



# Petrofac, Middle East

## Key Facts

**Company:** Petrofac

**Website:** [www.petrofac.com](http://www.petrofac.com)

**Industry:** Petrochemical

**Region:** Middle East

**Products Used:**  
CAESAR II®

## Petrofac Saudi Arabia Benefits from Hexagon Engineering and Design Collaboration

With 18,000 employees, Petrofac is a leading service provider to the global oil and gas production and processing industry. The company designs, builds and operates oil and gas facilities and also develops and co-invests in upstream and infrastructure projects. Petrofac maintains operating centers in Aberdeen, Sharjah, Abu Dhabi, Woking, Chennai, Mumbai and Kuala Lumpur and an additional 24 offices and 14 training centers worldwide.

Saudi Aramco and Sumitomo Chemical awarded Petrofac the \$500 million Rabigh II refining and petrochemical project to develop U02 and U03 packages in their new aromatics complex and expand the facility to process 30 million standard cubic feet per day of ethane and three million tons per year of naphtha. These products provide feedstock for various high value-added petrochemical products. With 248 systems requiring stress analysis, Petrofac chose CAESAR II® for the project deliverables which included stress isometrics using the ISOGEN tool; graphical plots; expansion joint datasheets; reports on input, stress summary, displacement summary, restraint summary, equipment nozzle compliance, civil and structural loadings data; calculations for API 650 appendix P.2, flange leakage, wear pad requirements and trunnion loading.

## Collaboration among Hexagon Products to Save over 20% in Man-Hours

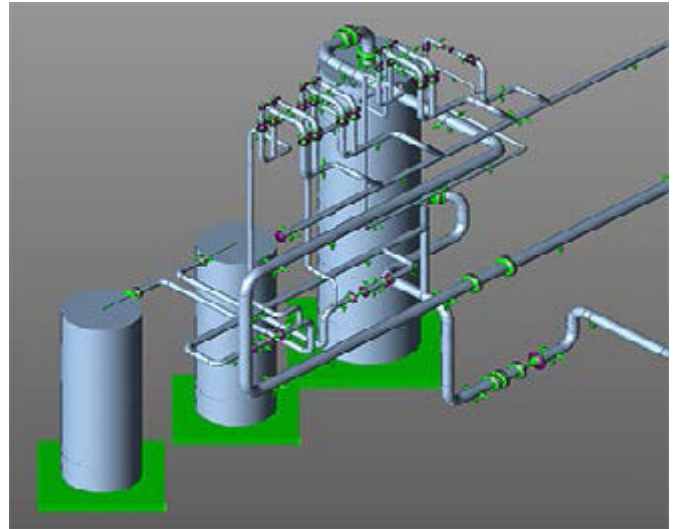
For such a large-scale project involving numerous vendors and companies working together, errors and overdesign are common due to the different interfacing contractors using or developing different solutions. On this project, Petrofac had 198 interface points with other contractors. Even with this complexity, the flow and sharing of engineering information among the contractors was smooth and efficient because many of them use CADWorx & Analysis Solutions that provide easy interface between design and engineering, including CAESAR II.

## Resolving Geotechnical Complications

Geotechnical investigations revealed clay at several site locations, and the settlement analysis indicated large long-term settlement values. Considering these values in the compliance checks resulted in nozzle connection overloads. This meant that Petrofac had to achieve equipment nozzle compliance on piping without special aids, such as spring supports or lateral expansion joints, and without soil improvements. “CAESAR II’s tools for dynamic analysis, API-650 nozzle flexibilities and center of gravity calculations addressed these challenges,” explained Shaikh Farrukh, lead piping stress engineer, “and its easy-to-use graphical interface provided the accurate analyses that allowed us to eliminate the risks associated with these complications.”

## Expediting Schedules, Saving More Time and Money

Using the built-in codes and post-processing tools in CAESAR II, such as WRC107/297, NEMA SM23, API 610, API 617 and API 661, Petrofac was able to quickly validate equipment nozzle loads for more than 500 nozzle connections. They achieved this without the aid of Teflon pads and low friction sliding plates, specifications that are not recommended in the prevailing sand storm and desert-like conditions at the site. These tools helped save additional man-hours and money and helped expedite the schedule.



## About Hexagon

Hexagon is a global leader in sensor, software and autonomous solutions. We are putting data to work to boost efficiency, productivity, and quality across industrial, manufacturing, infrastructure, safety, and mobility applications.

Hexagon's PPM division empowers its clients to transform unstructured information into a smart digital asset to visualize, build and manage structures and facilities of all complexities, ensuring safe and efficient operation throughout the entire lifecycle.

Hexagon (Nasdaq Stockholm: HEXA B) has approximately 21,000 employees in 50 countries and net sales of approximately 3.9bn EUR. Learn more at [hexagon.com](https://www.hexagon.com) and follow us @HexagonAB.