

Space Requirements for Electrical Rooms

CASHMAN
Power Solutions



Electrical Room Space Requirements

The space requirements for standby and emergency power systems often do not rank at the top of an architect's design list.

Consequently, service personnel can find themselves in tight quarters when these power systems are jammed into areas that meet only minimum safety requirements and don't take serviceability into account.

Building service equipment and the associated personnel must have an advocate early in the design process. It is far easier and less expensive to plan for adequate space and access in the design phase than to compromise on unit size and retrofit equipment to fit in cramped areas, which are difficult to access. A properly designed power system space will provide expected performance and reduce maintenance costs.

Basic Room Requirements

Minimum requirements set for the National Fire Protection Association (NFPA) in the National Electric Code (NEC) are that a person must be able to complete service duties with enclosure doors open and for two people to pass one another. If maintenance must be done at the rear of the cabinet, similar access space must be available.

The NEC also requires 3 to 4' (1m to 1.3m) of aisle space between live electrical components of 600 volts or less, depending on whether live components are on one or both sides of the aisle. This requirement holds even if components are protected by safety enclosures or screens.

Installations over 600 volts require even wider aisle space, from 3' (1m) to as much as 12' (4m) for voltages above 75kV. Service rooms with 1,200 amps or more require two exits in case of fire or arcing. Because transformers vary, make sure minimum wall clearances are met as specified by the manufacturer.

Specific rules and exceptions are spelled out by the NFPA in its recently revised NEC rules.

Genset Space Needs

Caterpillar suggests floor space between an engine and parallel wall space or another genset should not be less than the width of the engine. There should be enough space overhead to allow convenient removal of cylinder heads, manifolds, exhaust piping, and any other equipment for service. Consider specifying enough room for a chain hoist or overhead crane. Space fore and aft of the engine should allow camshaft removal.

Batteries to start gensets should be kept as near as possible to the engine to avoid long energy robbing cables. The fuel tank should be located near gensets to prevent long fuel line runs which can tax fuel pumps. Access to this equipment for service must also be considered in the design phase.

Switchgear Considerations

Controls and switchgear are best housed in a separate air-conditioned room next to the genset with a window into the engine room. Switchgear that can't be placed in a separate room should be located to take advantage of incoming air to cool the switchgear.

Consider Remote Options

Many times, building demands for emergency power increase so dramatically that the standby facility outgrows the space it was originally allocated. Consider the following remote options:

- Remote radiators. Radiators mounted on rooftops or inconspicuously at ground level outside can open up floor space and help lower room temperature when gensets are in operation. NOTE: We recommend remote radiators as a last resort. Increasing the complexity of your design and adding components to the system inherently affects its reliability. The complexity of new Tier III and IV emissions-compliant products and their associated cooling systems exacerbate the challenges associated with them.

Space Requirements for Electrical Rooms

CASHMAN
Power Solutions



- Remote switchgear. Switchgear placed in another service area near the genset room opens floor space and helps keep operators out of high decibel areas when gensets are in operation and protects delicate electronics from the heat and vibration associated with these machines.
- Stand alone packages. Here, the total genset installation is moved to a separate building or a standalone pre-package genset is utilized. Self-contained units can be equipped with removable wall and/or roof sections that allow for genset maintenance and repairs.