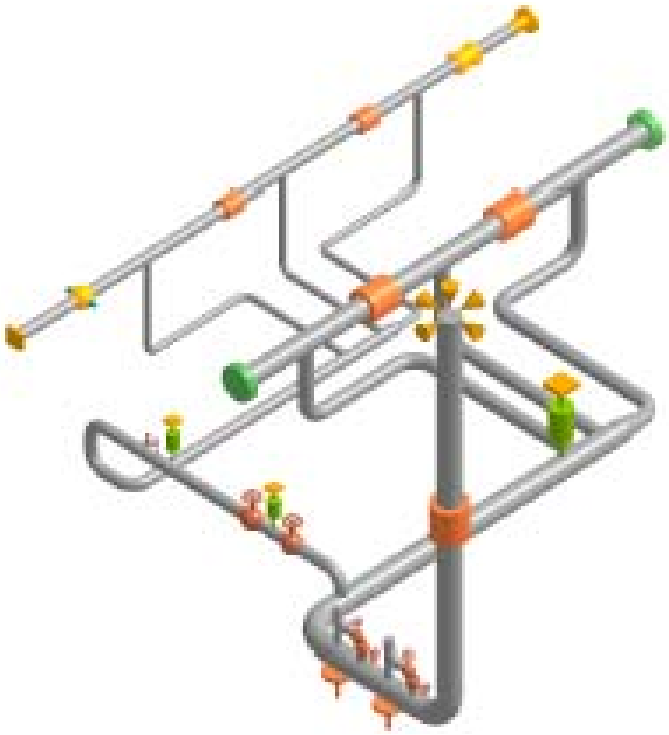
HotClash™
User's Manual



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Users must carry out all necessary tests to assure the proper functioning of the software and the applicability of its results.

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1.0 Introduction

It is common practice worldwide that piping designers/layout personnel route pipes with consideration given mainly to space constraints, process and flow constraints (such as pressure drop) and other requirements arising from constructability, operability and reparability. Often pipe stress requirements are not sufficiently considered while routing and supporting piping systems, especially in providing adequate flexibility to absorb expansion/contraction of pipes due to thermal loads. In order for piping designers to consider "first-level" of pipe stress requirements while routing and supporting pipe systems, the product CheckStress was developed by SST Systems, Inc. and InfoPlant Technologies Pvt. Ltd. and released.

CheckStress is an add-on pipe stress check software module to 3D Plant Design Systems such as PDMS, CADMATIC, etc. It helps designers decide "Code Complaint" pipe routing during layout stage and is meant for first level of stress check by designers. So, by using CheckStress, the designer is able to send mostly "Code Complaint" piping systems to pipe stress engineers for detailed analysis and stress report preparation.

In order to comply with space constraints, piping designers check for interferences between piping and the adjacent structures, concrete buildings, equipment and reserve volumes for walkthrough, maintenance space etc. either manually on General Arrangement drawings or nowadays in a 3D Plant model. Unfortunately, such "Clash-check" is performed using only "as-designed" drawings/3D model. In reality, piping systems deform due to its own dead-weight during installed/shut-down condition, during hydrotest as well as during operating condition. Clash-checks for piping systems under such "deformed conditions" are usually never performed till date. This product "HotClash", developed by SST Systems, Inc. and InfoPlant Technologies Pvt. Ltd., eliminates this deficiency in the plant design process. HotClash is an add-on software module to 3D Plant Design Systems (currently available only on PDMS). It transfers "deformed shapes" for the piping system under three different loading conditions to the 3D Plant Design software, namely

- "Shut-down" condition
- "Hydrotest" condition
- "Operating" condition

The 3D Plant Design Software, in turn, could then check for interference under the above three loading conditions as well as under the traditional "as-designed" model condition.

"Shut-down" Condition

Under Shut-down condition, it is assumed that the following loads are applied on the piping system under consideration.

- the pressure specified by the user inside the 3D Plant Design software
- weight of the system including dead weight of pipes, fittings, components such as valves, instruments and flanges as well as weight of operating fluid (assumed filled fully throughout the piping system).

In order to avoid any interference between the "deformed shape" of the system under the above-defined shut-down condition and the adjacent structures, concrete buildings, equipment, reserved volumes etc.,

It may be necessary to support the piping system vertically. Typical vertical supports to carry dead-weight are:

a. Variable spring hangers.
b. Constant support hangers,
c. Rod hangers and
d. Resting steel supports.

Both rod hangers and resting steel supports fully restrain downward pipe movement but permit pipe to lift up at such supports.

“Hydrotest” Condition

Under Hydrotest condition, the following loads are applied on the system

- the pressure specified by the user in the graphical user interface
- weight of test fluid entered as specific gravity in the GUI with respect to water (assumed filled fully through out the piping system)

Since variable spring hangers are always pinned during hydro-test, HotClash internally replaces any such variable spring hangers with rigid 2-way vertical restraints for calculating “deflected shape” for hydro-test condition.

“Operating” Condition

Under Operating condition, the following loads are applied on the system selected for HotClash.

- the pressure specified by the user inside the 3D Plant Design software
- weight of the system including dead weight of pipes, fittings, components such as valves, instruments and flanges as well as weight of operating fluid (assumed filled fully throughout the piping system).
- the temperature specified by the user inside the 3D Plant Design software

1.1 Recommended HotClash Procedure

The steps given below may normally be followed to perform first-level interference checks for piping systems against the adjacent structures, concrete buildings, equipment, etc.

Step1:

Apply HotClash on the piping system under consideration in the 3D model, without exiting the 3D plant design system.

Step2:

Execute HotClash and from the Results menu, select shut-down condition and transfer its deflected shape to 3D Plant Design Software.

Step 3:

Again execute HotClash and this time, on the Results menu, select Hydro-test condition and transfer its deflected shape to 3D Plant Design software.

Step 4:

Repeat Step 3 above for Operating condition and transfer the deflected shape to 3D Plant Design Software.

Step 5:

Perform Clash check in 3D Plant Design Software for Original “as-designed” piping layout and also for the three hypothetical set of piping representing the three loading conditions namely “shut-down”, “hydro-test” and “operating” conditions.

Step 6:

Once the clash check is performed, the hypothetical set of piping can be deleted from the 3D model.

This manual describes the operational details of HotClash. It is assumed that the user is already familiar with the principles of Plant Design Software Piping Application and the practices followed in Plant Design Piping catalogue and specifications, and the user has used Plant Design Software to generate the piping by using available facilities in Plant Design Software.

The working sequence of the software is listed below.

1. The pipe branches modeled in the Plant Design Software are read and passed onto HotClash.
2. HotClash then, from the material mapping database (see Note 1) provided with HotClash, identifies valid materials (which will be used for first level interference check) that would

correspond to the material specifications given for those branches in the 3D Plant Design Software. This executable finally carries out stress analysis and transfers the deflected shapes for shut-down, hydotest and operating load cases to 3D Plant Design software.

The sequence of HotClash operation is shown diagrammatically in Figure 1-1.

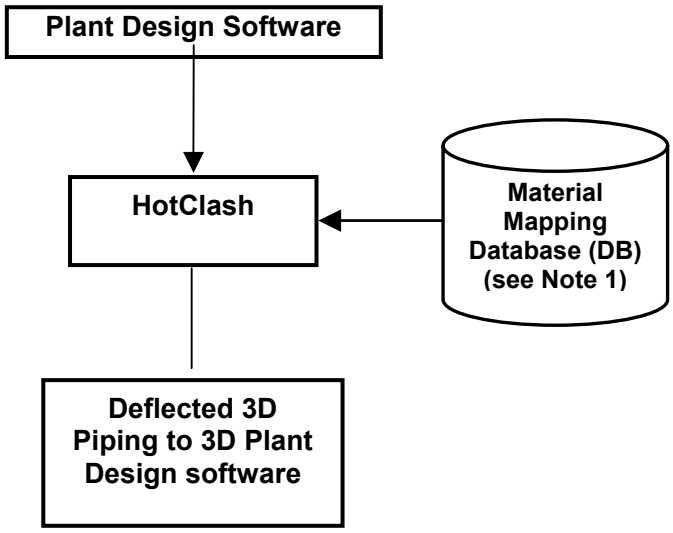


Figure 1.1

Note 1:

Refer **Appendix B** for more details on Material Property.

