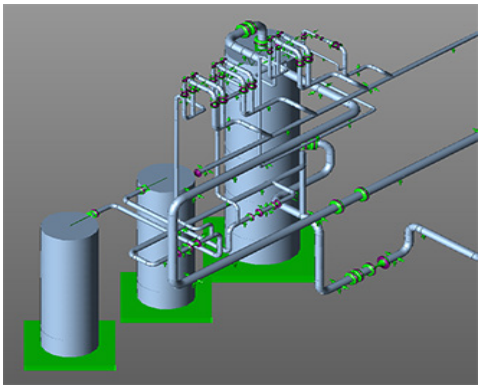
CASE STUDY
CADWorx & Analysis Solutions



"The efficient cross-discipline communications these products provide helped us reduce man-hours by 20 to 25%."

PRODUCT INDEX

Intergraph CAESAR II®

INDUSTRIES SERVED

• Petrochemical

Intergraph CADWorx & Analysis Solutions
7840 N. Sam Houston Parkway W.
Houston, TX 77064 USA
Phone: +1 281-890-4566 • Fax: +1 281-890-3301
E-mail: sales.icas@intergraph.com
Web: www.coade.com

PETROFAC Saudi Arabia benefits from Intergraph 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, 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 Sumitono Chemical awarded Petrofac the $0.5 billion 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 3 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 Intergraph® 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 Intergraph 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 Intergraph 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.

View the CAU2013 Drivers of Success Competition Winners' Panel at:
http://bit.ly/1e8p8ZL