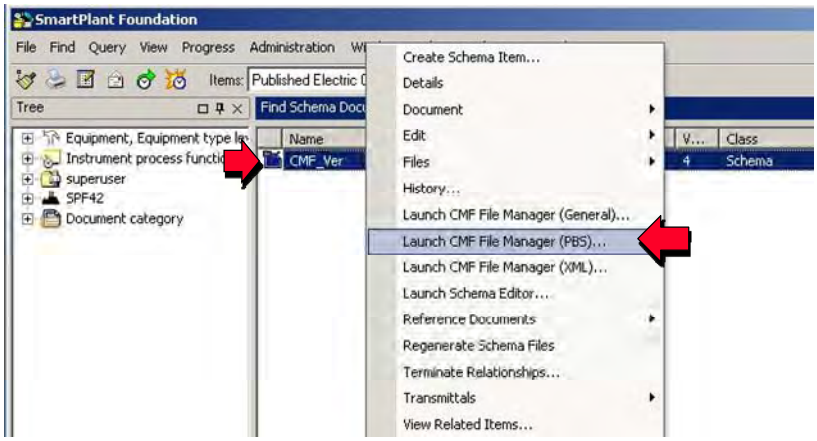
13.3 Create Admin Objects for the New Hierarchy

Before you can create your new hierarchy in the Desktop Client, you need to create the necessary methods, forms, and menu items to create the systems and subsystems beneath the plant objects. A utility, part of the Desktop Client software, is provided to create load files that will create these administrative pieces, based on the changes to the PBS you made in the schema file.

Right-click on the CMF file. Choose the ***Launch CMF File Manager (PBS)*** command.

Custom Plant Hierarchy

- **From the Desktop Client, right-click on the CMF file and choose the *Launch CMF File Manager (PBS)* command.**

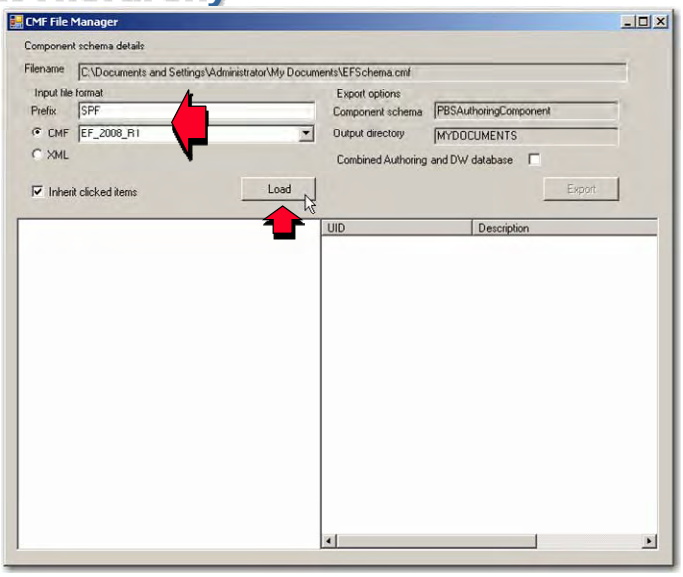


© 2005. Intergraph Corp.
All Rights Reserved.

Make sure a value is provided in the Prefix field. The default value is ***SPF***. The ***CMF*** option and the ***EF_2008_R1*** schema should be selected by default. Make sure the ***Inherit clicked items*** check box is selected, and then click the ***Load*** button.

Custom Plant Hierarchy

- **From the CMF File Manager dialog box, make sure the *Prefix* is set to *SPF*, and the *CMF* file and *EF_2008_R1* schema are selected.**
- **Make sure the Inherit clicked items check box is selected.**
- **Click the *Load* button.**

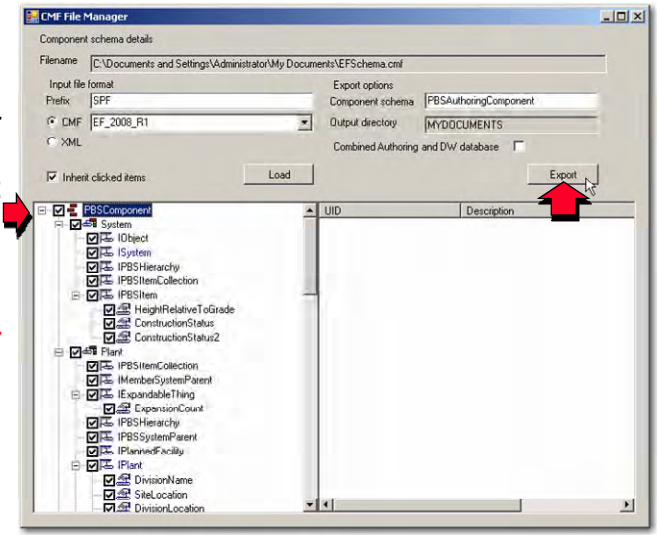


© 2005. Intergraph Corp.
All Rights Reserved.

When the load process is complete, the items will appear in the bottom left pane. Select the objects to include in the load files to be created, and then click the ***Export*** button.

Custom Plant Hierarchy

- **Select the check box beside *PBSComponent* to select the new component schema and all the related objects.**
- **Click the *Export* button.**

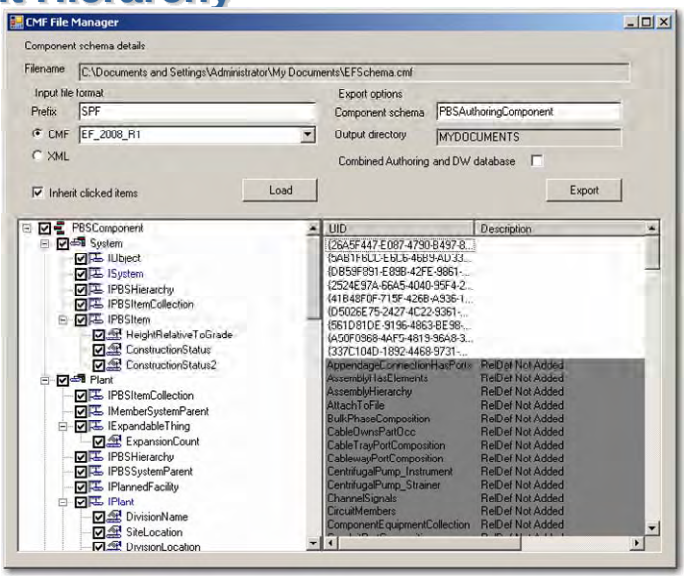


© 2005. Intergraph Corp.
All Rights Reserved.

When the system has finished creating the load files, you can close the CMF File Manager.