2.0 Installing the Program

Before installing the SST License Manager and the Client product on any of your computer, please make sure the computer meets the following requirement listed below.

Note:

If you are using the old version of SST License Manager (i.e., earlier than version 5.0), then follow the procedure listed in Appendix A of Security System User's Manual on uninstalling the same before installing the new version of SST License Manager.

2.1 Operating System Requirement

a. Internet Explorer 5.01 or later and Windows Installer 2.0 or later.

b. Windows NT 4.0 (Workstation or Server) with Service Pack 6a

c. Windows 2000 (Professional, Server, or Advanced Server)

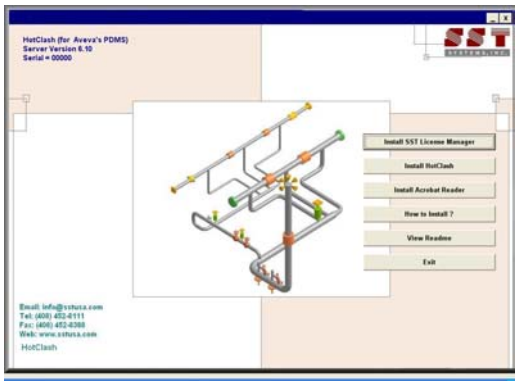
d. Windows XP (Personal and Professional)

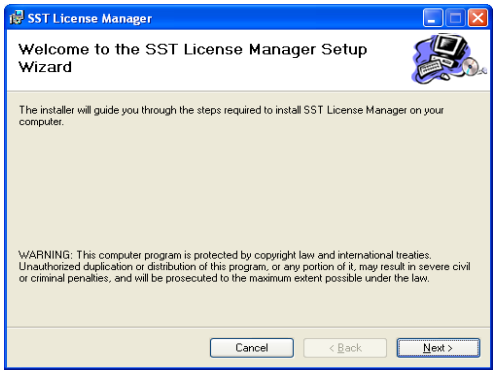
2.2 Installing SST License Manager

Locate/Decide the computer that you want to use as a server for the HotClash. Any machine available in the network can be used as a server machine and it is not necessary to be a real server.

Insert the compact disc supplied by SST Systems Inc, to the CD-ROM drive of the computer that you decided to use as a server for HotClash. Wait for few seconds to enable the "Auto play" of the CD. Please note, if the CD-ROM does not start automatically, simply browse the CD, and double-click on the "setup" application icon. You will see a typical window; similar to that shown in the figure left below.

Click on "Install SST License Manager" option. You will be shown window similar to that shown in the figure right below.





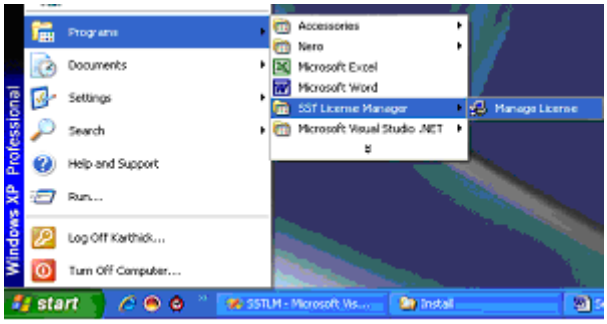
Follow the instructions as they appear on the screen.

2.3 Manually registering the windows service for SST License Manager

The SST License Manager setup program will register and start the service automatically, when you perform step 2.2. If the setup program fails to register the service automatically for any reason, then register the service manually as stated below.

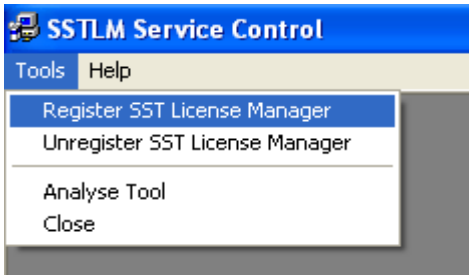
After the successful installation of the SST License Manager, launch the program "ManageLicense.exe" by selecting Start Menu->Programs->SST License Manger->Manage License

from the computer where the SST License Manager is installed. The details are shown graphically below.



Select the option “Register SST License Manager” through “Tools->Register SST License Manager” to register the window service as shown in figure left below.

After successful registration of the service you will see a message shown in figure right below.



2.4 Installing the client program

Locate/Decide the computer(s) that you want to use as client(s) for HotClash. The client program can be installed in as many systems as you want.

To install the product on the client computers, insert the compact disc supplied by SST Systems Inc to the CD-ROM drive and wait for few seconds to enable the Auto play feature. Please note, if the CD-ROM does not start automatically, simply browse the CD, and double-click on the “setup” application icon. You will see a window as shown in figure left of section 1, “Installing the SST License Manager”.

Click the option “Install HotClash” and follow the instructions as they appear on the screen.

For sharing the license information, client computer need to communicate with the server (computer where the SST License Manger is installed). The communication between the client computer and the server computer can be established by setting the Environmental Variable “SSTLM” on the client computers. Please note, the automated procedure for locating the server computer by the client computer for sharing license information is purposefully not given for the following reasons.

1. SST License Manager is used as a security system for all SST Systems Inc products and hence user can have different servers in the same network environment for different SST Systems Inc products.
2. Can have one server for various SST Systems Inc products installed in different client machines.
3. Can install both server/client in one computer.
4. Can have two different servers for one SST Systems Inc product by splitting the number of users (not applicable for single user) and

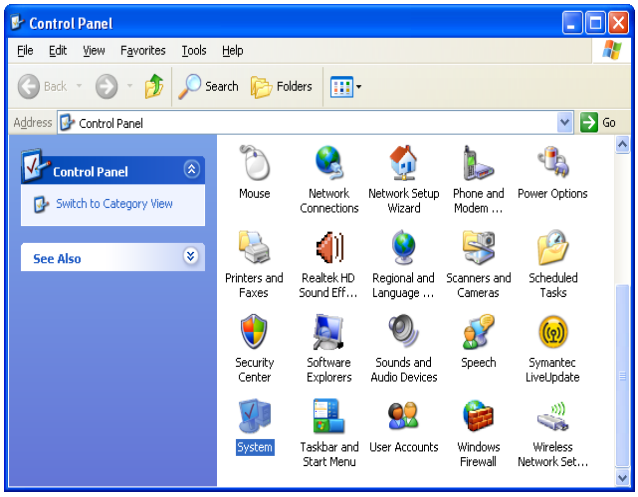
5. Locating the server automatically under a huge network environment is a time consuming process.

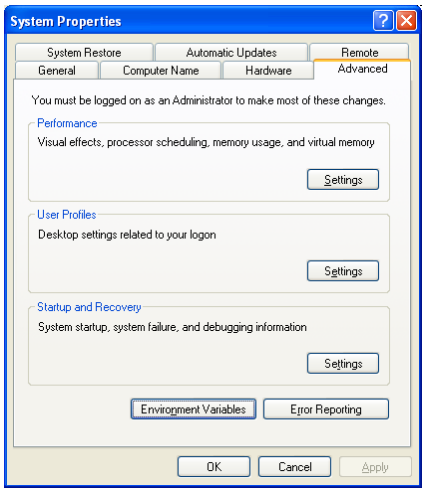
On the other hand, the Environmental Variable is set automatically for the machine where SSTLM is installed. In other words, if you install the client program in the same machine where the SST License Manager is installed, then there is no need to set the environmental variable “SSTLM”. If the client program is installed other than the machine where SST License Manager is installed, then follow the procedure listed below for setting the environmental variable under different operating systems.

2.4.1 Windows 2000/ XP/ Vista

Open the “Control Panel” window through Start Menu->Settings->Control Panel.

