

Background

The Chevron-operated Gorgon Project is one of the world's largest natural gas projects and the largest single resource development in Australia's history. Located on Barrow Island, approximately 60 kilometres off the north-west coast of Western Australia, the Gorgon Project includes the construction of a 15 million tonne per annum LNG plant located and a domestic gas plant with the capacity to provide 300 terajoules of gas per day to Western Australia.

The Gorgon Project is operated by an Australian subsidiary of Chevron and is a joint venture of the Australian subsidiaries of Chevron (47.3 per cent), ExxonMobil (25 per cent), Shell (25 per cent), Osaka Gas (1.25 per cent), Tokyo Gas (1 per cent) and Chubu Electric Power (0.417



MPower Projects Pty Limited
10 Williamson Road,
INGLEBURN NSW 2565
P: +61 2 8788 4600
E: contracts@mpower.com.au
W: mpower.com.au

CS0023: Gorgon Temporary Power Station

Introduction



In 2009, MPower secured a contract for the design, manufacture and commissioning of a 28 megawatt power generation plant that will be used to power the construction and commissioning phase of the Project. This contract is valued at \$32 Million and commenced in October 2009.

The designs ensure survival against harsh environmental conditions including Category 5 cyclones. Other key design features included a reduced footprint to minimise space requirements on Barrow Island, where construction activities are limited to 300 hectares of uncleared land, and a minimal modular transportable installation package.

Design

The TPS was designed by MPower Projects' highly skilled and qualified engineering and design team. Utilising experience along with knowledge and skills ensured the details in this design met all the standards and requirements of the project.

Designed with a ten year design life (as per specifications), 12 units were combined to form a Temporary Power Station (TPS) that would supply power during construction of the main facility on Barrow Island. The Quarantine Management System implemented by Chevron is protecting the conservation values of Barrow Island, a Class A Nature Reserve. MPower is complying with these measures to protect Barrow Island by maintaining high quarantine standards at our manufacturing facility (located in Ingleburn New South Wales).

Environmental impact, space constraints and safety were considered essential in the design of the units. Heat rise and air flow emitted from the radiator systems contributed to the footprint of the TPS and additionally the radiators occupied valuable space in a relatively small area. To resolve this issue, the radiators were designed to be roof mounted, this significantly reduced the footprint and allowed refuelling from the ground whilst in operation, eliminating the need to work at heights and maximise running time.

The units were designed using 3D SolidWorks® modelling and a full analysis was performed on main structures. Some of the structural design features include a steel base and frame, multiple doors down each side of the units to allow easy access for maintenance and integrated fuel and oil make up tanks.

Design

To ensure high standards in safety, an Inergen® fire suppression system was installed, providing additional safety features. The system effectively eliminates harm to people, property and the environment as the gases within the extinguisher are natural.

Minimising noise levels generated from the TPS was a safety and environment consideration. By balancing the airflow and fan system integrated within the TPS, noise levels were significantly reduced.

Power Management Solution

The Power Management System designed for the power plant was comprised of two main systems – an Allen Bradley ControlLogix PLC system and a Citect SCADA system.

The Power Management System provides real-time information to the control room operator on the status of the various components of the temporary power station including the diesel generators, fuel system and electrical distribution system.

It also allows for automatic and manual control of the diesel system to provide diesel to the generators as well as automatic start/stop for the generators, load sharing and load shedding.

The TPS produces a significant amount of energy ensuring the LNG Plant is well powered. To manage the high levels of power without experiencing technical issues, a high-tech automatic system was integrated into the TPS. The ramp-up-sequencing-system brings online, high capacity, high voltage set up transformers and assists in enabling connection to the power grid.

To ensure availability of power was maintained, N+2 Design was integrated. This special feature increases the operation of the power plant providing added assurance should one of the units fail or requires maintenance.

Each of the 12 generators were rigorously factory tested at the MPower Ingleburn facility, utilising HV switchgear and transformers to verify power output and load share

Mpower has extraordinary experience and knowledge designing, engineering and manufacturing a vast array of capabilities, and is an industry leader in oil and gas power generation. For all power solutions contact Mpower.

