OCTAVE

FREQUENTLY ASKED QUESTIONS

Aspect Nuclear Pipe Stress

Contents

3	General Information
5	Installation
6	Licensing
6	Purchasing
7	Training
7	Maintenance and support
8	Q.A./Certification
8	Key functionality
12	Geometric modeling
17	Deliverables
17	Software upgrades
17	Online resources

General Information

What is Aspect Nuclear Pipe Stress (PepS)?

PepS is the commercial package integrating Aspect Nuclear Pipe Stress (formerly PIPESTRESS) and Editpipe.

- Editpipe is the graphical user interface that works with Aspect Nuclear Pipe Stress.
- Aspect Nuclear Pipe Stress is the core piping analysis software.

Aspect Nuclear Pipe Stress performs analysis of piping systems subjected to normal and complex loads such as weight, pressure, thermal, seismic (including response spectra), time history and other static and dynamic conditions following more than 10 international piping code standards (including nuclear safety level class 1 & 2 piping codes). It has been continuously maintained in accordance with nuclear QA procedures for more than 50 years.

Who uses Aspect Nuclear Pipe Stress?

Aspect Nuclear Pipe Stress is used by more than two hundred engineering organizations in 30 countries to analyze piping in more than 50 nuclear power plants. It is also used for piping calculations in nuclear submarines in the USA, China, France and the United Kingdom.

Why is Aspect Nuclear Pipe Stress used?

Although it can perform non-nuclear piping analysis according to codes such as ASME B31.1, B31.3, CODETI and EN 13480, Aspect Nuclear Pipe Stress is widely used in nuclear piping analysis due to the maintenance of Nuclear QA procedures and its distinctive capacity in handling dynamic analysis of Nuclear safety class 1 & 2 piping according to the international nuclear safety class 1 & 2 piping codes.

What are the major features of the software?

- Static analysis
- Dynamic analysis
- Non-linear restraints with gaps and friction
- Thermal stratification loading
- Buried piping
- Mixed model pipes/beams (e.g., to model supports together with piping)
- Time history analyses with gaps in restraints
- Nuclear safety class 1 piping calculations and detailed fatigue analysis
- Heat transfer and thermal gradient stresses
- Strain energy weighted composite modal damping for time history and response analysis

Installation

What are the hardware and software requirements?

Computer	PC (laptop or desktop)
Memory	RAM memory of at least 512MB is recommended
Operating system	Windows 10 (32-bit or 64-bit)
Hard disk	1GB or greater
Graphics card	A graphics card optimized for OpenGL is recommended

Does PepS (Aspect Nuclear Pipe Stress +Editpipe) require a specific version of the Windows operating system?

Refer to the link Compatibility Matrix

Select product Aspect Nuclear Pipe Stress and select the version from the dropdown to view its requirements.

In what languages is Aspect Nuclear Pipe Stress available?

Aspect Nuclear Pipe Stress is available only in the English language.

Does Aspect Nuclear Pipe Stress work on Linux or Mac OS?

Aspect Nuclear Pipe Stress only works on Windows.

Does Aspect Nuclear Pipe Stress work on 32 and 64-bit platforms?

Yes, it is supported on both 32-bit and 64-bit platforms.

Is it possible to install Aspect Nuclear Pipe Stress silently?

No.

Can Aspect Nuclear Pipe Stress be installed on several computers?

Aspect Nuclear Pipe Stress can be installed on as many computers/workstations as required. Concurrent access and use of the software is controlled by licensing.

If only a single license of an Aspect Nuclear Pipe Stress product is purchased, can this be used on more than one computer?

Yes, but only one license can be used at any one time.

Are Aspect Nuclear Pipe Stress licenses named users?

No, licenses can be used by any user, maximizing license use.

Can new and old versions of Aspect Nuclear Pipe Stress be run in parallel on the same computer?

Yes.

Is Aspect Nuclear Pipe Stress backward compatible?

Yes, as the files are free (.fre) format, they can be opened in any version and can be edited with Notepad.

Can Aspect Nuclear Pipe Stress be installed on a virtualized system?

Yes, providing the system offers the required resources and meets the minimum software and hardware requirements that Aspect Nuclear Pipe Stress needs to work efficiently.

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Licensing

How is Aspect Nuclear Pipe Stress licensed?

All Octave products, Aspect Nuclear Pipe Stress included, are licensed by Octave's cloud-based licensing solution – Octave Licensing.

Octave Licensing Client and a Configuration Connection Information (.CCI) file are installed on each workstation that needs to access licenses in the cloud. The Configuration Connection Information (.CCI) file provides a handshake between the software product, Octave Licensing Client, and the cloud licensing server, enabling software users to request and return licenses when they start or exit the software product(s) they are using.

