SmartPlant P&ID to PDS Piping Data Transfer

Configuration and Reference Guide

Process, Power & Marine

INTERGRAPH

Version 4.3 July 2005 DPID2-PE-200019D

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Preface

This document is a user's guide for the SmartPlant P&ID to PDS Piping Data Transfer Configuration and Reference Guide. The content is the same as the online Help delivered as part of the software.

Send documentation comments or suggestions to PPMdoc@intergraph.com.

Transferring Piping Data: An Overview

Piping data defined in SmartPlant® P&ID can be transferred to PDS® using the SmartPlant P&ID to PDS Piping Data Transfer capability. The ability to transfer PDS P&ID data to PDS 3D is documented in the PDS documentation and is therefore not covered here.

Piping System Schematic and Physical Representations

Although both SmartPlant P&ID and PDS describe the same plant, a one-to-one correspondence between the components in the two models does not always exist. SmartPlant P&ID to PDS piping data transfer is essentially the transfer of data from the SmartPlant P&ID segment table, piping_seg, entity 112 to the PDS piping segment table, pdtable_12_xx.

The conceptual definition of a segment is the same in both applications, however that does not mean that there is a one-to-one correspondence between these two tables. For example, the number of segments is not the same, even if the SmartPlant P&ID and PDS piping model exactly match from a design point of view. This situation is caused by the different drafting practices of SmartPlantP&ID and PDS. For example, drains are shown as macro symbols on the SmartPlant P&IDdrawing. However, drains are branch segments in the PDS model. Also, process connections to instruments are recorded as instrument signal lines in the SmartPlant P&ID database, but on the PDS side, process connections are piping segments.

Due to these differences, the data transfer process requires establishing a logical link between the corresponding segments. This linkage can either be in the form of interactive input from the PDS designer, who can choose a piping segment in a drawing by clicking it, or be a combination of attributes defined as unique criteria in the pid_to_piping file. For more information on attribute mapping, see*Mapping Attributes: An Overview*, page 17.

Data Transfer in the Real World

When you model a new line in PDS, use the **Data from P&ID** option, and then click a SmartPlant P&ID segment. By doing this, you are establishing the logical link. After this link is established, future data transfers can be fully automated.

However, as with most plants, there is a time when SmartPlant P&ID drafting and PDS modeling continues in parallel. The P&IDs are changing while piping modeling continues in PDS. When the designer models a particular pipeline, the equivalent SmartPlant P&ID segments may not yet exist in the SmartPlant database, creating a significant amount of piping that does not have the associative link between SmartPlant P&ID and PDS. This is just one example of how creating and updating links is an ongoing process rather than a one-time effort. For more information about maintaining links between SmartPlant and PDS, see*Creating and Maintaining Links: An Overview*, page 11.

Related Topics

- *Appendix A: Troubleshooting*, page 39
- *Creating and Maintaining Links: An Overview*, page 11
- *Establish a SmartPlant/PDS Link*, page 14
- *Map an Ignored Attribute*, page 18
- *Map an Unmapped Attribute*, page 20

Installation: An Overview

You can setup SmartPlant P&ID using a *silent* or *full* installation. Silent installation requires only that the SmartPlant P&ID Integration Tools component be loaded to the client computer, and does not require a P&ID license. Full installation works with the full SmartPlant P&ID Installation on the local computer.

The software versions supported for SmartPlant P&ID to Piping Data Transfer are:

- Client Computers: Windows XP with Service Pack 2 or Windows 2000 with Service Pack 2
- SmartPlant P&ID plant database in Oracle® 8.1.7.4, 9.0.1, 9.2, or 10g. You can also use Microsoft SQL Server 2000 Service Pack 3a.
- SmartPlant P&ID server with Windows XP with Service Pack 2 or Windows 2000 with Service Pack 2
- PDS 7.3 with Windows XP with Service Pack 2 or Windows 2000 with Service Pack 2

We recommend that you always start with a fresh installation of Windows XP with Service Pack 2 or Windows 2000. If you must use with a computer that already has Windows installed, we recommend that you:

1. Remove any SmartPlant P&ID entries such as Intergraph SmartPlant Attribute Mapper, Intergraph SmartPlant P&ID WorkStation, and SmartPlant Engineering Manager that appear in **Add/Remove Programs**.
2. Remove PD_Shell and restart your computer. Then verify that the PDSHELL directory and and all the PDS entries in the registry are deleted.
3. Run a registry cleaning utility.
4. If your computer is running Windows XP, install Windows XP Service Pack 2. If the computer is running Windows 2000, install Windows 2000 service pack 2. Then restart your computer.

Note

- If you have a customer ID and password, you can access the latest compatibility matrix, that explains which Intergraph software is compatible with each operating system, at http://ppocrm.intergraph.com/ecustomer/start.swe?SWECmd=Login.

Related Topics

- *Establish a SmartPlant/PDS Link*, page 14

Install Oracle

1. Start Oracle Database Configuration Assistant, select the **Local Net Service Name configuration** option from the list, and click **Next**.
2. Click **Add**, and then click **Next**.
3. Select the Oracle database version that you want to access.
4. In the **Service Name** box, type the oracle SID name of the SmartPlant database. Click **Next**.
5. In the protocol form, accept the default **TCP** option. Click **Next**.
6. In the **Host Name** box, type the P&ID site server name. Accept the default port number 1521. Click **Next**.
7. Click **Yes** to perform the test, and then click **Next**.
8. To test the service, click **Change Login** and specify a valid username/password combination of the SmartPlant database, and then click **OK**. You should see the **Connecting...Test successful** message. Click **Next**.
9. In the **Net Service Name** box, type the name of the database alias to use for the data transfer. The Net Service Name must be exactly the same as it was defined in the SmartPlant database server. Click **Next** three times, then click **Finish**.

Note

- The Oracle Net8 configuration for a new database alias might be different from one Oracle version to another. Refer to the proper Oracle documentation for further details on a specific Oracle version.
- For Oracle 9i configuration, you can refer to the cheat sheet on the Siebel e-customer web site at http://ppocrm.intergraph.com/ecustomer/start.swe?SWECmd=Login. Look for "Technical Tips for PDS System and Project Setup Issues" on the PDS 3D Product Information page.

Related Topics

- *Installation: An Overview*, page 7

Install SmartPlant P&ID

Important

- If you need to install SmartSketch® on the same computer, be sure to install it first. If you require SmartSketch for PDS 7.3 (for example, for the pipe support explorer), SmartSketch 4.0 is the compatible version.

SmartPlant P&ID Full Installation

1. Insert the **SmartPlant P&ID** CD and install the SmartPlant software.

Note

- For more information on *full* installation of SmartPlant P&ID, see *The SmartPlant P&ID Installation Guide*.

