WBPS POWER YOU CAN TRUST

PROJECTS

WB Power Services (WBPS) was first established in 1983 and since then we have grown significantly in size and service capability. Today, we provide critical power services to some of the UK's most important businesses and organisations, ensuring essential services are protected. We proud to retain our family values on a national scale as we strive to be the biggest and the best power generation company in the UK.

CASE STUDY

HYPERSCALE DATA CENTRE GROUP – PHASE 1

Over a number of years, we have worked very closely with this global Data Centre operator to support in the design, supply installation and commissioning of a range of high quality and cost-effective generator packages of various ratings and configurations. To date we have designed, supplied, installed and commissioned nearly 120 generating sets of various ratings and configurations. All packages being designed to meet the power requirements of a particular data hall, the space envelope available for the generator package, scalability of the requirement as well as electrical distribution and level of operational redundancy required, all delivered to a very tight client driven programme.
To fully explore the innovative packages that WB Power Services have been able to offer this client, the power range flexibility offered by Kohler generating sets, control system flexibility, acoustic packaging option and fuel system options: this is the first of three different case studies we have prepared based on the work completed at this site and for this client.

The early design brief issued by the client sought for:

- Scalability of standby power capacity to cater for a range of data hall footprints / capacities
- Utilisation of the same generator building blocks for ease of maintainability and user familiarity
- Control system adaptability with high levels of site wide connectivity
- Good product adaptability but with short production times for shortest possible site build times

Early packages of five generating sets were match to smaller data halls with, by todays standards, relativley low power densities. Later data halls were configured with eight and later nine generating sets some using the same Kohler V715 (715kVA / 572W) or V770 (770kVA/615kVA) rating.

DETAIL OF WORKS

GENERATOR SELECTION

Working closely with the client we identified that a 650kVA 520kW Prime/DCC rated generating set offered the optimum capacity and flexibility to meet their current and foreseeable needs. WB matched this requirement to our partner Kohler's V715 generating set powered by the highly reliable 16L, 6 cylinder Volvo: an engine in volume production for both the standby power and truck markets. Selection of this engine would ensure high availability of product leading to short production times, ready access to spare parts and the flexibility to add more power on future data halls should this be required whilst maintaining the use of the same engine. The engine was matched to the highly efficient Leroy Somer alternator.

The generating sets would be housed in the standard Kohler factory assembled close fit canopy with a standard base tank, again focused on ensure short delivery periods.

The two key adaptations for these sets was the addition of a dual output panel offering an A and B system output, and the provision of dual start motors, starting batteries and battery chargers. This ensured that the client would be able to secure his tier III operational requirements for the data centre. Working with the team at Kohler, WB developed an output and cable connection panel which was mounted on the end of the standard close fit canopy. The output panel was designed to be straightforward for the factory to build and fit but was flexible enough to be adapted for top or bottom cable entry.

CONTROL PANEL SYSTEMS

All of the generating sets utilise the sophisticated Kohler AMP802 control panel and are configured for set-to-set synchronising. The AMP802 is the control system of choice for many of our clients across multiple industries, as it offers a very fast multi set “deadbus synchronising” facility. When configured for this client we were able synchronise all nine sets of one data hall package from start signal to accept load with within ten seconds.

A key function for this client was the ability of the APM802 to “load match” which enables generators to drop out when not required (whilst retain N+1 redundancy), and start again when called upon, this optimises fuel consumption and reduces consumption, emissions and general operating costs associated with the maintenance of the equipment.

The Kohler AMP802 control system also offers a comprehensive range of remote monitoring / status interface options which include RS485 and Modbus etc which are available via volt free connections, ethernet or fibre optic connections. In this application the generating sets are connected to both the onsite BMS and EMS systems. By way of an example of the level of flexibility offered by the APM802 the fuel level of each generator day tank can be remotely identified, auto minimum fill level adjusted, or an auto tank replenishment initiated from the central control location.

With the client using an A and B output distribution system in order to both fulfil its tier III requirements and facilitate on load transfer of loads from bar A to B and vis versa it was essential to provide a comprehensive breaker status monitoring system. Fitted with the prerequisite levels of I/O and using the APM802’s in built programmable logic capabilities this requirement was readily managed whilst at the same time offered for remote display to both the clients independent BMS and EMS systems.

FUEL SYSTEM

Each generating set is complete with an eight hour bunded day tank; this is fed via a pressurised fuel distribution system from multiple large fuel bulk tanks which range in capacity from 30,000 to 65,000 litres depending on the number of connected sets. The bulk tanks are a split tank design with valved balance pipe, offering additional system resilience to the fuel distribution system. The fuel distribution system is completed with the deployment of duty standby pumps (with bypass) and a high-performance fuel polishing system installed within the bunded area of each bulk tank. All of these elements are in place to enhance reliability, facilitate ease of maintenance and potential replacement of components without taking the fuel distribution system offline.