The initial .CCI file issued to a new customer is usually named 'Site ID.CCI', e.g., 00123456.CCI. This file is generated for a site-based Keystore, i.e., a Keystore containing all licenses of all products purchased. If product licenses need to be deployed differently, for example, some of the total licenses for various products held by the customer need to be allocated for use on a specific project, then a project-based configuration must be created in the Licensing Portal. Doing so results in additional keystores being created, and so two or more CCI files being used to access licenses in the cloud.

Consult online help for further information about Octave Licensing:

Search Results • Documentation (hexagonali.com)

What license options exist for Aspect Nuclear Pipe Stress?

Perpetual or lease.

Is an Internet connection required to use Aspect Nuclear Pipe Stress?

No Internet is needed.

Purchasing

What purchase options are available?

Perpetual licenses with or without maintenance, or lease licenses (minimum 3-month term) including maintenance, can be purchased.

How is the software purchased?

Aspect Nuclear Pipe Stress may be purchased through our reseller network and direct from Octave. To find your local Octave sales office or reseller, visit www.octave.com/about/office-locations.

Alternatively, contact us at:

5775 North Sam Houston Parkway W. Suite 500

Houston, Texas, 77086, United States

T: +1 281 671 1528

F: +1 281 671 1556

Contact Us

What is Octave Global Network Dealers?

Global Network Dealers are the local face of Octave. They provide product sales and support in your local time zone and language. They have certified instructors and consultation specialists to help clients define and meet their requirements at all levels. Worldwide dealers work together to ensure that Octave multinational clients have access to the right products, training, and consultation, anywhere around the globe.

What is a Octave Authorized Reseller?

Authorized Resellers are the local Octave software experts who provide local sales and support to clients in their respective regions.

To find your local reseller, visit www.octave.com/about/office-locations

Is a free evaluation available?

Yes, please contact your local reseller or Octave.

Can a live presentation be given by the local reseller or by Octave?

Yes, Octave and its resellers have personnel who provide live product presentations that answer simple to complex technical questions and who understand project workflow-specific questions. For more information, please contact your local reseller or Octave.

Can an online web demo be provided?

Yes, online web demonstrations can be arranged. Contact your local reseller or Octave for more information.

Training

Is training available?

Yes, instructor-led training can be purchased, provided either on site or delivered at an Octave training center, or online over the web. Contact your local reseller or Octave to request a quote.

What is the best way to learn how to use and get started with Aspect Nuclear Pipe Stress?

The best way to learn how to use and get started with Aspect Nuclear Pipe Stress is to receive instructor-led training.

Are example models provided with Aspect Nuclear Pipe Stress?

Yes. Two example files are provided with Aspect Nuclear Pipe Stress. These are in the folder named 'Demos.' We also provide the full QA set of validation files (between 200 and 300 models).

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Maintenance and Support

What does software maintenance provide?

Annual software maintenance covers the provision of technical support and software upgrades.

Does maintenance include training?

No, training is not part of maintenance.

How do users request technical support?

Maintenance customers receive technical support via Hexagon's support system - Octave Community.

How do users get access to Octave Community?

Users can request access here.

What documentation is provided with Aspect Nuclear Pipe Stress?

A user manual and help are provided with Aspect Nuclear Pipe Stress. You can access them via the Help button in Aspect Nuclear Pipe Stress UI.

Can users request enhancements be made to Aspect Nuclear Pipe Stress?

Octave interacts with and listens to customers, then responds by developing innovative solutions and enhancing current products to address customers' needs in ways that improve their work processes. This customer-centric focus helps us to grow our product line to serve an ever-broader base of users and applications, which in turn further increases opportunities for our clients to enjoy the benefits of interdisciplinary collaboration with other departments and organizations.

New feature/function/capabilities are submitted via Aha! Ideas, which is accessible to maintenance customers inside Octave Community.

How are the enhancement requests prioritized?

Enhancement requests are evaluated and prioritized based on a given industry and market. Octave prioritizes requests based on the benefit delivered to the highest number of our users.

Q.A./Certification

Is the software certified and how?

See PQAP in the C:\Program Files (x86)\PepS 8.0\ Manuals directory.

Is a Q.A. certificate provided with the software?

Yes. This is found in the C:\Program Files (x86)\PepS 8.0\Manuals directory.

Key Functionality

Analysis

What does the error message "ANALYSIS CONTROL CARD MISSING OR OUT OF ORDER" refer to?

As explained in the Aspect Nuclear Pipe Stress user manual, the analysis cards must respect a strict order during the modeling. One common mistake is to incorrectly define the combinations `(CCAS or CSTR)` that always should be defined after all the elementary cases (that includes static load cases `(LCAS)` or response spectrum analysis `(RCAS))`.

What is the difference between cold modulus and hot modulus?

When you define cold modulus, the stiffness matrix of any element is always calculated from the modulus of elasticity at room temperature, for any case, including the modal extraction `(FREQ` card). It means that all the calculations are based on one single stiffness matrix for the full analysis.