SmartPlant P&ID Silent Installation

1. Load PD_Shell and other PDS modules as needed. See the *PDS Project Setup Technical Reference* for more information.
2. Through the PDS component loader, select the **SmartPlant P&ID Integration Tools** option.

Note

- On the PDS component loader, the installation option for these tools from the PDS component loader is disabled if you did a full SmartPlant P&ID installation because the tools are included in the full SmartPlant P&ID software. In addition, a SmartPlant P&ID license is not required if you only use the integration tools.

Related Topics

- *Installation: An Overview*, page 7

Test the SmartPlant Connection

If you chose the *full* installation of SmartPlant P&ID, then you can test the connection with a plant structure that is already configured.

1. Click **Start > Programs > Intergraph SmartPlant P&ID > Drawing Manager**.
2. Click **File > Open Database**.
3. Click **Site Servers** and browse to a SmartPlant initialization (.ini) file.
4. Select the file and click **OK**.
5. Select the plant structure in the **Open Plant Structure** dialog box.
6. Click **Open**, and the selected plant with its drawings appears in the Drawing Manager view.

Note

- If you experience problems connecting to the SmartPlant P&ID site or getting into the plant structure, verify that the site server is running and ask the SmartPlant P&ID administrator to set the PDS 3D users as SmartPlant P&ID administrators during this configuration. You need administrator privileges until you start doing restrictions per plant structure. SmartPlant P&ID permissions are handled in SmartPlant Engineering Manager.

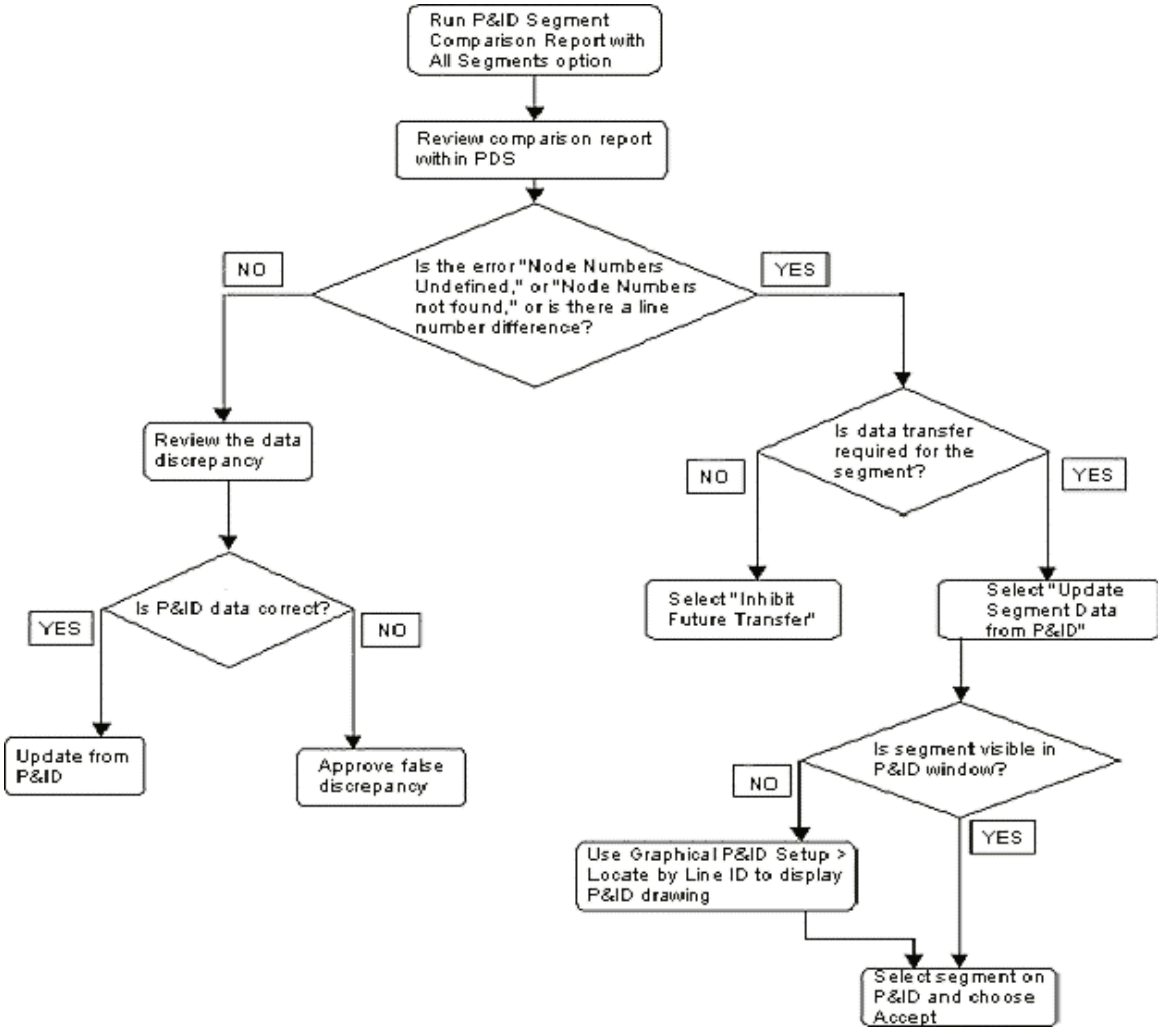
Related Topics

- *Installation: An Overview*, page 7

Creating and Maintaining Links: An Overview

Understanding the SmartPlant P&ID to Piping Data Transfer process during PDS project execution helps you make the most of the benefits offered by this feature. Careful use of the procedures in this document, combined with delta training for piping designers and other personnel, produces considerable time savings as opposed to manually checking P&ID against PDS piping data. If you would like to use this feature but need help, Intergraph Process, Power & Marine offers consulting services to guide you. For more information, see the **Customer Support** links on the **About SmartPlant P&ID** dialog box.

The key factor in these benefits is creating and maintaining links betweenthe SmartPlant P&ID and the PDS segments. The following flowchart shows the workflow for resolving data transfer discrepancies during the plant design.



PDS Design Considerations

- Use the **Data from P&ID** command often while routing new piping in PDS.
- When creating a pipeline by copying existing piping, use the **Revise Attribute > Update from P&ID** command to load the data from SmartPlant P&ID.
- When creating a branch using an existing segment or pipe, check whether the branch is shown in SmartPlant P&ID. If it is shown, then use the **Revise Attribute > Update from P&ID** command to load the data from SmartPlant P&ID.
- If a branch is not shown on the P&ID – for example, drains and small bore lines – then make sure that pid_id_part_a and pid_id_part_b are completed to match those options for the header line. Also, verify that the **Partial P&ID Data Transfer** option at the end of the **Segment Attribute** list is selected. You can change this value by using the **Revise Attribute** command. Default transfer modes are set such that during a partial transfer all diameter-independent properties are transferred. This option allows the drain to share the line sequence number, pressure, temperature, and so forth, with the header and still have a different diameter and line number label. This action is controlled in the pid_to_piping file.
- Instrument connections or drains on equipment with no equivalent segment in SmartPlant P&ID, can be excluded from future comparison reports. Simply select the **Inhibit Future Transfer** option when you review a comparison report error related to these segments.

