CASE STUDY

# Larsen & Toubro reduces design cycle times with Octave Aspect Pipe Stress

## Key facts:

**Company:** Larsen & Toubro Limited

**Website:** www.larsentoubro.com

**Industry:** Chemical & Petrochemical

**Country:** India

**Octave products used:** Aspect Pipe Stress *(CAESAR II)*

A global company founded in 1938 and one of the largest private companies in India, Larsen & Toubro Limited's Heavy Engineering group (L&T HE) designs, manufactures and supplies precision custom-engineered critical static hi-tech equipment and systems for the processing industries including oil & gas refineries, petrochemical, fertilizer and coal gasification plants. This includes reactors, pressure vessels, high pressure and heat exchangers for such facilities plus waste heat boiler and steam drum packages with interconnected piping for facilities in more than 40 countries.

It operates fabrication facilities in Mumbai, Hazira and Ranoli in India and also in Oman, each with ISO 9001:2000 certification.

## Designing and fabricating complex ammonia and SNG projects for India and China

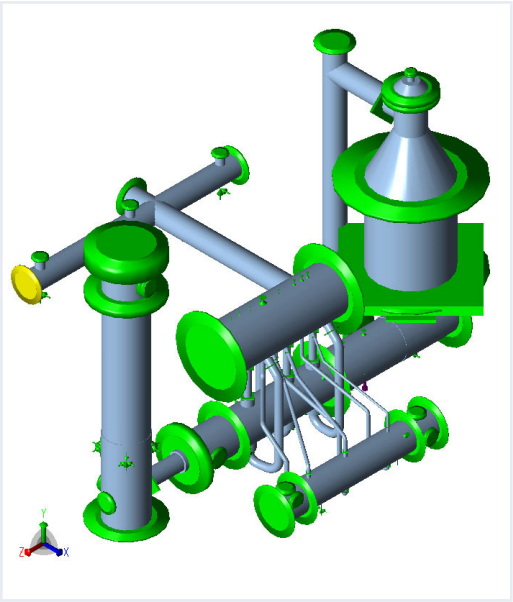
For ammonia plant feedstock changeover projects in Panipat and Bhatinda, India, L&T's task was to supply the waste heat boilers, steam super-heater, steam drum, riser and down-comer piping. For a 4 billion m3/year coal-to-synthetic-gas project in Inner Mongolia, China, L&T had to supply the methanator boilers, steam super-heater, steam drum, riser and down-comer piping. These projects required thermal and mechanical design, procurement, manufacturing, inspection and testing, and installation of all equipment plus the interconnecting piping between steam drum and boilers. These projects required precise calculations for riser and down-comer piping between waste heat and methanator boilers and steam drum to ensure code compliance, and it had to evaluate piping systems for operating loads and wind and seismic loads.

## Visualizing for quick alterations with Aspect Pipe Stress

To address these complex system design challenges, Larsen & Toubro chose Aspect Pipe Stress because of its ease of use, capabilities and universal acceptance. “With Aspect Pipe Stress we were able to access and modify the input elements element by element, allowing for quick alterations that helped us take multiple runs and optimize the design,” explained Sachin Khanderajuri, assistant manager at L&T HE. “The software’s animation capability helped us understand the behavior of the system for each load case and take corrective measures if necessary.” L&T HE used Aspect Pipe Stress to check the complex system for different load combinations and ensure an optimum design. “The user-definable Aspect Pipe Stress software reports were very clear and accurate,” Khanderajuri added.

## Reducing design cycle times with Aspect Pipe Stress

The graphical user interface of Aspect Pipe Stress allows L&T HE’s engineers to learn, understand, implement, and deliver the results quickly. L&T HE uses Aspect Pipe



Stress stress analysis and piping flexibility calculations for new piping systems and to address code compliance and fitness for service evaluation for existing piping systems. “The ease of use and quick iterations with Aspect Pipe Stress in our projects has reduced the design cycle time substantially,” concluded Khanderajuri.

## 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.