

Cryogenic Ethane Storage & Receipt Facility – Dahej

In a first of its kind project, LTHE has successfully set up a Cryogenic Ethane Receipt and Storage Facility for Reliance Industries Limited (RIL) at its Dahej Manufacturing Complex. The project had multiple engineering challenges which the expert team at LTHE overcame with innovative construction methods. The project was completed in record time and LTHE created a new benchmark in cryogenic storage facilities construction.



RIL was seeking to establish the largest supply chain for ethane from production facilities in USA to Cracker Units in India. There were multiple technological challenges in this project as well as a time constraint. LTHE is renowned in the industry for its strong execution capabilities and technological supremacy. This led RIL to put faith in and award LTHE the turnkey EPC project to establish a Cryogenic Ethane Receipt and Storage facility at its Dahej Manufacturing Complex. The facility needed to be designed to handle up to 1.8 MMTPA liquid ethane.

Two-Phase Project

The first phase of the project, awarded to LTHE in August 2014, included the basic & detail engineering of the Dahej Facilities comprising of unloading arms, 8 km cryogenic pipeline from jetty to the plant, the storage tank and associated Balance of Plant (BOP) facilities, procurement and construction of double-walled full containment Cryogenic Ethane Storage Tank.

In the second phase in June 2015, RIL awarded the contract for Balance of Plant (BOP) of the ethane storage facilities to LTHE.

Construction of The Ethane Storage Tank

LTHE partnered with M/s Saipem, the world leaders in cryogenics for the design and engineering of the facilities. The project had a robust beginning with early commencement of basic engineering and mobilisation to the project site within 7 days of being awarded the project.

Exhaustive studies, stringent quality checks were undertaken during the piling phase. Various tests were conducted at IIT Madras and Madrid University for construction of a crack free slab base in the tank. The Supply Chain Management at LTHE put in significant efforts on the global sourcing of materials of special metallurgy.

Rigorous expediting was done to meet the stringent delivery requirements of all materials to meet the construction sequence requirements. Extensive value engineering and design optimization helped in reduction of cutting wastages and minimization of site works substantially.

Balance of Plant Facilities

This comprised of a 3 km import pipeline, 0.8 km export line, boil off gas compressors, recondenser, booster pumps, heating system, flare system pipelines, sub-station building, control room building and associated facilities. The deadlines were extremely tight with a mechanical completion schedule of 19 months and required extraordinary team effort.

LTHE features innovative construction methods to minimize duration without compromising on the design quality and safety requirements.

Special care was taken in maintaining proper cleanliness of the systems of the Pipelines and the facilities to ensure flawless start-up. Prior to start of commissioning activities, detailed procedures were developed which helped in ensuring smooth and trouble free start-up of the operations.

The highest commitment to HSE this project worked 9.38 million manhours with 'Zero LTI' while working. The project also received the highest score in Safety Audits conducted across all RIL Projects. The successful execution of this iconic project has set up a new benchmark in execution of complex Cryogenic Storage facilities in India and abroad.

Key Challenges

Schedule – deadline for EPC of storage tank was 29 months while that for BOP facilities was 19 months. This called for innovation in various stages of construction and fabrication.

Dual purpose – the storage tank was to be designed for dual service of ethane and LNG

Storage tank – the tank base slab (90 m diameter, 1,65,000 m3 capacity) needed to be crack free. The entire diameter of the outer concrete wall needed to be cast up to a height of 37 m.

Air raising tank roof - 810 MT roof along with the suspended deck prefabricated at grade needed to be lifted to a height of 37 m, which was completed in 16 hours.

Longest unloading pipeline – the underground section of the cryogenic ethane unloading pipeline is one of the longest in the world and was designed with 'Pipe in Pipe' (PIP) technology

Success Stories

Piling output was maximized to a productivity of 536 piles in 97 days

The critical milestone of Roof Air Raising was reached in 15 months, creating a benchmark in Cryogenic Tank construction

Phased Array Ultrasonic Testing Technique (PAUT), implemented for the first time in India, as NDT for the welding joints of Inner Tank Shell resulted in complete fabrication in a record 4 months.

Hydro testing of the tank completed in 20 days and the water was recycled back to the fire system at RIL.

The perlite filling insulation of the tank was completed in a record 17 days

Completion of state-of-the-art Sub-Station & Control Room building within 12 months