Synchronizing P&ID and Piping Data

Synchronizing SmartPlant P&ID and PDS piping data should be done only a few times during plant design. The best times to synchronize are when the majority of the P&IDs are completed, revised, or issued. This synchronization involves running a P&ID Segment Data Comparison Report and then resolving any discrepancies and helps to build the association between SmartPlant and PDS that is then maintained throughout the plant lifetime.

This synchronization involves running a P&ID Segment Data Comparison Report and then resolving any discrepancies, and is outlined in the flowchart above.

Running a Segment Data Comparison Report

Running a Segment Data Comparison Report is the starting point on the flowchart. The results of this report depend on two key factors:

- The matching criteria defined in the pid_to_piping file in the plant directory. For more information, see*Map an Ignored Attribute*, page 18 or *Map an Unmapped Attribute*, page 20.
- The **Compare Segment with Node Numbers/Compare All Segments** setting.

While running this report, the **Compare All Segments** setting should be used, and matching criteria should be node numbers.

Based on the availability of P&IDs during the initial piping design stage, the number of discrepancies can be very high on the first run. Our experience shows that a piping designer, who has good knowledge of the piping involved and the related P&ID, takes approximately two to four minutes to resolve a discrepancy. Successive uses of this procedure should reduce the numbers of discrepancies. If plant design resources or time do not allow resolving all discrepancies, then you should consider alternative methods to running the Segment Data Comparison Report.

One alternative is to change the matching criteria. Matching criteria directs the software to establish associations between SmartPlant P&ID and PDS piping segments based on the value of the attributes specified. For example, the default criteria of node numbers means that node numbers for a PDS piping segment must match with a P&ID segment. If the SmartPlant P&ID to PDS Piping Data Transfer has not been done for a piping segment, then no node number is defined for that segment. This situation generates a **Node Numbers Undefined only** discrepancy. If the majority of the piping falls under this category, then the number of discrepancies can be very high. To reduce this number, change the matching criteria to something other than node numbers. Typically, any of the individual properties of a line number label such as NPD, line sequence number, insulation purpose, and so forth, can be used. It is better to use as many properties as possible so that they form a unique combination. All properties specified as matching criteria should have some value assigned to them on both sides.

Another alternative to running the comparison report is to specify segment search criteria. This method can be used if all instrument connections on equipment or drain lines not shown on the P&ID contain common attributes such as different fluid codes or prefixes to line sequence numbers, and so forth.

Another possibility is to use a range of diameters so that small diameter segments can be eliminated.

Related Topics

- *Appendix A: Troubleshooting*, page 39
- *Establish a SmartPlant/PDS Link*, page 14
- *Map an Ignored Attribute*, page 18
- *Map an Unmapped Attribute*, page 20

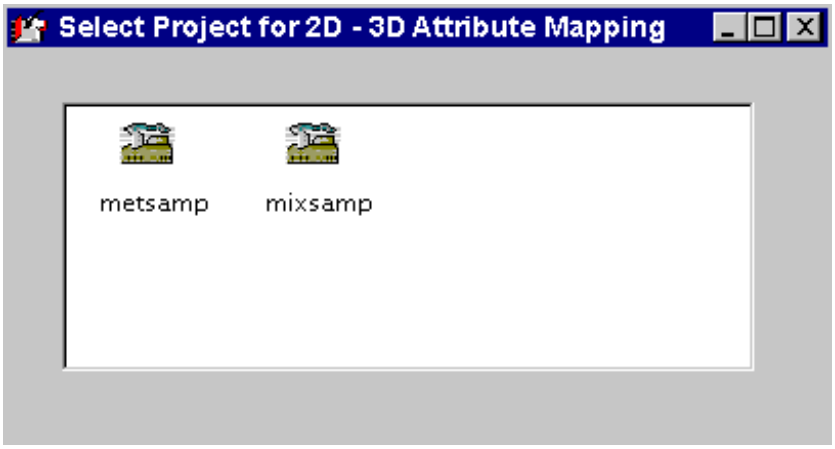
Establish a SmartPlant/PDS Link

Important

- When setting up data transfer for multiple plants, if the PDS 3D and SmartPlant P&ID plants have the same set of properties and the same intended mapping, then you can copy the SPMap.mdb file from one plant to another. The Attribute Mapper always verifies that the SmartPlant site in the .mdb file is the same as the map for the selected PDS project. However, if you are not sure if the plants have the same set of properties, we recommend that you copy the delivered SPMap.mdb file from the PDSHELL\pid\ folder.
- For a project where data transfer was setup to work with an earlier version of SmartPlant P&ID, some attribute mappings have changed. You can use either the new SPMap.mdb file delivered in the PDSHELL\pid\ folder or follow the procedure mentioned for CR32693 in the PDS README file.
- Even if you are going to work with the default attribute mapping, you must start SmartPlant Attribute Mapper at least once. If necessary, you can back up the updated SPMap.mdb file, delete the changes, and copy a fresh SPMap.mdb to go through the mapping process again.

1. Copy \WIN32APP\INGR\PDSHELL\pid\SPMap.mdb and SPTransferOpt to the PDS project directory. For projects created with version 6.4.1 or later, these files are copied automatically from the PDSHELL\pid folder at the time of project creation.

2. Click **Start** > **Programs** > **PD_Shell** > **SP PID to PDS 3D** to display a list of available PDS projects.



Tips

- The software reads the list of PDS projects from the PDS proj_file.
- The Attribute Mapper does not honor any other variables defined in the pds.cmd file, such as RIS parameter file locations, and so forth.

3. Double-click the PDS project to use with SmartPlant P&ID and locate the SmartPlant initialization (.ini) file.

   The **SmartPlant Migrator for P&ID** utility opens and shows the PDS attributes for the selected project:

Notes

- After a relationship between attributes is established, the SmartPlant Attribute Mapper opens. The link between the SmartPlant P&ID plant and the PDS 3D project is established and updated automatically in the SPMap.mdb file.
- For more information about mapping attributes, see *Map an Unmapped Attribute* or *Map an Ignored Attribute*.