Custom Plant Hierarchy

- **When the export is complete, a confirmation dialog box appears. Click *OK* to dismiss it.**
- **You can now dismiss the *CMF File Manager* dialog box, as well.**

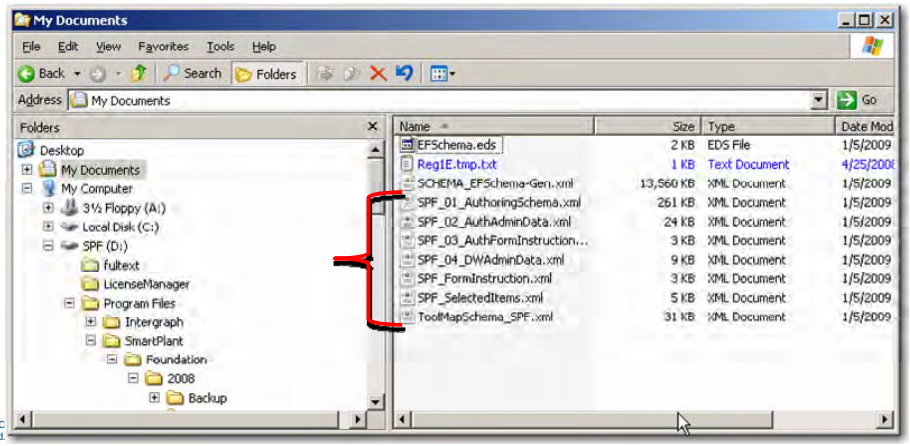


© 2005. Intergraph Corp.
All Rights Reserved.

The following files were created in the ***My Documents*** folder.

Custom Plant Hierarchy

The utility created a number of load files in the *My Documents* directory. These load files can be used later to create new methods, forms, and menu items in the Desktop Client.

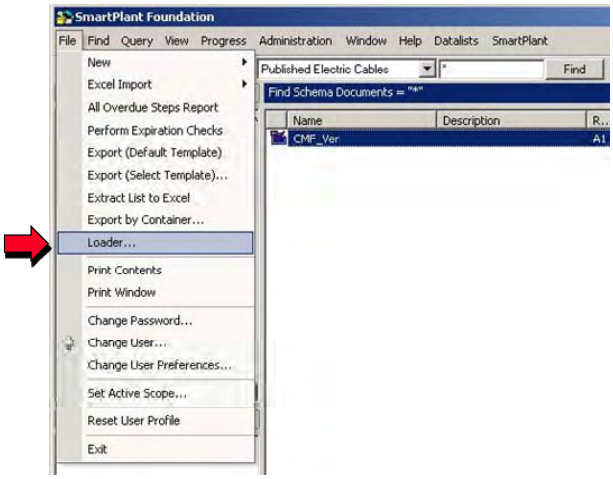


© 2005. Intergraph C
All Rights Reserved.

From the Desktop Client, open the Loader.

Custom Plant Hierarchy

- **From the Desktop Client, use the *File > Loader* command to open the *Loader*.**



© 2005. Intergraph Corp.
All Rights Reserved.

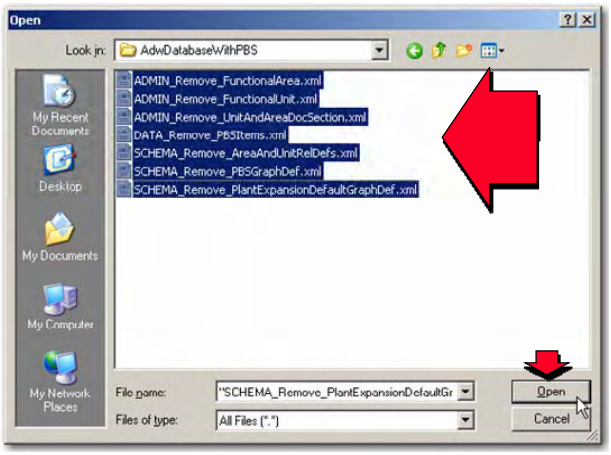
Before you use the loader to add the new admin objects, run the delivered load files to remove the old admin objects. The files are delivered in the product directory: ...\SmartPlant\Foundation\2008\Samples\SampleData\AlternatePBS\ADWDatabaseWithPBS.

Note: If this folder contains a file named ADMIN_Remove_PlantCreate.xml, do NOT run that file. This file removes the method in SmartPlant Foundation that is used to create new plants in the site.

INTERGRAPH

Custom Plant Hierarchy

- **In the following directory: …\SmartPlant\Foundation\2008\Samples\SampleData\AlternativePBS\AdwDatabaseWithPBS, run all the load files.**



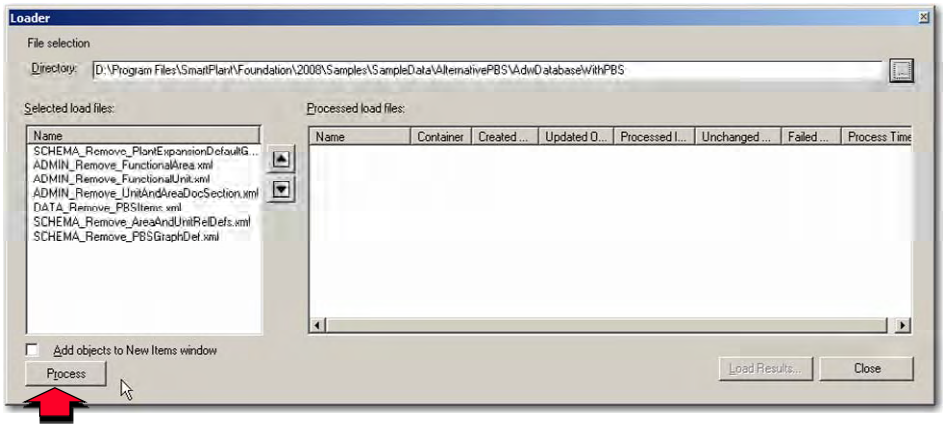
© 2005. Intergraph Corp.
All Rights Reserved.

Once the files have been selected, use the ***Process*** button to start the loader.

INTERGRAPH

Custom Plant Hierarchy

- **Use the *Process* button to begin the loading of changes.**



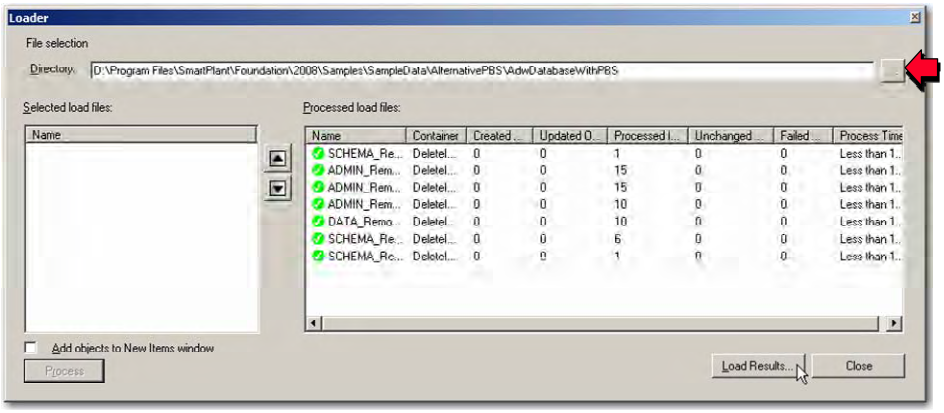
© 2005. Intergraph Corp.
All Rights Reserved.

When you have finished loading the delivered sample files, use the browse button to find the load files created by the CMF File Manager (PBS) utility.

INTERGRAPH

Custom Plant Hierarchy

- **When the files have been loaded successfully, use the browse button to find additional load files to run.**



© 2005. Intergraph Corp.
All Rights Reserved.

