

Installation of 1 x 1500kVA Generator Set and Associated Plant



Project Brief

To design, manufacture, deliver, install and commission a new Standby generator set plus associated plant, our scope of works under this contract included:

- 1 x 1500 kVA PRIME rated 'open' Cummins generator set
- Acoustic container designed to achieve 75 dBA @ 1m and incorporating an 8 hour daily service fuel tank, a lub oil top up system, lighting and small power, fire detection panel and an external cable connection box, container equipped with motorised inlet and gravity discharge louvres

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CASE STUDY

- 1 x 1500 kVA PRIME rated 'open' Cummins generator set
- Acoustic container designed to achieve 65 dBA @ 1m and incorporating a lub oil top up system, lighting and small power, external cable connection box and fire detection panel
- 1 x 8800 litre bulk fuel tank located at ground level
- Remote day tank due to weight restrictions at roof level
- Fuel transfer system incorporating fuel transfer pumps and control panel and circa 350m of transfer pipe work
- Master Control Panel incorporating G59 and closed transition operation
- Delivery to site, off-load, position & install generator sets, master control panel, acoustic package, exhaust and fuel transfer system etc.
- Commissioning of generator set, Master Panel and fuel transfer system
- Off site Witness Test against REACTIVE loadbank
- 12 month Maintenance Contract

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 ran smoothly and 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 1 x 1500 kVA Prime rated Cummins powered generator set with a set mounted control panel and local protection circuit breaker.

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

Controls Specification

The generator set was supplied with a set mounted control panel suitable for facilitating single set operation with parallel function and synchronising onto a common bus, this worked in conjunction with the supplied Master Control Panel, the LV switchboard (supplied by others) and building management system (by others)

The free standing Master Control Panel supplied as part of our scope of works was a Cummins MC250 panel and designed to work in conjunction with the set mounted parallel panel and provided functionality for automatic load shedding / add with the system was designed for short term parallel with no-break return to mains from any outage, the G59 relay was incorporated.

The panel was supplied with a high resolution colour touch screen (5.7 Inch) with flexible, custom graphical information and control displays, password protected for security. A Membrane-Style Operator Panel ensured a totally sealed operator panel with membrane switches provides protection to internal controls, all controls accessed via this panel and numerous menu driven screens.

CASE STUDY

Acoustic Package

A 'walkround' style acoustic container was supplied, this was designed to accommodate the generator set and achieve a noise level of 65 dBA @ 1m in assumed free field conditions. The container was supplied with an internal electrical package including lighting, small power and a heater cable entry into the container was via an externally mounted Load Terminal Box designed to accommodate the incoming armoured site cables and associated control cabling. A single zone fire panel was incorporated within the container with BMS output for interconnection with the on site building systems.

The exhaust system was mounted on the roof of the acoustic container and comprised primary and secondary silencers to achieve the required noise level; a catalytic convertor was incorporated in the primary section of the system.

Fuel System

The generator set was supplied with a remotely positioned daily service fuel tank sized for approximately 4 hours operation, the tank was not located within the container due to localised weight restrictions on the steel framework holding the generator set.

A bulk fuel tank was located at ground level, this was an 8800 litre double skin tank sized to allow the set to run for 18 hours and spare capacity for the content of the roof mounted tank, a duplex fuel transfer pump set installed on the bulk tank with a fuel transfer panel fed the roof mounted tank, a remotely located fill point cabinet was installed complete with appropriate transfer pipe work.

Fuel transfer was via 165m of pipe in pipe fuel feed line, this ran vertically from the tank room to third floor level, across the building in the ceiling void then vertically up to roof level to be connected to the day tank via motorised valves, a further pipe run connected the day tank to the engine an additional 10m away. Further provision made for a fuel dump line to evacuate the contents of the day tank from roof level in the event of an emergency; this was also approximately a 175m long run.

Access

The acoustic container was installed at roof level, the main body of the container was lifted to into position then the attenuation and exhaust silencers were fitted in-situ.

Installations

The installation works for this project required careful coordination of our on site activities with other trades on site.

Commissioning

The generator set and its associated fuel transfer panel were commissioned with the generator being tested against site load. 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.