When you define hot modulus, the stiffness matrix is adjusted to the temperature of the current case. Especially, you need to use the `RF` field in the `FREQ` card in order to give Aspect Nuclear Pipe Stress the temperature to consider during the modal extraction. For certain codes (class 1, EN13480, etc.), the use of hot modulus is mandatory.

How does Aspect Nuclear Pipe Stress define room temperature?

Room temperature, as considered for the cold modulus of elasticity (Ec), is hardcoded at 70°F (21.11°C) or 20°C, according to the piping codes. You have the possibility to override Ec using the field `EC` in the `MATL` card. You can control the value of Ec used by Aspect Nuclear Pipe Stress by reading the report P-2 in the *.pri file, `MATERIAL` card. The `TA` field of the `MATH` card is only used for calculations of the thermal expansion.

What is the difference between base case and dependent case?

A base case `(LCAS/NCAS)` is a case without `RF` field. A dependent case `(LCAS/NCAS)` is a case with `RF` field.

The operating conditions of a base case need to refer to the CA field on the load case:

- `LCAS CA=1 => OPER CA=1 TE=XXX PR=XXX`

While the operating conditions of a dependent case need to refer to the RF field:

- `LCAS CA=1 RF=2 => OPER CA=2 TE=XXX PR=XXX`

The case `LCAS (NCAS) CA=2` can exist or not.

The operating conditions (temperature, pressure) are used to calculate the following properties: modulus of elasticity, allowable stress, thermal expansion coefficient and flexibility factor.

The source of these operating conditions depends on the situation: hot modulus or cold modulus, and base case or dependent case.

The interest of using the dependent case exists when the hot modulus option is defined to remove the effects of the thermal expansion, as explained in table 2.1 of the Aspect Nuclear Pipe Stress user's help (2-50). In this case, the operating conditions to which we refer are only used to calculate the modulus of elasticity, the allowable stress and optionally the flexibility factors. In the following sample, the dead weight solution is obtained from Eh (350°C), without considering the thermal expansion.

```
TITL MD=1
etc.
LCAS CA=1 TY=3 RF=2 TI=/Dead Weight/
OPER CA=2 TE=350 PR=5
```

Note: the difference with the following base case modeling:

```
TITL MD=1
etc.
LCAS CA=1 TY=3 TI=/Dead Weight + Thermal expansion/
OPER CA=1 TE=350 PR=5
```

Note: We recommend not using the dependent cases when the cold modulus option is selected.

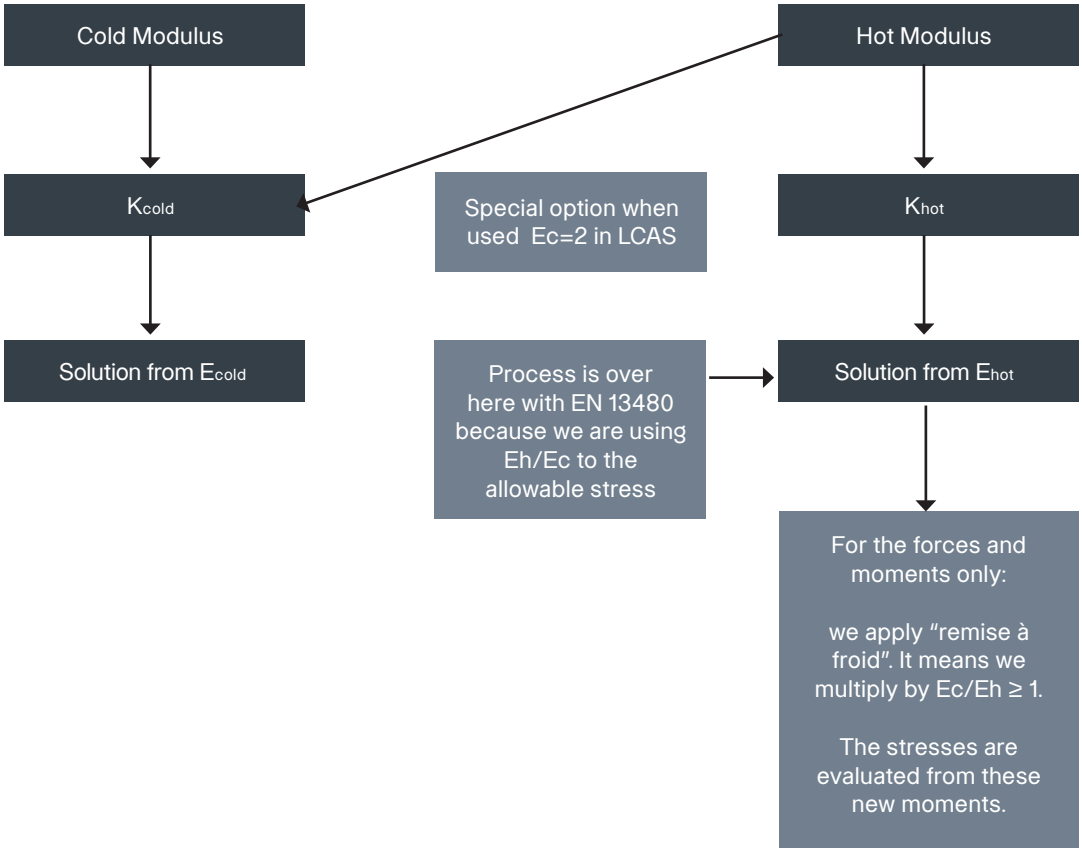
Impact of the field TY defined in the load cases

