CASE STUDY

Code Tech International optimizes FPSO project execution with advanced Octave solutions

Key facts:

Company: Code Tech International

Website: www.codetechinternational.com

Industry: Engineering, Procurement and Construction

Country: India

Octave products used: Forte 3DWorx *(CADWorx Plant Professional),* BricsCAD, Aspect Pipe Stress *(CAESAR II),* Aspect Pressure Vessel *(PV Elite)*

Key benefits:

- Seamless integration between design and analysis tools that streamlined processes and enhanced efficiency
- Intuitive user interface of the 3D modeling software with smooth integration into existing workflows

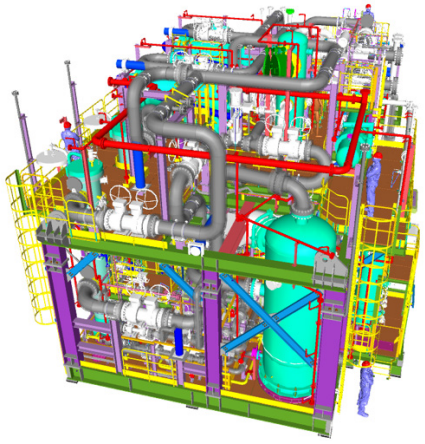
Identifying goals

Code Tech International, a leading Indian engineering, procurement and construction (EPC) firm, specializes in piping design and offers services such as static equipment, skid packages and steel structures to customers worldwide. Guided by Managing Director of Code Tech International Mozammil Khan, a professional of more than two decades in the industry, Code Tech has built strong relationships with significant international EPC companies and assisted in remarkable projects around the world.

Overcoming challenges: FPSO project challenge

Code Tech initiated an ambitious project – the design and installation of a Floating Production, Storage, and Offloading (FPSO) unit for the Indian market. An FPSO is a floating vessel that processes and stores fluids, like crude oil and natural gas, extracted from underwater reservoirs. The crude oil stored in the FPSO's storage tanks is offloaded onto shuttle tankers for market distribution or further refining onshore. The design of offshore plants encompasses a range of significant challenges. From project initiation to maintenance, engineers are required to consider various conditions that are specific to both the platform itself and its surrounding environment:

- **Blast Conditions:** The design had to mitigate the impact of potential explosions, ensuring the FPSO's structural integrity wouldn't be compromised.



- **Design for Damage Conditions:** High winds and other extreme conditions necessitated a thorough assessment of the skid's stability, center of gravity and weight.
- **Fatigue Condition:** Basic loads to be considered for the fatigue assessments include inertia loads based on operating weights as well as wind loads. In addition, for welded modules, the effect of hull deformations due to vertical wave bending moment shall be considered.

The weight of the platform is the ultimate factor to consider as it weighs approximately 350 metric tonnes, and the company allowed a 5% tolerance at the initial phase, which was later reduced to 2.5%. All these conditions must be thoroughly evaluated and applied to the equipment, structures and packages.

"In our field, efficiency and precision are paramount. The integration of Forte 3DWorx for design and Aspect Pipe Stress for analysis has been instrumental in achieving this project, providing a reliable foundation for our work."

Mozammil Khan
Managing Director,
Code Tech International

Realizing results

The challenge was not only in the complexity of this project but also in adhering to tight deadlines and budget constraints. The FPSO Compressor skid measures 13 meters long, 10 wide and 9 meters height, applying the conditions enumerated is challenging in a short amount of time, Khan noted, "You cannot wait for one activity to get over to the other, you have to complete everything in parallel."

Code Tech's phased approach:

The model creation is done in three phases: During the initial phase, Code Tech International started with the modeling in Forte 3DWorx and made and made the first changes necessary for the completion of the project. Meanwhile, the team completed the vessel and heat exchange equipment through the equipment module. With 30% of the project completed, the equipment was placed, the equipment's thickness was found, and the nozzles were put on hold.

At the midway point, the focus shifted to finalizing piping routes and integrating the model, using Aspect Pipe Stress for analysis. Approaching 90% completion, the team wrapped up the modeling, ensuring the accuracy of metric drawings for both piping and structure of the skid. This meticulous process, spanning five months, was crucial in bringing the FPSO project to fruition, with the design incorporating a thorough evaluation of potential impact consequences.

Moving forward

In reflecting on the project's success, Khan highlighted the synergy between skilled teamwork and advanced technology.

"This project stands as a testament to our team's profound expertise, the unparalleled power of cutting-edge software, and our unwavering commitment to excellence," he said. For an endeavor as complex and demanding as this, the reliance on a team that's not only trustworthy but also highly skilled is paramount. It's this belief that drives my personal commitment to continually upskill our engineers, especially in software proficiency."

Khan also underscored the critical role of sophisticated tools in such ambitious projects. "The right tool doesn't just facilitate accuracy and quality in 3D modeling; it needs to integrate seamlessly into our workflow, delivering results swiftly and efficiently under tight deadlines," he said. To meet these rigorous demands, CodeTech International selected a suite of complementary software tools – Aspect Pipe Stress and Forte 3DWorx. This strategic choice was driven by the synergy between these applications, ensuring not only their individual performance but also their cohesive operation, thus guaranteeing streamlined processes and integrated solutions at every stage of the project.

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.