

The Generator Company Generator Power System Modernisation at Grade II Listed Offices in Mayfair



With extensive refurbishments taking place at grade II listed offices in Mayfair, London, The Generator Company were approached for the provision of an upgrade to the property's existing back-up generator power system.

This formidable Grade II listed property, was originally constructed between 1665 to 1673 and was built on the site of Berkeley House.

It encompasses office space of 71,700 ft², boasts a charming treetop view of one of London's most beautiful parks and is surrounded by the West End's most prestigious streets, including Piccadilly, Stratton Street and Berkeley Street. This impressive commercial building provides the ultimate location for companies looking for affordable luxury offices hence the investment in the upgrade.

Client

London Offices FM

Project Specifications

Design, installation and integration of existing and new equipment to upgrade the back-up generator power system as part of the refurbishment programme.

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The stunning modernisation at this site not only included the new interior design of the commercial office space but also an overhaul of the mechanical and electrical facilities and services.

This was a fantastic opportunity for The Generator Company and an exciting challenge to provide a solution and commercial proposal to completely renew the site's existing back-up generator power system to align with the upgrade of the site's M&E facilities and services as well as the modernisation of the commercial space.

There were some major challenges to overcome within a modicum of space set to a stringent timeframe. **In summary these were:**

- *To carry out thorough and detailed site visits of existing equipment and their capabilities.
- *To design a new bespoke built generator system that would fit within the existing basement level plantroom and operate with existing exhaust system and attenuation package where possible.
- *To ensure its seamless integration with the existing and new services.
- *The removal of the existing generators and old system parts from a basement level and light well via very narrow corridors and service lift with weight limit of 2 tonnes.
- *The installation of the new generators in CKD and associated equipment via narrow corridors and service lift and rebuild in situ.
- *The commissioning of the new back-up generator power system.

The submission of our proposal was met with a favourable response from the client however they had not worked with us before so were keen to visit our Rochester and Dover facilities to get a better understanding of our capabilities and to see where we would build each bespoke generator and associated controls gear.

A mutually agreeable date was set for their visit to meet with our dedicated Team for this project and to discuss the details and delivery in more depth. The meeting proved incredibly successful and immediately followed by the placement of a sub-contract to proceed with the works. As soon as the sub-contract was mutually and amicably negotiated and agreed there was no time to lose in proceeding with design drawings and ordering the new equipment and ancillary items to build a bespoke back-up generator power system to ensure the schedule of works would run smoothly and to the required deadlines.

Our solution and proposal comprised:

- *The bespoke design and build of 3 x new 500kVA prime rated diesel powered Volvo TAD 1641 generators with a narrow base and alternator housing to fit into the existing basement plantroom.
- *The provision of a temporary generator hire package for the duration of the site works.
- *The removal of 2 x 750kVA Petbow generators and associated redundant equipment from the existing basement plantroom, which required a complete breakdown due to access, space and weight restrictions.
- *The installation of 3 x new 500kVA prime rated diesel powered Volvo TAD 1641 generators including their strip down prior to delivery and rebuild into the existing basement plantroom, again due to access, space and weight restrictions.
- *The temporary retention of an existing 3rd 750kVA Petbow generator, located in a separate plantroom, which required its site load to be supported by the newly installed generators which then required removing to give way for additional office space.
- *The installation of a new air cooling and attenuation package including new air inlet fans, air inlet attenuators, discharge air attenuators, and duct work, connecting to existing duct work at high level.
- *The installation of a new exhaust silencer system including new exhaust silencers, pipework and connection to existing exhaust flues.



*The installation of a new bespoke built Master Control Panel [MCP] based on Deep Sea Electronics Panels DSE8660 providing complete power management of the new system as well as interfacing with the existing switchgear and building management systems [BMS].

*The comprehensive commissioning with onsite loadbanks, an integrated system load test and client training. At our Dover Facility, to enable testing before the installation, the new generator engines and auxiliary components were purchased and assembled, each with a purpose built generator control panel.

Due to the very short program, at the same time, another team of installation engineers commenced breaking down the old existing sets on site at the property.

Before dismantling the old generators our in-house rental department, Powerhire, coordinated the scheduling, supply and installation of a temporary generator to ensure back-up power protection throughout the removal of the existing sets and the incorporation of all the new equipment whilst the site remained live.

With restricted access and limited space our engineers installed a temporary gantry over the existing generators to enable the dismantling process. Cables, water and fuel pipes, exhaust bellows, silencers, the alternator, engine mounts, heat exchangers, bulk tanks, attenuators and the base frame for each generator were disconnected. The alternator and then the engine were lifted into the skates, removed from the room and taken through a narrow corridor into the goods lift where they were taken from the basement up to the ground floor. With numerous trips, as the lift space and weight restrictions allowed, the remaining parts followed using the same process and once all the old parts arrived at ground level they were systematically skated from the lift, through double doors and utilising our HIAB they were loaded onto vehicles ready for disposal.

The only way of removing the old sets was to methodically break each one down. Its components required removing from the basement by skating them to the goods lift via a narrow corridor, on sub level -2, in order to get them up to the ground level for disposal. The removal of the old sets required intricate planning as there were not only space restrictions on getting to the lift; the lift was also tight on space with a 2 tonne weight limit.

Once the new generators at our Dover facility were successfully tested in their entirety they were broken down and readied onto our HIAB for delivery and installation. Before arriving onsite a new base was constructed in the basement for the addition of the 3rd new generator. As soon as the base was complete and all the new equipment delivered to site our engineers worked in reverse of the dismantling and removing the old sets as above. Once again, with patience and skill they expertly manoeuvred, skated, located and rebuild the new 3 x 500kVA generators and new ancillary components within the generator room in the basement. They diligently made all the required re-connections and finally routed the cabling from each new generator into 3 separate link boxes.

The link boxes were then connected into a free standing DSE8660 MCP, designed and supplied by ourselves and installed and located in a separate quieter room, which then connected into the site's new switchboard. The MCP will allow the client to manage all or each of the generators at any one time. It will manage single or multiple set synchronisations, load sharing, transfer switch capabilities, operational performance, off site monitoring and much more.



With the upgrade of any back-up power system old parts are often no longer fit for purpose and new components are usually inevitable. We replaced an existing day fuel tank and installed 3 day new base fuel tanks as well as introducing a new fuel polishing unit to the existing fuel bulk tank to keep the fuel clean and avoid contamination.

We also renewed the exhaust system, which included fitting a new flue from each new generator that we then connected via silencers to existing building flues to exhaust via the roof on level 9 and via building level 2. Our engineers tested the existing flues before we connected up the new ones to ensure their integrity.

We also designed a more cost effective way of cooling the back-up generators as well as the plantroom they are located in. Instead of using expensive remote radiators to combat overheating, our engineers were able to utilise the fans on each of the generators' engines to blow the hot air out of the room via an existing pre-tested mains flue to discharge at ground level.

From receiving the project approval it took just 2 ½ months of careful planning and engineering, helped immensely by our in-house resources, to remove the old and out of date plant and install the entire new back-up generator power system. We couldn't have asked for greater project dedication and performance from our engineers and this was an integral part of meeting all our pre-agreed deadlines to the client's immense satisfaction.

Generator: System Design Supply Install Hire Service Maintenance

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