



Prime power

> Case History

BHP Billiton Mine, Groote Eylandt



Power Generation

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Where:

BHP Billiton manganese mine, Groote Eylandt

What:

Powerhouse comprising three 1.2 MW Cummins Power Generation QSK60 generator sets

Purpose:

Provide power to the mine and also the island's main town

Primary choice factors:

Class-leading fuel efficiency, reduced emissions and low maintenance costs of Cummins Power Generation QSK60 generator sets

Cummins Power Generation QSK60s deliver new power efficiency at remote mine

GROOTE EYLANDT — Three Cummins Power Generation QSK60 gensets have transformed the powerhouse on the remote Australian island of Groote Eylandt, home to a manganese mine owned by one of the world's premier mining companies, BHP Billiton.

The powerhouse serves the mine — established in the mid-1960s by BHP's Groote Eylandt Mining Co (Gemco) — and also the island's main town of Alyangula. Groote Eylandt lies in the Gulf of Carpentaria in northern Australia.

The three QSK60s drive Cummins Newage alternators and are a world apart from the three slow-speed, 36-year-old English Electric diesel generators they replaced.

Gemco initially looked at replacing the old generators with slow-speed diesels, but then began to investigate technically advanced high-speed diesels, such as the Cummins QSK60, a 60-liter V16 which appeared to offer reduced operating costs.

The QSK60 was chosen after a comprehensive engine selection and tender process. It was confirmed during this process that the 60-liter Cummins engine, with its



The generators were installed as a turn-key project by Cummins Power Generation that included the complete electrical and mechanical installation.

1.2 MW continuous rating at 1500 rpm, could match the slow-speed diesels for fuel efficiency while providing overall cost advantages over other high-speed engines, including Caterpillar and MTU.

Cummins Power Generation guaranteed fuel consumption of the QSK60 and also provided a guaranteed maintenance rate per hour.

Guaranteed fuel consumption

Cummins Power Generation guaranteed the fuel consumption of the QSK60, which was verified during site acceptance testing, and also provided Gemco with a guaranteed maintenance rate per hour.

The QSK60 has proved in other applications that it is a class-leader in terms of its fuel efficiency (less than 200 g/kWe), reduced emissions and low maintenance costs.

Gemco powerhouse supervisor Keith Heale relates, amusingly, how the QSK60 has changed the lives of the crew on Groote Eylandt.

“To give you an idea of the quantum leap the power station has taken with the installation of the new generator sets, let’s compare the starting of an old English Electric with the new Cummins QSK60,” he says.

“The English Electric was started thus: Obtain a two-meter long bar (50 mm diameter), insert it into slots in the flywheel and heave and strain to move the engine into the start position. Grasp the handle of the lube oil priming pump and vigorously move it back and forth to get some priming oil into the engine. Now get yourself into a contortionist position to operate the fuel and air



The Groote Eylandt powerhouse not only powers the manganese mine, but also the island’s main town, Alyangula.

levers to start the engine. Puff, puff, pant, pant. Hopefully it started. If not, you get to do it all over again.”

“The QSK60 Cummins is started thus: Take the mouse and click the start button on the computer screen in the control room.”

Turn-key project

The generating sets comprise QSK60G3 engines coupled to Newage 3.3 kV alternators. They were installed as a turn-key project by Cummins Power Generation which included the complete electrical and mechanical installation. (Cummins Power Generation was also responsible for the mechanical and electrical removal of the three old English Electric generator sets).

The installation includes Cummins PowerCommand® Control for paralleling, Cummins CBM cooling systems, Cummins Centinel oil burn system, all HV protection systems, and remote control of the power station through a Scada system.

Power generation personnel from both Cummins Perth and Cummins Darwin were involved in the project which presented some logistical challenges in transporting the equipment 3000 km by road from Adelaide to Darwin and then 200 km by barge from Darwin to Groote Eylandt.

Gemco’s Groote Eylandt mine produces around 1.8 million tons of manganese a year which is used by customers in Australia as well as being exported to Asia, Europe, the Middle East and the Americas. It is primarily used in the production of steel as a strengthening agent.

For more information about integrated prime power systems, contact your local Cummins Power Generation distributor or visit www.cumminspower.com.

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