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Emergency Power Systems:

Small Changes in Code Text = Significant Changes to the Design

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CODE CHANGES HAVE A LARGE AFFECT ON SPACE AND COST

Since September 11, 2001 and recently due to Hurricane Katrina the building industry has seen an enormous spike in the request for Emergency Power Systems and the upgrading/ updating of such systems. With that in mind, there have been several changes in the recent code cycles that are having tremendous impacts on what is required for an Emergency Power Supply System (EPSS), when they are required, and how they are applied.

In planning for electrical needs within a building, one of the first items coordinated with the Electrical Engineer is the electrical room(s) required. NFPA 110 7.2 states that Level 1 EPSS equipment shall not be installed in the same room with the normal service equipment, where service equipment is rated over 150 volts to ground and equal to or greater than 1000A. Level 1 systems are imposed when failure to perform may result in the loss of human life or serious injuries. In plain terms, this means that a separate electrical room is required for the Emergency Equipment (switchgear, panels, etc).

In a change that has a large impact on the fuel storage requirements of a building, the on-site fuel requirements for Level 1 EPSS systems now requires **96** hours of on-site storage if the location of the facility falls within Seismic Zones 3 or 4 (this encompasses several areas of Ohio and West Virginia). NFPA 5.5.1.1 states that fuel supplies for a Level 1 EPSS system cannot be shared for any other purpose, for example, to provide a backup fuel source to domestic water heaters and boilers. A new requirement of NFPA 110 5.5.3 requires the fuel reservoir must be at least **133%** of either the low fuel indication level or the quantity needed to meet run-time requirements – a major increase in the size of the storage vessel from previous requirements. Level 1 installations also necessitate the use of a generator control panel that allows remote operation of the equipment with visible indication of volts and amps for each phase, frequency, and a voltage adjustment rheostat or controls to allow +5% voltage adjustment.

Another item of significance is in regards to emergency power requirements for elevators. This code cycle introduced new requirements for buildings with four or more stories. The International Building Code (IBC), which is referenced in the Ohio Building Code, requires buildings to have the elevator be part of the emergency standby power system, and therefore have an EPSS. This is most significant for new construction projects that had not planned for an emergency standby

generator. This would also apply to elevator modernization projects, however it is possible that the Authority Having Jurisdiction might allow a variance for this requirement.

Lastly, there are some significant changes in the IBC with regards to emergency egress lighting. The new code states that emergency egress lighting shall be carried out to the public right of way. This right of way is further defined as "A street, alley, or other similar parcel of land essentially open to the outside air, deeded, dedicated, or otherwise permanently appropriated to the public for public use and having a clear width and height of not less than 30 feet and 6 feet." The remote emergency light typically installed above an exterior door for emergency egress illumination now has to provide adequate lighting to the public right of way. One problem that presents itself is that the public right of way could potentially be a good distance from the egress door(s) of the building. It is feasible that additional light fixtures on the exterior of the building or along the egress path will be required to provide the required illumination and uniformity ratios set forth in NFPA 101.

These Emergency Power Supply Systems and their components' requirements appear to only be small changes in their respective sections. However, each of these items has a large impact, both in a financial aspect and a space aspect. These items can definitely increase the project cost of the electrical system, and can require additional space for increased equipment size and number of components. It is important that the Project Architect, Building Owner, Estimator, and Electrical Engineer begin coordination of these items early in the project to ensure they are accounted for.