Double-click on “SYSTEM” icon as shown in figure left below.



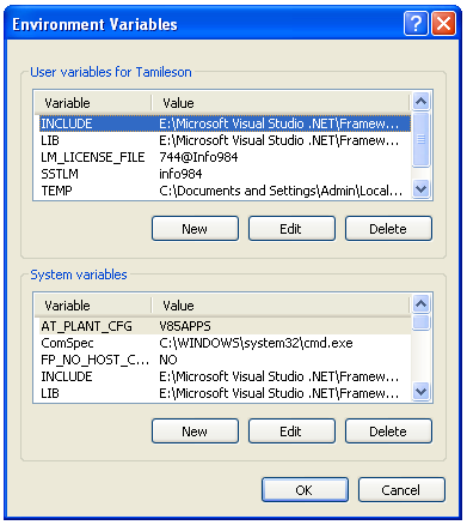


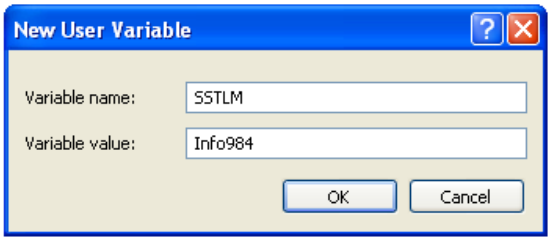
Select the tab “Advanced” and press the button “Environmental Variables” as shown in figure right above.

Click the button “New” under the “User Variables” as shown in figure below.

Type “SSTLM” as Variable Name, and Name or IP Address of Computer where SST License Manager is installed (for e.g., info024 or 192.0.0.4) as a Variable Value then press the “ok” button.

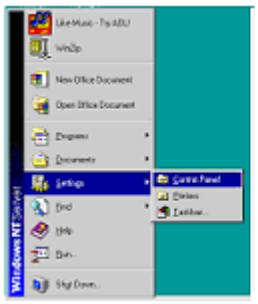
Press the button “OK” to complete the setting.

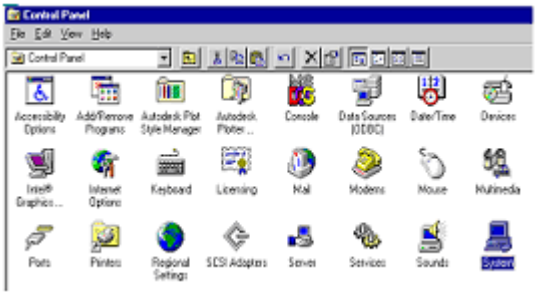




2.4.2 Windows NT 4.0 (Server/Workstation)

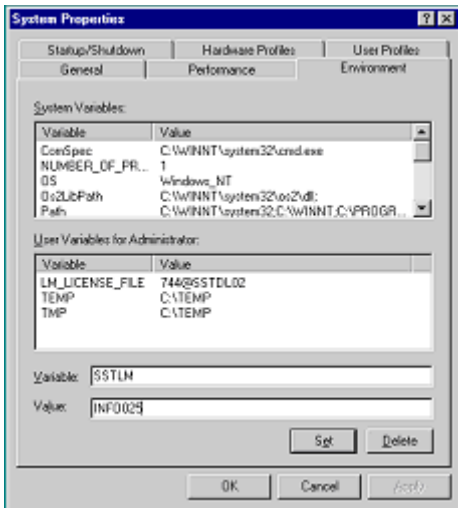
Open the “Control Panel” window through Start Menu->Settings->Control Panel as shown in figure left below.





Double-click on “SYSTEM” icon as shown in figure right above.

From the window, select the tab “Environment”, you will see a window as shown in figure below.



Type “SSTLM” under the variable name prompt and key in the Name or IP Address of the computer where SST License Manager is installed (for e.g., info025 or 192.0.0.4) under the value prompt.

Press the button “set” and then “Ok” to complete the setting.

2.5 Product Key Generation

Before generating the Product Key, user has to make sure that the following requirements are met.

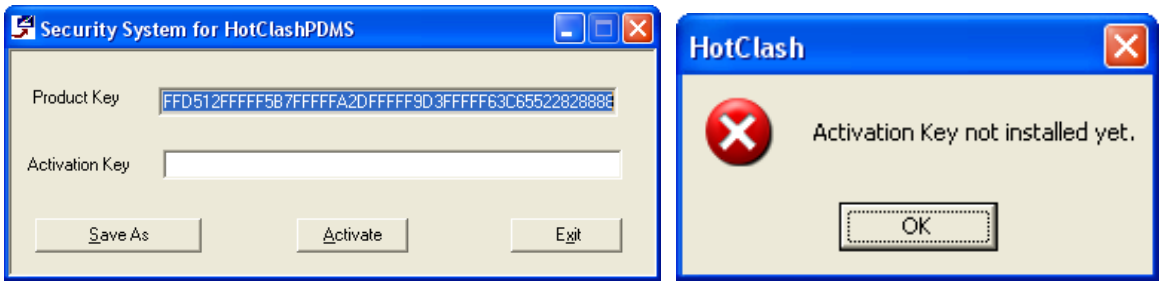
1. Ethernet card installed with proper driver files.
2. Static TCP/IP assigned to the server machine. If your machine (where SSTLM is installed) is configured to obtain the IP Address automatically from a DHCP server, then user can disable the feature of checking the IP Address by SSTLM by defining an environmental variable with name “SKIPIP” and setting its value as “YES”. This feature can also be used when a product is installed in a Laptop that is being used in a different network environment with different TCP/IP address.
3. Network cable plugged and connected to the network. Please note, if you generate a Product Key without connecting to a network (network cable unplugged), then the license issued for that Product Key could not be used when the network cable is plugged-in. On the other hand, the license issued for the Product Key generated with network cable plugged-in can be used in unplug mode too. Hence, it is always recommended to keep the network cable plugged-in before generating the Product Key on both Desktops as well as Laptops (configured to use both in standalone and network mode).

4. For XP operating system with service pack later than 1.0, open the TCP/IP port 12000 from the Windows Firewall.

The procedure for creating the product key is explained in this section by assuming the name of the module you own as “HotClashPDMS”.

During the first run of the product, the client program communicates with the server computer and sends request to check for the availability of the license to use the product.

The server (SST License Manger) checks for the availability of the license in the windows registry. If not available, program automatically generates a new Product Key and sends the same back to the client machine. Client machine then pops up the same in a dialog box as shown in figure below.



Press the button “Save As” and key-in the name of the file to store the details on a text file. Press the button “Exit” to close the dialog. The client computer will show a message as shown in figure right above until the Activation Key is installed in the Server computer.

Send the text file created above to InfoPlant via e-mail. SST Systems Inc will provide you the Activation Key for the same.

2.6 Installing the Activation Key

The Activation Key can be installed in two ways.

1. Using client module and
2. Using the Manage License Tool.

2.6.1 Using Client module

Launching the client product (SST Systems Inc product module), checks for the availability of the Activation Key corresponding to the module and pops up “Security System” dialog box (in the client machine the SST Systems Inc product being loaded) with provision to enter the “Activation Key” upon unavailability of the key. Enter the Activation Key in the “Activation Key” text box and click the “Activate” button. Upon successful installation, user gets a message “Activation Key successfully installed”.

