

EASYSURE

3 x 1000 kVA PRIME Rated Generator Sets



The Customer

This NHS Trust is one of the largest health care provider in southwest London, with their main site in Tooting, South West London. This is one of the country's principal teaching hospitals and is shared with St George's, University of London which is a dual faculty institution offering medicine, biomedical sciences and health and social care sciences.

**Largest health care
provider in southwest
London**

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Project Brief

The customer required The Generator Company to design, manufacture, deliver, install and commission new Standby generator sets and their associated plant, our scope of works under this contract included:

- 3 x 1000 kVA PRIME rated 'open' Cummins generator set(s)
- Acoustic attenuation package designed to achieve 79 dBA @ 1m (3 sets running)
 - 1 x 47650 litre bulk fuel tank, 3 x 1600 litre day tanks + fuel transfer pumps and control panel(s)
 - Lubricating Oil Make-up system per generator set
 - External foam connection point and sprinkler heads in plant room for fire brigade hook up
 - Master Control Panel (suitable for multiple incoming supplies)
 - Delivery to site, off load, position & install generator sets, master control panel, acoustic package, exhaust & fuel transfer system etc.
 - Commissioning of generator set(s)
 - REACTIVE loadbank for commissioning
 - 'Doomsday Test'
 - Client Training
 - 12 month Maintenance Contract



All systems were designed such that a 4th set could be incorporated at a later date; this included designing the attenuation system to facilitate upgrade with the minimum of disturbance in a very restricted plant room. The Master Control Panel was also designed to accommodate 4 generator sets at the initial installation stage so the hardware of the panel would not need modifying only the software.

Project Management

The project was awarded via a Main Contractor with The Generator Company being responsible for the above scope of works, an experienced site manager was appointed to the project to ensure that the daily running of the project went smoothly and that all necessary drawings and other associated aspects of the project were managed in an appropriate and timely manner.



Generator Set

In line with the requirements of the site The Generator Company supplied 3 x 1000 kVA Prime rated Cummins powered generator sets, each generator had a set mounted control panel to facilitate set to set parallel operation each set.

Reflecting the potential for extended running periods each set was supplied with an automatic lubricating oil make-up system; this was located immediately adjacent to the generator sets and allowed the sump to be automatically topped up between services intervals as required.

Controls Specification

Each generator set was supplied with a set mounted control panel suitable for facilitating 'set to set' parallel function and synchronising onto a common bus, these worked in conjunction with our Master Control Panel, the LV

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switchboard (supplied by others) and building management system / SCADA (by others)

The free standing Master Control Panel supplied as part of our scope of works was designed to work in conjunction with the set mounted parallel panels and provided functionality for automatic load shedding / add and load demand which allows all sets to start together in the event of a mains failure situation, synchronise and then adjust to site requirement by shutting down sets if required. The system was required to work in conjunction with 5 off separate substations / incoming supplies and was designed for short term parallel with no-break return to mains from any outage.

A 15" HMI screen was incorporated within the panel complete with mimic screens indicating status of the elements of the system, this included single line screens displaying the system status by a combination of animation, text messages and pop indicators. The status / conditions displayed include:

- Individual generator sets and bus configuration with breaker status indicated by change of colour and semaphore
- Generator mode (manual / off / auto)
- Generator status (normal / shutdown / load demand)
- Feeder circuit breaker status indicated by change of colour and semaphore

The outputs from the Master Panel were configured such that it was a central interface point into the buildings existing SCADA system.

Acoustic Package

The acoustic package for this project required the inlet attenuation to be fitted at high level to one end of the plant room drawing air from a plenum created in the roof space of the building, the inlet attenuation was manufactured off site and installed prior to the roof being fitted to the building, whilst the discharge attenuation was fitted at low level and delivered to site in kit form to be assembled in situ due to space restraints.

The exhaust system was supported from the floor with a free standing gantry; this was designed such that it can be extended to accommodate a future 4th set. A twin wall stainless steel flue was installed from the outlet of each exhaust silencer turning through 90 degrees to penetrate the roof and terminating with a cowl to protect against ingress of rain.

Fuel System

Each generator set was supplied with a locally positioned daily service fuel tank sized for approximately 8 hours operation, these are fed from a remotely located bulk fuel tank with a usable capacity of 47,650 litres, a duplex fuel transfer pump set is installed on the bulk tank with a fuel transfer panel and slave panel to allow independent fuel call off for each day tank, each generator has a fusible link and fire shut-off valve installed to allow isolation of the fuel feed to the plant room in the event of a fire within the room.



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Access

The equipment was installed within a plant room, this was a modified storage area and restrictive spatially for the required generator sets. Access for all equipment was via one of the discharge attenuator apertures with the generators being landed onto a small hard standing and then 'skated' into position across the room. Other equipment also entered the room in this manner with the exception of the inlet attenuation which was lowered into position



prior to the roof of the building being installed.

Installation

The installation works for this project were undertaken in a building that was restricted and as such careful management of on site activities and trades etc. was essential. The equipment was installed against an aggressive timescale for the level of works required.

Commissioning

The 3 off generator sets were commissioned individually and then operating in parallel with each other against a REACTIVE loadbank of our supply. Once this had been proven the sets were configured for short term mains parallel and a 'Doomsday Test' was conducted out of normal hours to ensure all systems performed as required in a mains failure situation, the complexity of the system required our engineers to interface with commissioning personnel from the other essential services suppliers and the Regional Electrical Company to ensure a functioning system was handed to the client within the minimum time frame practical.