

Piping Stress Analysis of Ethane Vaporizer Skid

Key Features

Technology:

CAESAR-II

Navisworks 2018

Duration:

The project was completed in a period of 3 weeks

Deliverables:

1. CAESAR II Analysis Report
2. Piping stress marked-up Isometrics
3. CAESAR Input List
4. CAESAR native files
5. Trunion Check report
6. COG points for piping

The Client

Australia based company that designs, manufactures, commissions, and services custom-engineered process equipment, modular skids, and turnkey plants for the oil & gas, chemical, power, food, industrial and mining sectors. It is a solutions provider to the process industries, delivering profitable and innovative technical solutions.

The Business Need

Rishabh Engineering was selected to conduct Piping Stress Analysis of Ethane Vaporizer Skid.

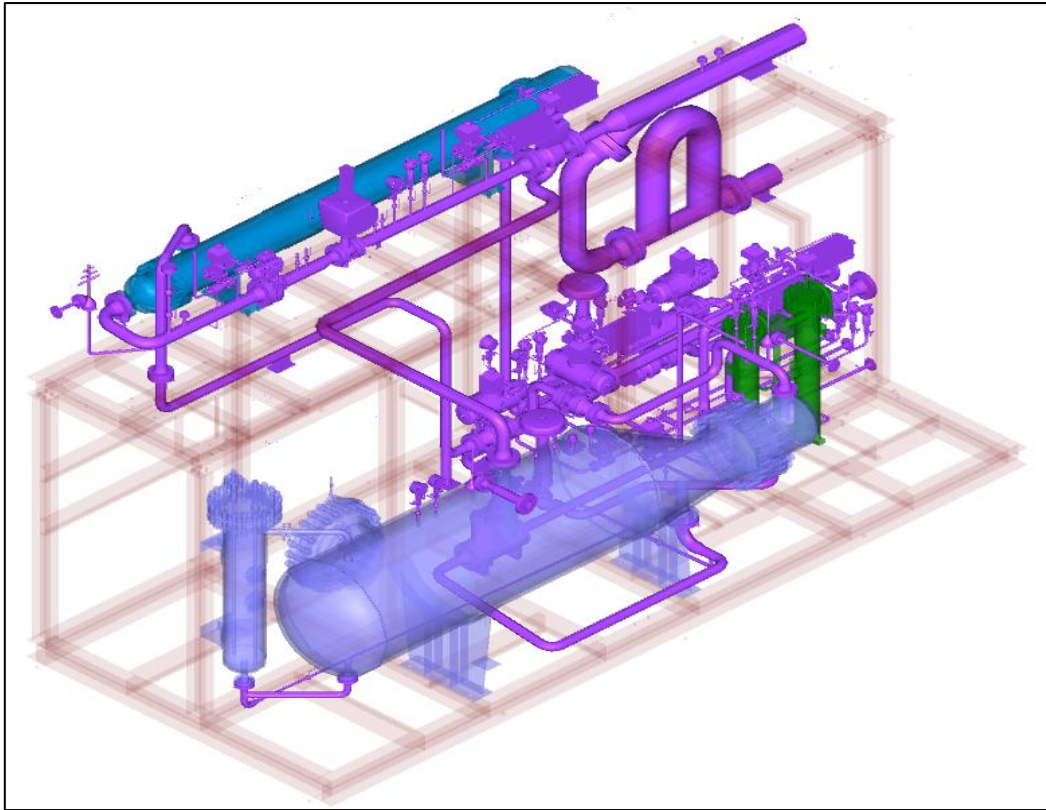
Rishabh's Solution

We delivered Piping Stress Analysis of Ethane Vaporizer Skid to ensure the system is safe as per the code requirements and suitable locations and types of support.