2.6.2 Using Manage License Tool

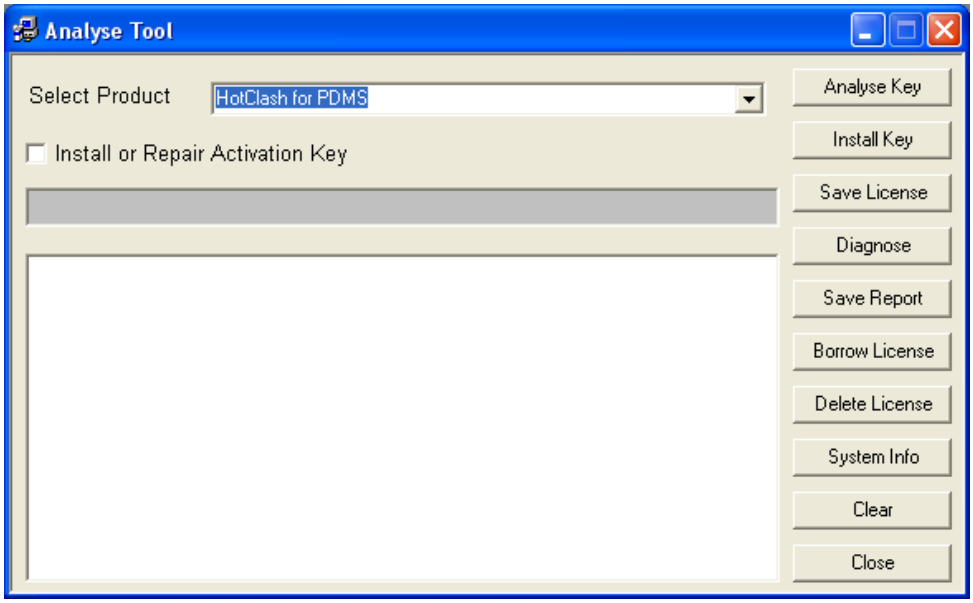
a. Run the program “ManageLicense.exe” available in the installation directory of “SSTLM”.

b. Select “Analyse Tool” from the menu “Tools” for server version or select “Analyse Tool” available in the main menu of the SST Systems Inc product for standalone version.

c. From the dialog box as shown in figure below, select the product from the “Select Product” combo box.

d. Select the check box “Install or Repair Activation Key”. This enables the text box below the check box.

e. Paste the “Activation Key” in it and press the button “Install Key”. On successful installation, user gets a message “Activation Key successfully installed”.



2.7 Renewing/Re-Installing the License

Follow the steps a. through e. listed in 2.6.2 above to renew/re-install the license (Activation Key). Refer SST License Manager User's manual for more details.

3.0 Limitations

Limitations defined in this Chapter are generic in nature and is not specific to any Plant Design application software. Limitations specific to each Plant Design application is listed in the corresponding Readme file (*.hlp) supplied along with the translator software for that Plant Design application.

The present version of the HotClash has the following limitations.

3.1 In Case of unavailability of HotClash material detail corresponding to Plant Design material description (available in the neutral file), then program takes the CAEPIPE Material information specified in the first row of the material Mapping DB selected during transfer to HotClash. Refer **Appendix B** for more details.

3.2 If OD (outer diameter) or Thickness (Wall thickness) for an element is not available in the neutral file, then OD and Thickness shall be extracted from the Mapping DB corresponding to the specified Nominal Size for that element.

Note: Thickness corresponding to Standard Schedule (ANSI) is entered in the Mapping DB and supplied with the standard product. User can change these values to suit their project requirement, if necessary. Refer **Appendix C** for more details.

3.3 The following items are currently not transferred from Plant Design to HotClash at this time.

a. Insulation Density and Insulation Thickness of the section.

b. Corrosion allowance and Mill tolerance of the piping section and

c. Lining Density and Lining Thickness of the piping section.

4.0 Reference

This section describes in detail, the methodology followed for transferring the piping components from Plant Design software to HotClash.

4.1 Loads

Temperature (Deg F or Deg C) and Pressure (psi or bar) entered in 3D Plant Design software is transferred to HotClash for all the elements. If the specific gravity of the fluid (with respect to water) is specified during the neutral file extraction, the same will be transferred to HotClash. If left blank then translator will transfer the same as 0.0.

4.2 Pipe

Pipe from 3D Plant Design software is transferred as Pipe to HotClash. OD and Thickness (in or mm) is read from the Plant Design Database for that element and is written to the neutral file. If OD and/or Thickness are not available/entered in the 3D Plant Design software, then translator will read the OD and/or Thickness from the Mapping DB corresponding to the Nominal Size specified in the 3D Plant Design for that element. Material name for each pipe element is read from the 3D Plant Design Database and is written to the neutral file. The program then gets the CAEPIPE material information corresponding to the 3D Plant Design material through the Mapping DB and writes the same to HotClash for that element.

4.3 Bend / Elbow

Bend/Elbow from 3D Plant Design software is transferred as “Bend” to HotClash. The radius (in or mm) of the bend is extracted from the database, if available otherwise; it is calculated as the distance between the Near/Far end of the bend and Tangent Intersection Point divided by Tan (θ/2), Where θ is the included angle of the bend. The value thus obtained above shall be written to bend radius field in HotClash.

4.4 Valve

Valve from 3D Plant Design software is transferred as “Valve” to HotClash. Dry weight of valve (without Fluid weight [lb or kg]) is read from 3D Plant Design Database and transferred to “Weight” field of HotClash Valve element.

4.5 Reducer

Reducer (Concentric and Eccentric) from 3D Plant Design software is transferred as Reducer to HotClash. The OD (in or mm) and Thickness (in or mm) obtained from the Arrive position shall be written to “OD1” and “THK1” fields of HotClash. On the other hand, the OD and Thickness obtained from the Leave position shall be transferred to “OD2” and “THK2” fields in HotClash.

4.6 Instrument

Instruments from 3D Plant Design software are transferred as “Rigid” element to HotClash. Dry weight (lb or kg) of Instrument is read from 3D Plant Design database and the same is transferred to “Weight” field of the rigid element in HotClash.

4.7 Flange

Flange from 3D Plant Design software can be transferred as “Pipe with Flange” or “Rigid element” to HotClash. If the user selects “Pipe with Flange” option from HotClash form then the translator creates a pipe with the length of the pipe equivalent to length of flange and creates a Flange at the pipe end in HotClash with flange type as “Weld Neck”. The OD and Thickness (in or mm) corresponding to Flange Nominal Size is transferred to pipe in HotClash.

If the user selects “Rigid element” option then, the translator will transfer the same as “Rigid Element” to HotClash. Dry weight of flange is read from 3D Plant Design database and the same is transferred to “Weight” field of the Rigid Element in HotClash.

4.8 Olet

Olet from 3D Plant Design software is transferred as Pipe to HotClash with a Branch SIF defined at the intersection (i.e., where the branch pipe intersect the main run of the pipe).

4.9 Tee

Tee from 3D Plant Design software is transferred as three pipes connecting the near end & center, far end & center and branch point & center with a Branch SIF (Welding Tee) specified at the center point of the Tee. OD and Thickness read from the 3D Pant Design database for this component is transferred to each HotClash pipe fields thus created as mentioned above.

4.10 Three Way Valve

Three Way Valve from 3D Plant Design is transferred as “Three Rigid Elements” or “Three Pipes with one Concentrated Mass at its Centre” to HotClash by connecting the near end & center, far end & center and branch end & center. From the section property, weight of fluid (kg/lb) is calculated and is added to the dry weight (kg/lb) of Three Way valve read from 3D Plant Design database. The total weight thus obtained is transferred to each rigid element in proportion to its length.

In the later option, the dry weight of Three Way valve is transferred as weight of the Concentrated Mass at the intersection of the three pipes.

4.11 Cross

Cross from 3D Plant Design software is transferred as four pipes connecting near end & center, far end & center and two branch points & center with Branch SIF (Welding Tee) at the pipes intersection in HotClash. OD and Thickness read from the 3D Pant Design database for this component are transferred to each pipe fields thus created as mentioned above.

4.12 Four way Valve

Four Way Valve from 3D Plant Design is transferred as “Four Rigid Elements” or “Four Pipes with one Concentrated Mass at its Centre” to HotClash by connecting the near end & center, far end & center and two branch ends & center. From the section property, weight of fluid (kg/lb) is calculated and is added to the dry weight (kg/lb) of Four Way valve read from 3D Plant Design database. The total weight thus obtained is transferred to each rigid element in proportion to its length.

In the later option, the dry weight of Four Way valve is transferred as weight of the Concentrated Mass at the intersection of the three pipes.

