

Generator and Utility Paralleling Control System Upgrade



Project Brief

A generator was required to supplement an existing unit at the main distribution hub near London to accommodate expansion of the site. The customer required The Generator Company to design, manufacture, install and commission a new 1500kVA PRIME Rated Standby Generator for parallel operation with one existing generator and two utility power supplies.

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CASE STUDY

The Generator was specified to be housed within its own acoustic container complete with inlet and discharge attenuation and an engine exhaust system designed to achieve 70 dBA @ 1m, a daily service fuel tank, lighting and small power, fire detection panel and external load box suitable for a bus bar trunking connection.

A new generator paralleling control system was also required due to the existing Puma Generators control system being obsolete and only designed to operate with one generator. The design challenges included the new control system having to operate in conjunction with two existing Merlin Gerin Switchboards, and the height of the generator enclosure was severely restricted due to local authority planning restrictions. The height issue was overcome by side mounting the engine exhaust silencer.

Generator Set

In line with the requirements of the site The Generator Company supplied a 1500 kVA Prime rated Cummins powered generator set, the set was purchased as 'Level 1' skeletal unit from Cummins Power Generation, it was then up fitted with our own a set mounted engine control panel to facilitate set to set parallel operation, the existing MTU powered Puma generator was modified on site to accommodate the same control system.

Controls Specification

A TGC1000 Generator Paralleling Control System was offered for the project as this will interface with any engine or alternator combination and was ideal for the application required at this site in view of the fact that a new Cummins/Newage generator was being supplied and that the existing equipment was fitted with an MTU Engine and Newage alternator. Due to the flexibility of the control system it also has a function that will enable it to parallel with two Utility supplies and an infinite number of circuit breakers.

The control system enclosure was manufactured to a bespoke design with regards to its physical dimensions due to access restrictions at the site. The system also had to accommodate the two generators being installed approximately 200 metres away from the paralleling switchgear.

The control system was also designed to enable it to operate in a "Long Term" Utility Paralleling mode of operation utilising the clients own G59 export protection equipment.

Installation

The generator was witness tested by the client and a 4 hour inductive loadbank test carried out prior to delivery to site. The generator enclosure had to be designed in such a way that it could be disassembled for transport due to its physical size, and this was achieved by making the attenuators, exhaust system, and load terminal box removable.

Installation of the generator included the provision of a 500,000 kg capacity crane to lift the generator onto the roof of the building into an area with limited access. New bus bar trunking was also required to connect the new generator to its corresponding paralleling circuit breaker located in the basement of the building.

The existing fuel transfer system had to be modified to accommodate the second generator with larger fuel transfer pumps and a new control system with additional overflow protections incorporated.

Commissioning

The site had to remain live during the installation and commissioning works save for a 4 hour window that was permitted during an out of hours period to enable commissioning of the Utility paralleling functions to be carried out.