



Mott MacDonald, United Kingdom

Key Facts:

Company: Mott MacDonald

Website: www.mottmac.com

Industry: Chemical & Petrochemical,
Oil & Gas - Onshore

Country: United Kingdom

Products Used: CAESAR II®

Mott MacDonald uses CAESAR II® with success on pipeline in Papua New Guinea

With more than 1,400 employees, Mott MacDonald is a major provider of engineering and design, management and technical consulting and project and construction management services to oil, gas and petrochemical businesses worldwide.

Engineering for a major PNG LNG onshore pipeline project

SpieCapag Pty Ltd. selected Mott MacDonald to provide engineering for 445 km of onshore pipelines for gas production and processing facilities in Papua New Guinea operated by Esso Highlands Limited, a subsidiary of Exxon Mobil Corporation. The pipelines transfer gas to the facility outside the capital city of Port Moresby for liquification and export to major LNG customers in Asia. Following Australian standards, the project encompassed all equipment and infrastructure for collecting and conveying the gas and condensate. Mott MacDonald's OGP Andheri office in India was the project lead.

Resolving diverse stress conditions and geographic challenges

The pipelines range from DN20 to DN850 and involve pressures of 12500 kPag to 56100 kPag and temperatures of -46 degrees C to 80 degrees C. These pipelines cross rugged terrain with geohazards such as surface fault crossings and seismic activity. Engineers had to address stress from the effects of wind, earthquake, soil properties and diverse operating conditions.

Addressing multiple changes while reducing the number of models

The project required multiple revisions in stress models and fast turnaround on rework, and Mott MacDonald benefitted from the proven flexibility of CAESAR II and its ability

to address these types of challenges. It analyzed the effect of pipelines according to ASME B31.4 and associated piping according to ASME B31.3 in the same model, reducing the number of models and saving time and associated costs.

Analyzing dynamic and static equivalent conditions with efficiency

CAESAR II allowed Mott MacDonald to create a site-specific earthquake spectrum and perform dynamic analysis to develop optimum loading conditions and analyze the possible vibration modes. With the project's diverse soil conditions, it used CAESAR II to simulate the above ground and buried pipe behavior and stresses for the location of virtual anchors. This saved in material, cost and time for the EPC contractor.

Leveraging ISOGEN for greater accuracy

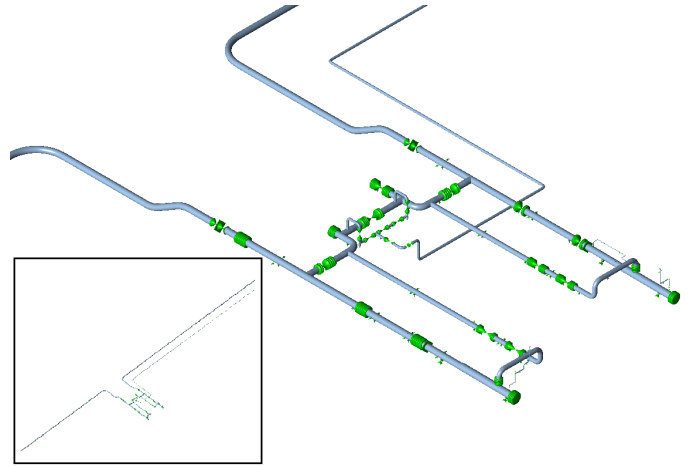
It used CAESAR II's ISOGEN module to generate isometric drawings internally for design inputs such as types of supports and piping layout changes. This provided greater accuracy, reducing errors, work-hours and costs.

Expediting equipment modeling to save time

As equipment, pig traps are typically outside the purview of the pipe stress engineer. While the civil team was designing the foundation of the pig traps, the engineers analyzed the composition of the foundation design loads and modeled the pig traps as pipe elements. This expedited foundation design, saving additional time.

Dealing successfully with changes in design codes

With the flexibility of CAESAR II's modeling and analysis capabilities, it was able to sail through this challenging project while addressing these continuous changes, while also achieving milestone incentives and generating additional revenue for the organization.



CAESAR II helped us confidently develop our project deliverables and its ISOGEN helped us quickly produce accurate isometric drawings”

Gaurav Bhende, Deputy Chief Engineer at Mott MacDonald
India PL

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.

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