4.13 Material

Material name from Plant Design software is mapped to get the corresponding HotClash material and then transferred to HotClash. Refer **Appendix B** for details.

4.14 Support

Support information (Location and its type) from Plant Design software can be transferred to HotClash in two ways viz.

a. With the use of mapping DB and

b. Without using Mapping DB

Refer **Appendix D** for details.

4.15 Units

This section describes the units of measurement used to transfer the information from 3D Plant Design software to HotClash.

Length (Inches or mm)

Length related dimensions such as OD, Wall thickness, Insulation thickness, Bend radius and Nominal Size from 3D Plant Design software are transferred as Inches or mm for English and SI units respectively.

Temperature (Deg F or Deg C)

Temperature from Plant Design software is transferred as Deg F or Deg C for English / SI units respectively.

Pressure (psi or bar)

Pressure from Plant Design software is transferred as psi or bar for English / SI units respectively.

Mass or Weight (lb or Kg)

Dry weight and Wet weight of components from Plant Design software are transferred as lb or Kg for English and SI Units respectively.

Density (lb/in3 or kg/m3)

Material Density, Insulation Density and Fluid Density from Plant Design software are transferred as lb/in3 or Kg/m3 for English and SI units respectively.

Translational Stiffness (lb/in or N/mm)

Translational stiffness from Plant Design software is transferred as lb/in or N/mm for English and SI Units respectively to CAEPIPE.

Rotational Stiffness (in-lb/deg or N-m/deg)

Rotational Stiffness from Plant Design software is transferred as lb-in/deg or N-m/deg for English and SI Units respectively to HotClash.

Appendix A

3D Plant Design–to–HotClash Component Mapping

All components available in Plant Design software are mapped with HotClash component. The details are tabulated below.

Type of Component in Plant Design software	Type of Component in HotClash	Keywords used in Neutral File
Pipe	Pipe	PI
Valve	Valve	VA
Flange	Rigid Element / Pipe with Flange	FL
Instrument	Rigid Element	RB
Reducer Concentric	Reducer Concentric	RD
Reducer Eccentric	Reducer Eccentric	ER
Cross	Four Pipes with Branch SIF (Welding Tee)	CR
Elbow / Bend	Bend	EL
Three way Valve	Three Rigid Elements / Three Pipes with Concentrated Mass	3W
Four way Valve	Four Rigid Elements / Four Pipes with Concentrated Mass	4W
Tee	Three Pipes with Branch SIF (Welding Tee)	TW
Olet	Pipe with Branch SIF (Weldolet)	TO
Support	Restraint Data Type(s)	HA
Hanger	Hanger Data Type	HA

Note: Refer Plant Design software specific Readme file (.hlp) supplied with the product for detailed component mapping.

Appendix B

Material

Material name for each element is read from the 3D Plant Design database and is written to the neutral file. The program then gets the HotClash material information corresponding to 3D Plant Design material information as follows.

a. HotClash reads the Material Mapping DB file name from the table “code” available in Codedb.mdb corresponding to the Analysis Code specified in the form during transfer.

b. Gets the HotClash Material properties from the Material Mapping DB (thus obtained above) corresponding to 3D Plant Design material description.

In case of unavailability of HotClash material property corresponding to 3D Plant Design material description available in the transfer file, then program reads the HotClash Material property specified in the first row of the Material Mapping DB (obtained above) and transfers the same to HotClash.

Material DB Modification / Creation

User is allowed to create their own material table and can use the same by modifying/adding the name of Material Mapping DB file name in table “code” of “Codedb.mdb” supplied along with this software. This table contains four fields viz. PdCode, KpCode, KpMat and KpSect. The first field “PdCode” contains the name of Piping Codes that can be specified in 3D Plant Design Software. The second field “KpCode” contains the name of Piping Codes that are available in HotClash corresponding to Analysis Code defined in 3D Plant Design Software. Third field “KpMat” defines the name of the Material DB file to be used (to get the CAEPIPE Material property) during transfer. Fourth field “KpSect” defines the name of the Schedule Table to be used (to extract OD and Thickness if not available in the Neutral file for an element) during transfer. Please note, the Material DB must exist before it is used in the Codedb.mdb. The procedure for creating a Material DB and modifying the Codedb.mdb is listed below.

a. Copy the existing file (B311.mdb) and rename the file with a desired name by pasting it to the directory where the source file was stored.

b. The newly created DB contains four tables viz. MaterialE, MaterialS, MdetailE and MdetailS. The MaterialE and MdetailE table in the DB are used to define material properties in English units whereas MaterialS and MdetailS tables are used to define the material properties in Metric units.

c. Enter the Plant Design Material description (available in 3D Plant Design Database) into the field “MatName” of “MaterialE/MaterialS” table and enter the engineering property of the material such as Density, Nu, Joint factor, etc., depending upon the availability of the information in the code selected and leave the rest of the fields as “None”. For example, the fields Tensile, CircFactor and Yield is not valid for B31.1 and hence it should left as “None”.

d. Enter the Temperature related property such as Young’s Modulus, Alpha, Allowable, etc., into “MDetailE/MdetaiS” table by expanding it using the button “+”. Fill the fields that are relevant to the Material Code selected and leave the rest as “None”.

e. Modify the contents of each table with new values and save the DB. Fill the table fields with the appropriate values available depending upon the type of piping code. Other fields can be left as “None”.

f. After successful creation of material Mapping DB as explained above in steps a to e, open the DB codedb.mdb and enter the name of the Material DB file thus created above in the field “KpMat”. For example, if you have created your own material Mapping DB file corresponding to B31.5 as B315.mdb, then enter the name of the file (B315.mdb) in the field “KpMat” as “B315” where the value of the field “PdCode” is equal to B31.5 and then enter the corresponding HotClash Section details table name in the field “KpSect”.

g. A sample “Code” mapping DB with Material DB is given below for reference.

Sample “Code” DB

PdCode	KpCode	kpMat	Kpsect
ASME CLASS2(1980)	ASME	B311	STDsch
ASME CLASS2(1986)	ASME-86	B311	STDsch
ASME CLASS2(1992)	ASME-92	B311	STDsch
B31.1	B311	B311	STDsch
B31.1(1967)	B311-67	B311	STDsch
B31.3	B313	B313	STDsch
B31.4	B314	B314	STDsch
B31.5	B315	B315	STDsch
B31.8	B318	B318	STDsch
BS806	BS806	B311	STDsch
CODETI(1995)	SNCT	B313	STDsch
Default	B311	B311	STDsch
EN13480	EUROPEAN	EN13480	STDsch
Norwegian(1983)	NORWEGIAN-83	B313	STDsch
Norwegian(1990)	NORWEGIAN-90	B313	STDsch
RCC-M(1985)	RCC-M	B311	STDsch
Stoomwezen(1989)	STOOMWEZEN	B311	STDsch
Swedish(1978)	SWEDISH	B311	STDsch
Z183(1990)	Z183	B313	STDsch
Z184(1992)	Z184	B313	STDsch

Fields in Code DB Table:

PdCode - Name of the Piping Code than can be specified in Plant Design Software.

KpCode - Analysis code corresponding to Plant Design Code.

KpMat - Material DB name from where the material details are specified.

KpSect - Section DB name from where the Schedule details are specified.

Sample “Material DB” (B315.mdb)

Sample Table “MaterialE” for English Units

	Index	MatName	Density	Nu	JointFactor	MaterialType	Tensile	CircFactor	Yield
+	1	A53-A	0.283	0.3	1	CS	None	None	None
+	2	A53-B	0.283	0.3	1	CS	None	None	None
+	3	A106-A	0.283	0.3	1	CS	None	None	None
+	4	A106-B	0.283	0.3	1	CS	None	None	None
+	5	A106-C	0.283	0.3	1	CS	None	None	None
+	6	API-5L-A	0.283	0.3	1	CS	None	None	None
+	7	API-5L-B	0.283	0.3	1	CS	None	None	None
+	8	A312-TP304	0.283	0.3	1	AS	None	None	None
+	9	A312-TP304L	0.283	0.3	1	AS	None	None	None
+	10	MonelB165-Annealed	0.283	0.3	1	CS	None	None	None
+	11	CopperB42-Annealed	0.283	0.3	1	CA	None	None	None
+	12	CopperB42-Drawn	0.283	0.3	1	CC	None	None	None
+	13	RedBrass-B43	0.283	0.3	1	CA	None	None	None
+	14	Aluminum-B241-A96061T6	0.283	0.3	1	AL	None	None	None
+	15	Aluminum-B241-A96063T6	0.283	0.3	1	AL	None	None	None

Sample Table “MdetailE” for English Units

Fields in each table and their descriptions are given below in detail.