Related Topics

- *Choosing Data Transfer Options*, page 24
- *Creating and Maintaining Links: An Overview*, page 11
- *Installation: An Overview*, page 7
- *Mapping Attributes: An Overview*, page 17
- *Revising Linked Models*, page 16
- *Transferring Piping Data: An Overview*, page 5

Revising Linked Models

Modification in SmartPlant P&ID

The SmartPlant P&ID software generates node numbers during consistency checking. If existing segments on the P&ID are modified, then those node numbers may also be modified. This situation occurs when placing a branch on an existing segment orplacing a segment break is placed, causing the link between SmartPlant P&ID and PDS outdated. In most cases, changes in SmartPlant P&ID mean changes in the piping model. Resolving this type of discrepancy improves the integrity of the design data.

Modification of a PDS Model

Physical modification of segments with PDS commands such as **Move Piping**, **Move Vertex**, **Move Pipeline End**, and so forth, do not affect SmartPlant P&ID to PDS Piping Data Transfer. All branch component placement commands break the segments and potentially lose links with SmartPlant. While placing drain connections, which are not shown on P&IDs, it is better to use the **Revise Attributes > Load from P&ID** command on the header segment before placing the drain connection or branch components. Then all three segments are linked with the proper segment in SmartPlant P&ID. After creating the branch drain segment, make sure that the **P&ID to Piping Transfer** mode attribute is set to **Partial** for the branch segment. Transfers done after placing a drainrequire that you use the **Revise Attribute** command three times.

Related Topics

- *Appendix A: Troubleshooting*, page 39
- *Establish a SmartPlant/PDS Link*, page 14
- *Map an Ignored Attribute*, page 18
- *Map an Unmapped Attribute*, page 20

Mapping Attributes: An Overview

SmartPlant P&ID to Piping Data Transfer relies on an attribute map stored in a Microsoft Access database located in the PDS project folder. This map databasefile is named SPMap.mdb, and contains information about the Smart Plant P&ID site server and plant.The Attribute Mapper utility is used to manipulate this map database. The Attribute Mapper is started from a shortcut provided in the PD_Shell program group named **SP PID to PDS 3D**.

The Attribute Mapper utility maps, un-maps, or ignores attributes between PDS 3D and SmartPlant P&ID. The Attribute Mapper interface is similar to WindowsExplorer in that it displays a tree view on the left side and list view on the right side. Attributes for piping segment, piping component, and instrument tables from the PDS 3D design database are available to map with corresponding SmartPlant P&ID tables, specifically the PipeRun, PipingComp and Instrument tables.

The tree view divides attributes into four categories based on map status: **Mapped**, **Unmapped**, **Ignored**, and **All**. For SmartPlant P&ID to PDS 3D data transfer, the **Ignored** map status is the same as the **Unmapped** status.

The default map

PDS software includes a default map in the PDSHELL\pid folder. This map has a set of attributes that are pre-mapped with known SmartPlant P&ID properties. When you create a new project using PDS software, this map is copied to the project folder. For older projects, the SPMap.mdb file should be manually copied from the PDSHELL\pid folder into the 3D project folder.

Note

- The default map is functionally equivalent to the pid_to_piping file used for PDS 2D to 3D data transfer with few exceptions. For example, units are not required to map because of the way unit information is stored. This applies to attributes like pressure and temperature. The SPTransferOpt file includes the three options that you can find at the bottom of the pid_to_piping file. For PDS 2D to PDS 3D data transfer, the mapper specifies the database attributes that are considered in order to perform the data transfer. By default, for PDS 2D transfer the mapper is mapping Nodea (piping attribute 67) and Nodeb (piping attribute 68). For SmartPlant P&ID to PDS 3D data transfer, because there are no node numbers in SmartPlant, the mapper is mapping piping attribute pid_index_no (piping attribute 73).

Select lists

Select-listed SmartPlant P&ID properties are transferred based on their text value instead of number. The Attribute Mapper creates a map of PDS codelist entries for every SmartPlant select list used in the mapped properties.

For example, fluid code "P" is represented by the PDS 3D codelist entry 25 and by entry 35 in the SmartPlant P&ID select list. When the fluid code property is transferred, the property value changes from 35 in the SmartPlant database to attribute value 25 in the PDS Database. This functionality has removed the requirement of maintaining the same select list and codelist values in SmartPlant P&ID and PDS 3D.

Related Topics

- *Appendix A: Troubleshooting*, page 39
- *Creating and Maintaining Links: An Overview*, page 11

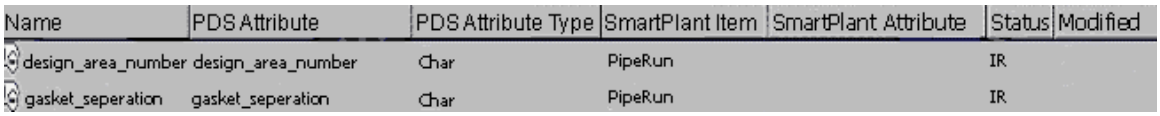
Map an Ignored Attribute

This procedure includes only the major steps involved in mapping an attribute. Refer to PDS online Help or documentation for detailed instructions.

1. Open the **SmartPlant Migrator for P&ID** utility. For more information, see *Establish a SmartPlant/PDS Link.*
2. Select the **Ignored** category.
3. Select the table in the tree view.
4. Select a PBS attribute in the list view.

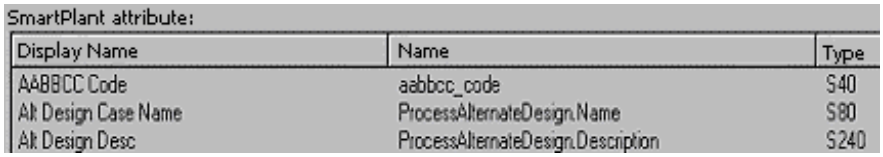
   Tips

   - PDS attributes available for mapping are shown in the list view:



Name	PDS Attribute	PDS Attribute Type	SmartPlant Item	SmartPlant Attribute	Status	Modified
design_area_number	design_area_number	Char	PipeRun		IR	
gasket_seperation	gasket_seperation	Char	PipeRun		IR	

   - The software looks on the SmartPlant P&ID side for all unmapped properties that match the size and type of the PDS attribute that you select. A list of the valid candidates is then displayed in the **SmartPlant attribute** window:



SmartPlant attribute:

Display Name	Name	Type
AABBCC Code	aabbcc_code	S40
Alt Design Case Name	ProcessAlternateDesign.Name	S80
Alt Design Desc	ProcessAlternateDesign.Description	S240

5. Select an item from the list, and choose the new status by using the **Set Attribute Status** options.

6. If necessary, change the **Transfer Mode** option.

Tips

- Properties mapped with the **Transfer Mode** option set to **Partial**are transferred when you use the **Partial Data Transfer** toggle within PDS.
- Properties mapped with the **Transfer Mode** option set to **Default**receive the default value, which you enter in the **Default** box, during partial data transfer.
- Properties mapped with the **Transfer Mode** option set to **No Default** do not get a default value and do not get transferred during partial data transfer.
- All **Mapped** properties are transferred during complete data transfer.