The `TY` field in the `LCAS` card allows the users to:

1. Add the dead weight effects with using weight `TY` (3, 4, 8, 9).
2. Apply a default equation.
3. Define the behavior of the restraints (see table 3.4 pdf 3-121).
4. The increasing of secondary forces & moments for some codes (see Ec/Eh to consider the secondary solution obtained from the cold modulus – conservative assumption required by the codes for the thermal expansion).

What is “remise à froid” (cold modulus multiplier)?

It is explained by this chart.



What is the difference between true combination and additive stress combination?

For most of the piping codes, the CCAS cards are designed to combine the mechanical solutions (displacements, rotations, accelerations only for dynamic cases, forces, moments, reactions) and the CSTR cards are designed to check the additive stress equations. For those piping codes, the following notations are used:

1. MA= moment due to permanent loads (DW) (usually directly obtained with static case LCAS/NCAS TY=3).MB= moment due to occasional loads (seismic, wind, snow, blast, water hammer, shock, wave, etc.). MB can, for example, be obtained from a combination of CCAS between primary part of earthquake and secondary part of earthquake (called SAM (Seismic Anchor Movements)).
2. MC= range of thermal moments.
3. MC is obtained from a combination CCAS defined with a range method (usually ME=S) calling all the thermal load cases to calculate the maximal variation between two cases, for any point of any element.
4. The notations are the same in Aspect Nuclear Pipe Stress, see CSTR card.

It means that to check the stress equations, we need to have these three moments: MA, MB and MC.

When we have these moments, the code stress equations can be verified by using a CSTR card calling MA & MB(DW + Occ), or MA & MC(DW+Th).

To clearly understand the difference between the combined moment stress equation and additive stress equation as required by the non class 1 codes:

Imagine a simple case where we have one single thermal load case (in this case we don't need to calculate the thermal range).

Now we want to check the stress equation DW+Thermal:

```
DW = the moments are -500/-400/-300
Th = the moments are +500/+400/+300
```

Based on additive stress equations: MA = MC = SQRT (500,400,300) = 707

Now, imagine that the code requires you to use the combined moments, so that we can note M(A+C).

In this case M(A+C)=SQRT (0,0,0) = 0, so we obtain stresses differently.

Why does the method ME have no impact on the stresses in a CSTR card?

The method ME defined in a CSTR cad is used only to combine the mechanical solutions of the constituent cases, but the stress post-processing of a CSTR is not based on this combined mechanical solution. Indeed, it does combine the resultant moments (M_A,M_B,M_C) of the constituent cases to check the stress equation according to the requirements of the piping codes.

Note: By default, Aspect Nuclear Pipe Stress prints the full combined mechanical solution. What's printed can be controlled using the OP field of the CSTR card.

What are the nonlinearities considered by Aspect Nuclear Pipe Stress?

Aspect Nuclear Pipe Stress deals with elastic calculations.

Aspect Nuclear Pipe Stress can deal with two kinds of nonlinearities: nonlinear supports (NRST,GAPR) (gaps, friction) and nonlinear springs (NTSP, NRSP).

How can I construct the analysis when the model is nonlinear?

The decomposition of loading into sustained loads, expansion loads and occasional loads by the piping codes was done at a time where the only reasonable way to analyze pipe stress was by solving linear problems. In this context, it makes sense to combine cases by linear superposition, and piping codes are precise on how to perform analysis and on how to determine which loadings cause which stresses.

However, when non-linear analysis became a possible option, piping codes became suddenly subject to interpretation. Indeed, the superposition of the solution of two loadings might not be the solution of the superposition of the loadings and it is almost never the case when friction is involved. Piping codes do not provide strict rules on how to handle this situation. It is eventually the user's responsibility to define the base cases and combinations such that the intent of the codes is met.

For example, a reasonable method of calculating the range of thermal expansion moments MC may be to include dead weight in all thermal expansion cases and to set up a range combination between all these cases and the dead weight case alone:

```
NCAS CA=100 TY=3 EQ=2 TI=/Dead Weight
alone - Moment MA/

NCAS CA=101 TY=3 EQ=1 TI=/Dead Weight +
Thermal 1/

NCAS CA=102 TY=3 EQ=1 TI=/Dead Weight +
Thermal 2/
.....

CCAS CA=200 ME=9 C1=100 C2=101 C3=102
EQ=7 TI=/Therma range - Moment MC/

CSTR CA=201 MA=100 MC=200 EQ=8 TI=/Dead
Weight + Thermal range/
```

How can I consider the reduction of coefficient to the primary part of the earthquake (RCC-M)?