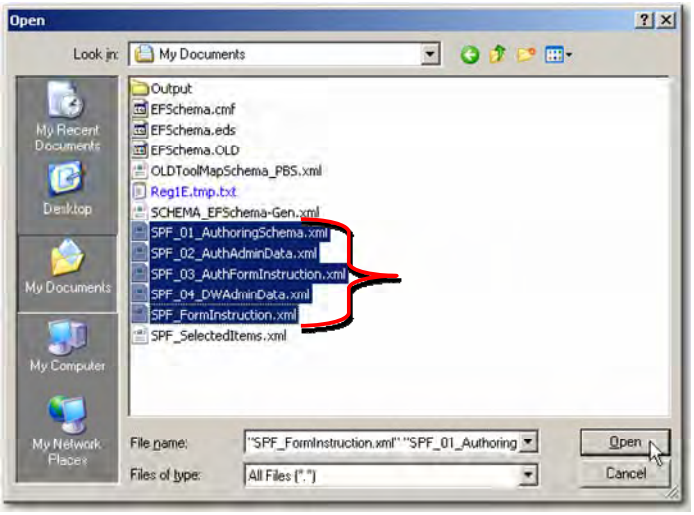
Load the following files through the loader:

- ❑ SPF_01_AuthoringSchema.xml
- ❑ SPF_02_AuthAdminData.xml
- ❑ SPF_03_AuthFormInstruction.xml
- ❑ SPF_04_DWAdminData.xml
- ❑ SPF_FormInstruction.xml

INTERGRAPH

Custom Plant Hierarchy

- ❑ **Run the five load files created with the PBS Utility.**

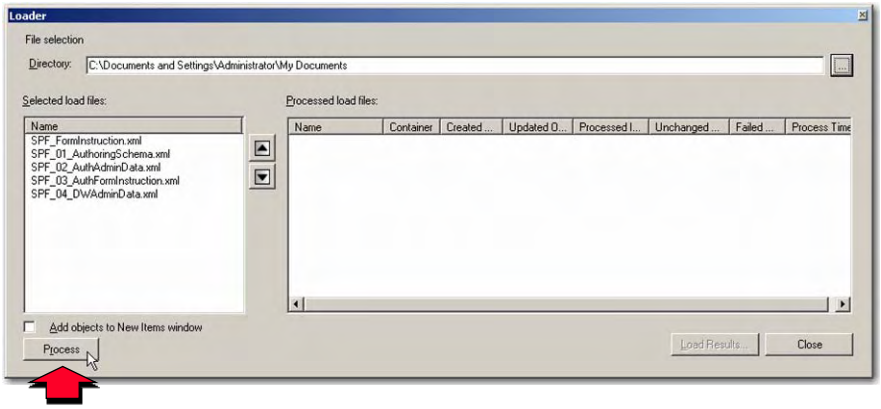


© 2005. Intergraph Corp.
All Rights Reserved.

To begin the process of running the load files, click the ***Process*** button.

Custom Plant Hierarchy

- **Click the *Process* button to begin the process.**

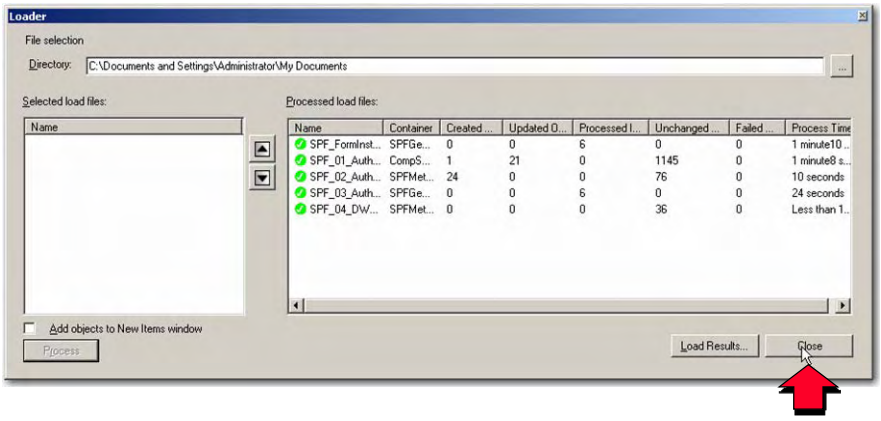


© 2005. Intergraph Corp.
All Rights Reserved.

When the load files have been processed, you can close the loader.

Custom Plant Hierarchy

- **When the loader files have been processed correctly, close the loader.**



© 2005. Intergraph Corp.
All Rights Reserved.

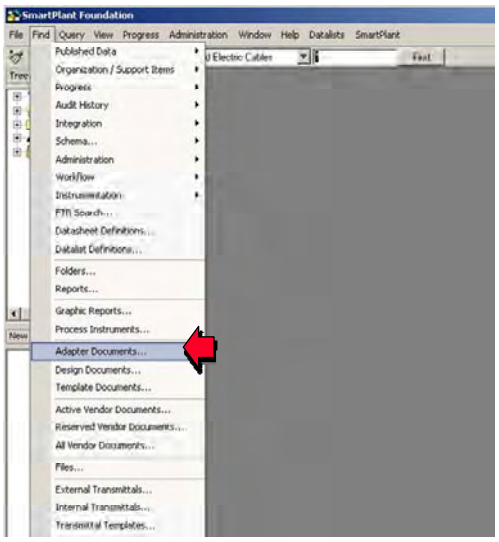
13.4 Update the PBS Map Files

Delivered files contain the mapping used to publish the PBS document from the Authoring domain to the Data Warehouse domain. If you change your PBS to something other than the default Plant/Area/Unit, you will need to update these map files.

Find the map files stored in the SmartPlant Foundation Desktop Client.

Custom Plant Hierarchy

- **Using the *Find > Adapter Documents* command, find the map file used by SPF to publish the PBS document.**

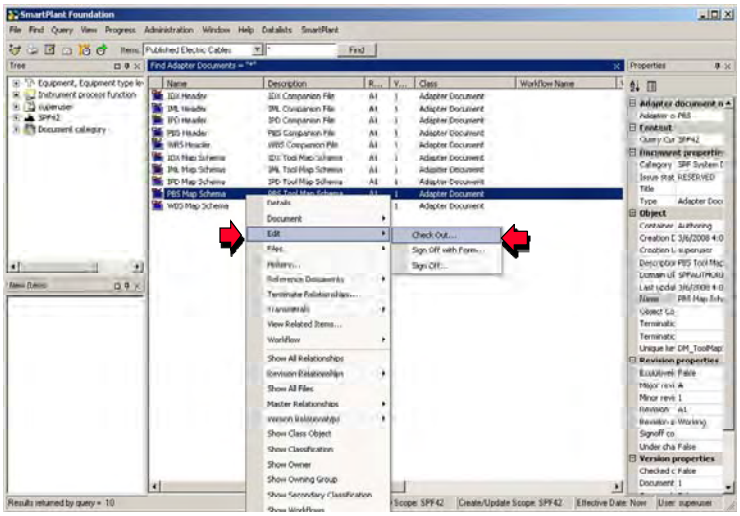


© 2005. Intergraph Corp.
All Rights Reserved.

