

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
- CAESAR native files
- Trunnion 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

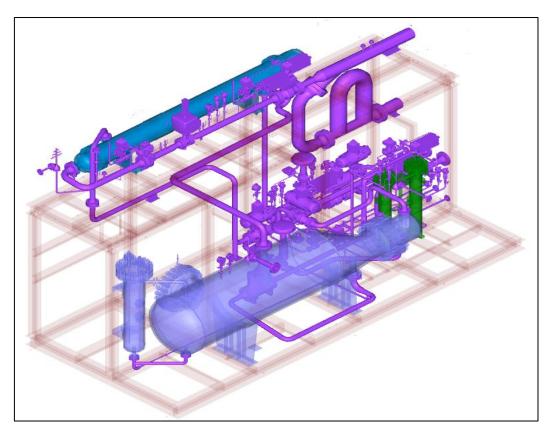
We delivered Piping Stress Analysis of Ethane Vaporizer Skid to ensure the system is safe as per the code requirements and suitable locations and types of support.

Design Parameters

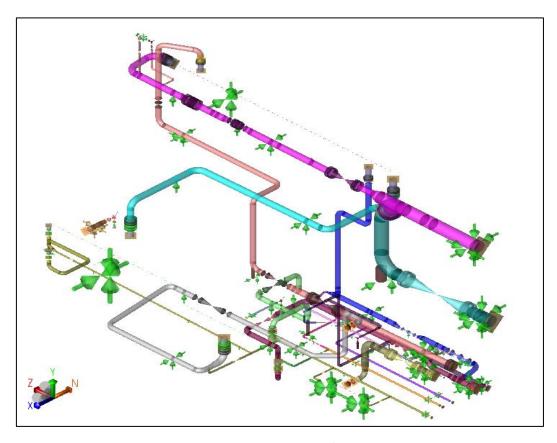
Parameter	Value
LINE SIZE	8", 4", 3" AND 1"
MAX. DESIGN TEMPERATURE	205° F
MAX. DESIGN PRESSURE	8o Bar

We had completed the piping stress analysis of Ethane Vaporizer Skid in 3 weeks with a team of o2 members (including one team leader).

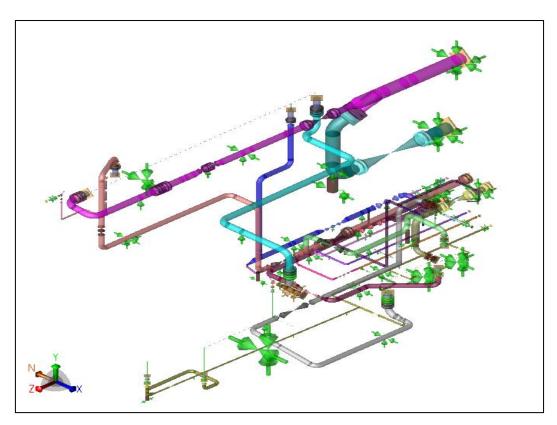




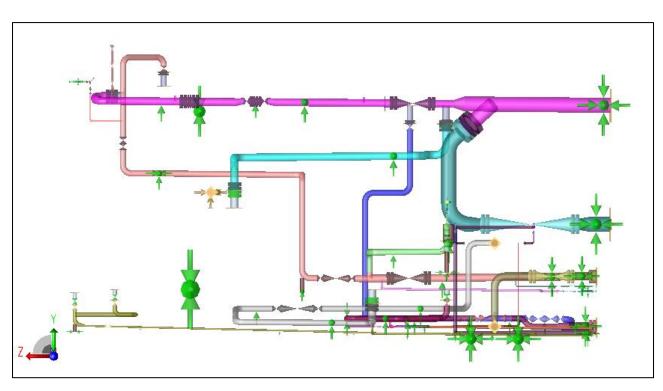
Isometric View - Piping Stress Analysis of Ethane Vaporizer Skid



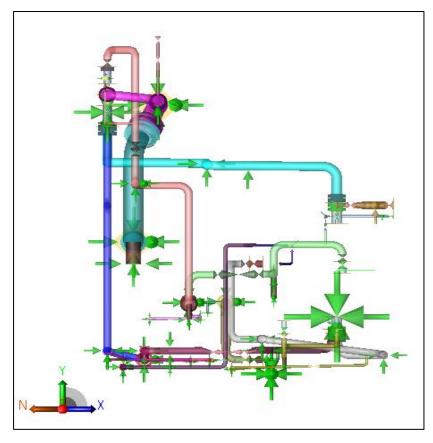
Isometric View - Piping Stress Analysis of Ethane Vaporizer Skid



Isometric View - Piping Stress Analysis of Ethane Vaporizer Skid



 ${\sf Side\ View\ -\ Piping\ Stress\ Analysis\ of\ Ethane\ Vaporizer\ Skid}$



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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