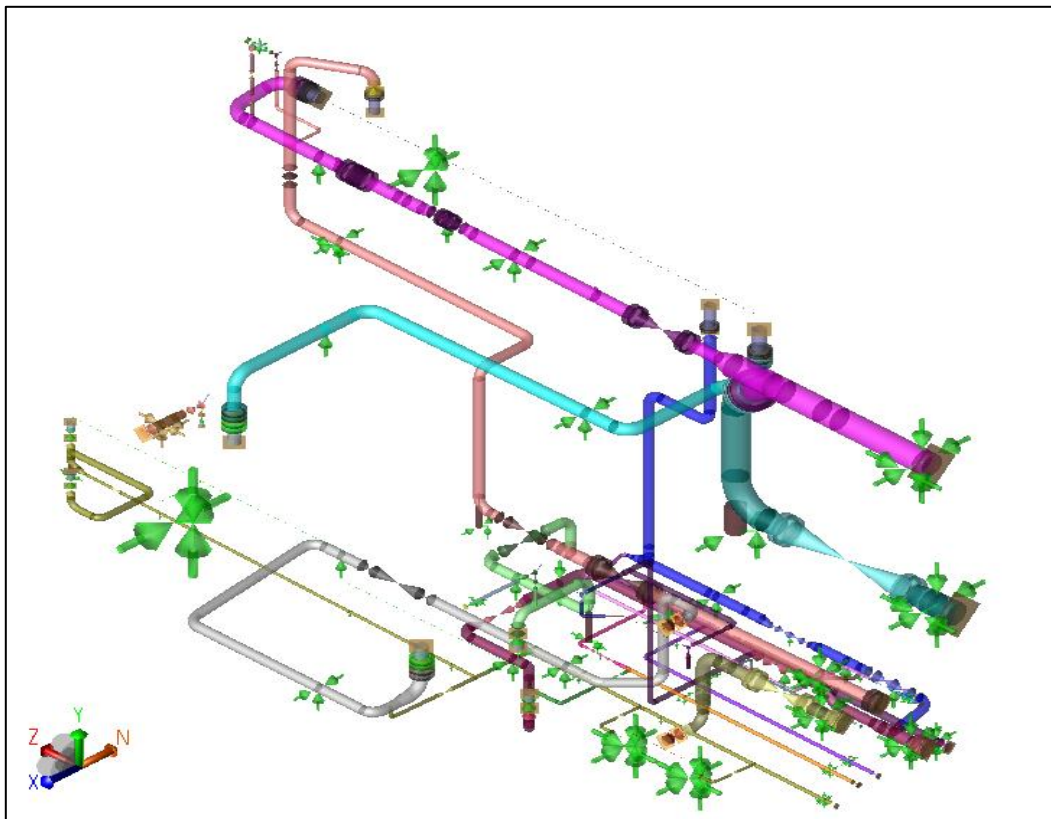
Design Parameters

Parameter	Value
LINE SIZE	8", 4", 3" AND 1"
MAX. DESIGN TEMPERATURE	205° F
MAX. DESIGN PRESSURE	80 Bar

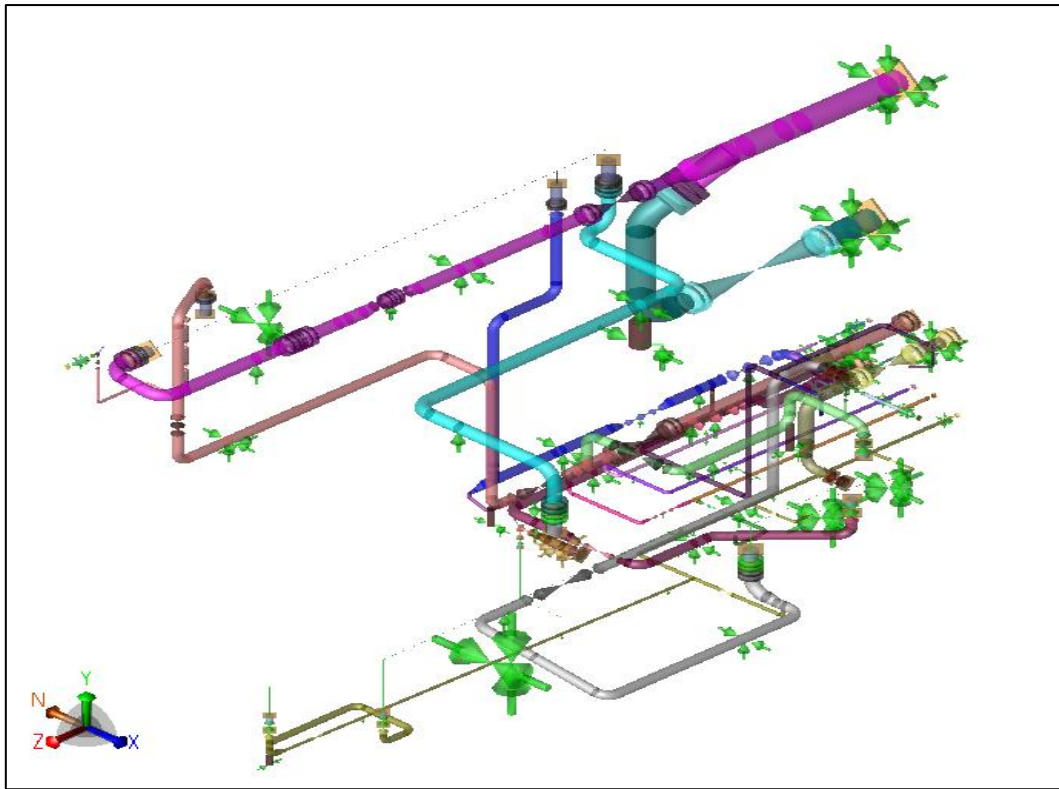
We had completed the piping stress analysis of Ethane Vaporizer Skid in 3 weeks with a team of 02 members (including one team leader).



