Dale Power Solutions Ltd

Case Study

Engineered solutions - for the marine, oil & gas industry

Background

A global oil and gas exploration company needed additional power on one of their oil platforms in the Middle East.

The challenge

Main electrical power supply to this platform is imported over 40kM from a third party operator's facilities through a 33kV subsea cable link. Under certain conditions, this link could be limited to 3MVA; less than sufficient for full production.

As a part of the project to ensure sufficient platform power was always available, the project objective was to install two new offshore generators, each rated for 2MVA Prime (continuous operation), to meet the additional power requirement of full production.

The Solution

Dale Power Solutions designed and supplied two containerised automatic start diesel generating sets (model MLE2500), producing a continuous output of 2500 kVA, 2000 kW, 6600 Volts at 0.8 power factor.

Dale Power Solutions designed and supplied two of their model MLE2500 containerised diesel generating sets, each producing a continuous (prime) output of 2500 kVA, 2000 kW, 6600 Volts at 0.8 power factor.

The assembled generating sets were fully tested prior to despatch on resistive load banks, witnessed by the client and independent inspectors. Drawings and documentation were included in accordance with the client SDRL.

The engineered package

Paul Roberts, Dale Power Solutions Senior Application Engineer on this project, said: "For this application, the generating set Dale Power Solutions selected was a 'V20' 1800 rpm diesel engine with a prime power rating of 2740kW for generator applications with variable load. Electronic engine speed governing is included to meet Class A1 performance. Engine over speed protection and emergency shutdown features are enabled by the installation of air intake shut-off valves on the set. Centrifugal lube oil filtration and duplex fuel filters are included for maintainability and reliability of the set.

The flexibly coupled IP23 Alternator operating in conjunction with an AVR using 'AREP' + 'PMI' excitation delivers improved transient load performance. Vibration levels are controlled by the heavy duty common base-frame with flexible mounts for the engine and alternator."

Automatic and manual start / stop control, synchronising and load sharing is handled by Dale's fully configurable generator set control system. A local generator touch screen control panel switchgear panel is housed within the acoustic enclosure and a remote control panel is provided in the clients switch room.

The ISO style enclosure container with certified lifting lugs and finished in an offshore painting specification suitable for marine / offshore environment is designed with acoustic lining and attenuators in the cooling air inlets and outlets to reduce the noise emitted to a level of 85 dBA at 1 metre.

Rated performance in the ambient conditions of up to 45°C is achieved with the horizontally roof mounted, electric motor driven air blast radiator. Airflow is managed with 4 off redundant inverter controlled fans fitted to the inlet plenum and designed to achieve twice the necessary combined airflow for cooling and combustion. In normal operation these fans run at reduced flow while provide the required cooling, but should one or two of the fans fail, the speed of the remaining fans automatically increase to compensate.

The roof mounted radiator allows the basic external dimensions to be kept down to 13.5M x 2.44M while still allowing room for the roof mounted nominal 4-hour daily service fuel tank of 2120 litres and the integral fire & gas system.

Roof mounted exhaust gas silencers with integral spark arrestors were produced from 304 stainless steel for durability in the offshore environment.

The enclosure Fire & Gas control panel with combined sounder beacons monitors the multiple UV flame detectors and flammable gas detectors installed on the container. The control panel performs weighted monitoring to reduce false alarms. Detected flammable gas trips the motorised gastight dampers fitted to inlet and outlet apertures and shuts down the engine with the air intake shut-off valves. Carbon dioxide fire suppression is included with four-off 45kg CO^2 cylinders (Water mist or inert gas fire suppression options are also available).

Roberts concluded: "In this industry's challenging environments, it is essential that generated power is secure safe and reliable. From application through design, build, test and installation, this project has demonstrated Dale Power Solutions' ability to deliver best practice in offshore power solutions.

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