



# FRONT END ENGINEERING DESIGN

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Our people have worked on numerous FEED studies over the years including the following:

- ✓ FEED and Detail Design for a new DN200 CL600 interconnect pipeline and DN150 CL1500 re-injection pipeline to AS2885.1 and associated station piping and mechanical equipment for new compressor station;
- ✓ Front end engineering design of a 50,000 manhour FEED in accordance with AS2885 for gas collection headers and export pipeline, including risk assessments, fracture control plan and order placement for long lead items, including the 537 km of DN1050 line pipe (approx. 210,000 tonnes).
- ✓ FEED for a 10km, DN 500, 1.818MPa pipeline including:
  - Basis of Design,
  - Application of AS2885.1,
  - Wall thickness calcs for both DN500 in X42 materials,
  - Ovality and induction bend requirements,
  - API 1102 crossing calculations,
  - Fracture Control Plans for DN500 & DN300 trunklines,
  - Pipeline material specification,
  - Line pipe requisition,
  - Specification and Drawing development,
  - Technical bid evaluation & order documentation, Induction bend requisition,
- ✓ FEED and cost estimate of a new Greenfield Pilot Plant facility for Latex and Solvent based resins which included:
  - Preliminary equipment sizing and pricing (pumps, vessels, heat exchangers, fractionation columns, scrubbers, agitators),
  - Preliminary pipe sizing
  - Layout design
  - Class 3 cost estimate ready for sanction.

- ✓ FEED and Detail Design for a new DN200 CL600 interconnect pipeline and DN150 CL1500 re-injection pipeline to AS2885.1 and associated station piping and mechanical equipment for new compressor station;
- ✓ Gas Storage Withdrawal Project FEED and Detailed Design:
  - Assessment and design of suitable gas treatment equipment to direct gas from the Processing Plant to the LPG plant.
  - Review of existing flare / blowdown system capacity and sizing of a new vent header / stack.
  - Hydraulic calculations and line sizing of new blowdown piping and liquids handling system
  - Sizing of PSV's and blowdown / flare system capacity
  - Development of HYSYS process models
  - Control valve sizing
  - Pump sizing
  - Development of PFDs and P&IDs
  - Three-phase Separator Sizing
- ✓ Conversion from gas oil to a mixed LPG/ethane feed which included:
  - Project Design Specification (FEED) and detail design phases of the project.
  - Modifications to the main processing plant, offsites and utilities
  - New and replacement equipment in greenfield and brownfield areas
- ✓ Gas Injection Storage Project which included:
  - FEED and Detail Design for a new DN200 CL600 interconnect pipeline and DN150 CL1500 re-injection pipeline to AS2885.1 and associated station piping and mechanical equipment for new compressor station;