Find the PBS Map Schema document, and check it out.

Custom Plant Hierarchy

- **Select and check out the *PBS Map Schema* document.**

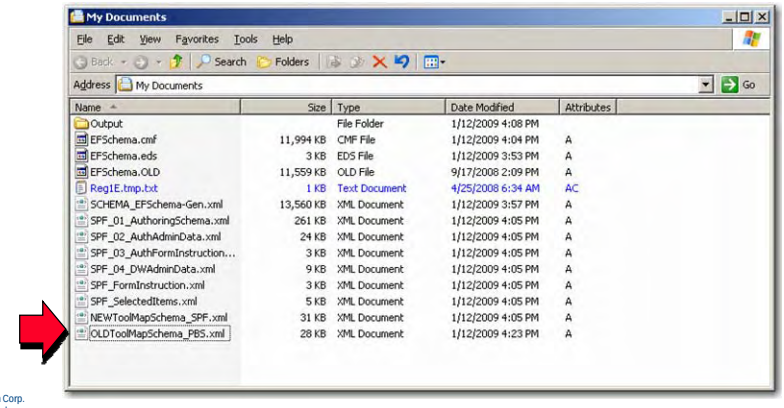


© 2005. Intergraph Corp.
All Rights Reserved.

A new copy of that file was created with the ***CMF File Manager (PBS)*** utility. Once you have checked out the PBS Map Schema document, rename it. Next, find the *ToolMapSchema_SPF.xml* file created in the My Documents folder and change its name to *ToolMapSchema_PBS.xml*, like the file just checked out.

Custom Plant Hierarchy

- **Rename the file you just checked out.**
- **Find the map file created by the PBS utility, and rename it to *ToolMapSchema_PBS.xml*.**

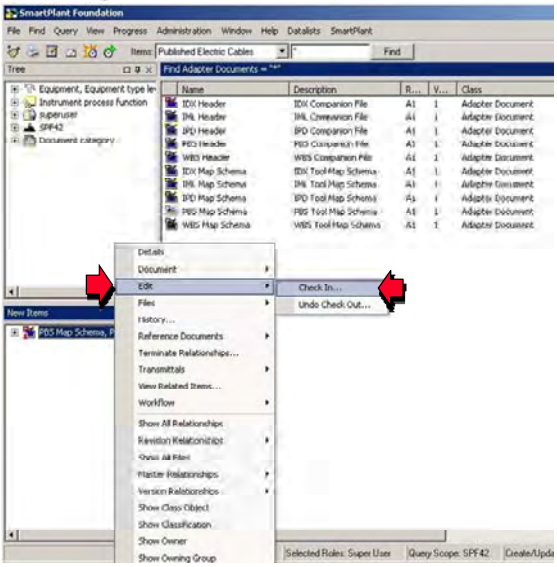


© 2005. Intergraph Corp.
All Rights Reserved.

When you check in the PBS Map Schema document, you will replace the previous map file with the version created by the system.

Custom Plant Hierarchy

- **Check in the *PBS Map Schema* document, replacing the old map file with the new one.**

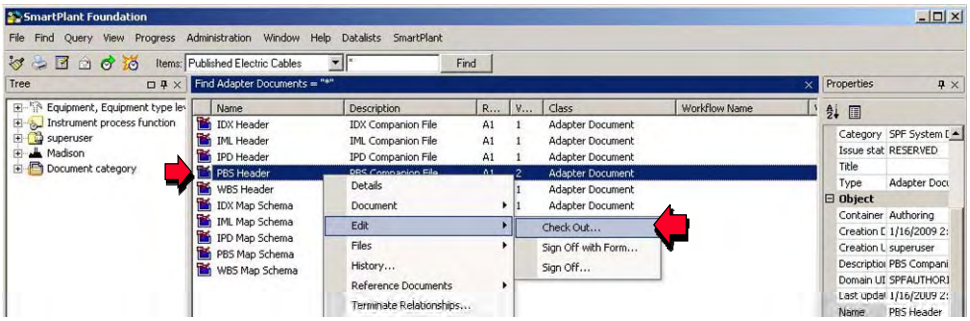


© 2005. Intergraph Corp.
All Rights Reserved.

Next, check out the PBS Header document.

Custom Plant Hierarchy

- **Check out the PBS Header document.**

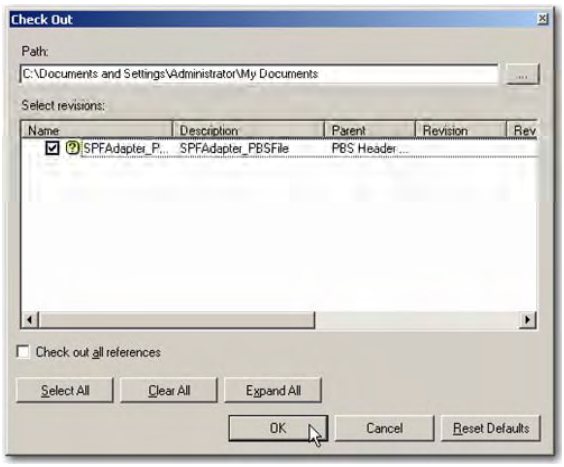


© 2005. Intergraph Corp.
All Rights Reserved.

Note where the system places the file, so that you can find it.

Custom Plant Hierarchy

- **Pull the file locally for editing.**

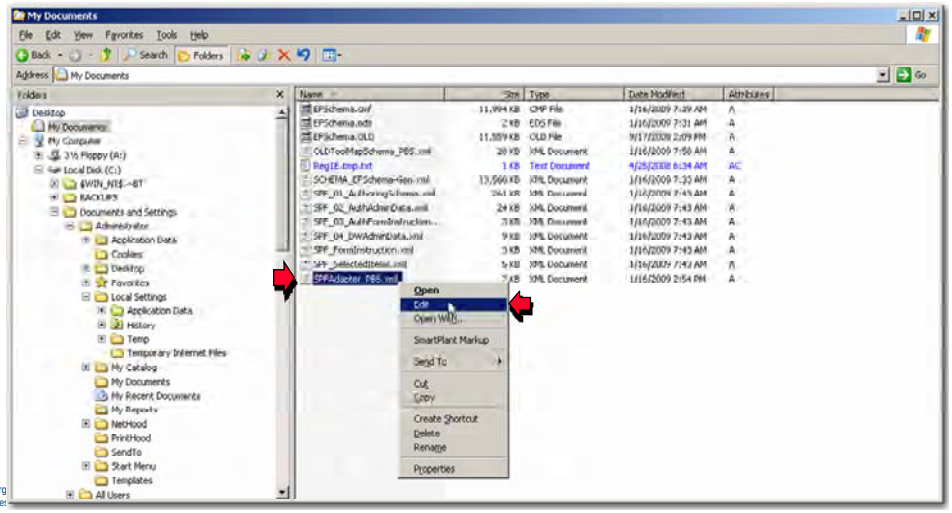


© 2005. Intergraph Corp.
All Rights Reserved.

Find the SPFAdapter_PBS.xml file, and open it in an editor application.

