



CASE STUDY

Rishabh Engineering analyzes complex refinery piping system with Octave design and engineering solutions

Key facts:

Company: Rishabh Engineering

Website:
www.rishabheng.com

Industry: Oil & Gas

Country: United States

Octave products used:
Aspect Pipe Stress
(CAESAR II), Forte
3DWorx (CADWorx Plant
Professional)

Headquartered in Vadodara, India, Rishabh Engineering provides engineering services to global engineering, procurement and construction (EPC) companies, engineering contractors, original equipment manufacturers (OEMs), fabricators and surveying companies in the oil and gas, chemical, petrochemical, power, water/waste water and utility industries.

Identifying goals

Rishabh provided pipe stress analyses for a refinery in Billings, Montana, U.S., that has eight heaters and piping of up to 18 inches in diameter operating at up to 1,029 degrees Fahrenheit with pressures up to 1,100 psig. The project required 32 load cases and adherence to strict international standards.

The client only had non-editable drawings showing a top view of the heaters and a cross section of the coils. Other project challenges included a tight schedule and limited resources.

Overcoming challenges

Rishabh selected Aspect Pipe Stress to perform the pipe stress analyses and Forte 3DWorx to create a model of the stress-critical heater coils.

"Aspect Pipe Stress has a comprehensive library of major international piping codes. It is easy to install and activate. Plus, the input



graphics module made it easy to develop models for analysis," explained the manager of business acquisition.

"The support service portal was extremely helpful in answering our questions, and we capitalized on the compatibility between Forte 3DWorx and Aspect Pipe Stress, importing the files into Aspect Pipe Stress for stress analyses without data loss," they added.

Key benefits:

- Imported Forte 3DWorx files into Aspect Pipe Stress for stress analysis without data loss thanks to bi-directional compatibility
- Took advantage of a comprehensive library of major international piping codes
- Designed supports to accommodate the movement of the horizontal radiant tubes with a 300 °F temperature difference
- Re-analyzed pipes in a compact and congested area
- Saved 200 work hours

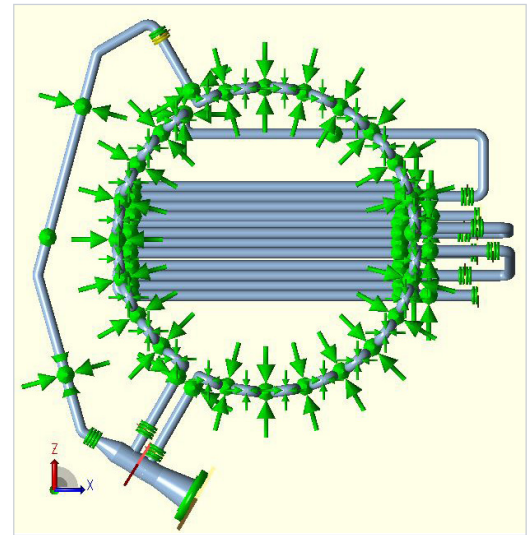
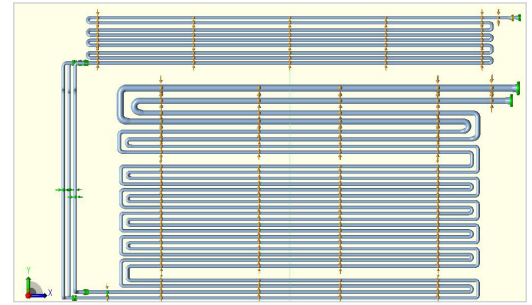
Realizing results

On the horizontal radiant tubes, there was a 300 degrees Fahrenheit difference between the hot and cold face, causing a bowing effect. Using Aspect Pipe Stress, the team designed supports to accommodate this movement. On the horizontal heaters, the client changed the tube metal, so Rishabh performed a new analysis to ensure a proper design.

The piping between the convection and radiant heater sections was in a compact and congested area but could not be rerouted. Rishabh re-analyzed the pipe, increasing the radius of the elbows to allow for the required flexibility.

The 50 piping supports in the system usually require a time-consuming check for lift-off supports, which can be quite tedious. Using the intuitive Alternative Sustained Stress (Alt-SUS) case tool in Aspect Pipe Stress significantly lessened this workload.

With Aspect Pipe Stress, Rishabh easily generated reports and comprehensive isometric drawings while improving accuracy and saving time. The team met the high expectations of a client with limited resources while saving 200 work hours (7% savings).



“Without Aspect Pipe Stress, the stress reports would be less comprehensive and deadlines missed. Plus, we would have needed separate tools for analyzing nozzles and generating isometric drawings.”

Manager of Business Acquisition, Rishabh Engineering

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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