

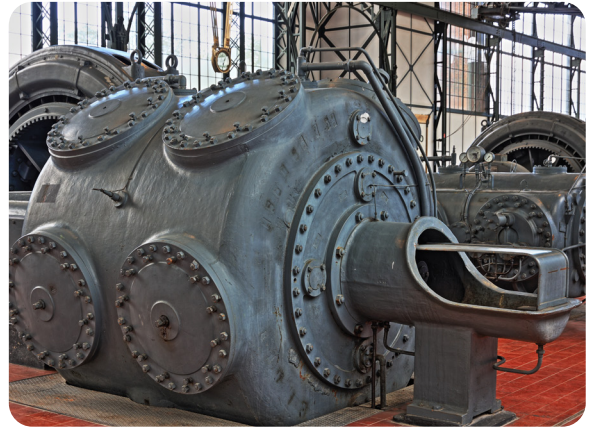
Complete Piping Design and Isometric Extraction for a US Renewable Energy Major

Developing Structural & Foundation Design for the various Equipment's/skids, designing the various Concrete sizes, structural member sizing, and conducting Pipe Stress Analysis.



About the Client

The Client is a US-based company ranked among the top 10% of the prestigious Top 400 Contractors by Engineering News-Record (ENR). They have executed projects throughout the United States as well as Latin America, South and Central America, and Southeast Asia. They specialize in front end engineering design as well as turnkey engineering, procurement and construction (EPC) for small to mid-sized oil and gas and petrochemical facilities, hydrocarbon reforming (including hydrogen, ammonia, methanol) and renewable energy production facilities such as biofuel, solar and waste-to-energy plants including landfills.



Project Background

The objective of the Renewable gas plant project is recommissioning three unused digesters to generate biogas, upgrade biogas to the pipeline quality and use it as a transportation fuel.

The project scope consists of restarting the three digesters (provided by another entity), installing a Hydrogen Sulphide (H₂S) Removal system at each farm to partially upgrade each farm's biogas, installing a biogas gathering pipeline to transport partially upgraded Biogas from each Farm site to Central Processing Facility.

The Central Processing Facility is where the Carbon Dioxide (CO₂) removal system completes the upgrading process. Once completely upgraded, the biogas will be injected into the grid via pipelines.

Business Need

The Client wanted help with the core Engineering activities and having executed similar projects for the same client, they instructed Enventure to take up this project.

The project had over 200 lines amounting to about 500 piping Isometrics from the 3 Farm Sites and 1 Central Processing Facility. The input provided was in the form of Guidelines in terms of Insulation, Heat Tracing Requirements, Pipe Support Standards, Piping Specification, Line List, Master P & ID released from Process group, 3D models of all the equipment's/skids coming in all the areas.



For the 3 Farm Sites and 1 Central Processing Facility, the client provided the plot plan and Existing Building Information after multiple site visits and surveys. The team started by doing the Structural & Foundation Design for the various Equipment's/skids coming in all the sites taking existing Building details into considerations designing the various Concrete sizes and structural member sizing.

The Piping team starts by placing the equipments as per the plot plan & layout design and started routing the pipes in AutoCAD Plant3D as per sizing provided in P & ID and piping Material Specification defined by the client. Requirements of maintenance and access were considered while routing along with existing building dimensions.

As the routing is progressed a 60%, 90% review is done along with end client to ensure the piping is inline with the End customer requirement and free of any potential clash with any of the services.

After the piping model is finalized Isometrics are extracted. MTO (Material Take off) is generated for the procurement of material required for fabrication/build. The extracted Isometrics according to segregated Stress Category of Piping Feasibility Analysis Criteria for ASME B31.3 Metallic Piping are issued to the Pipe Stress Analysis Team for their review and analysis. Priority is given to the Cat-2 and Cat-3 Stress class and routing suggestions/changes are done in sync with the customer and finalized isometrics are issued for Construction in a phased manner.

Why Enventure?

The Client approached Enventure to complete this project in a short time frame of 3 months, with specific emphasis on piping systems. While the task on hand was critical for the operation of the plant before the harsh winter season ahead in the northern part of the US, it was a challenge in hand with immediate action to mobilize the Team and deliver within the agreed timeframe. Besides, there was limited bandwidth internally at the Client's end to complete this activity.



The team at Enventure had a detailed discussion with the Client, based on which a detailed plan was submitted with information on the approach and ability to scaleup the team to complete the activity within the agreed timeframe. The Client saw the obvious benefits in engaging with Enventure for the project and commissioned Enventure to execute the same.

Approach

Enventure's partnership with the Client enabled them to complete a critical project efficiently. The key benefits realized by the Client were:

- Zero-defect deliveries
- Any changes suggested by the clients were taken care of in the short timeframe and most of the time returned by the time they came back the next morning.
- Responsiveness and Coordination between Design and Analysis team to ensure there is minimum iteration/revisions.
- Flexible virtual dedicated team that could vary in size and structure based on work requirements.

Outcome

The Client had a challenging yet well-defined requirement that needed to be addressed strategically. The team at Enventure was able to capitalize on its experience and skill to understand the bigger picture, and thereby create a solution that solved the business needs of the Client. Enventure has thus continued to be a strategic partner for the Client, supporting them on various projects over the years.

About Enventure

Enventure provides optimized **pipng isometric drawings** for **the process industry**. We provide detailed piping isometrics, **Generation of P & ID from PFD, carrying out safety study (HAZOP, HAZID) Generation of P & ID IFC, Generation of Valve & Instrument List, Finalizing Issue for construction and piping MTOs** and fabrication drawings using modern software's like **AutoCAD Plant3D, PDS, PDMS**.

Enventure also has inhouse Building Engineering & **integrated structural design plant engineering team** which helps in providing **CIVIL DESIGN SERVICES FOR PLANT** like steel **structural analysis**, civil foundations and anchor bolt designs for equipment and skid mounting. Along with this Enventure also does **Existing Structure Review, Failure Analysis, Structural Inspections, and Structural Repair/Reinforcement Design**.



www.enventure.com

Enventure Engineering LLP

India

124, HAL Airport Road,
Bangalore - 560017
Tel: +91.80.4116.1000

USA

Pease International Tradeport
One, New Hampshire Avenue, Suite 125,
Portsmouth, NH 03801
Tel: +1.603.766.4960

E-mail: info@enventure.com

For more case studies, visit: <http://www.enventure.com/resource-center-case-studies>