Related Topics

- *Choosing Data Transfer Options*, page 24
- *Installation: An Overview*, page 7
- *Mapping Attributes: An Overview*, page 17
- *Revising Linked Models*, page 16
- *Transferring Piping Data: An Overview*, page 5

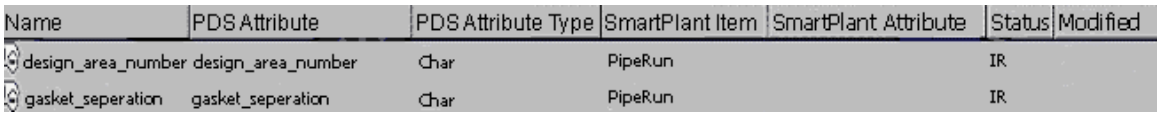
Map an Unmapped Attribute

This procedure includes only the major steps involved in mapping an attribute. Refer to PDS online Help or documentation for detailed instructions.

1. Open the **SmartPlant Migrator for P&ID** utility. For more information, see *Establish a SmartPlant/PDS Link*, page ??? .
2. Expand the **Unmapped** category.
3. Select the table in the tree view.
4. Select a PBS attribute in the list view.

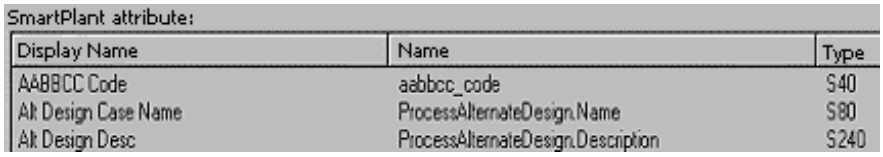
Tips

- PDS attributes available for mapping are shown in the list view:



Name	PDS Attribute	PDS Attribute Type	SmartPlant Item	SmartPlant Attribute	Status	Modified
design_area_number	design_area_number	Char	PipeRun		IR	
gasket_seperation	gasket_seperation	Char	PipeRun		IR	

- The software looks on the SmartPlant P&ID side for all unmapped properties that match the size and type of the PDS attribute that you select. A list of the valid candidates is then displayed in the **SmartPlant attribute** window:



SmartPlant attribute:

Display Name	Name	Type
AABBCC Code	aabbcc_code	S40
Alt Design Case Name	ProcessAlternateDesign.Name	S80
Alt Design Desc	ProcessAlternateDesign.Description	S240

5. Select an item from the list, and choose the new status by using the **Set Attribute Status** options.
6. If necessary, change the **Transfer Mode** option.

Tips

- Properties mapped with the **Transfer Mode** option set to **Partial**are transferred when you use the **Partial Data Transfer** toggle within PDS.
- Properties mapped with the **Transfer Mode** option set to **Default**receive the default value, which you enter in the **Default** box, during partial data transfer.
- Properties mapped with the **Transfer Mode** option set to **No Default** do not get a default value and do not get transferred during partial data transfer.

- All **Mapped** properties are transferred during complete data transfer.

Related Topics

- *Choosing Data Transfer Options*, page 24
- *Installation: An Overview*, page 7
- *Mapping Attributes: An Overview*, page 17
- *Revising Linked Models*, page 16
- *Transferring Piping Data: An Overview*, page 5

Segment Data Comparison Report

The software compares segment data on the basis of the matching criteria defined in the pid_to_piping correlation table. If no matching criteria are defined, the software compares segment data on the basis of the SmartPlant P&ID node numbers that are common to both the SmartPlant database and the PDS database, or the node numbers and line number labels, depending on what you specify using the available options.

The piping segment data is also compared on the basis of the **Complete** or **Partial** data transfer options.

If a match is found, each attribute value, as specified in the pid_to_piping correlation table and filtered for either complete or partial data transfer, is compared with the corresponding property value in the SmartPlant database. For any pair of corresponding attribute values that differ, the discrepancy is reported in the Segment Data Comparison Report.

This report includes a comparison of the flow direction for the PDS piping segment and the SmartPlant P&ID segment by using the P&ID node numbers. If no corresponding segment is found in the SmartPlant database for a PDS piping segment with valid matching criteria, an error is reported.

If the search mode is set to **END** in the pid_to_piping file, the software compares all of the SmartPlant P&ID segments that have matching search criteria to the applicable PDS piping segment and uses the SmartPlant P&ID segment that best matches the PDS piping segment for the comparison. Otherwise, the search mode is **FIRST**, and comparison is made with the first P&ID segment that has matching criteria.

Notes

- The Segment Data Comparison Report also includes line sequence numbers.
- Because the data comparisons are performed on the basis of the PDS piping segments, not all segments in the SmartPlant database are checked for matches.

The software creates the following files in the same directory location as the processed model file:

- A report file named *model_number*.pc (*model_number* is the number of the model that is extracted from the PDS Project Database.)
- A non-printable, sorted file named *model_number*.pci (This file is used by the **Review P&ID Comparison Report** command.)

- A non-printable, sorted file named *model_number*.pca (This file is used by the **P&ID Data Comparison**, **Update Model**, **Segment Data Comparison Report**, and **Review P&ID Comparison Report** commands for the approval of data discrepancies. The .pca file is initially created when you approve a discrepancy, and the file is appended to with each additional approval.)

You can format the title page and the heading for each page of the Segment Data Comparison Report using the \win32app\ingr\pddesign\sample\pid_cmprpt.fmt format file. The remainder of the report is in the following format:

<line number> <P&ID Node Numbers> <P&ID Drawing Number>

Attribute	**Value in Model**	**Value in P&ID**
line_number_label	2"A-A5A2F-N-55011	2"A-A5A2F-P-550107
line_sequence_no	550111	550107
insulation_purpose	N	P

Data in the Segment Data Comparison Report is sorted first by line number label and then by the SmartPlant P&ID node numbers, if applicable.

Related Topics

- *Creating and Maintaining Links: An Overview*, page 11
- *Mapping Attributes: An Overview*, page 17
- *Transferring Piping Data: An Overview*, page 5

Choosing Data Transfer Options

Matching Criteria

PDS uses matching criteria to generate the Segment Data Comparison report. In order to compare segment records, the records must first be matched or correlated. Matching criteria defines the correlating attribute in the PDS 3D database. The default attribute map reserves the pid_index_no attribute for matching criteria. This fact means that the Segment Data Comparison report compares piping segment attributes from the PDS and SmartPlant databases if the pid_index_no in the PDS database matches the unique sp_id in the SmartPlant database.