See RCC-M B3652 (class 1) and RCC-M C3654 (class 2).

This reduction factor must be applied only to the primary part.

If you combine a `CCAS` primary part and a secondary part, the reduction factor needs to be applied using the `CCAS` factor field of the primary part.

If you directly call the primary part in a `CSTR` card, you should use the `FB` factor.

What values to set for the automatic mass points (MP field in FREQ card)?

In any case, the value defined in the `MP` field needs to be greater than the value defined in the `FR` field of the `FREQ` card to ensure that the modal extraction is sufficiently precise.

What is the difference between the true time history method and the Generalized Response Analysis (GRA) method?

The Generalized Response Analysis was previously used to reduce the time of the calculations—by selecting some zones of the modeling to run the true time history analysis and using an equivalent of response spectrum analysis for the rest of the modeling.

In its place, the full true time history method should now be applied using the lines of options 1-9999.

Why are the displacements not zero at restrained degrees of freedom?

Aspect Nuclear Pipe Stress uses the penalty method: the stiffnesses of the restraints have high values (non-infinite).

How can I have the displacements in local coordinates?

Since version 4.1.0, the `DLCS` card is available to calculate the displacement, rotations and accelerations (optional) in any user-defined coordinates system.

How can I design a spring hanger with Aspect Nuclear Pipe Stress?

The spring hanger modelled with `VSUP` can be pinned by using the design analysis weight `LCAS/NCAS TY=9` to calculate the pre-compression force.

Based on this pre-compression force and the maximal displacement at this point, the user can select in the catalog of the fabricator the adequate spring hanger.

Once done, the stiffness `SP` and pre-compression force `FO` can be introduced in the `VSUP` card, and the analysis `TY=9` replaced by `TY=3`.

Which ratio of the mass is considered for the response spectrum analysis (missing mass)?

By default, Aspect Nuclear Pipe Stress considers the rigid modes using a method called Left-Out-Force (static correction). It means that 100% of the mass is considered in each direction; it is not necessary to extract a minimal percentage of the mass. Only the flexible modes (modes with dynamic magnification) need to be extracted.

Which mass matrix model is Aspect Nuclear Pipe Stress using?

Aspect Nuclear Pipe Stress only implements the lump mass matrix, with or without rotational inertia (see `BL` field in `TITL` card).

Note: The consistent mass matrix is not implemented in Aspect Nuclear Pipe Stress.

Loads

Applied displacements (projection)

The movements applied to the supports with the RMVT card need to directly be defined after the RSTN card. Indeed, PS projects these displacements along the restrained direction previously defined.

In the case of skew piping, all the directions of displacements with nonzero projections along the restrained direction need to be defined:

- RSTN PT=10 DX=1 DY=1 *skew direction 45° in plane (XY)
- RMVT PT=10 CA=61 GX=10 *SAMX
- RMVT PT=10 CA=62 GY=20 *SAMY

Bourdon effect (elongation due to the pressure)

The Bourdon effect is considered with using IP=1 in the TITL piping and composite piping. card. This option is mandatory for class 1 analysis, HDPE piping and composite piping.

The Bourdon effect is only considered by Aspect Nuclear Pipe Stress for thermal expansion cases (LCAS/NCAS TY=0) and test cases (LCAS/NCAS TY=4) for straight elements.

Why are the accelerations defined in the spectrums are limited? How to force Aspect Nuclear Pipe Stress?

By default, Aspect Nuclear Pipe Stress strictly controls the input data, and stops the calculations when “exotic” inputs are introduced.

In the case of very high accelerations, the user can force Aspect Nuclear Pipe Stress to using the RA range option in the SPEC card.

What is the stratification?

The stratification occurs when the temperature is not the same in the piping, for example because of a partially filled pipe.

Aspect Nuclear Pipe Stress can consider additional bending effects when using the stratification cards (STRF,STRG,STRX) where we can define the kind of variation of temperature.

Note: Aspect Nuclear Pipe Stress only considers these bending global effects. The local effects of the stratification, to consider during the class 1 fatigue analysis, are non-implemented.

Geometrical modeling

Angle of reducer

The angle is used for the calculations of the stress intensification factor.

The default angle is considered as 60° and gives a maximal value SIF=2 (conservative assumption).

The stresses of the reducer can be optimized just by introducing the correct angle.

Local coordinates of spring element

The six stiffnesses of the spring element SPRS (AX, AY, AZ, BX, BY, BZ) are defined in the local coordinates system of the spring. As for all elements, DX,DY and DZ are the global coordinates of the local Z axis (Z′). Consequently, AZ is the axial stiffness and BZ is the torsional stiffness.

