

Woodside LNG Expansion - EPCM Phase 4

PROJECT DETAILS:

Location:	North West Shelf, Australia
Contract Value:	A\$280 million (2004) (EPCM Value) A\$1.6 billion (Total Development Value)
Contract period:	April 2001 - June 2004
Safety Statistics:	Manhours: 3,160,506 LTIFR: 0



CLIENT: Woodside Energy Ltd

Scope of Work:

As part of the North-West Shelf Gas Project, Woodside Energy's \$1.6 billion LNG Train 4 Expansion contract was completed by the Kellogg Joint Venture (comprising Clough, Kellogg Brown & Root, JGC and Hatch), providing engineering, procurement and construction management (EPCM) services for the project's development.

The project team comprised of 400 personnel in the Perth office and 150 personnel at the construction site. Clough's share of the EPCM manning was approximately 45% of the total manning.

Phase IV scope included:

- LNG Train 4
- Sulfinol Unit
- Power Generation Unit
- Other Utilities
- Brownfields Interconnecting Racks
- Tie Ins
- Trunkline Onshore Terminal (Basis of Design (BOD) and front end engineering design (FEED) initially)

Scope of work:

Key features of the project included:

- Largest capacity (4.2 million tonnes per annum) LNG train to date.
- First all new LNG train to be designed in its own country.
- Significantly integrated electronic design and project management functionality.
- Main Cryogenic Heat Exchanger (MCHE) technology by Linde.
- Main refrigeration compressors by Nuovo Pignone – largest propane compressor available worldwide.
- Propane precooled mixed refrigerant (C3MRC) process incorporating hydraulic turbines and enhanced end flash.
- Utility integration with the existing LNG and Domestic Gas plants.
- Air cooled process utilising large banks of air fan coolers covering the length of the train.
- Project team closely integrated with client.
- Project execution is database intensive with essentially 'paperless office' environment goal.
- EPCM scope included provision of maintenance information database and detailed maintenance activity planning.

Clough participated in a number of previous phases of Woodside's LNG and domestic gas plants and also seconded a significant team of experienced people from previous Woodside onshore project developments to the Kellogg Joint Venture.