Fields in MaterialE Table:

Index	- Unique Material Id
MatName	- Material Name
Density	- Density of the Material in English units
Nu	- Poisson Ratio
JointFactor	- Joint Factor of the Material
MaterialType	- Type of Material
Tensile	- Tensile Strength
CircFactor	- Circular Factor
Yield	- Yield Strength

Sample Table "MaterialE" for English Units

MatName	Temperature	E	Alpha	Allowable	Yield	Rupture	Design	Proof	fh	fCR
A106-A	-20	2.99E+07	5.89E-06	12000	None	None	None	None	None	None
A106-A	70	2.95E+07	6.08E-06	12000	None	None	None	None	None	None
A106-A	100	2.93E+07	6.14E-06	12000	None	None	None	None	None	None
A106-A	300	2.83E+07	6.88E-06	12000	None	None	None	None	None	None
A106-A	350	2.80E+07	6.85E-06	12000	None	None	None	None	None	None
A106-A	400	2.77E+07	6.82E-06	12000	None	None	None	None	None	None
A106-A	150	2.91E+07	6.24E-06	12000	None	None	None	None	None	None
A106-A	200	2.88E+07	6.35E-06	12000	None	None	None	None	None	None
A106-A	250	2.86E+07	6.62E-06	12000	None	None	None	None	None	None
A106-B	300	2.83E+07	6.88E-06	15000	None	None	None	None	None	None
A106-B	350	2.80E+07	6.85E-06	15000	None	None	None	None	None	None
A106-B	400	2.77E+07	6.82E-06	15000	None	None	None	None	None	None
A106-B	-20	2.99E+07	5.89E-06	15000	None	None	None	None	None	None
A106-B	70	2.95E+07	6.08E-06	15000	None	None	None	None	None	None
A106-B	100	2.93E+07	6.14E-06	15000	None	None	None	None	None	None
A106-B	150	2.91E+07	6.24E-06	15000	None	None	None	None	None	None
A106-B	200	2.88E+07	6.35E-06	15000	None	None	None	None	None	None
A106-B	250	2.86E+07	6.62E-06	15000	None	None	None	None	None	None

Fields in MDetailE Table:

MatName	- Material name
Temperature	- Material Temperature
E	- Young's Modulus
Alpha	- Alpha value for material
Allowable	- Allowable Loads
Yield	- Yield Strength
Rupture	- Rupture Stress
Design	- Design Factor
Proof	- Proof Stress
fh	- Allowable Stress at Maximum Temperature
fCR	- Allowable Creep Stress

Material properties for six piping codes viz B31.1, B31.3, B31.4, B31.5, B31.8 and EN13480 are available in the DB (i.e. B311.mdb and B313.mdb).

Modification of "Config.ini" File

Material Mapping DB's and Support Mapping DB's are stored in the Application directory of the Product. The customized Material Mapping DB's and Support Mapping DB's can be shared among the users of the product by copying these files in a shared location and modifying the "config.ini" file to point to the new path.

For clarity, "config.ini" file contains the path of the Material Mapping DB's and Support Mapping DB's. By default, this will point to the application directory. Copying these files to a shared location and modifying the path in the "config.ini" to reflect the new location will help users to share the customized DB's. The content of the file is listed below for reference.

[Config]

Product Name=HotClash

Product Type=Server Version

Materials_DB=

Code_DB=

Support_DB=

leaving the above fields empty will use the default path

Assuming the Material Mapping DB's, Code DB and Support DB are stored in the shared location DBS of machine "InfoP025", modify the Materials_DB, Code_DB and Support_DB as follows.

[Config]

Product Name=HotClash

Product Type=Server Version

Materials_DB=\\InfoP025\DBS

Code_DB=\\InfoP025\DBS

Support_DB=\\InfoP025\DBS

leaving the above fields empty will use the default path

Warning: Care should be taken while entering the fields of the CodeDb.mdb and the Material Mapping DB as the wrong entry or leaving the field empty may lead to malfunction of the software.

Appendix C

Schedule Table

The table “code” in Codedb.mdb contains a field named “KpSect” to specify the schedule to be used during transfer. Incase of unavailability of OD and/or thickness values in transfer file, translator reads the OD and/or thickness from the standard schedule table and transfers the same to HotClash. In case the value of the field “KpSect” is not defined or left empty in the table, then the program will use the “Standard Schedule (STD)” for ANSI standard by default.

Schedule Table Creation / Modification

The procedure for creating the user defined Standard Schedule Table is listed below

1. Copy the table “STDsch” and then paste it as new table in the same “Codedb.mdb” by specifying a new name for the table.
2. Modify the contents of the table with the new values.
3. Open the table “Code” and then enter the “KpSect” field with the name of the table created above corresponding to the “PdCode”. For e.g. assuming the name of the new Standard Schedule table created as “Sch40” corresponding to “B31.1” PdCode, change the value of field “STDsch” as “Sch40”.

PdCode	KpCode	kpMat	Kpsect
B31.1	B311	B311	STDsch

Sample Schedule Table

NPD_E	NPD_M	OD	THK
0.125	4	10.287	1.7272
0.25	8	13.716	2.2352
0.375	10	17.145	2.3114
0.5	15	21.336	2.7686
0.75	20	26.67	2.8702
1	25	33.401	3.3782
1.25	32	42.164	3.556
1.5	40	48.26	3.683
2	50	60.325	3.9116

Fields in standard schedule table and their descriptions are given below in detail.

NPD_E - Nominal Piping Diameter in Inches

NPD_M - Nominal Piping Diameter in Millimeters

OD - Outside Diameter in mm

THK - Wall thickness in mm

Warning: Care should be taken while filling the fields of the Schedule DB as the wrong entry may lead to malfunction of the software.

Appendix D

Supports

Support information (Location and its type) from Plant Design software can be transferred to HotClash in two ways viz.

1. With the use of mapping DB
2. Without using Mapping DB

With the use of mapping DB

The support details (entered via attributes) and its location specified in the Plant Design software are transferred to HotClash. The values of the attributes filled at support locations shall be in accordance with the values specified in the field #1 of tables “Zvertical” and “Yvertical” of “SupportType.mdb” built into the application. The values from field #1 of table “Zvertical” shall be referred and entered at the support locations (via attributes), if the Global Vertical Axis to be used in the Stress Model is “Z”. On the other hand, values from field #1 of table “Yvertical” shall be referred and entered at the support locations (via attributes), if the Global Vertical Axis to be used in the Stress Model is “Y”.

Fortunately, the values entered/available in the field #1 of tables “Zvertical” and “Yvertical” are kept identical, because most Plant Design software always consider the vertical direction as Z-axis. On the other hand, pipe stress engineers in different parts of the world use either Z-axis as vertical or Y-axis as Vertical. So, the values entered in the field “KpSupport” are different for “Zvertical” and “Yvertical”. Program always uses the value entered in the field “KpSupport” corresponding to the value entered in field “PdSupport”, for its stress model file generations.

User can modify the values available in the field “PdSupport” of tables “Zvertical” and “Yvertical” to suit their requirements. It is recommended to keep the values entered in the filed “PDSupport” of tables “Zvertical” and “Yvertical” identical as much as possible. This will help to avoid the user in reentering/changing the values at support locations for different Global Vertical Axis.