In most cases, the spring element are used to model guide internal link, especially between two pipe elements in the case of jacketed pipe. The easiest way is to give the spring the same direction as the axis of the piping. If doing it this way, the high stiffnesses to define are AX and AY.

Note: when the element is axially symmetrical (it means AX=AY and BX=BY), it is not necessary to define the local axis X (X′), using the fields XX, XY and XZ.

- JUNC PT=XXX
- SPRS PT=YYY D.=0.001 AX=1.E6 AY=1.E6

Why must the spring be defined as very short?

The spring is not a physical element because the coupling terms are not considered: we are considering only diagonal values (AX,AY,AZ,BX,BY,BZ).

For example, if a force is applied at the end of the spring, then we only obtain a displacement in the same direction as the force without any rotation (means zero moment).

How can I consider the flange effects on the elbow?

The flange effects are user-defined with using the field FL in the BRAD,BEND,MITB,MITC,MITW,MITJ cards:

- FL=1 if one single flange is connected directly or almost directly to the elbow.
- FL=2 if flanges are connected to both end points.

Indeed, Aspect Nuclear Pipe Stress cannot automatically detect the flange because the FLNG card designed to model flange was implemented in Aspect Nuclear Pipe Stress only 10 years ago.

Most codes do not provide an exact distance criteria between the flange and the elbow for which the extra stiffness should be considered. Usually, the terminology "in the neighborhood" is used, and it must be estimated by the engineer.

How can I consider the thrust effects of an axial bellow?

Aspect Nuclear Pipe Stress automatically generates the thrust effects in the case of an axial bellow (BELW TY=1) when the AP field of the BELW card is defined to calculate these forces. The forces are printed in the *.pre file.

What is the impact of the corrosion to the calculations?

We can define internal or external corrosions using the fields CI or CO in the CROS card.

The corrosion is to consider during the calculations of the section modulus Z (used to calculate the moment stress).

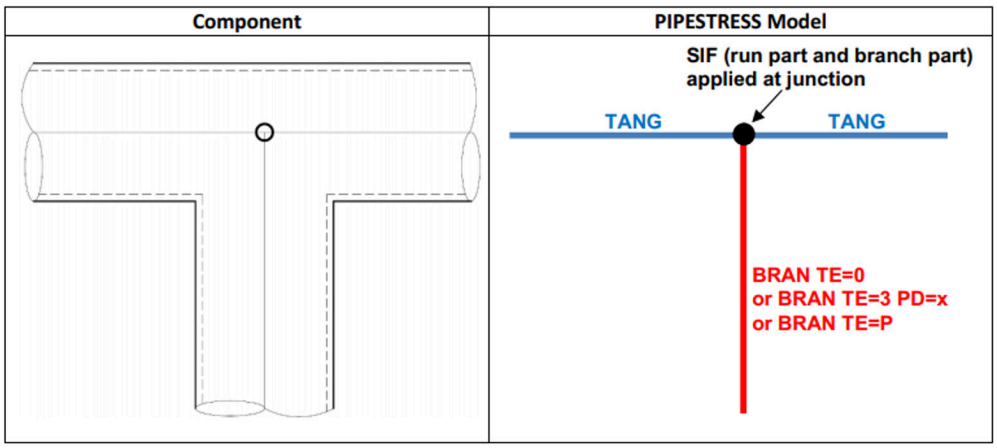
Usually, we don't want to consider the corrosion for the calculations of the stress intensification factors, but the user can control this assumption by using the field CO in the TITL card.

If the corrosion is enabled, the stress reports are duplicated, once with corrosion and the other without.

Note: EN13480 2020 gives specific rules (implemented in Aspect Nuclear Pipe Stress) about the consideration of the corrosion: the corrosion must be applied only to calculate the primary stresses (MA,MB).

How Aspect Nuclear Pipe Stress considers the branches?

The BRAN card is used to define any kind of branch. The type of the branch is defined with the TE field:



What are the effects of the IN (Insulation) field on the CROS card?

The insulation IN is used only when snow or wind loads apply to the model.

What is the difference between the cards INDB and INDI?

INDB is to use when the users want to apply a user-defined stress intensification factor to consider in an element.

INDI is to use when the users want to apply a user-defined stress intensification factor to consider in an specific point.

What is the effect of the field TY in the MATH card?

