PRODUCT SHEET

Octave Aspect Nuclear Pipe Stress (formerly PIPESTRESS)

The reference for nuclear pipe stress analysis

Capabilities

- Linear and non-linear calculations
- Fully featured Nuclear Class 1 analysis
- Advanced floor spectrum analysis
- Time history analysis
- Buried piping
- Flange verification
- Strain energy weighted composite modal damping
- Automatic mass point generation
- Dynamic susceptibility

Advanced modeling

Aspect Nuclear Pipe Stress has the capability to model very large structures and complex loadings with up to 900 user-defined load and combination cases. It includes a complete set of piping elements and supports including straight pipes, elbows, miter bends, expansion joints, flanges, linear and non-linear restraints with gaps and friction, spring hangers, snubbers, etc. In addition, you can model beam elements with a non-prismatic cross-section.

Static analysis

By using Aspect Nuclear Pipe Stress you have access to an extensive set of static loads: operating and test weight, thermal expansion, snow and wind, settlement, cold springing, variable pseudo-static acceleration, applied support movements, variable fluid density, uniform and trapezoidal loads, horizontal and non-horizontal stratification effects.

Dynamic analysis

Aspect Nuclear Pipe Stress offers advanced dynamic capabilities for floor response analysis and time history analysis. Increase the precision of your calculations by enabling the rigid mode correction (“left-out-force” method), avoid unnecessary conservatism by calculating the displacements, rotations and accelerations in user-defined local coordinates, define the most complex loads with up to 3800 independent support levels, compensate uncertainties of the modal extraction by enabling the shift option, and use the strain energy weighted composite modal damping defined in ASME-1233.

Customize your methods with a large variety of options for complete floor response analysis:

- Intermodal combination method according to RG 1.92 up to revision 3: SRSS, absolute, 10% grouping, double sum, Rosenblueth, Der Kiureghian (CQC)
- In-phase and out-phase interlevel combination methods
- Gupta and Lindley-Yow methods for hybrid modes

Piping codes
ANSI/ASME B31.1 (1972 to 2020)
ANSI/ASME B31.3 (1999 to 2018)
CODETI (1982 to 2016)
RCC-M Classes 1 and 2 (2022)
RCC-MX (2008)
EDF Piping Code for Composite Materials, Indice D
EN 13480-3 Piping Code (2002 to 2024)
ASME HDPE Piping Code (2011 to 2017) includes Code Case N-7555 and Section III Appendix XXVI
ASME B31J (2017)
RCC-MRx (2022)

Use special tools to generate an amplified spectrum at the decoupling point between run piping and branch piping. Calculate water hammer, blast, valve discharge, seismic accelerograms or other time history analysis with modules based on the modal superposition method that can take into account gapped restraints. With Aspect Nuclear Pipe Stress, seismic analyses can utilize artificial accelerograms for seismic analyses from response spectrum data.

The THIST post-processor can be used to obtain more detailed results, including time history plots for selected degrees-of-freedom.

Class 1 piping analysis

Build your nuclear power plant with confidence. Aspect Nuclear Pipe Stress performs analysis of piping systems in accordance with nuclear standards and codes, including detailed stress analysis according to ASME III NB-3600, RCC-M and RCC-MRx codes.

- Precise stress evaluation at fittings
- Evaluation of thermal stresses due to fluid transients
- Fatigue usage factor calculation
- Elastic shakedown criteria
- Simplified elastic-plastic analysis
- Thermal ratchet criteria
- Evaluation of environmental effects
- Alternative penalty factor per Code Case N-779

Buried piping

Benefit from simplified workflows with automatic soil spring generation. Springs can be either elastic (as per ASME B31.1 Appendix VII) or elastic-plastic (as per ASCE code). An integrated soil calculator provides easier modeling workflows in accordance with ASME B31.1 App. VII.

Flange calculation

Flange modules automatically retrieve results of piping analysis and input them in flange verification, according to codes EN 13480, ASME III and RCC-M, and various methods (equivalent pressure, Taylor Forge, etc.).

Aspect Nuclear Pipe Stress Quality Assurance Program

The Aspect Pipe Stress Quality Assurance Program has a rigorous development methodology and well- proven QA procedures. Aspect Nuclear Pipe Stress has earned the trust of engineers for decades by providing accurate analysis results. This program conforms to 10CFR50 Appendix B and 10CFR21 Reporting.

Graphical user interface

Users can view and manipulate models with ease. Aspect Nuclear Pipe Stress offers a smart input file editor with syntax coloring, interactive piping view, and translucent view for jacketed pipes. It also proposes a quick pipe wizard to speed up the input of engineering data.

Rapidly check the model with data tables and tree view. Benefit from easy post-processing with animated vibration modes, deformed shapes, forces and moment diagrams, colored stress ratios and support reactions. Export the model views to various graphic formats and automatically generate stress reports based on customizable templates. Use the automatic validation tool to run the QA problems and verify that the results generated on the hardware are the same as the ones generated by the Octave QA team.

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.