In case, the CAEPIPE support information corresponding to the attribute value entered in the Plant Design is not available/defined in the mapping DB, then the translator skips that support at the location.

Without using mapping DB

Using this option, user can define the support conditions (boundary conditions) in HotClash equivalent to the Physical Support configurations from Plant Design software. In such cases, the mapping DB will not be used for transferring the support information. Refer the sections listed below for details on entering the support information in Plant Design software.

Hangers

Hangers can be transferred from Plant Design software to HotClash by specifying the following at support locations.

Syntax:

Hanger(Type of Hanger:Number of Hangers:Allowable Travel Limit[in or mm]:Load Variation[%]:Short Range)

Example:

Hanger(Spring Supports:2: :20:1)

Note: Allowable Travel Limit option is not enabled at this time. Please skip that field while entering the values.

Rod Hanger

Rod Hangers can also be transferred from Plant Design software to HotClash by specifying the following at support locations.

Syntax:

Hanger(ROD:Number of Hangers)

Example:

Hanger(ROD:1)

Constant Support

Constant Support can be transferred from Plant Design software to HotClash by specifying the following at support locations.

Syntax:

Hanger(CONSTSUPPORT:Number of Hangers)

Example:

Hanger(CONSTSUPPORT:3)

User Hanger

User specified Hangers could also be transferred from Plant Design software to HotClash by specifying the following at support locations.

Syntax:

USERHANGER(Number of Hangers:Spring Rate[ib/in or N/m]:Cold Load:Hot Load)

Example:

For example one number of user hanger with spring rate of 1E8N/m, and hot load 1000 can be specified as follows,

USERHANGER (1:1E8: :1000)

Guide

Guide Restraint can be transferred from Plant Design software to HotClash by specifying the following at support locations.

Syntax:

GUI(Stiffness[ib/in or N/m]:Gap[in or mm]:Friction Coefficient)

Example:

Guide with Rigid stiffness, 50mm gap between guide and pipe and 0.3-friction coefficient can be specified as follows,

GUI(R:50:0.3)

Skewed Restraints

Skewed restraint(s) with different directional vectors can be transferred from Plant Design software to HotClash by specifying vector details with the following at support locations.

Syntax:

SKEW(VecX:VecY:VecZ:Stiffness[ib/in or N/m]:Gap[in or mm]:Friction Coefficient:Type)

Example:

SKEW(0.707:0.707:0.707:1E10: : :R)

Note: Gap and Friction Coefficient options are not enabled at this time. Please skip those fields while entering the values.

Double acting Translational Restraints

Double acting Translational restraint(s) can be transferred from Plant Design software to HotClash by specifying the following at support locations.

If Double acting Translational restraint(s) are specified with Stiffness and Gap then transferred as “Anchor” data type with stiffness specified in that restraint will be assigned to corresponding translational stiffness to the Anchor and Gap specified in that restraint will be assigned to corresponding translational Displacement to the Anchor.

If Double acting Translational restraint(s) are specified without Stiffness and Gap then transferred as Restraint Data type.

Syntax:

Translational Restraint Type(Stiffness[ib/in or N/m]:Gap[in or mm)

Example:

Double acting Translational restraints in X and Y directions with stiffness 1E+12 lb/in and gap of 0.10 in can be transferred by specifying the support attributes as, X(1e12:0.10);Y(1e12:0.10).

Please note, Stiffness, Gap and Friction Coefficient are optional values. If not defined, then transferred as Restraint Data type i.e. X and Y restraint to CAEPIPE. If Stiffness or Gap, any one value is not specified then the Stiffness and Gap shall be transferred to HotClash as 1E+12 lb-in (RIGID) and 0.0 respectively.

Double acting Rotational Restraints

Double acting Rotational restraint(s) can be transferred from Plant Design software to HotClash by specifying the following at support locations.

If Double acting Rotational restraint(s) are specified with Stiffness and Gap then transferred as “Anchor” data type with stiffness specified in that restraint will be assigned to corresponding rotational stiffness to the Anchor and Gap specified in that restraint will be assigned to corresponding rotational Displacement to the Anchor.

Syntax:

Rotational Restraint Type(Stiffness[lb/in or N/m]:Gap[in or mm])

Example:

Double acting Rotational restraints in X and Y directions with rotational stiffness 1e12 lb-in/deg and gap of 0.10 rad can be transferred by specifying the support attributes as, RX(1E12:0.10);RY(1E12:0.10).

Please note, Stiffness and Gap are optional values. If not defined, then the Stiffness and Gap shall be transferred to HotClash as 1E+12 lb-in/deg (RIGID) and 0.0 respectively.

Limit Stop

Limit stop can be transferred from plant design software to HotClash by specifying the following at support locations. Directional components are must while specifying limit stop.

Syntax:

LIM(Stiffness[lb/in or N/m]:Gap[in or mm]:Friction Coefficient:Xcomp:Ycomp:Zcomp)

Example:

Limit stop in Y direction with Rigid stiffness and gap of 50 mm with coefficient of friction 0.2 can be transferred by specifying the support attribute as LIM(RIGID:50:0.2:0:1:0).

Please note Rigid stiffness means 1E+12 N/m will be taken in HotClash. The Gap value specified will be assigned to Lower limit of the limit stop and Upper limit is assigned as ‘None’ in HotClash.

Single acting Translational Restraints

Single acting Translational Restraints are transferred as Limit stop to HotClash. If the user specify both single acting restraints (i.e., “+” and “-“) for same direction then the Gap value of “+” directional restraint is assigned to Lower limit and the Gap value of “-“ directional restraint is assigned to Upper limit of the Limit stop.

If any one (i.e., “+” or “-“) directional restraint is specified then the Gap value will be assigned to lower limit or upper limit depends upon the sign and other limit will assigned as “None”. By following the syntax mentioned below, user can transfer the Single acting restraints to HotClash.

Syntax:

Single Acting Restraint Type(Stiffness[lb/in or N/m]:Gap[in or mm]:Friction Coefficient)

Example:

For transferring the Single acting Translational Restraints in X direction enter the attribute of Plant Design Support location as

+X(1e10:35:0.25);-X(1e10:25:0.25)

Snubber

Snubbers can be transferred from Plant Design software to HotClash by specifying the following at support locations.

Syntax:

Types of Snubber(Stiffness[lb/in or N/m])

Example:

YSNB(1E10) or ZSNB(1E6)

Skewed Snubber

Skewed Snubbers can be transferred from Plant Design software to HotClash by specifying the following at support locations.

Syntax:

SNB(VecX:VecY:VecZ:Stiffness[lb/in or N/m])

Example:

Skewed Snubber with stiffness 1E+9 can be specified with directional vectors as follows,

SNB(0.707:0:0.707:1E9)

Force / Moment

Force and Moments can be transferred from Plant Design to HotClash by specifying the following at support locations.

Syntax:

FORCE(Fx:Fy:Fz[lb or N])

MOMENT(Mx:My:Mz[lb-in or Nm])

Example:

1000N Force acting in Y direction can be specified as follows

FORCE(0:1000:0)

500Nm Moment acting in Z direction can be specified as follows

MOMENT(0:0:500)

Skewed Restraint

Skewed Restraints can be transferred from Plant Design software to HotClash by specifying the following at support locations.

Syntax:

SKEW(VecX:VecY:VecZ:Stiffness[lb/in or N/m]:Gap[in or mm]:Friction co effiecient:Type)

Note: Gap and Friction co efficient is not enabled this time. Please skip those fields while entering the values.

Example:

SKEW(1:0:0.707:1E11: : :R) or SKEW(0:1:0:RIGID: : : T)

Threaded Joint

Threaded Joint can be assigned to nodes by specifying the following at support locations.

Syntax:

TJOINT

User SIF

User SIF can be assigned for a node by specifying the following at support locations in Plant design software.