Custom Plant Hierarchy

- **Edit the SPFAdapter_PBS.xml file.**



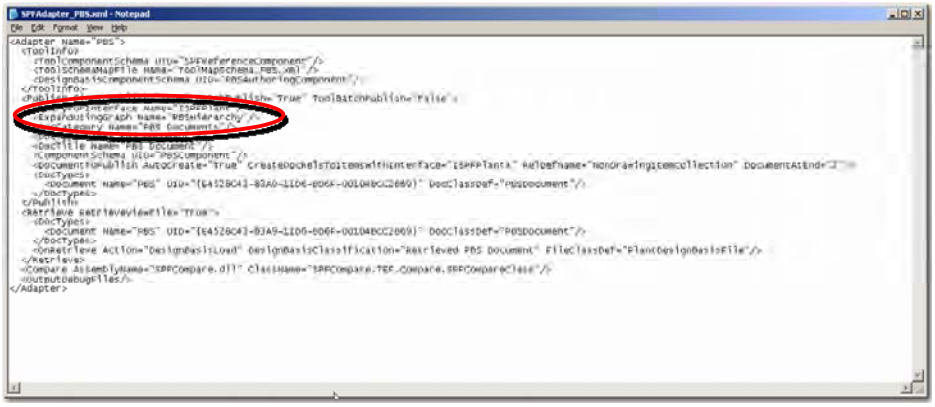
© 2005. Interg
All Rights Re

Find the setting for ExpandUsingGraph Name, and update the value from *PBS* to *PBSHierarchy* to match the name of the graph def created by the system when you replaced the area and unit levels with system and subsystem. Save the changes to the file and check in the PBS Header document.

INTERGRAPH

Custom Plant Hierarchy

- **Update the *ExpandUsingGraph Name* setting to *PBSHierarchy*, the new graph def created with the load files.**



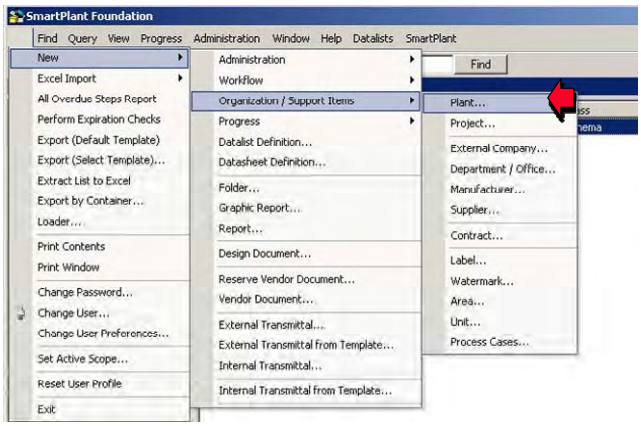
© 2005. Intergraph Corp.
All Rights Reserved.

13.5 Test the Custom PBS Hierarchy

Log out of the Desktop Client application, and then log back in, ensuring that your changes to the menus and forms will be visible. Using the ***File*** > ***New*** > ***Organization/Support Item*** > ***Plant*** command, create a new plant.

Custom Plant Hierarchy

- ❑ **Log out of the Desktop Client and then back in again.**
- ❑ **Create a new plant using the *File > New > Organization/Support Item > Plant* command.**

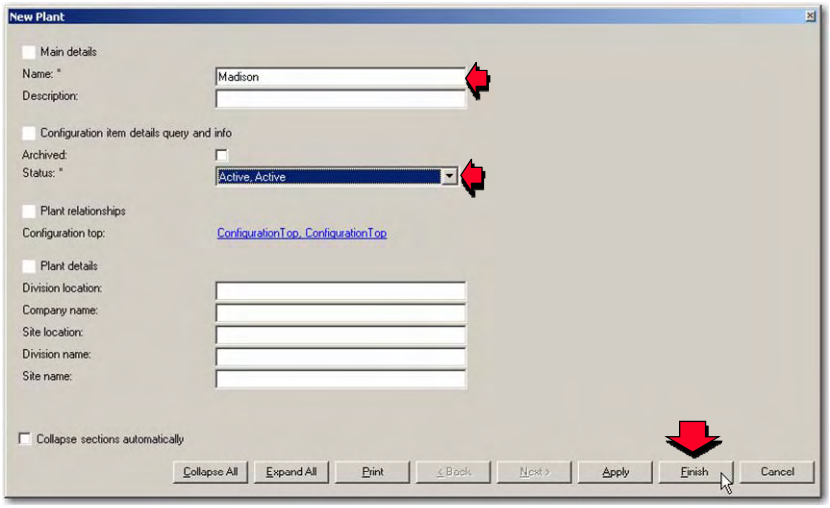


© 2005. Intergraph Corp.
All Rights Reserved.

Provide a name for the new plant and choose a status of ***Active***.

Custom Plant Hierarchy

- **Create a new plant with all required properties.**

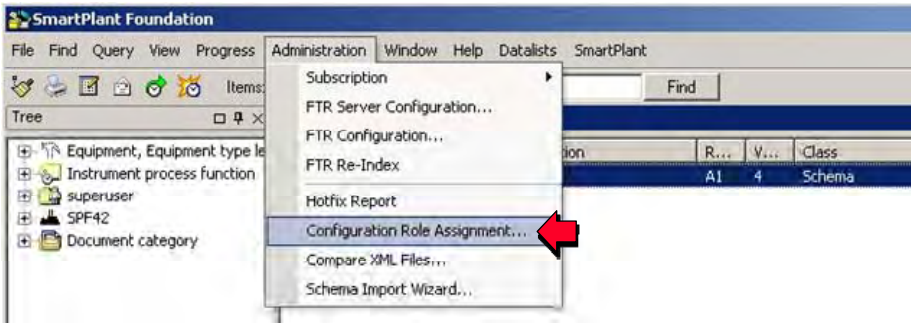


© 2005. Intergraph Corp.
All Rights Reserved.

When the new plant is created, assign at least one user permission to access it. Use the ***Administration*** > ***Configuration Role Assignment*** command to access the ***Configuration Role Assignment*** dialog box.

Custom Plant Hierarchy

- **From the *Administration* menu, choose the *Configuration Role Assignment* command.**



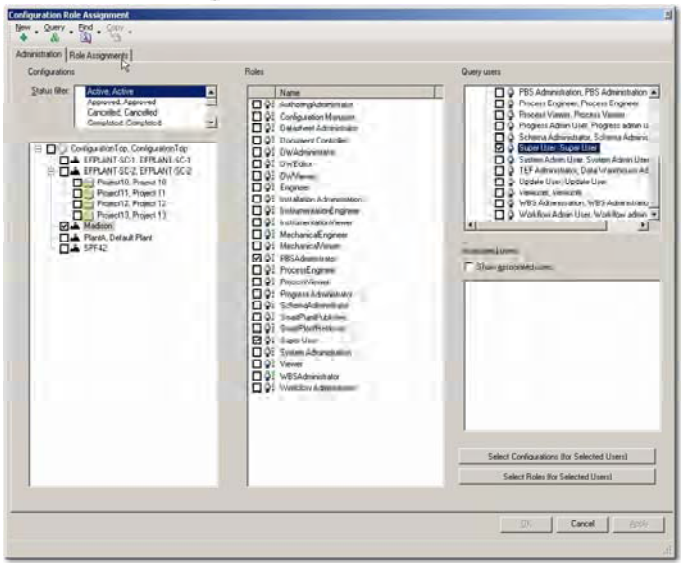
© 2005. Intergraph Corp.
All Rights Reserved.

