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## UTAH CHAPTER of IAEI

### Emergency Systems vs. Legally Required Systems

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Among the many difficult concepts in the NEC, emergency systems and legally required standby systems may be one of the hardest concepts for people to grasp. I think the reason for this is that it takes the collaboration of at least two codes to correctly implement these components. The NEC contains the requirements for emergency systems in Article 700, and legally required standby systems in Article 701. The NEC does not, however, tell us when these systems are required to be installed, nor does it tell us which components of the building are required to have emergency or standby power. These requirements can be found in the International Building Code (IBC). Chapter 27 contains a summary of locations in a commercial building where these systems are required. For example, exit signs and means of egress illumination require emergency power [See 2003 IBC 2702.2.3, 2702.2.4, 10011.5.3 and 1006.3]. Elevators that are required for the purposes of egress are required to have standby power, as required by IBC 1007.4 for accessible egress, and 403.10.2 for high rise buildings. Hospitals, on the other hand, require the elevators to be on the emergency system [NEC 517.32(F)]. As you can see, it takes knowledge of more than just one code to design, review and inspect these systems.

The NEC has three groupings of backup power systems, and they are as follows: Emergency Systems (Article 700), Legally Required Standby Systems (Article 701) and Optional Standby Systems (Article 702). These Articles and their respective topics are arranged logically according to priority. For example, the emergency system will be providing functions that are essential to physical survival, such as illumination, whereas legally required systems control things that are more prevalent to rescue operations and the like, such as elevators. Taking third place on the list of priorities is the optional standby system, which is providing power for things that are not critical in nature, such as task illumination, heating, air conditioning and refrigeration, and are not required to be installed by any other applicable codes.

After the designer or plans examiner has determined the right type of system to employ, the rules of the applicable code Article must be addressed. One of the requirements that I see overlooked most often is the requirement found in 700.6(D). The requirement found here is that only emergency loads can be located in the emergency transfer switch enclosure. On a plan I was reviewing only last week, I had to make the note of requiring *two* transfer switches for *one* generator. This was because the designer had mistakenly called the elevator an emergency load, which it is not. This installation also required *two* electrical panels, due to the rules found in 700.9.

There are also many other code rules that are worth mentioning about these systems. For example, A permanent sign must be installed at the service disconnect, indicating the presence of an emergency or standby system (700.8, 701.9 and 702.8).

Another much overlooked requirement is the rule found in 700.12(F) for unit equipment. Included in this section is the requirement for the circuiting of battery powered unit equipment, such as exit signs and “bug-eye” style lighting fixtures. These fixtures must be installed on the same circuit as the general lighting in the area served by the emergency fixtures. 700.16 also contains an interesting requirement, and that is that the required emergency lighting cannot be dependant upon a single bulb to illuminate the area. This is a much violated rule where exit discharge (exterior) illumination is required.

In closing, there are many, many requirements that need to be considered when designing or inspecting a backup system. A careful reading of Articles 700, 701 and 702 is a valuable investment.

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