SmartPlant P&ID

Consider the following points when planning for data transfer from a SmartPlant P&ID plant to a PDS 3D project.

- **Symbol Properties** - By default, PDS searches the piping specification based on predefined aabbcc codes. SmartPlant P&ID symbols must have a property mapped to the aabbcc_code attribute in the PDS database. The delivered SmartPlant P&ID piping component symbols have a property called aabbcc_code, which can be viewed and edited in Catalog Manager. Any new symbols must have this value defined, either at symbol creation or later.
- **Naming Conventions** - PDS 3D is not capable of handling spaces in the path names to any files. Therefore, this PDS restriction also applies to P&IDs. While creating units and drawings in the SmartPlant P&ID site, take care to avoid creating paths with spaces.
- **Symbology** - SmartPlant P&ID stores drawings in a format other than IGDS (MicroStation). These drawings are converted to IGDS format to display in PDS. By default, PDS and MicroStation use a black background, while SmartPlant P&ID uses a white background. When converted to IGDS format, this difference can make some SmartPlant P&ID graphics barely visible on the black background. Consideration should be given to this fact while defining symbology within SmartPlant P&ID plants. SmartPlant P&ID symbology is defined in Options Manager.

  Two methods exist to manipulate the display so that all of the graphics are clearly visible in their new format:

  - **Method 1**: Turn off the **Reference File > Use Color Table** setting under **User > User Preferences > Reference File** in PDS. This action displays the drawing using the active color scheme for the PDS model, rather than honoring the colors from SmartPlant P&ID.

  - **Method 2**: Change the **Background** color of the piping model to a light color by using **Settings > Colors**.
- **Additional Attributes** - If properties added to the SmartPlant database need to be transferred to PDS, be careful to match attribute type and length on either side. The maximum string length supported by RIS / PDS 3D is 240 characters. If a property has an associated select list in SmartPlant P&ID, then it should have a corresponding codelist in 3D. You must run the Attribute Mapper to map new properties if you want the data to transfer.
- **Codelists and Select Lists** - Even though having the same number and sequence for entries within a codelist or select list is not required, for any mapped attributes, the PDS 3D codelist should have all entries from the SmartPlant P&ID select list. If a new text entry is added to a SmartPlant P&ID select list, the same text entry should be created in the corresponding PDS 3D codelist. The Attribute Mapper must be run after any such change.
- **Layers and Drawing Filters** - PDS uses the concept of layers in a piping design to display selected elements of a drawing; whereas, SmartPlant P&ID uses drawing filters. The ExportLayer.xls file defines how the layers in PDS are related to the different drawing objects. The location of this Excel file is defined in Options Manager.
- You can assign layer numbers between 10 and 63 to item types in order to assure that graphics appear in the designated layers in PDS. Items are named according to filters, which are defined in Filter Manager. For more information, see the topics dealing with layers in the SmartPlant P&ID online Help.

PDS 3D

- **Codelists** - A PDS 3D codelist can be a super set of a SmartPlant P&ID select list. This means that a PDS code list can have extra entries not contained in the SmartPlant select list because the data transfer works one way; that is, from SmartPlant P&ID to PDS 3D.
- **User Attributes** - Attributes can be created in PDS 3D independent of the SmartPlant P&ID plant if data transfer is not required. If transfer is required, care should be taken when adding attributes. A SmartPlant database does not distinguish between short and long integers. Any new integer property that is added to such a database as must be created as long in the PDS database.

Related Topics

- *Appendix A: Troubleshooting*, page 39
- *Establish a SmartPlant/PDS Link*, page 14
- *Map an Ignored Attribute*, page 18
- *Map an Unmapped Attribute*, page 20
- *Transferring Piping Data: An Overview*, page 5

Load From P&ID Options

Updates the active segment data based on information defined in the SmartPlant P&ID. The system verifies the temperature and pressure service limits when loading segment data from the SmartPlant database into an existing piping segment for which data was previously transferred.

Complete Data Transfer Option - Transfers all mapped attributes from the selected SmartPlant P&ID segment into the active PDS segment data. Attributes that are transferred are shown in yellow. Attributes that are not mapped are shown in black.

Partial Data Transfer Option - Transfers those mapped attributes, that have the Partial option chosen during attribute mapping, from the selected SmartPlant P&ID segment into active PDS segment data. Attributes that are transferred are shown in blue.

Equipment and Nozzle Numbers Option - Updates the active segment data from the SmartPlant P&ID using the segment data attached to the specified Equipment/Nozzle ID.

Related Topics

- *Choosing Data Transfer Options*, page 24
- *Mapping Attributes: An Overview*, page 17
- *Transferring Piping Data: An Overview*, page 5

Graphical P&ID Setup Command

This command searches, selects, and displays the SmartPlant P&ID within the PDS piping design environment. This display enables the graphical transfer of piping segment data by snapping to graphics in the active P&ID. You can also specify a component name for placement by selecting a component in the P&ID.

For data transfer purposes, only one P&ID can be active. You can select a P&ID to display from the list of P&IDs extracted from the SmartPlant database. The list of P&IDs is limited to P&IDs for the active unit number in the PDS piping model, or if the active unit number is undefined, then all P&IDs from the SmartPlant database arelisted in alphanumeric order by drawing number.

The **Graphical P&ID Setup** command checks for the existence of SmartPlant P&ID data in the PDS project. If P&ID data is found, then PDS 2D starts the old software component to allow data transfer from P&ID. If the project is PDS 3D only, then the data transfer from SmartPlant P&ID to PDS 3D starts.

You can use the following options to select the P&ID to display.

P&ID Conversion Option - Launches SmartPlant P&ID automation to convert the selected P&ID from its native format to IGDS format. The converted drawing is placed ina temporary folder. The drawing is closed automatically uponexiting the design session.

Units of Measure Option - Converts SI units in SmartPlant P&ID using unit-related codelists from the Standard Note library in PDS. SmartPlant P&ID stores all properties with a unit of measure in SI units. For example, length is stored in meters regardless of your plant settings. The software then checks another property, that determines how you want length values to appear. When a property represents a quantity based on units (for example, pressure, temperature, and so forth) data transfer looks at the active segment data, or type 63 settings, to determine the unit of measure to use. The SI value stored in the database is then converted using unit-related code lists from the Standard Note library.

Code-listed Attributes Option - Uses a codelist map to translate thecodelisted attributes. The Attribute Mapper stores mapping of codelist numbers such that their text values match. Data transfer uses this codelist map to translate the codelisted attributes from the database to the PDS database.

Notes

- If the SmartPlant database participates in Workshare environment, then the P&ID list is a combination of the P&IDs owned and subscribed to (that is, published by remote location) by the site.

