CASE STUDY

DC PRO Engineering redesigns failing support system for Oman convention facility

Key facts:

Company: DC PRO Engineering

Website: dcproeng.com

Industry: Power

Country: United Arab Emirates

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

Headquartered in Sharjah, UAE, DC PRO Engineering is a recognized world leader in the fields of district energy systems, co-generation, and tri-generation, and is renowned as a sustainability leader in green building mechanical, electrical and plumbing designs. Services include engineering design, consulting and project management plus engineering reviews, feasibility studies, efficiency monitoring and recommendations for energy performance improvement.

The company has completed projects in Australia, Uganda, Singapore, Chad, Abuja, Seychelles, Iraq, Lebanon and Gulf Cooperation Council (GCC) countries.

Identifying goals

Carillion Alawi LLC selected DC PRO to redesign the failing supporting system for the Oman Convention and Exhibition Centre project. The energy center contained 17,500 tons of refrigeration capacity covering an area of 130 m x 35 m. In this project, DC PRO was tasked with providing detailed stress and structural analysis for the design of piping systems and equipment.

The equipment design included seven chillers, 10 cooling tower cells, 22 primary and secondary pumps, 11 condenser pumps, five air separators, six heat exchangers and 20 centrifugal separators. The project's piping systems included carbon steel piping up to 48″ in diameter for chilled water and glass-fiber reinforced plastic condenser piping ranging up to 64″ in diameter. The longest piping runs in each system were approximately 150 m.

Key benefits:

- Provided detailed stress and structural analysis for the design of piping systems and equipment
- Designed piping support system modifications within the original supporting system
- Verified existing supports after modifications
- Reduced client expenses by rectifying the existing installed supports
- Completed the project with minimal delay from schedule

"Without Aspect Pipe Stress and FEATools, the support rectification plan would not have been possible in the first place."

Abdul Aziz
Senior Mechanical Engineer, DC PRO Engineering

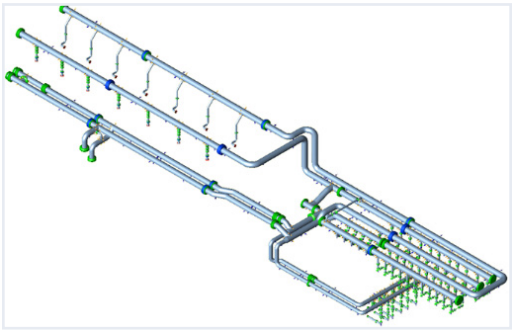
Overcoming challenges

The main challenge was that the original supporting system failed. DC PRO's assignment was to design the necessary modifications of the piping support system. Since the piping system was already in place, the modifications had to be designed within the original supporting system while rectifying the failing supports and verifying the other existing supports after modifications to ensure no further failures would occur once in operation.

Realizing results

"We used Aspect Pipe Stress to analyze the piping system stresses along with FEATools for finite element analysis," said Abdul Aziz, senior mechanical engineer on the project.

By rectifying the existing installed supports, the company saved the client significant expenses compared to having to change the entire support system. It completed the project with minimal delay from schedule.



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.