CASE STUDY

IDOM harnessed Aspect Nuclear Pipe Stress for enhanced pipe stress analysis and structural validation for its nuclear projects

Key facts:

Company: IDOM

Website: www.idom.com

Industry: Power - Nuclear

Location: Bilbao, Spain

Octave products used: Aspect Nuclear Pipe Stress *(PIPESTRESS)*

IDOM is a leading multinational company providing professional services in consulting, engineering and architecture.

Identifying goals

As the world increasingly turns to sustainable energy solutions, nuclear power generation is poised to set new records in the future. This surge is largely driven by its reclassification as a green energy source. This has escalated investments from nuclear alliance countries, with France taking a prominent role in transitioning to a low-carbon global economy.

With a commitment to supporting its customers in developing reliable, sustainable and safe energy solutions with net-zero emissions, IDOM provides specialized services to the nuclear industry in over 30 countries. The company executes some of the world's largest and most complex projects in the nuclear industry, spanning from commissioning and maintenance to decommissioning. This reinforces IDOM's role in shaping the future energy landscape.

Overcoming challenges

As the company expanded its global presence, it encountered increasing challenges in accurately and compliantly calculating pipe dynamics for its projects. The necessity for advanced capabilities in stress calculations and structural validation became paramount.

To tackle these challenges, IDOM utilized Aspect Nuclear Pipe Stress for projects at the Tricastin, Chinon, Blayais, Cruas and Gravelines areas of France The objective was to reassess and potentially redesign pipe stress analysis across five nuclear sites to extend their operational life. This involved conducting a comprehensive assessment of the dynamics of various piping systems to ensure their structural integrity and compliance with safety standards.

With this objective in mind, IDOM was requested to comply, among others, to the specific stipulations of the RCC-M code (Règles de Conception et de Construction des Matériels Mécaniques des îlots nucléaires REP), a French regulatory framework for nuclear mechanical equipment mandatory in the sites.

Luis Briceño, a pipe stress engineer, underscored the complexity of the nuclear project: "After a long career in oil & gas, it was my first experience working on a nuclear plant. This required a significant adjustment, not only in the technical tools used but also in understanding the unique operational, safety and regulatory demands of nuclear facilities."

Key benefits:

- Modernized code builder ensures enhanced safety and thorough analysis for nuclear projects.
- Guaranteed industry compliance through adherence to diverse nuclear standards like KTA, DIN, ASME and RCC-M.
- Enhanced safety, extended longevity and improved performance of piping systems, facilitated by the creation of component line acceleration.

"Aspect Nuclear Pipe Stress allows us to gain a deeper understanding of the coding system and the piping codes, compelling engineers to truly comprehend the underlying principles of their work."

Luis Briceño
Pipe Stress Engineer, IDOM

Realizing results

The challenge lay not only in the time it took for the IDOM team to fully harness the capabilities and potential of Aspect Nuclear Pipe Stress, but also in meeting the stringent requirements and regulations imposed by the nuclear industry.

Aspect Nuclear Pipe Stress is a crucial software in the nuclear sector, adhering to international standards and complying with strict piping code regulations. Briceño notes, "Aspect Nuclear Pipe Stress is the reference in the nuclear field, as it complies with RCC-M, KTA, DIN and ASME rules."

Thanks to Aspect Nuclear Pipe Stress, the team had the flexibility to extract data as needed. Successful delivery of the nuclear site extensions required a rigorous methodology: "With the support of our client, a service contractor for the French nuclear fleet, we were able to enhance the dynamics and response data of the spectrum for various sites and conduct stress calculations for all internal piping lines."

The project was executed in two phases, aimed at enhancing the dynamics and response data of the spectrum for different sites and conducting stress calculations for all internal piping lines. The tasks were twofold:

- Designing pipe stress analyses to qualify the stresses within the pipe system and determine load requirements
- Validating the support structure

This last phase involved performing detailed stress calculations, determining loads and accurately measuring accelerations in line components—crucial for the project's success and essential for the rigorous analysis required in nuclear plant safety.

One of the advantages of Aspect Nuclear Pipe Stress, thanks to its modules, is the ability to obtain precise accelerations in line components. Briceño remarked, "Generating acceleration components in line with Aspect Nuclear Pipe Stress saved us time, as normally we would have to do it manually."

Moving forward

Continuous training and software adaptation are essential for the successful execution of Aspect Nuclear Pipe Stress. Briceño emphasizes, "Aspect Nuclear Pipe Stress is not like any other software; it has allowed us to gain a deeper understanding of the coding system and the piping code, compelling engineers to truly comprehend the underlying principles of their work." Since Aspect Nuclear Pipe Stress is built as open-source software, engineers can modify the code and parameters of their framework, offering more customization.

IDOM and Octave collaborated to supply training and support, aiding nuclear pipe stress team in enhancing their knowledge of structural analysis and response spectra piping analysis.

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.