- Use the LocalModelItemLookupTable.sql utility if your connected Workshare satellite experiences performance problems when transferring piping data from SmartPlant P&ID to PDS. This script converts a satellite database view (namely, the T_ModelItemLookup) that references a host table into a local table, allowing the data transfer to proceed without using a DBLink. SmartPlant P&ID uses the DBLink to fetch unique Long IDs from the Host when running from a connected Workshare satellite. If the performance of opening the PID file in PDS is an issue or if maintaining the correlation between SmartPlant P&ID and PDS after the merge is not an issue, then you can run this script to change the lookup for the Long ID from a view to the host to a local query. This utility is delivered as an SQL script to the C:\Program Files\SmartPlant\P&ID Workstation\Program folder and can be executed using any Oracle user interface, such as SQLPlus. Do not use this script if the transferred PDS data will be merged back into a host PDS database because the Long IDs will not be unique at the host.
- Because SmartPlant databases are unit-dependent and PDS databases are design area-dependent, one PDS piping design area can include data from different SmartPlant units. Consequently, you must specify the correct unit number in the active segment data prior to requesting a list of P&IDs from a SmartPlant database.

Related Topics

- *Choosing Data Transfer Options*, page 24
- *Establish a SmartPlant/PDS Link*, page 14
- *Map an Ignored Attribute*, page 18
- *Map an Unmapped Attribute*, page 20

Select P&ID by Line ID Command

This command specifies a line ID by identifying piping in the PDS piping model or by accepting the active line ID. The system determines the SmartPlant P&ID (or list of P&IDs) from the line ID. It searches the Segment Table of the SmartPlant database using the system-unique number for the drawing and the line ID for the segment. All P&ID segments belonging to the specified line ID are highlighted.

Related Topics

- *Establish a SmartPlant/PDS Link*, page 14
- *Map an Ignored Attribute*, page 18
- *Map an Unmapped Attribute*, page 20
- *Transferring Piping Data: An Overview*, page 5

Select P&ID Drawing by Nozzle Command

This command specifies an equipment number and nozzle number by locating a component connected to a nozzle, by typing in an equipment number and nozzle number, or by placing a data point over a nozzle in a model. The system determines the SmartPlant P&ID from the equipment number and nozzle number and data in the SmartPlant database. All P&ID segments that have the same line ID as the segment connected to the active nozzle are highlighted.

Note

- Currently, only the first segment coming off the nozzle is highlighted, not the entire line.

Related Topics

- *Appendix A: Troubleshooting*, page 39
- *Establish a SmartPlant/PDS Link*, page 14
- *Map an Ignored Attribute*, page 18
- *Map an Unmapped Attribute*, page 20
- *Mapping Attributes: An Overview*, page 17
- *Transferring Piping Data: An Overview*, page 5

Review P&ID Drawing Details Command

Displays information about a selected SmartPlant P&ID in the active unit.

P&ID Drawing Display Categories Command

Displays SmartPlant P&ID display categories. Categories that are currently displayed are highlighted on this dialog box. Selecting a category toggles its setting. P&ID controls display and symbology through the use of drawing filters. The P&ID graphics in the converted IGDS format are not organized into familiar categories such as piping, equipment, or instruments, instead the software displays MicroStation levels 1 through 63 as SmartPlant P&ID drawing filters. Some of the categories are turned off automatically to hide blank label enclosures and inactive heat tracing graphics.

Related Topics

- *Choosing Data Transfer Options*, page 24
- *Transferring Piping Data: An Overview*, page 5

Restore View of Piping Model Command

Restores the PDS 3D model view in the window where the SmartPlant P&ID is currently displayed.

Related Topics

- *Revising Linked Models*, page 16
- *Transferring Piping Data: An Overview*, page 5

Disable Display of P&ID Drawing Command

Closes the currently displayed SmartPlant P&ID and restores the PDS 3D model view.

Related Topics

- *Revising Linked Models*, page 16
- *Transferring Piping Data: An Overview*, page 5

Name from P&ID Option

Selects the piping or instrument component that you want to place by identifying a component in the SmartPlant P&ID. If the selected instrument has a tag number that does not exist in the Piping Job Specification, the system displays the **Instrument Placement** dialog box with both **Data From Reference Database** and **Data From User** options. Select the **Data from User** option, select the shapethat you want, and enter the dimensions that are required. This procedure allows the tag number and the property that were mapped in the attribute map to transfer from the SmartPlant to the PDS database.

This mechanism also applies to piping specialties.

Related Topics

- *Choosing Data Transfer Options*, page 24
- *Mapping Attributes: An Overview*, page 17
- *Transferring Piping Data: An Overview*, page 5

Named Component Existence Report Command

Compares the existence of user-specified named components between the PDS and the SmartPlant databases in batch mode on the basis of a user-defined list of lines and then generates a report of the results.

If a PDS 2D P&ID database exists, then it is used with the PDS model as the basis for comparison. If it does not exist, then the SmartPlant database is used as the basis for comparison. As part of the report, the software includes the database that the comparison was based on. The comparison does not make use of either the P&ID drawing or the PDS piping model. Therefore, the order of components is not considered in the report.

A user-defined list, design area, or model is used to define those items that are included in the report. The user-defined list must have one line ID per line. Whether you create a list or use a design area or model, the list of line IDs used to perform the comparison is included in the report.

The comparison considers the entire piperun in both the SmartPlant database and the PDS database. If a line ID is used in multiple SmartPlant P&IDs or is included in multiple PDS models, the complete definition of all P&IDs or models is included in the report regardless of the line-ID option that is selected.

The following items are included in the comparison report:

- The named components in the piping design database are included and are compared on the basis of the following data:
  - :Tagged piping commodities are compared on the basis of their piping component number
  - Piping specialties are compared on the basis of their piping component number
  - Inline instruments are compared on the basis of their instrument component number
- Tagged piping commodities in the SmartPlant database that have the following data are included:
- The **Commodity Code** flag is set to by system or by user and the commodity code is defined
- The **Piping Component Number** is defined
- Piping specialties in the SmartPlant database are determined by those piping components that have the following data:
- The **Commodity Code** flag is set to by user
- The **Commodity Code** flag is blank

- The **Piping Component Number** is defined
- Instruments in the SmartPlant database are determined by the following criterion.
- Only those instruments that are applicable to the PDS 3D model, such as those requiring dimension definition in the RDB, as determined by an Instrument Correlation List

The Instrument Correlation List, which is necessary to define the applicable instruments for transfer, is a user-defined ASCII file in the project folder and is named pid_instrument. With this list you can specify the inclusion or exclusion of SmartPlant P&ID instruments on the basis of their aabb or aabbcc codes. You can include or exclude groups of instruments on the basis of the aabb code for that instrument by using the appropriate keyword, either **Include** or **Exclude**, followed by the aabb code. You can specify exceptions to the aabb codes on the basis of specific aabbcc codes so that you can exclude from an **Include** group, or you can add those entries to an **Exclude** group by adding the exceptions under the line containing the **Include** or **Exclude** statement.

