

Piping Stress Analysis of Group Gathering Station, Kuwait

Key Features

Technology:

Intergraph CAESAR II
 Autodesk AutoCAD 2015
 Navisworks 2015

Duration:

The project was completed in 9 months

Deliverables:

1. Stress Isometric
2. CAESAR II Plot
3. Input Echo
4. Stress Summary Report
5. Restraint Load Summary Extended Report
6. Displacement Report
7. Flange Leakage Report
8. Nozzle Load Check Report
9. Dynamic Modal Analysis Report
10. WRC Report

The Client

Dubai based major EPC contractor that specializes in the Energy, Industrial and Infrastructure sectors. They have successfully executed projects in over 20 countries in the Middle East, Europe, Africa, India and South-East Asia.

The Business Need

The client required Rishabh Engineering to perform Piping Stress Analysis using CAESAR II for Above Ground & Under Ground piping systems.

Rishabh's Solution

Rishabh Engineering was appointed to carry out piping stress analysis on 35 systems (225 lines) of the Group Gathering station in a sequence of 2 phases and subsequently submit Stress Isometrics for final IFC (Issue for Construction).

We successfully executed the stress analysis project with Intergraph CAESAR II, thus completing the project in 9 months with a team of 7 members (including a team leader). The project work was carried as per ASME B31.3 standard and below design conditions:

Parameter	Value
Total Piping Systems	35
Total Number of Lines	225
Max. Pipe Diameter	48"
Max. Temperature	200° C
Max. Pressure	25 bar

The scope comprised of the following segments:

- Buried piping
- Flange check by 1) NC Method 2) ASME Sec VIII
- Modal analysis – Frequency check
- Equipment nozzle Analysis

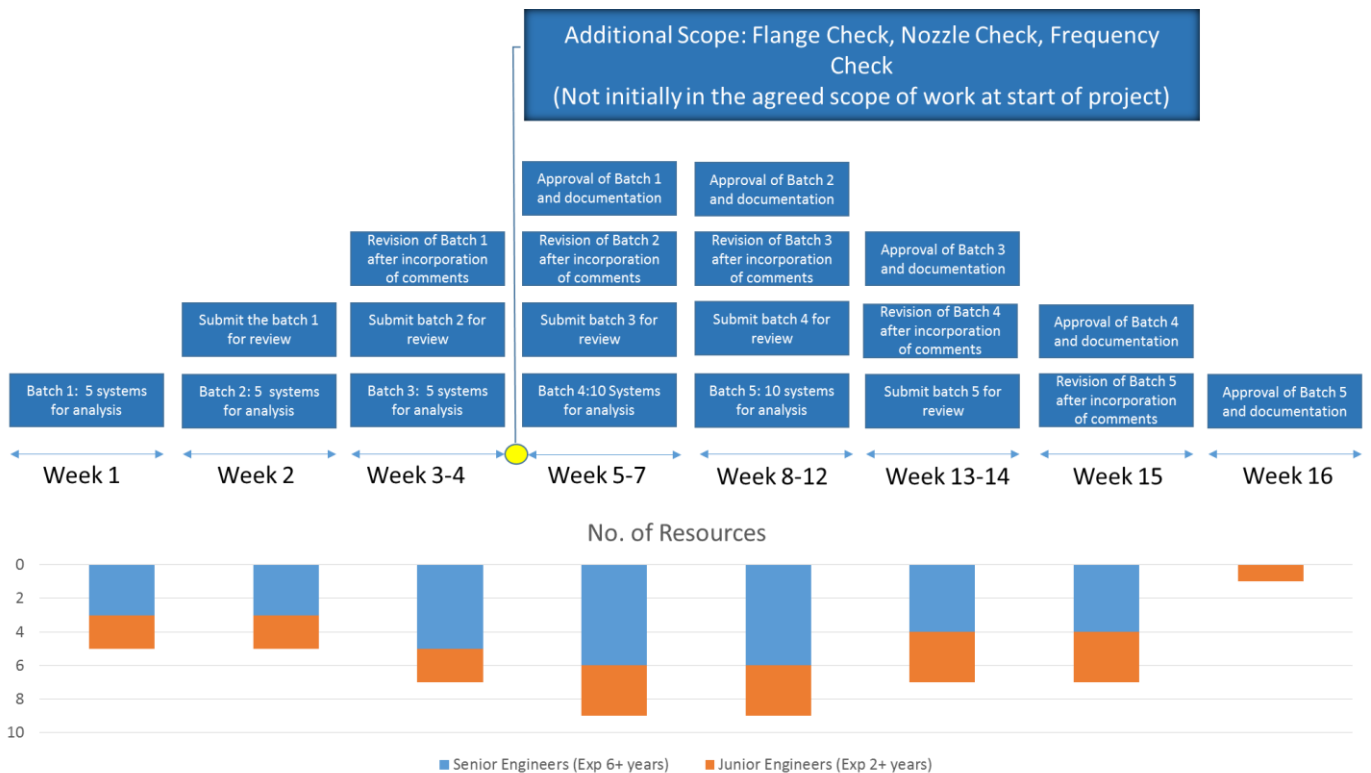
Equipment involved in Pipe Stress Analysis project:

