

2008 NEC Article 708 and SPD Commissioning (continued)

As previously discussed in our last article on this subject, the Critical Operations Power Systems, commonly referred to as COPS appears for the first time under Article 708 of the 2008 NEC. These systems are defined in the NEC as ***"power systems for facilities or parts of facilities that require continuous operation for the reasons of public safety, emergency management, national security, or business continuity."*** These systems may involve complete facilities or specific areas defined as DESIGNATED CRITICAL OPERATIONS AREAS or DCOA. These areas are specific to designated locations within a facility that requires critical operations power. Our focus today will be on the ***"business continuity"*** portion of this definition.

The immediate question becomes, what is a critical operations power system? While it is correct and as previously stated, The Fine Print Note No. 1 in Article 708 states that ***"Critical operations power systems are generally installed in vital infrastructure facilities that, if destroyed or incapacitated, would disrupt national security, the economy, public health, or safety, and where enhanced electrical infrastructure for continuity of operation has been deemed necessary by governmental authority."*** Given this definition, facilities that may fall into this realm may include air traffic control centers, HAZMAT facilities, hospitals, water and sewage treatment facilities, 911 centers to name a few.

However, looking at the broader scope of 708 as stated in 708.1, we see that: ***"the provision of this article apply to the installation, operation, monitoring, control, and maintenance of the portions of the premises wiring system intended to supply, distribute, and control electricity to designated critical operations areas (DCOA) in the event of disruption to elements of the normal system."*** The scope goes on to state that ***"Critical operations power systems are those systems so classed by municipal, state, federal, or other codes by any governmental agency having jurisdiction or by facility engineering documentation establishing the necessity for such a system. These systems include, but are not limited to; power systems, HVAC, fire alarm, security, communications and signaling for designated critical operations areas. "***

From a ***"business continuity"*** standpoint, the critical factor is that the implementation of COPS systems is NOT only subject to governmental

requirements; but, applies to the private sector as well. This is shown immediately above in the broader scope of 708.1, "**facility engineering documentation establishing the necessity for such a system**" in the private sector as well, is a key determining factor for COPS implementation.

As stated previously, the Scope of Article 708 is considerably broader than in standard NEC articles. For example. 708.3 includes Application of Other Articles; 708.4 addresses Risk Assessment and .5 addresses Physical Security. 708.6 includes Testing & Maintenance and 708.8 specifically discusses Commissioning.

Under these sections, some of the specific requirements include the following:

- Comprehensive facility engineering documentation
- Telecommunications and controls protection
- More security, redundancy and fire protection
- Automatic operation
- Minimum 72-hour run time
- Full-load witness testing
- Ongoing testing, maintenance and service.

Of particular focus today is Section III, Power Sources and Connection. According to 708.20, Sources of Power, (A) General Requirements, "**Current supply shall be such that, in the event of failure of the normal supply to the DCOA, critical operations power shall be available within the time required for the application. The supply system for critical operations power, in addition to the normal services to the building and meeting the general requirements of this section, shall be one or more of the types of systems described in 708.20 (D) through (H).**"

The specific systems covered in (D) through (H) are as follows:

- (D) SURGE PROTECTION DEVICES
- (E) STORAGE BATTERY
- (F) GENERATOR SET
- (G) UNINTERRUPTIBLE POWER SUPPLIES
- (H) FUEL CELL SYSTEM

With specific focus on **(D) SURGE PROTECTION DEVICES**, it is stated that "**Surge protection devices shall be provided at all facility distribution voltage levels.**" Thus, Low Voltage Surge Protective Devices will be a critical component within these systems.

That is why **Surge Suppression Incorporated**[®] has, throughout its history, been very "hands-on" in assisting consultants, owners and contractors to ensure three very specific, critical things are accomplished:

1. Each specific SPD model that was specified is installed and properly connected to the correct piece of equipment or panel/switchboard as intended by the designer.
2. Each SPD is installed to help ensure maximum performance by the SPD (i.e.: as close to the load to be protected as possible for phase, neutral and ground wires.)
3. Each SPD is installed correctly with each wire as short as possible, no sharp bends, 90-degree angles, extended leads, etc. Each SPD is installed in strict accordance with the provided installation instructions from the manufacturer, the written specification, and the NEC.

This type of attention to detail is an element of the commissioning that will be even more critical in the COPS environment. In the hardening of existing facilities as well as new facilities that have COPS system requirements, surge protective devices are absolutely essential. As part of this effort, **SSI** has provided consultants throughout the world with a guide-form specification in which we have included specific language to cover inspection requirements to verify the three critical elements described above. Perhaps most importantly it also helps to protect the consultant and the owner by placing the compliance responsibility squarely on the shoulders of the installer and/or contractor, as it should be. It contains specific language stating the consultant will not sign off on the project until receipt of written notification from the SPD manufacturer certifying that all pertinent criteria in the specification are satisfied.