



CASE STUDY

Transforming Sweden's energy landscape: how an engineering company leverages Octave Aspect Nuclear Pipe Stress for nuclear plant maintenance

Key facts:

Company: AFRY

Website:
afry.com/en

Industry: Power - Nuclear

Location: Sweden

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

Identifying goals

Focused on boosting energy production and achieving carbon neutrality in the power sector by 2045, Sweden is initiating a new expansion phase to address the rapidly growing demand for electricity to power its economy. This initiative comes as Europe witnesses a significant shift in its stance toward nuclear energy, now reclassified as a green energy source.

Sweden is a leader in the clean energy transition, relying on hydro, renewable sources and nuclear energy. Swedish lawmakers have set a target to build additional nuclear reactors - potentially up to 10 units by 2045 - marking a significant policy shift from their decision in 1980 to phase out nuclear power gradually.

SMRs (Small Modular Reactors), characterized by power outputs below 300 MWe, are modular and compact, making them suitable for sites where larger nuclear plants cannot be built. This technology is emerging as a promising next-generation solution in the nuclear energy sector. According to the OECD, SMRs could become commercially viable by the early 2030s, leading to more projects in Sweden.

AFRY, an international engineering, design and advisory company, is at the forefront



of this transformation. Driven by a commitment to digitalization and sustainability in the energy, infrastructure and industrial sectors worldwide, AFRY is assisting the nuclear industry in assuring the long term integrity of the sites.

Overcoming challenges

To tackle the challenges associated with maintaining nuclear plants, where the integrity and safety of pipe systems are paramount, AFRY utilizes Aspect Nuclear Pipe Stress. This comprehensive calculation system, tailored for nuclear piping codes, enables AFRY to address the intricate challenges of designing, maintaining and upgrading these complex systems.

Key benefits:

- Enhanced safety of nuclear piping systems through reliable and detailed analyses
- Easily performed precise calculations for complex scenarios using nuclear-specific codes
- Maintained compliance with safety standards effectively using dedicated solution
- Prolonged life of aging nuclear plant components through software-assisted checks



Nuclear plants house extensive pipe systems. These require regular analysis and adjustments to accommodate new loads and system changes. A common task is replacing components, such as valves, which requires thoroughly reevaluating the system's integrity using Aspect Nuclear Pipe Stress. AFRY's Business Unit Manager, Henrik Lysemark, emphasizes that "Rigorous safety analyses are essential to ensure compliance with current standards and Aspect Nuclear Pipe Stress ensures that analysis of piping system subjected to normal and complex loads are in order."

With Sweden's strategic shift to reintroduce nuclear energy in its energy landscape, there is an increased focus on extending the life expectancy of nuclear plants - potentially up to 60 years. Such extensions demand meticulous analysis to ensure that aging components remain functional and safe.

Realizing results

AFRY selects Aspect Nuclear Pipe Stress for several reasons:

- Its compatibility with ASME codes makes it an industry standard for such analyses.
- The software's advanced dynamic capabilities are crucial for floor response and time history analysis, allowing for precise calculations that account for several factors, such as displacements, rotations, accelerations and complex load scenarios.

"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

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.

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