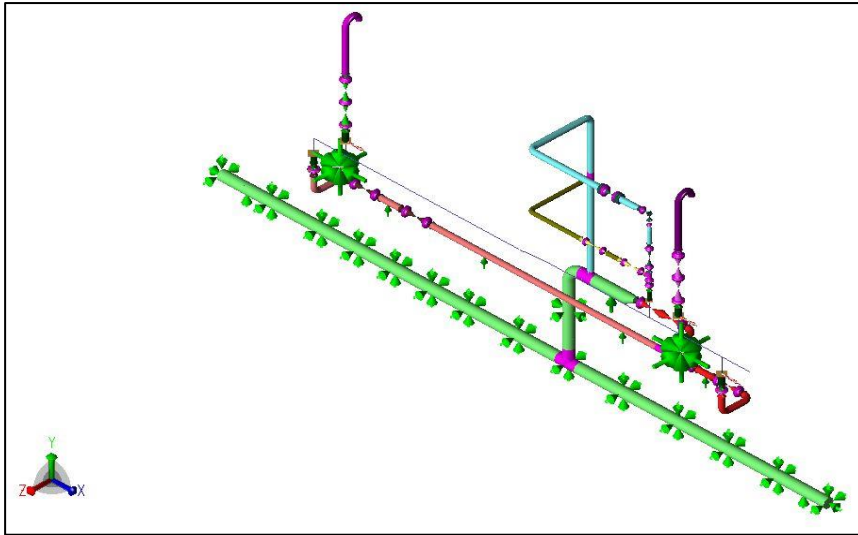
- | | | |
|---------------------|-----------------------|---------------------|
| ➤ Desalter (Vessel) | ➤ Pumps | ➤ Fuel Gas Scrubber |
| ➤ Heat exchanger | ➤ Tanks | ➤ Dual Storage Tank |
| ➤ Pig Launcher | ➤ Feed Heater / Tower | ➤ Drum |

Major Challenges:

- For Pig Launchers, piping involved above ground and underground portions. Apart from that, the engineering team addressed large displacements at QOC (Quick Opening Closure) by modifying piping route. Also, Thermal Relief Valves (TSV's) were a part of the scope of stress assignment for the Pig Launchers.
- The team worked on complex system consisting of multiple pumps whose suction and discharge nozzles had to be qualified within specified parameters.
- Tank nozzles for large tanks (>36 meter diameter) were qualified with consideration of tank settlement. Also, Bottom Tank Nozzle was qualified in adherence to API560, Appendix P.
- For Flare Piping, systems involving multiple PSVs were analysed considering thrust forces.

Project Execution Methodology

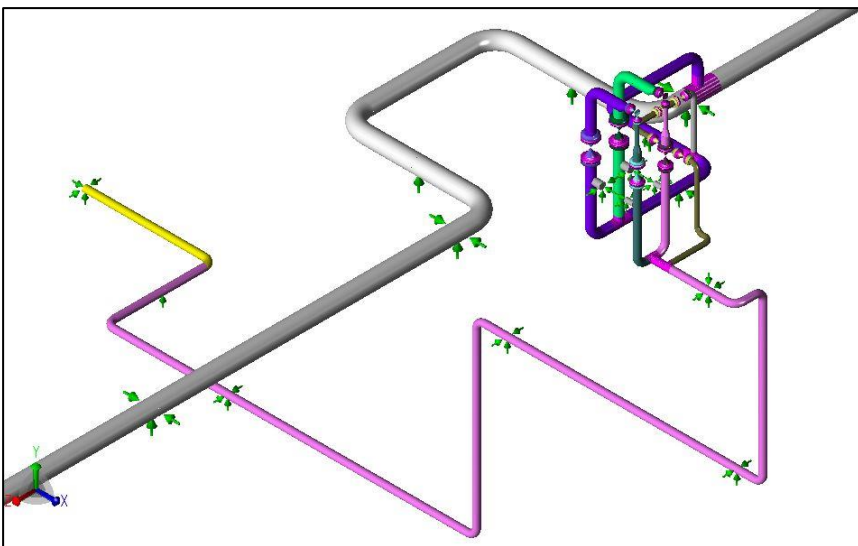




Crude Export PIG Receiver/ Launcher



Piping from Pumps to Tanks



Flare Piping

Technology Used

- Pipe Stress Analysis – CAESAR II
- AutoCAD 2015
- Navisworks 2015

Key Deliverables

- Stress Isometric
- CAESAR II Plot
- Input Echo
- Stress Summary Report
- Restraint Load Summary Extended Report
- Displacement Report
- Flange Leakage Report
- Nozzle Load Check Report
- Dynamic Modal Analysis Report
- WRC Report

Contact Details

US Ph : +1-201-484-7302, 1-877-RISHABH (747-4224)

UK Ph : +44-0207 993 8162

Email : sales@rishabheng.com

Twitter : www.twitter.com/RishabhEng

Linkedin : www.linkedin.com/company/rishabh-engineering-services

More information about Rishabh Engineering, please visit:

www.rishabheng.com | www.rishabhsoft.com | www.rishabhbpo.com

About Rishabh Engineering

Rishabh Engineering provides multidisciplinary engineering support services to EPC companies in industries like Oil and Gas, Petrochemical, Power and Water treatment. Our parent company, Rishabh Software is a CMMI level-3, ISO9001 and ISO27001 company that provides services in Software Development, Business Process Outsourcing (BPO) and Engineering Services Outsourcing (ESO) to clients globally. Rishabh has offices in USA, UK and India with their main delivery center in Vadodara, India.