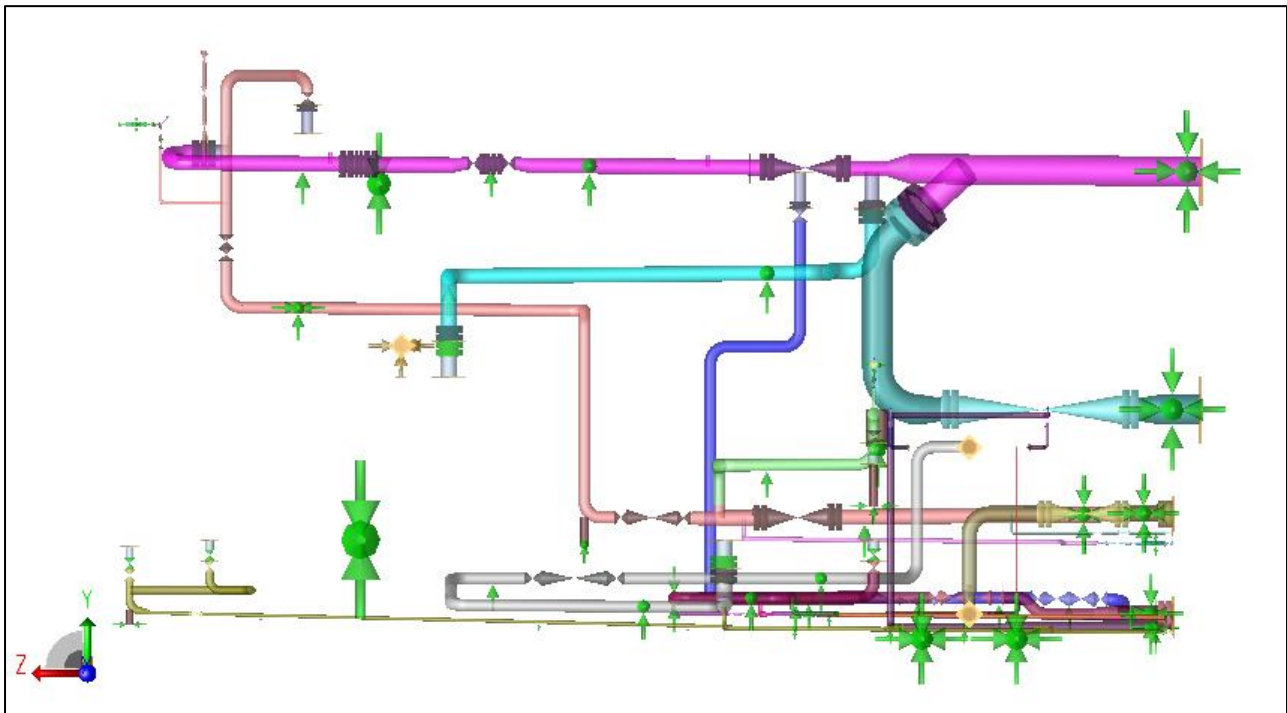
Isometric View - Piping Stress Analysis of Ethane Vaporizer Skid



