

CO₂ / natural gas liquefaction – Ethylene refrigeration

Cool Energy, Australia

Cool Energy has developed and patented new technology for separation of CO₂ from natural gas, by solidifying the CO₂ and removing it as a solid, instead of the more conventional amine process. They erected a pilot plant in an operational gas field to test the new technology.

An ethylene refrigeration unit is a central part of that plant to liquefy a natural gas with high content of CO₂. Liquid CO₂ was used as the ethylene condensing medium.

- Zone 2 hazardous area
- 49 kW cooling, liquefying gas/ CO₂ mixture at -65°C
- Ex d Copeland scroll compressor
- Flooded shell and plate heat exchanger liquefying gas/ CO₂ mixture , design pressure 8500 kPag
- Liquid CO₂ flooded brazed plate exchanger as condenser
- System controlled directly from the client DCS, using logic provided by RE.

The unit is equipped with a small air-cooled auxiliary refrigeration unit to keep the pressure in the ethylene refrigeration circuit below critical pressure during system shutdown.

In order to meet tight project deadlines, the unit was designed and delivered within 14 weeks. As power available at site was very limited, low drawn power was a critical design requirement

The system is equipped with hot gas bypass to operate at all load variations from 100% down to 0% capacities.

Following commissioning, RE has provided operator training, maintenance, spares and technical support for this refrigeration unit.



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