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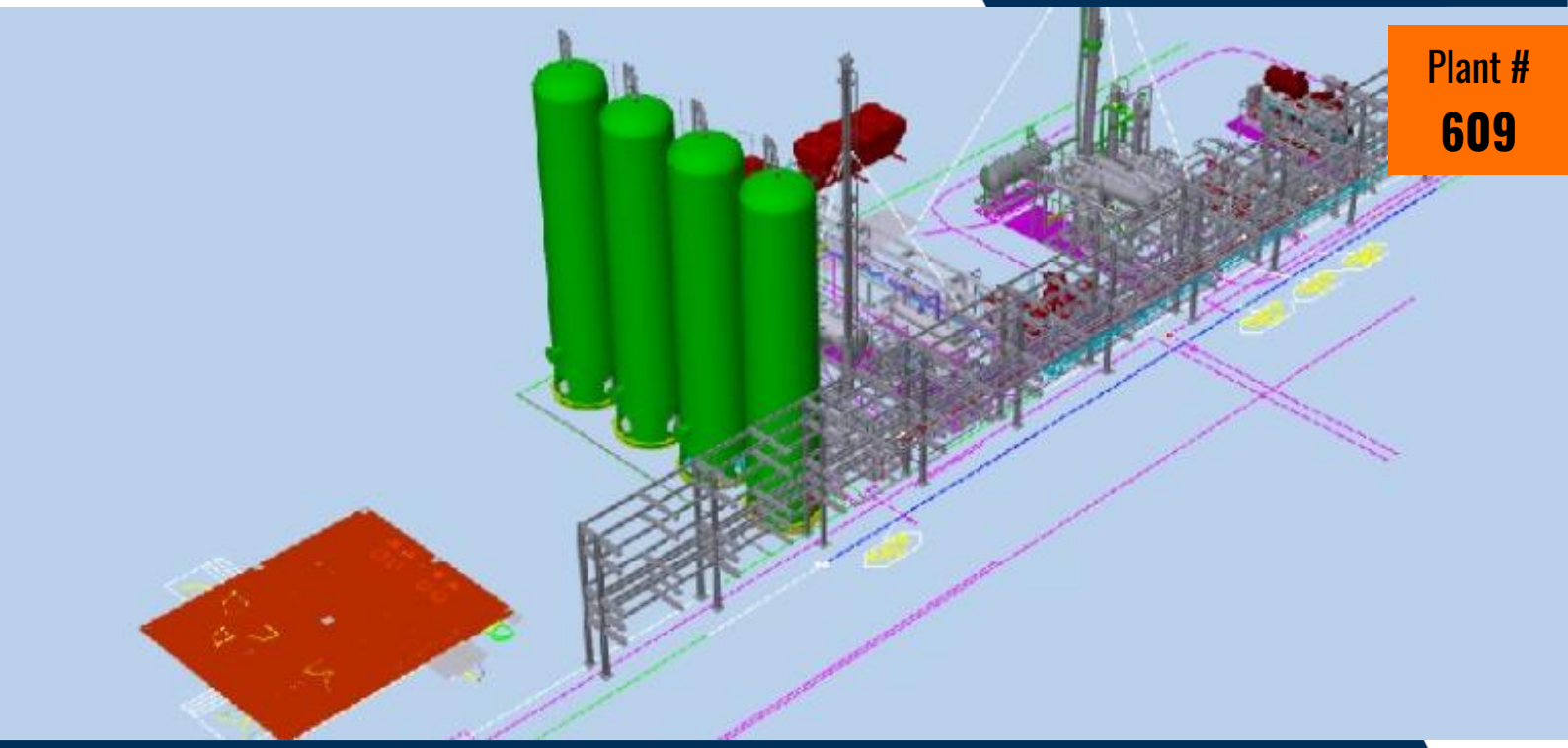

Plant # 609

Carbon Dioxide Liquefaction Plant - 50 MTPD

Capacity: 50 MTPD

Process Information: Never installed CO2 liquefaction system designed by Pentair to convert incoming CO_2-rich gas into purified, liquefied CO_2.

Major Equipment:

- 0120 – Inlet KO Drum
- 0201 – Feed Gas Compressor
- 0317 A - MeOH Absorber
- 0317 B – MP MeOH Flash Vessel
- 0317 C – LP MeOH Flash Vessel
- 0317 D – MeOH Circulation Pump
- 0317 E – MeOH Cooler
- 0318 - MeOH Storage Tank
- 0335 – Dehumidifier
- 0361 – Dehydrator
- 0347 – Particle Filter
- 0371 – Distillation Column
- 0373 – Reboilers and Pump
- 0375 – Reflux Tank and Pump
- 0381 - CO2 Condenser
- 0381B - Liquid CO2 Flash Drum
- 0382 – Top Cooler
- 0401 - Refrigerant Compressor
- 0451 - Economizer
- 0463 – Refrigerant Condenser
- 0471 - Refrigerant Receiver
- 0481A - CO2 Cascade Compressor
- 0481B - CO2 Cascade Refrigeration Condenser
- 0481C - CO2 Cascade Receiver
- 0501 – Air Cooler
- 0502 – Cooling Water Heat Exchanger
- 0611 – CO2 Storage Tank

Brief Plant Description

The unused CO_2 liquefaction plant is designed to convert incoming CO_2-rich gas into purified, liquefied CO_2 through a sequence of compression, purification, drying, distillation, and refrigeration steps. The process begins as feed gas enters the inlet KO drum (0120) to remove liquids before being pressurized by the feed gas compressor (0201). The gas then passes through a methanol absorption system—including the absorber, flash vessels, circulation pump, cooler, and storage tank (0317A–E, 0318)—where NOx and other impurities are removed. Additional drying is performed by the dehumidifier and dehydrator units (0335, 0361), followed by fine filtration in the particle filter (0347). The purified gas then enters the distillation column (0371), supported by reboilers, reflux equipment, and pumps (0373, 0375), where CO and other light contaminants are separated. After purification, the CO_2 is cooled and condensed in the CO_2 condenser (0381), with excess vapor managed in the liquid CO_2 flash drum (0381B) and temperatures further reduced by the top cooler (0382). A dedicated refrigeration system—including the refrigerant compressor, condenser, receiver, economizer, and CO_2 cascade refrigeration equipment (0401, 0463, 0471, 0451, 0481A–C)—provides the low temperatures required for CO_2 liquefaction. Final cooling is achieved through air and water exchangers (0501, 0502), allowing the condensed CO_2 to be collected and stored safely in the CO_2 storage tank (0611).

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