On the ***Administration*** tab of the ***Configuration Role Assignment***, choose the ***Madison*** plant, the ***Super User*** and ***PBSAdministator*** roles, and at least one user who will be able to perform those roles. Then, go to the ***Role Assignment*** tab.

INTERGRAPH

Custom Plant Hierarchy

- **Choose the new plant and at least one role and one user to assign to the new plant.**
- **Click the *Role Assignment* tab.**

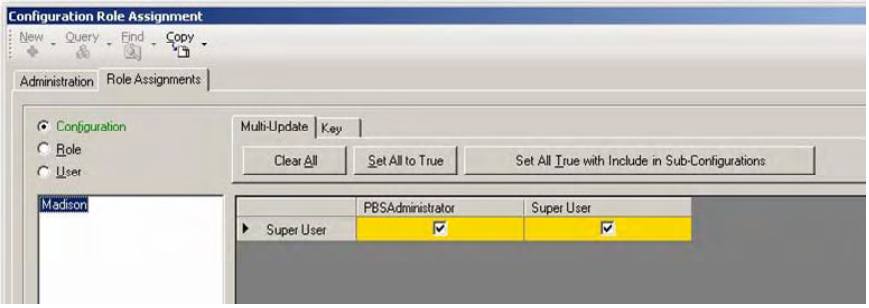


© 2005. Intergraph Corp.
All Rights Reserved.

Give the selected user access to the selected roles for the Madison plant. Click ***OK***.

Custom Plant Hierarchy

- **Grant at least one user access to the new plant, and then click *OK*. Make sure that the role has the necessary permissions to create PBS structure items.**

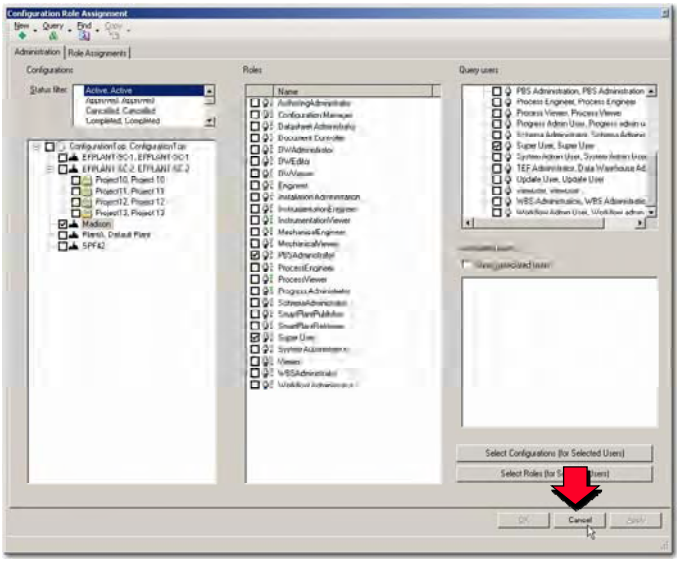


© 2005. Intergraph Corp.
All Rights Reserved.

From the ***Administration*** tab, click ***Cancel*** to dismiss the dialog box.

Custom Plant Hierarchy

- **Click *Cancel* to dismiss the *Configuration Role Assignment* dialog box.**

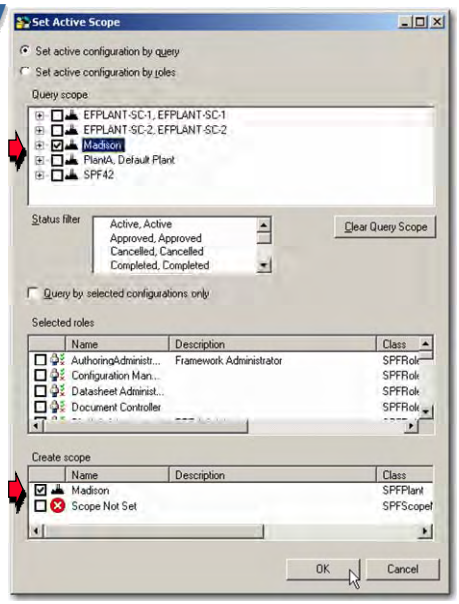


© 2005. Intergraph Corp.
All Rights Reserved.

Set your active scope to the Madison plant.

Custom Plant Hierarchy

- **Change your scope to the new Madison plant.**

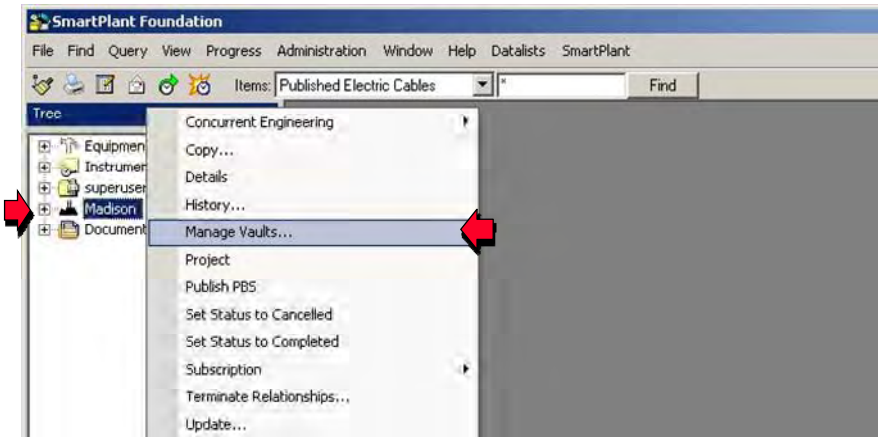


© 2005. Intergraph Corp.
All Rights Reserved.

Right-click on the ***Madison*** plant in the tree, and click the ***Manage Vaults*** command.

Custom Plant Hierarchy

- **Right-click on the *Madison* vault, and click the *Manage Vaults* command.**

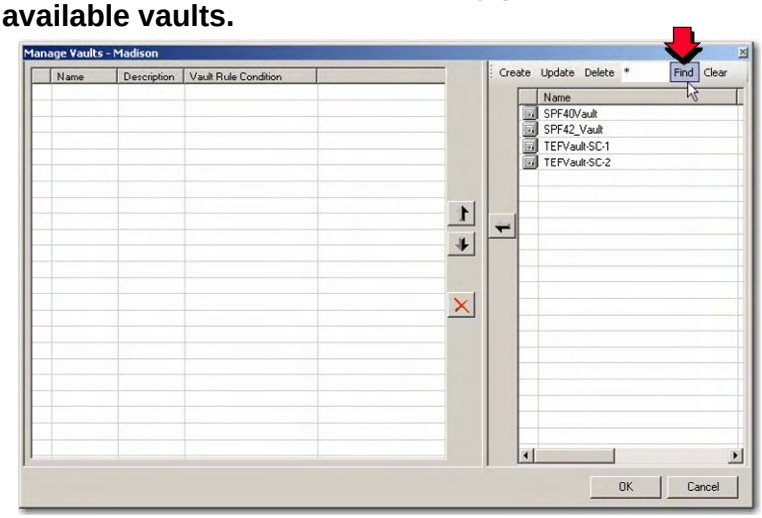


© 2005. Intergraph Corp.
All Rights Reserved.

