

# Consultant's Corner: Electrical Room Space Requirements



consultants corner

## Electrical room space requirements

The space requirements for standby and emergency power systems 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 must have an advocate early in the design process. It is far easier and less expensive to plan for adequate space in the design phase than to compromise on unit size and retrofit equipment to fit in cramped areas.

## Basic room requirements

Minimum requirements set for the National Fire Protection Association (NFPA) in the National Electric Code (NEC) is 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 feet (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 hold even if components are protected by safety enclosures or screens.

Installations over 600 volts require even wider aisle space, from 3 feet (1m) to as much as 12 feet (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.

## Gen set space needs

Caterpillar recommends floor space between an engine and parallel wall space or another gen set should not be less than the width of the engine. Overhead, there should be enough space allocated 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 gen sets should be kept as near as possible to the engine to avoid long energy robbing cables. The fuel tank should be located near gen sets 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 gen set 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 out grows 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 gen sets are in operation.
- Remote switchgear. Switchgear placed in another service area near the gen set room opens floor space and helps keep operators out of high decibel areas when gen sets are in operation.
- Stand alone packages. Here, the total gen set installation is moved to a separate building or a stand alone package is utilized. Stand alone, self contained units can be equipped with removable wall sections that allow for gen set maintenance and repairs.