CASE STUDY

Southern Nuclear uses Octave Aspect Structure on million digital turbine controls project

Owner operator saves $3 million on project to upgrade analog technology to all new digital controls

Key facts:

Company: Southern Nuclear Operating Company

Website: southerncompany.com

Industry: Nuclear Power

Country: United States

Octave products used: Aspect Structure *(GT STRUDL)*

Key benefits:

- Performed system evaluation in less than 23 days
- Uncovered past manual calculation errors
- Reduced the structural modifications required for cable tray supports
- Minimized the outage execution time

Headquartered in Birmingham, Alabama, Southern Nuclear Operating Company (Southern Nuclear) builds and operates nuclear power plants in Waynesboro and Baxley, Georgia, and in Dothan, Alabama. It is a leader among the nation's nuclear energy facility operators and an innovator in advanced nuclear technologies. For more than 40 years, Southern Nuclear has operated its three nuclear energy facilities at the highest levels of reliability, with a current average three-year fleet capacity factor of 93.2 percent, exceeding the US average of 91.2 percent for the years 2013–2015.

Identifying goals

Southern Nuclear is overseeing the licensing and construction of two new nuclear units at the Plant Vogtle site near Augusta, Georgia. The US$2 million Vogtle 3 and 4 units are among the first new nuclear plants built in America in more than 30 years.

The existing cable tray infrastructure in the turbine building was a typical early 1980s design. At that time, the use of structural analysis was limited and computations were performed by hand. The project required upgrading the plant's turbine-generator analog controls with a new Mark 6e (VI) digital turbine control (DTC) system.

The project involved significant new equipment, 65,000 feet of new cable, and 2,000 feet of new conduit. This type of modification could cost millions of dollars plus considerable plant resources and time.

Overcoming challenges

"As part of the DTC upgrade, our engineers decided to investigate the attachment of commodities to cable trays," explained Parimal Gandhi, lead engineer on the project.

When reviewing the original hand calculation, the team discovered a simple unit conversion error. When corrected, engineers determined that the torsion levels exceeded the allowable stresses. This called for a different type of structural analysis.

Using Aspect Structure, engineers created models for portions of the cable tray infrastructure system and linked individual supports using cable tray attributes, which enabled engineers to create structural systems for multiple tray supports.

The group evaluated stiffness of upstream and downstream supports with cable trays using NF17-Code commands for the torsion analysis, addressing the excessive torsion and preventing the expense of nuclear plant outages.

"With Aspect Structure, we saved $1 million in manpower expenses and overall $3 million in time and resources, performing the evaluation in less than 23 days."

Parimal Gandhi,
Lead Engineer,
Southern Nuclear



Realizing results

Without Aspect Structure, the team could not have implemented the project as quickly, which would have added significantly to costs. The new controls system is a significant improvement for the plant, with modern equipment that is easier to operate and is more reliable. The new equipment also provides more accurate controls which results in both long-term time and cost savings for the plant.

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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