

DIVISION 16 - ELECTRICAL

Section 16620 - Standby Power Generator Systems

Introduction

The design for emergency power generation takes on two separate designs at this campus. For the typical building at the main campus, it is generally used only to provide power to emergency lighting and similar building maintenance pieces of equipment. In some other buildings additional loads are added for such things as freezers or other types of mechanical equipment which need to be on due to worry about losses of expensive equipment (including some valuable experiments) which are stored in the freezers. For this reason, it will be necessary to discuss in great detail the design of the emergency generation system with the Engineer, prior to the proposal of the system. As a part of the design the following items should be taken into account:

- In general, we require that the fuel type for any new emergency generators be #2 diesel. Be aware that we may require natural gas or bio-fuel units from time to time. Coordinate needs with the CPM.
- Make sure that the generator will be adequately cooled in case of loss of power to the general building system. It may be necessary to provide additional capacity for the generator just to cover an additional fan coil unit to provide cooling to the generator room if it is located inside of a closed room in the building.
- Provide for adequate exhaust from the building in a location where the fumes will not be sucked into the building air conditioning system during normal or emergency conditions.

In addition, it may be decided that some of the emergency generator systems will in the future be used for peak shedding. For this reason, it is important that the generator provided be of a top brand of manufacture and designed for more than just an occasional run emergency operation. Engine generators shall be site tested for rated output plus 10% for 1 continuous hour, connected for temperature, based on capability to operate continuously at 115°C ambient. (Refer to base specification).

As a part of the design development documents, provide a load calculation which is used for providing the basis for the sizing of the emergency generator. Taking into account that at least 30% spare capacity shall be provided for in the design of the emergency generator.

As part of the plans design make sure that the required circuits for the battery charger and the engine oil and manifold heaters are shown and provided.

Remote control or annunciation panels shall be shown on the drawings with all the required wiring. Show ATS (automatic transfer switch) and all associated wiring on the plans. Fire alarm shall monitor generator run and generator trouble via a relay at the annunciation panel, and each ATS position (connected to emergency source.) Fire alarm shall control normal weekly generator exercise and load transfer (via a fire alarm relay at each ATS.) Refer to DSS 16720 for connection details.

It is the responsibility of the engineer to provide a complete specification for this design.

Part 1 - General

- Provide complete submittals on the emergency generator, including at least 4 copies of all operations and maintenance manuals. Submittal information shall include documentation on fuel efficiency based on a KW per pound of gas. This should be provided for evaluation by the engineer prior to approving the use of any brand of emergency generator set.
- distribution for legally required loads and optional loads as outlined in Article 700,701 and 702 of the applicable NEC-70. This shall include, but not be limited to, telephone equipment, servers, cooling for telephone and server equipment and elevators. (elevators where required by ANSI 17, SFM or ADA).

Part 2 - Products

- The generator should be the product of a top-quality generator manufacturer such as Caterpillar or pe-approved equal as listed. For product to be considered the manufacture or manufacturer's representative shall have a service department within 50 miles of the project location and must have factory trained or factory qualified service technicians in the local service department.
- Generator shall have a docking station for load bank testing and connection of a temporary generator without having to disconnect the load feeders from the generator.
- Engine Generator System shall have a 10-year top available option extended warranty. Whenever the transfer switch manufacturer offers an extended warranty, it shall be included with a 10-year top available option.
- The contractor shall provide (2) complete sets of parts and repair manuals for all engine, generator and transfer switch systems and components.
- The generator shall be connected to Cat Connect for monitoring to provide all operational and load data points.

Part 3 - Execution

- The generator shall be bolted to a housekeeping pad and if in a building, there shall be a containment area built around it to contain any oil or anti-freeze spills. The generator shall be installed and connected to meet the requirements of the manufacturer.
- Provide a resistive load bank test of all generators prior to acceptance. Minimum tests should show all required control options of the generator and transfer switch as well as a one-hour load bank test at 80% load and an additional one hour load bank test at 110% load, corrected for temperature of 115° C. Generator shall also be tested in a full load live situation test prior to acceptance.

End of Section 16620