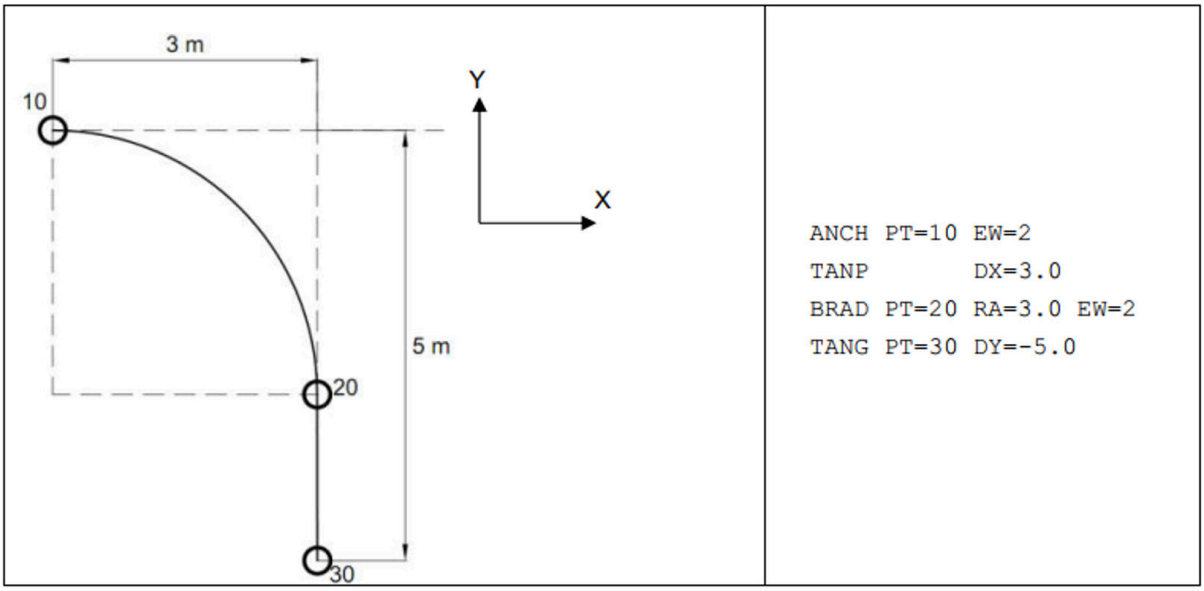
This field is used for class 1 analysis to consider the correct fatigue curves: indeed, we have two fatigues curves: one for carbon steel and one for austenitic.

What value is set to the EX field in the MATD cards? (Where EX=2 is introduced in MATH)

Some piping codes, for example RCC-M (see volume Z), give the value of the thermal expansion coefficient. Two values are provided: one called "instantaneous", and one called "mean". The value to introduce in Aspect Nuclear Pipe Stress is the mean value.

What is the difference between the cards TANG and TANP?

In the case of an elbow with the BRAD card, TANP can be used instead of TANG to avoid creating additional points.



How can I easily define intermediate points in a bend?

Aspect Nuclear Pipe Stress implements a feature called multiple-BRAD to create any intermediate point in an elbow, using angle. You can find an example in the user manual (3-34).

What is the utility of the COOR card?

The `COOR` card can be useful to control the consistency of the geometry, or to precise the locations of multiple sub-parts of modeling.

How is the reducer element calculated?

As presented in ASME III NB-3686.6-1, Aspect Nuclear Pipe Stress generates two prismatic straight elements from the reducer: the first one with the initial cross section, and the second one with the final cross section.

How can I model the socket weld fittings?

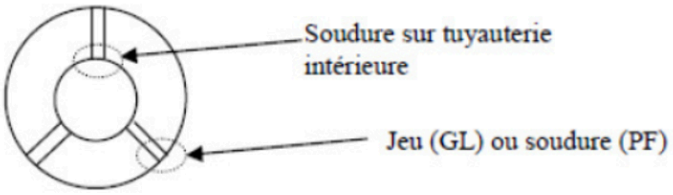
The piping codes do not cover the socket fittings; stresses are not checked for socket fittings.

Aspect Nuclear Pipe Stress implements the SOCK card to model the socket fitting, usually to use with `EW=3` to apply the correct socket welds connections. The stresses in the `SOCK` cards are disabled in Aspect Nuclear Pipe Stress.

When the `BRAD` card is used to model elbow, Aspect Nuclear Pipe Stress automatically calculates `FIF` and `SIF` according to the piping codes. But these values are applicable for smooth bends (B16.9) and not socket bends (B16.11). It is possible to override the flexibility factor with using `FF=1` and disable stress check with `STOF/BRAD/STON`.

How can I model the jacketed pipe?

