

device type and settings protecting the transfer equipment, shall be field marked on the exterior of the transfer equipment.

In this requirement, the term *short-circuit current rating* (see Article 100) includes all the various options by which the product standard evaluates transfer switches for fault currents, such as short-circuit withstand and closing rating, short-time current rating, and the common industry term withstand/close-on rating.

Product standards require transfer equipment to be marked with the short-circuit withstand/closing or short-time current rating (short-circuit current rating). Some transfer switches are marked by the manufacturer with several options, each resulting in a different short-circuit current rating. Short-circuit current rating values can vary based upon the overcurrent protective device (OCPD) type, ampere rating, and setting. The field marking required by this section documents the specifics of the protection scheme and verifies compliance with 110.3(B) and 110.10.

**701.6 Signals.** Audible and visual signal devices shall be provided, where practicable, for the purposes described in 701.6(A), (B), (C), and (D).

**(A) Malfunction.** Malfunction signals indicate a malfunction of the standby source.

**(B) Carrying Load.** Load carrying signals indicate that the standby source is carrying load.

**(C) Battery Charging Malfunction.** Battery charging malfunction signals indicate charging malfunction on a battery required for source readiness, including the prime mover starting battery.

Informational Note: See NFPA 110-2019, *Standard for Emergency and Standby Power Systems*, for signals for generator sets.

**(D) Ground Fault.** Ground-fault signals indicate a ground fault in solidly grounded wye, legally required standby systems of more than 150 volts to ground and circuit-protective devices rated 1000 amperes or more. The sensor for the ground-fault signal devices shall be located at, or ahead of, the main system disconnecting means for the legally required standby source, and the maximum setting of the signal devices shall be for a ground-fault current of 1200 amperes. Instructions on the course of action to be taken in the event of an indicated ground fault shall be located at or near the sensor location.

For systems with multiple emergency sources connected to a paralleling bus, the ground-fault sensor shall be permitted at an alternate location.

Informational Note: See NFPA 110-2019, *Standard for Emergency and Standby Power Systems*, for signals for generator sets.

Although 701.31 specifies that automatic ground-fault protection of equipment is not required to be provided on the alternate source, ground faults can occur on such systems, and they can result in equipment burndown. Because of the importance of legally required systems, automatic disconnection of power in

the event of a ground fault is inappropriate. Detection of such a fault, however, is required so that the condition can be corrected.

If multiple sources are connected to a paralleling bus, the ground-fault sensor can be located on feeders connected to the bus, rather than to each of the sources. With this arrangement, ground-fault protection can easily discriminate between more critical and less critical loads. The system would not be disabled for a downstream fault and critical loads such as fire pumps and emergency circuits can be alarmed, while less critical circuits can be tripped. This results in overall better protection for less critical systems and better reliability for critical circuits.

### 701.7 Signs.

**(A) Mandated Standby.** A sign shall be placed at the service entrance indicating type and location of each on-site legally required standby power source.

*Exception: A sign shall not be required for individual unit equipment as specified in 701.12(I).*

**Δ (B) Grounding.** Where removal of a grounding or bonding connection in normal power source equipment interrupts the grounding electrode conductor connection to the alternate power source(s) grounded conductor, a warning sign shall be installed at the normal power source equipment stating:

WARNING  
SHOCK HAZARD EXISTS IF GROUNDING  
ELECTRODE CONDUCTOR OR BONDING JUMPER  
CONNECTION IN THIS EQUIPMENT IS REMOVED  
WHILE ALTERNATE SOURCE(S) IS ENERGIZED.

The warning sign(s) or label(s) shall comply with 110.21(B).

Legally required standby systems that have a solid (unswitched) neutral in the transfer equipment (nonseparately derived system) rely on the grounding and bonding connections in the normal source supply equipment to ensure that the ground-fault current path is completed from a ground fault to the alternate source. If a main or system bonding jumper is removed [e.g., to perform testing on ground-fault protection of equipment (GFPE) systems], service personnel could inadvertently become part of the current path if a ground fault occurs.

## Part II. Circuit Wiring

### Δ 701.10 Wiring Legally Required Standby Systems.

**N (A) General.** The legally required standby system wiring shall be permitted to occupy the same raceways, cables, boxes, and cabinets with other general wiring.

Unlike emergency system wiring, which must be kept entirely independent of other wiring to ensure reliability, the wiring for legally required standby systems may be installed with other general (normal) wiring because legally required standby system loads are not essential for life safety.