Use the ***Find*** button in the library pane to find the existing vaults.

Custom Plant Hierarchy

- **Click the *Find* button in the library pane to find a list of the available vaults.**

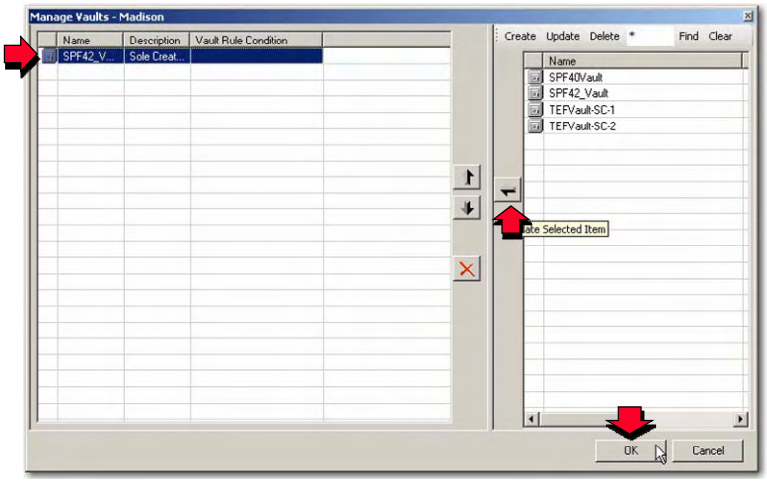


© 2005. Intergraph Corp.
All Rights Reserved.

Find the ***SPF42_Vault*** and move it to left hand pane to associate that vault with the ***Madison*** plant.

Custom Plant Hierarchy

- **Select the *SPF42_Vault* and click the arrow to move that vault into the pane on the left. Click *OK*.**

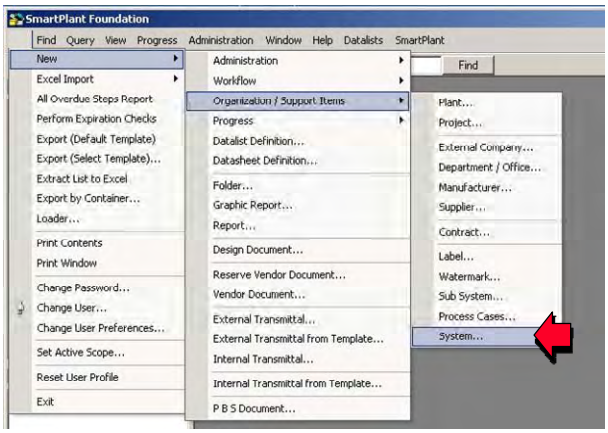


© 2005. Intergraph Corp.
All Rights Reserved.

Create a new system using the ***File*** > ***New*** > ***Organization/Support Items*** > ***System*** command.

Custom Plant Hierarchy

- **Use the new *File > New > Organization/Support Items > System* command to create a new system within the Madison plant.**

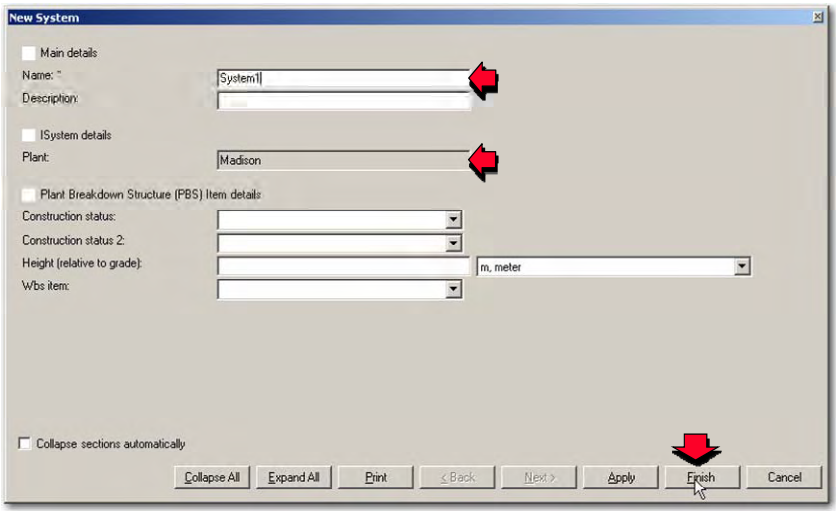


© 2005. Intergraph Corp.
All Rights Reserved.

Provide a name for the new system, and click ***Finish***.

Custom Plant Hierarchy

- **Provide the required information about the new system.**

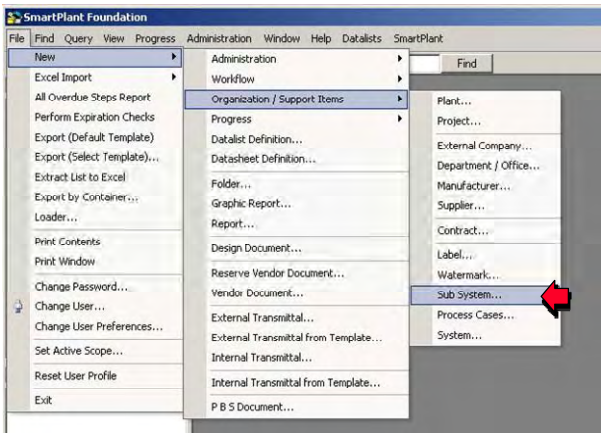


© 2005. Intergraph Corp.
All Rights Reserved.

Create a new SubSystem using the ***File*** > ***New*** > ***Organization/Support Items*** > ***SubSystem*** command.

Custom Plant Hierarchy

- **Use the new *File > New > Organization/Support Items > SubSystem* command to create a new subsystem within the new system you just created.**

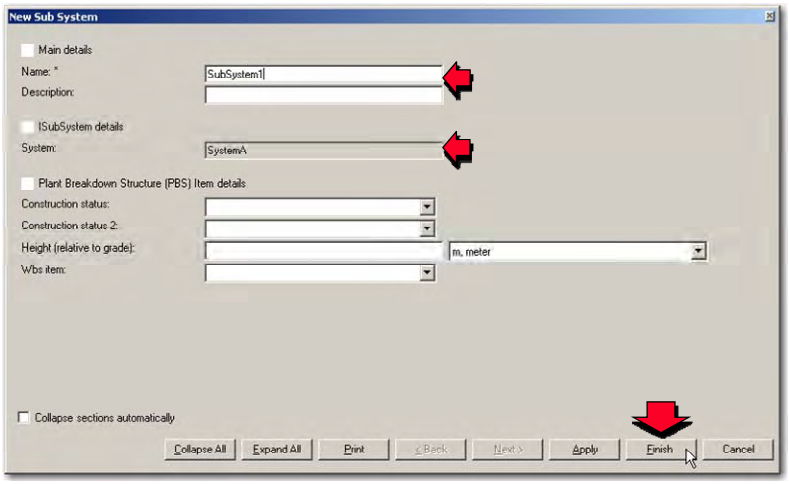


© 2005. Intergraph Corp.
All Rights Reserved.

