



1. Description of the proposal and plant summary

The hospital is configured with twelve sub-stations strategically located around the hospital. The sub-stations have emergency power support to serve patient areas in the event of external loss of mains power from the utility supplier or an internal fault.

The hospital's maximum load demand has been recorded at 7.5MVA and Capital & Estates department is in the final stages of upgrading the existing electrical intake infrastructure from the external utility supplier to 10MVA. This is required to maintain resilience and a degree of redundancy to allow suitable maintenance to be carried out by the Trust on the system without compromising critical services and patient care.

The emergency power systems at the Royal Free London hospital are currently supported by two emergency generator systems referred to as G1/G2 system and G3 system.

The G1/G2 generator system comprises of two individual generators each rated at 2.1MVA (Total 4.2MVA). They were installed when the Hospital was originally built in the 1970's and have been suitably maintained and are in an operational condition. However, the control system serving the G1/G2 generators is operating past its recommended working life and is due for replacement. The G3 generator system, installed in 1995, comprises of a single generator rated at 2MVA, this also is in a serviceable condition, though is operating at its maximum capacity.

The existing combined emergency generator power system capacity at the hospital is 6.2MVA.

The existing emergency power system is currently operating at full capacity. The recent addition of theatre 15 and 16 is currently supported with emergency power by means of a temporary standalone generator positioned on Rowland Hill Street which is not linked into the main emergency power infrastructure.

The key objective of this project is to add the required additional capacity to accommodate the new theatres and other developments within the clinical blue print which will require additional emergency power provision. Beyond this objective, the investment required will also strengthen the resilience of the emergency power system, engineering out a number of single point failure risks.

The new G4 generator of 2MVA capacity will provide an increased level of resilience and will also provide additional capacity to support new and existing loads. This new G4 system will be configured and integrated within the existing G3 generator system to provide N+1 redundancy to the hospital's emergency generator power system.

In addition to the installation of new G4 generator set, this project will include for the replacement of existing main switchgear that is nearing end of its useful working life. In addition new components to enhance and extend provision of the emergency power distribution infrastructure to priority areas such as Theatres 15 & 16, the lifts, Imaging department and the energy centre is also included.

In summary, the key elements of this project are:-

- The installation of a new 2MVA emergency power Standby generator (G4) and integrate into existing G3 generator system.
- Upgrade existing G1/G2 generator controls arrangement and associated switchgear.
- Integrate Theatres 15 & 16 within the emergency power distribution infrastructure
- Strengthen power resilience to the lifts, Imaging department and energy centre.

This project will also improve and simplify the operational aspects of the emergency power controls to restore power in event of an external mains failure or an internal fault event.

2. Access proposals

The new plant area does not impact on public access around or within the hospital. Access to the plant area will be from the existing hospital and restricted for maintenance personnel.