See spring card.




```
*modélisation tuyauterie intérieure
CROS CD=25
COOR PT=10 AX=0. AY=0. AZ=0.
JUNC PT=10
TANG PT=20 DX=1    *taquet GL01
TANG PT=30 DX=1.5 *taquet GL02
TANG PT=40 DX=1 EW=2
BRAD PT=50 RA=0.038 EW=2
TANG PT=60 DZ=-1. *taquet GL03

*modélisation tuyauterie extérieure
CROS CD=50
COOR PT=A10 AX=0. AY=0. AZ=0.
ANCH PT=A10
TANG PT=A20 DX=1    *taquet GL01
TANG PT=A25 DX=0.5 *support
MULR PT=A25 DY=1 DZ=1 AL=/SupportGL01/
TANG PT=A30 DX=1    *taquet GL02
TANG PT=A40 DX=1 EW=2
BRAD PT=A50 RA=0.076 EW=2
TANG PT=A60 DZ=-1.   *taquet GL03
```

```
*premier taquet GL (X global libre)
JUNC PT=20
SPRS PT=A20 DX=0.001 AX=1.E6 AY=1.E6

*deuxième taquet GL (X global libre)
JUNC PT=30
SPRS PT=A30 DX=0.001 AX=1.E6 AY=1.E6

*troisième taquet GL (Z global libre)
JUNC PT=60
SPRS PT=A60 DZ=0.001 AX=1.E6 AY=1.E6
```

Reports

What do the generated reports contain?

The important letter of the extension file is the last letter.

- Prc => c for combination
- Pri => i for input
- Prl = > l for load cases
- Prf = > f for fatigue (class 1)
- Prd => d for dynamic (modal extraction)
- Prr => r for response spectrum analysis

Where can I find the stress intensification factors?

Pri (i also for "i") => report P-5.

Where can I find the flexibility factors?

Add PF=1 in `TITL` card to print the flex factors at the start of the *.prl.

Where can I find the extracted mass during the modal extraction?

See *.prd file D-5.

Aspect Nuclear Pipe Stress gives the extracted mass for each mode and each direction.

The notion of extracted mass does not make sense per level.

Where can I find the local coordinates of the elements?

Aspect Nuclear Pipe Stress 4.1.0 implements a new report where we can read the local coordinates of all the elements, in the *.pri file report P-4b (in addition of existing P-4 for the local coordinates of anchors).

Flange & supports post-processing (**POSTR**)

Why is there an additional tool?

The combinations to use for the supports and the flange analysis are different from the combinations for the piping stresses.

For this reason, it was decided for better readability to use a new input file (pos file or txt file) to define the specific combinations for supports and flanges.

Why define the `RF` field in the `GROU` cards?

The `RF` field is mandatory for flange analysis because we need to know the operations conditions (temperature, pressure) to check the flanges.

Why do the calculations sometimes cause the program to crash?

If your `POSTR` data file calls a non-existent Aspect Nuclear Pipe Stress case, then `POSTR` crashes without providing any feedback.

General

What is the kludge?

The kludge filed `(KL=1)` can be used in various cards to disable checks by Aspect Nuclear Pipe Stress. For example, it can be used in the `OPER` card to manage negative pressure. If it's not used, Aspect Nuclear Pipe Stress will raise an error in case of negative pressure.

Does Aspect Nuclear Pipe Stress support some kind of scripting features or programming functionalities (IF, DO, basic operations for example DX=1+2)?

No.

Deliverables

Are reports customizable?

Text reports generated by the solver allow for some customization to be performed e.g. field `GL` of the `TITL` card to select local/global forces output.

There is also a «Stress Report Generator» tool available in the GUI to create customizable .rtf documents.

What formats can reports be exported to?

Reports can be exported to text format and can be printed later to PDF format.

Editpipe can also generate documents in .rtf format.

Is it possible to generate stress isometric drawings?

Yes. Using `PLOT` card, it is possible to generate stress isometrics. But it is possible only in older versions of Aspect Nuclear Pipe Stress (4.0.0 and prior).

Is a viewer available to review results?

Not currently.

Through Toggle Edit/view option, the user can see the model graphically. Here, a restart file generated after the analysis run has been completed can be loaded to view the results.

Software upgrades

How often is an updated version released?

An updated version of Aspect Nuclear Pipe Stress is typically released every two years.

Who has access to the latest upgrades?

All users with current maintenance contracts are entitled to receive the latest software upgrades.

How are users informed that an upgrade is available?

If 'Subscriptions' are configured inside Octave Community, maintenance customers are automatically notified whenever a major, minor, service pack or hotfix version is released.

How are upgrades supplied?

Octave operates a "pull" system for supply of software upgrades, that is, major/minor upgrades are not shipped automatically to maintenance customers when the software is released; customers need to request upgrades themselves, when they need them e.g., a release contains a fix/enhancement that the customer has been waiting for.

- US customers can open a service case against product=upgrade in Octave Community.
- International customers should contact their local order administrator or contact their local Octave sales office.

Online resources

How can I keep informed?

Sign up for specific solution updates via the Subscription Management Centre to stay up to date on the latest offerings, news, events, etc.

Other useful information?

Visit the Resource Center then filter resources using the 'Type' drop-down.

About Octave

Octave is a leader in enterprise software, turning data into decisive action and intelligence into your edge. Our software solves for and simplifies complexity, from the design and build to operations and protection of people, property and assets – for any scope, at any scale. For decades, we've partnered with customers to sharpen performance, elevate efficiency and amplify results. From factory floors to entire cities, our solutions are tuned to scale up what's possible from day one onward.