

# Contracting Powerprofile

**Customer:** Balfour Beatty Engineering Services

**Location:** Queen Elizabeth Hospital, Birmingham

**Customer requirement:**

12MVA standby power generation

**Equipment:** 6 x Cat® 3516, 11 kV generator sets, 2 x Cat 3412 generator sets, C18 generator set, GEH220 generator set

**Services:** Planning, supply, design and build, installation, commissioning, ongoing maintenance and service

## Power Need

The new £560m super hospital in Birmingham will be the first new acute hospital built in the city for 70 years. It will have 1105 beds and will replace the Selly Oak and the Queen Elizabeth hospitals.

Un-interrupted power supply in the event of a mains failure is critical for a hospital. The sheer scale and complexity of this project means that few organisations would be able to meet the brief.



## Solutions

This turnkey project involves providing 12MVA of standby power, the high voltage switchgear, the power management system and the design and erection of the energy centre, which will house the generator sets.

Finning has project managed the entire scheme from initial conception with the client through to design, construction and fit out of the energy centre shell. This included sound attenuation for the powerhouse and other plant areas, power management and controls, 10 Caterpillar diesel generator sets and associated ancillary equipment as well as fully integrating the systems into the hospital infrastructure. Housed within the new energy centre building are 6 high voltage (HV) generator sets, high voltage substations and switchrooms, control rooms and operations facilities. Plus a further 4 low voltage (LV) sets installed in different locations in purpose built plant rooms around the new hospital campus.



## Results

In the event of a mains failure, the system will prioritise critical loads; shedding and restoring power supplies as necessary. With 10 substations around the site, it can also reconfigure the HV ring main so that power reaches critical areas in the event of a ring circuit fault.

The Caterpillar HV generator sets are designed to synchronise with each other onto a HV switchboard for onward distribution of power around the site via a dual ring HV network.

The LV sets will operate as single units providing back up power to substations not supported by the HV generators on the main hospital ring. All equipment and systems have been designed to provide N+1 functionality with back up systems in the event of system failure. This ensures security of supply to the critical areas of the hospital during utility outages.

Finning is also contracted to provide ongoing support for the project after construction is complete, with a service agreement for the energy centre which will also cover the existing plant on the old hospital sites.