Note

- The ! character signifies a comment line in this ASCII file.

The following text represents the default Instrument Correlation List that defines the SmartPlant P&ID instruments that are applicable to the PDS 3D model. In this example, the aabb code represents a substring search of the aabbcc code.

```
!Include all control valves
Include 7P1E
!Include all relief devices
Include 7P2C
!Include all other in-line instruments
Include 7P3C
!except for the following
7P3C44
7P3C46
!Exclude all off-line instruments
Exclude 7Q4D
!except for the following
7Q4D21
7Q4D24
7Q4D27
7Q4D28
7Q4D29
7Q4D30
7Q4D31
7Q4D32
7Q4D33
! Exclude all system functions
Exclude 7Q5A
```

You can format the title page and the heading for each page of the Named Component Existence report using the win32app\ingr\pddesign\sample\pid_cmprpt.fmt file. The remainder of the report contains the following sections:

- The list of line IDs that determine the basis for the report
- Named components in the SmartPlant database, that are not in the PDS 3D model, are reported with the component number and the drawing number
- Named components in the PDS 3D model that are not in the SmartPlant database are reported with the component number, the design area number, and the model number

Related Topics

- *Mapping Attributes: An Overview*, page 17
- *Transferring Piping Data: An Overview*, page 5

Appendix A: Troubleshooting

Some common difficulties that you may encounter are listed here, along with possible solutions.

No Projects on This Site

On some systems, you receive the **No projects on this site** error when you try to connect to the SmartPlant P&ID site server. As a workaround, you can edit the Microsoft Access file \projectname\project\SPMap.mdb directly and add a line in the connection table as follows:

- **Project Number** is the SmartPlant P&ID plant name
- **MapPathName** is the complete UNC path to the SmartPlant P&ID plant SPMap.mdb file
- **IsThreeD** has to be selected
- **SPSiteNode** is the UNC path to the SmartPlant initialization file
- **SPProjectName** is the project name

Save changes made to the SPMap.mdb file, and run the **SP PID to PDS 3D**command again.

Note

- If a client computer experiences problems connecting to the project, remove the Intergraph SmartPlant Attribute Mapper and Intergraph SmartPlant P&ID Automation components using **Add/Remove Programs**. Restart the computer and reinstall PD_Shell and SmartPlant P&ID Integration Tools using the silent installation. Be aware that for PDS users to set up the attribute map and perform data transfer, they must have permission to access the SmartPlant server through SmartPlant Engineering Manager.

Display

Start PD_Shell, and go to piping. Inside the PDS piping model but before using the **Graphical P&ID Setup** command, select one of the two methods below so that all of the P&ID items are clearly visible in order to display properly the converted P&ID within PDS:

- Method 1: Turn off the **Reference File > Use Color Table** setting under **User > User Preferences > Reference File**. This action displays the drawing using the active color scheme for the PDS model, rather than honoring the colors from SmartPlant P&ID.
- Method 2: Change the **Background** color of the piping model to a lighter color by using **Settings > Colors**.

Display by Unit Filter

Run the **Graphical P&ID Setup** command as with PDS 2D, unless the unit is simply a filter. If not specified, all plant P&IDs are shown. Note that the P&ID Drawing Name is what you see on the data transfer dialog boxes, not the drawing number.

Temperature/Pressure Units

Select lines for piperun and component data for the **Name from P&ID**option. For Pipeline data, four sets of temperature/pressure values with units must be set in the SmartPlant P&ID or you will receive an error about temperature/pressure limits. You can choose the **No Minimum T-P Data for Service Limits Verification** option in the PDS project data manager to prevent that error. When using this option, the lower range of the temperature/pressure values is not checked, thus allowing undefined values in PDS: -9999.

Removing Software from a Silent Installation Configuration

For a silent installation, when you accept the **SmartPlant P&ID Integration Tools** option on the PDS component loader dialog box, the following components are installed and the following folders created:

- Intergraph SmartPlant Attribute Mapper
- Intergraph SmartPlant P&ID Automation, including
  - \Program Files\Common Files\Intergraph\RAD (used by SmartPlant P&ID and SmartSketch)
  - \Program Files\Common Files\Intergraph Shared\SmartPlant
  - \Program Files\SmartPlant

If you need to remove the components for the silent installation and have SmartSketch on the computer, remove SmartSketch and its associated components *first*. Continue by removing PD_Shell from the **PDS remove product** utilities. This action prompts you to confirm deletion of the Intergraph SmartPlant Attribute Mapper. Select **Yes**, and confirm the deletion of all shared files.

Note

- This step does not delete Intergraph SmartPlant P&ID Automation. To remove automation, go to **Add/Remove Programs**, select **Intergraph SPP&ID Automation** from the list, accept its deletion, and confirm deletion of all shared files. Then restart your computer.

Before re-installing any software in the client computer, delete the three folders specified above, and any files contained in them.

Known Issues and Limitations

- The **Graphical P&ID Setup** command cannot convert and display a P&ID that has a space in the P&ID file path. Make sure the paths and filenames to the P&IDs have no spaces in them. You get the same result if you use a comma in the P&ID title.
- When the P&ID plant hierarchy does not contain the **Unit** item, an error occurs when snapping to a piping segment or a component in the **PD_Design** environment.
- You must define the **Option Code** property for a component in SmartPlant P&ID if you are planning to use the **Name from P&ID** command for transferring any other component information. The implication is that your piping specifications must be created before drawing the P&IDs if you use this command for any data transfer.
- You must dismiss the **Graphics Setup** menu after selecting the P&ID that you want to display. Sometimes this form may be hidden, and you must dismiss it before you can transfer data from a pipeline.
- Levels settings (that is, displays of drawing filters) are not saved for a SmartPlant P&ID drawing. You must select the correct levels each time that you enter the drawing.
- If you want to see the P&ID labels and line types correctly, you must map your P&ID fonts to proper MicroStation fonts in one of the .ini files. ISO Plus RDB fonts and borders.txt contain this information. Also, the standard RDB Arial Narrow is mapped to a not-always-present MicroStation font and causes unreadable labels on the screen.

Related Topics

- *Choosing Data Transfer Options*, page 24
- *Establish a SmartPlant/PDS Link*, page 14
- *Installation: An Overview*, page 7
- *Map an Ignored Attribute*, page 18
- *Map an Unmapped Attribute*, page 20

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