Provide a name for the new subsystem, and then click ***Finish***.

Custom Plant Hierarchy

- **Provide the necessary information about the new subsystem.**

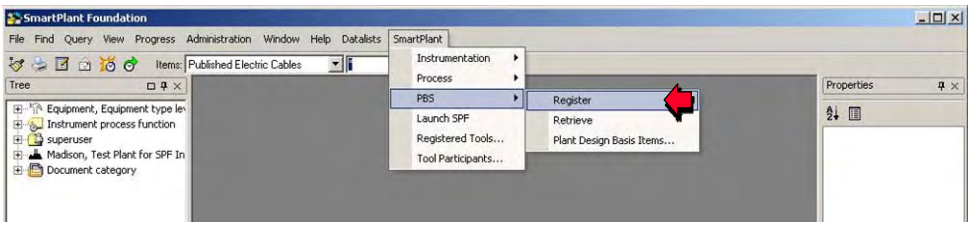


© 2005. Intergraph Corp.
All Rights Reserved.

Before you can publish the PBS document, you will need to register the plant. Use the ***SmartPlant*** > ***PBS*** > ***Register*** command.

Custom Plant Hierarchy

- **Click *SmartPlant > PBS > Register*.**

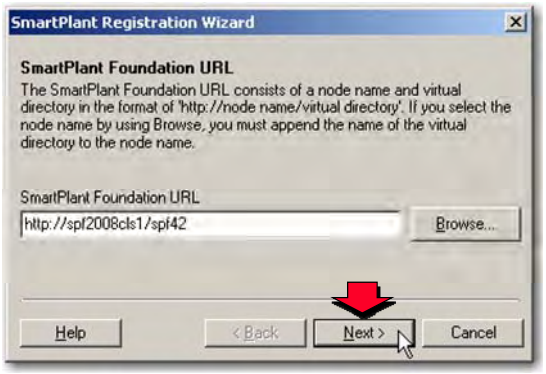


© 2005. Intergraph Corp.
All Rights Reserved.

Provide the connection information to the SmartPlant Foundation server and site.

Custom Plant Hierarchy

- **Provide the connection information to the SmartPlant Foundation Server and site, and click *Next*.**

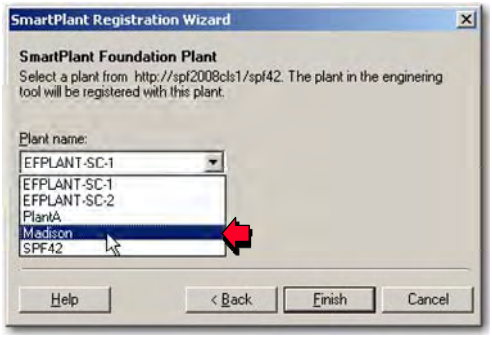


© 2005. Intergraph Corp.
All Rights Reserved.

From the list of plants in the SPF site, choose your plant.

Custom Plant Hierarchy

- **Choose the plant from the list of plants within the selected site.**

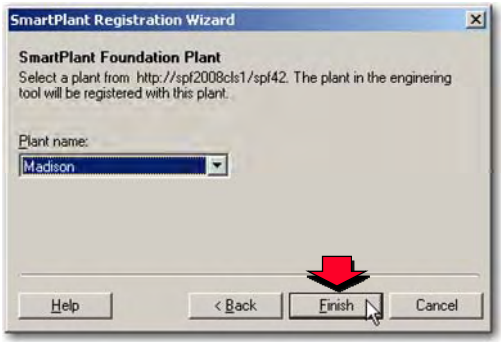


© 2005. Intergraph Corp.
All Rights Reserved.

Click the ***Finish*** button to create the register relationship.

Custom Plant Hierarchy

- **Click *Finish*.**

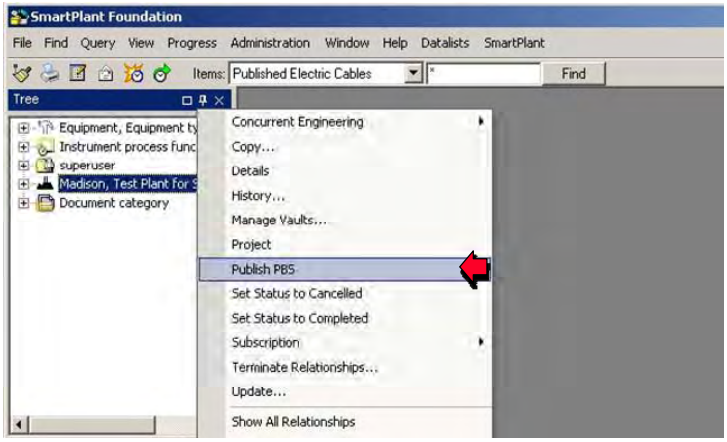


© 2005. Intergraph Corp.
All Rights Reserved.

Right-click on the Madison plant, and click the ***Publish PBS*** command.

Custom Plant Hierarchy

- **Right-click on the *Madison* plant in the Tree window, and choose the *Publish PBS* command.**

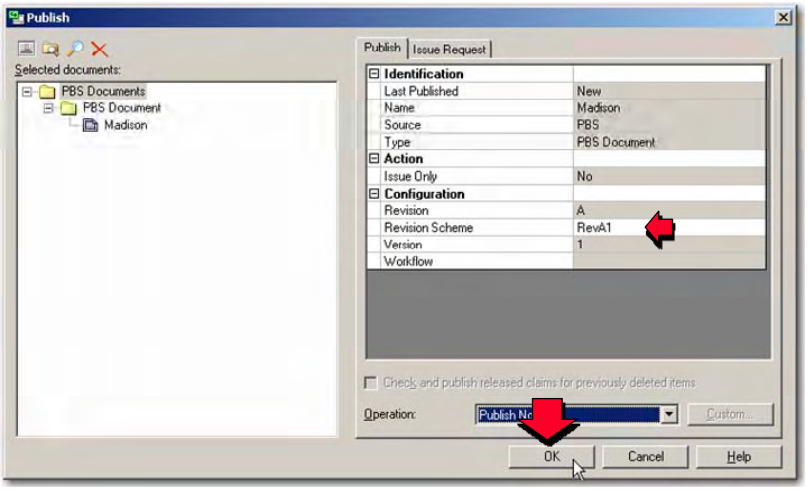


© 2005. Intergraph Corp.
All Rights Reserved.

On the ***Publish*** dialog box, choose a revision scheme, and click ***OK***.

Custom Plant Hierarchy

- **Choose a *Revision Scheme* from the *Publish* dialog box, and then click *OK*.**



© 2005. Intergraph Corp.
All Rights Reserved.

13.6 Activity – Creating a Custom Plant Hierarchy

Complete the **Chapter 13 - Activity** in the SPF Configuration and Administration II activity workbook.

DSPF1-TP-100016A

SmartPlant Foundation 2008 (4.2) Configuration and Administration II

***Course Guide* Volume 2**