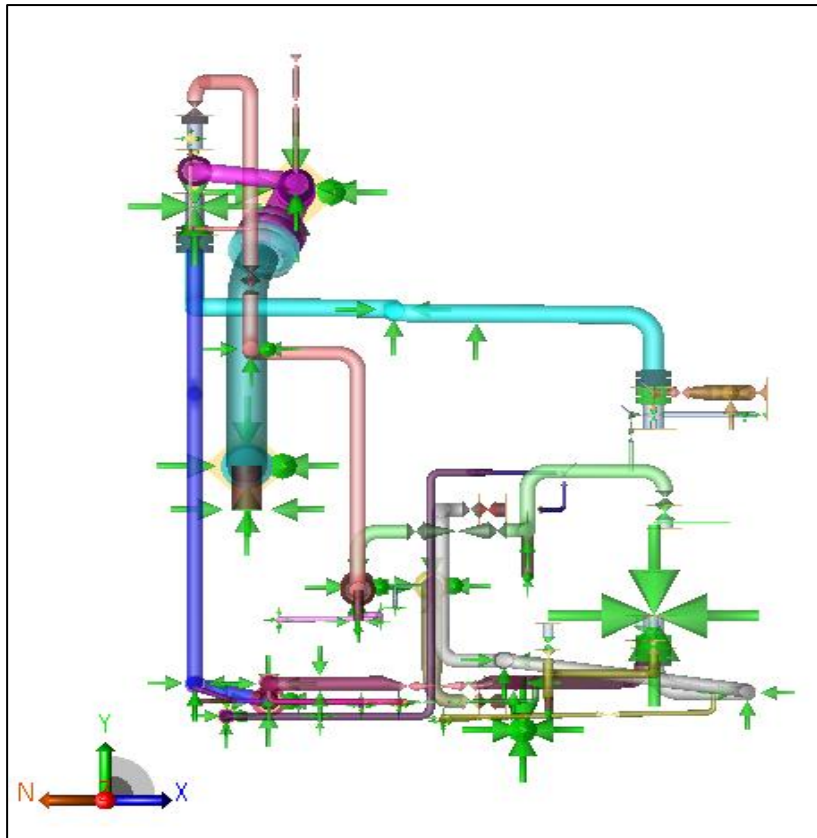
Isometric View - Piping Stress Analysis of Ethane Vaporizer Skid



Isometric View - Piping Stress Analysis of Ethane Vaporizer Skid



Side View - Piping Stress Analysis of Ethane Vaporizer Skid



Elevation View - Piping Stress Analysis of Ethane Vaporizer Skid

Challenges & Approach

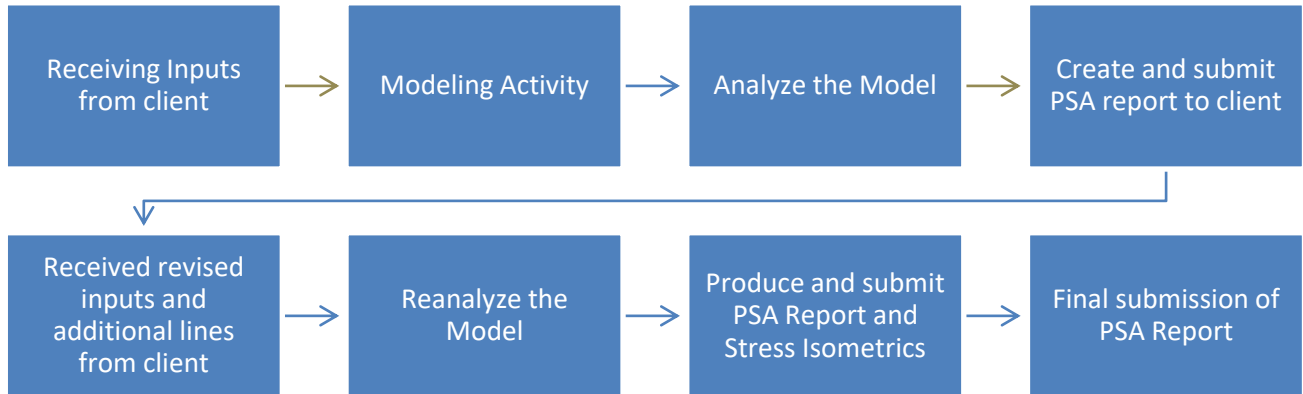
Technical Challenge:

- For small-bore lines, forces and moments at tie-in points were excessive. We recommended our forces and moments to clients in the first submission
- Furthermore, we had suggested two solutions to the client:
 1. To furnish external piping, which is going to be connected with Ethane skid for a realistic result
 2. To provide actual forces & moments of external piping at all Tie-in points
- The client has changed the fixed support location of equipment which results in nozzle load failure. We have to revise the routing & support type to qualify the nozzle load

Project Level Challenges:

- 85 % of the skid piping has been re-routed by the customer, increasing the number of nozzles connected to equipment. To overcome the same Rishabh has to re-do the CAESAR modeling

Project Execution Methodology



Stress analysis was performed as per ASME B 31.3 piping code & Piping stress analysis philosophy of the Customer. Moreover, Piping Design and Stress analysis have been done concerning the Codes & Standards of CAESAR-II software.

Technology Used

- CAESAR-II 2018
- Navisworks 2018

Key Deliverables

- CAESAR II analysis report (along with input echo, stress summary, restraints summary, displacement)
- Piping stress marked-up Isometrics
- CAESAR native files
- Trunnion Check report
- Center of Gravity (COG) points for Skid piping

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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.