Syntax:

UserSIF(Value)

Example:

UserSIF(100)

Appendix E

Possible Restraints Types and Hangers

Particulars	Syntax	Example
Anchor		
Anchor	ANC(Stiffness:Gap)	ANC or ANC(1E12:0.0) or ANC(1E12)
Double Acting Translational Restraints		
X	X(Stiffness:Gap)	X or X(1E12) or X(1E12:25)
Y	Y(Stiffness:Gap)	Y or X(1E10) or Y(R:50)
Z	Z(Stiffness:Gap)	Z or Z(RIGID) or X(RIGID:35)
Double Acting Rotational Restraints		
RX	RX(Stiffness:Gap)	RX or RX(1E12) or RX(1E12:0.0)
RY	RY(Stiffness:Gap)	RY or RY(R) or RY(1E12:25)
RZ	RZ(Stiffness:Gap)	RZ or RZ(RIGID) or RZ(R:50)
Double Acting Snubbers		
XSNB	XSNB(Stiffness)	XSNB or XSNB(1E12)
YSNB	YSNB(Stiffness)	YSNB or YSNB(R)
ZSNB	ZSNB(Stiffness)	ZSNB or ZSNB(RIGID)
Skewed Snubbers	SKEW(VecX:VecY:VecZ:Stiffness)	SKEW(0.707:0.0:0.707:1e12) or SKEW(0:0:0.707:RIGID)
Single Acting Translational Restraints		
+X and -X	Restraint Type(Stiffness:Gap:Friction Co-efficient)	+X(1E10:35:0.35) or -X(RIGID:25)
+Y and -Y	Restraint Type(Stiffness:Gap:Friction Co-efficient)	+Y(R:50:0.2) or -Y(:15:0.28)
+Z and Z	Restraint Type(Stiffness:Gap:Friction Co-efficient)	+Z(:45) or –Z(RIGID::0.26) or +Z(:25)
Double Acting Limit Stops		
LIM	LIM(Stiffness:Gap:Friction Co-efficient:Xcomp:Ycomp:Zcomp)	LIM(1E12:30::0:1:0) or LIM(RIGID:50:0.4:0.707:0.707:0)
Skewed Restraints		
Skewed Restraints	Skew(VecX:VecY:VecZ:Stiffness:Gap: Friction coefficient:Type of Restraint)	Skew(0.707:0.707:0.0:1E12: : :R)
Guide		
GUI	GUI(Stiffness:Gap:Friction Co-efficient)	GUI or GUI(1E12) or GUI(R:50) or GUI(RIGID:25:0.25)

Spring Hangers		
Hanger	Hanger(Type:No.of Hangers:All.Travel Limit:Load Variation:Short Range)	Hanger or Hanger(Grinnell :1) or Hanger(Grinnell :1: :25) or Hanger(Grinnell :1: :25:1)
Constant Support Hanger	Hanger(CONSTSUPPORT:No.of Hangers)	Hanger(CONSTSUPPORT) or Hanger(CONSTSUPPORT:2)
Rod Hanger	Hanger(ROD:No. of Hangers)	Hanger(ROD) or Hanger(ROD:1)
User Hangers		
User Hangers	UserHanger(Spring Rate:No.of Hangers: Cold Load:Hot Load)	UserHanger(200:1:1131) or UserHanger(200:1:0.0:1088)
Force / Moment		
Force	Force(Fx:Fy:Fz)	Force(1200:800:0.0)
Moment	Moment(Mx:My:Mz)	Moment(0:500:250)
Threaded Joint		
Threaded Joint	TJOINT	TJOINT
User SIF		
User SIF	UserSIF(Value)	UserSIF(100)

Note:

1. Stiffness, Gap and Friction Coefficient are optional values. If not defined, then it will be transferred as 1E12 lb/in i.e. RIGID, 0.0 in, and 0.0 respectively to HotClash.
2. For SI units, the Stiffness and Gap should be specified in N/mm and mm respectively.
3. The Hanger Type, Number of hanger, Allowable Travel Limit (not applicable at this time), Load variation and Short range are optional value. If the above information are not defined, then the program will assume the following
    a. Hanger Type = Hanger Type is selected/Specified in the Plant Design to HotClash form.
    b. Number of Hanger = 1
    c. Allowable Travel Limit = 0.00 (not applicable at this time)
    d. Load Variation = 25 %
    e. Short range = 1 (Use short range)
4. For SI units, the Spring Rate, Cold Load and Hot Load should be specified in N/mm, Kg and Kg respectively.
5. For defining more than one support at each support location use ";" in between support definitions.

Hanger Types		
ABB-PBS	Fee & Mason	Nordon
Basic Engineers	Flexider (30-60-120)	NPS Industries
Berger-Paterson	Flexider (50-100-200)	Piping Services
Bergen-Paterson (L)	Fronek	Piping Tech & Products
BHEL Hyderabad	Grinell	Power Piping
BHEL Trichy	Hydra	Sanwa Tekki(30-60-120)
Borrello	Lisega	Sanwa Tekki(85-170)
Carpenter & Paterson	Mitsubishi (30-60-120)	Sarathi
Comet	Mitsubishi (80-160)	Spring Supports
Corner & Lada	Myricks	SSG
Dynax	NHK (30-60-120)	
Elcen	NHK (80-160)	

Appendix F

Errors and Descriptions

This Appendix presents the list of errors, their descriptions and the necessary actions to be taken.

1. **"Invalid Entry. Starting Node number should be a Numeric value."**

   Starting Node number specified is not a numeric value. Please enter only numeric value.

2. **"Invalid Entry. Node Increment should be a Numeric value."**

   Node Increment specified is not a numeric value. Please enter only numeric value.

3. **"Invalid Entry. Staring Node number should be < 10000."**

   Node number cannot be more than or equal to 10000. Please reenter the starting Number below 10000.

4. **"Invalid Entry. Node Increment should be < 10000."**

   Node Increment value is too high. Node number cannot be more than or equal to 10000. Please reduce the Node Increment value.

5. **"Cannot determine product. Contact Program vendor for details"**

   Some of the files required for the translator either moved or deleted. Please reinstall the product or contact program vendor for details.

6. **"Cannot initialize application. Contact Program vendor for details."**

   Contact program vendor immediately.

7. **"Invalid Data Type. Expected = 'Real' Available = 'String'"**

   a. When reading the Plant Design neutral file, one of the field values in a line is expected to be Real number format. But the field is filled with string format. Translator unable to read that field, so it will show an error message with a line number and Entire line Data and the above message. User needs to check that particular field and modify to Real number format and need to transfer the file.

   b. For example, Outer Diameter of a pipe is expected in Real Number format like “4”, But in neutral file it may be like “4inch”. In this case translator will give the above error message. User needs to remove “inch” from that field and save that neutral file then need to transfer.

8. **"Improper Bore or Weight Units. Check the Neutral File."**

   Bore and Weight units entered in neutral file are invalid. Translator will expect Bore Unit as either “IN” or “MM” and Weight unit as either “KG” or “LB”. If any value other than the above is specified, the translator will show error message containing the line number, Entire line and the above message. User needs to check unit used then needs to transfer.

9. **"Wrong Neutral File. No Piping Elements available to Read..."**

   Translator expects at least any one piping component present in the Neutral file. If not, it will show the above error message. User needs to check the Plant Design Neutral file.

10. **"Number of Fields available in the above Line < The Required Fields.”**

    Translator expects some of the fields in a line from the Plant Design Neutral file. If not available, it will show the above said message with Line number and that particular line. User needs to check and correct that line and then need to transfer or contact program vendor for more details.

11. **"Error in Mapping Data Base. Check the Data Bases."**

    Improper changes were mode to the Mapping Database. Check the entries made carefully.

12. **"Node number <Numner> is defined twice in the Neutral file. Check the neutral file and proceed."**

    The node number specified above is defined two times i.e., for the same node number X, Y and Z coordinate values specified in two places in the Plant Design Neutral file. User needs to check the neutral file.

13. **"The Node number exceeded 10000. Check the 'Start Node' and 'Node Increment'."**

    During rearrange of node number, the new node is crossing 10000, which is not correct. Please reduce the "Start Node number" and "Node number Increment" values and try again.