

not a longer-term power failure until the utility automatic protective devices fail to restore power to the facility. For example, the 10-second power restoration requirements would become effective after the 2-second recloser cycle.

Once the load is transferred to the alternate source, another timer delays transfer back to the normal power source until that source has time to stabilize. Another important function of this timer required by 700.12(D)(1) is to allow an engine generator to operate under load to ensure continued good performance of the set and its starting system. This delay should be automatically nullified if the alternate source fails, and the normal source is available.

Engine generator manufacturers often recommend a cool-down period for their sets that allows them to run unloaded after the load is transferred back to the normal source. A third time delay, usually 5 minutes, is provided for that purpose. Running an unloaded engine longer is usually not recommended, because it can cause deterioration in engine performance.

If more than one ATS is connected to the same engine generator, it is sometimes recommended that transfer of the loads be sequenced to the alternate source. Using a sequencing scheme can reduce starting capacity requirements of the generator. A fourth timer, adjustable from 0 to 5 minutes, will delay transfer to the emergency supply source for this and other similar requirements.

Δ (A) General. Transfer equipment shall be automatic, listed, and marked for emergency use. Transfer equipment shall be designed and installed to prevent the inadvertent interconnection of normal and emergency sources of supply in any operation of the transfer equipment. Transfer equipment and electric power production systems installed to permit operation in parallel with the normal source shall meet the requirements of Article 705. Meter-mounted transfer switches shall not be permitted for emergency system use.

Most ATS are not designed to permit parallel operation of generation equipment and the normal source. Compliance with Article 705 is necessary only where the transfer allows parallel operation with the normal supply. Certain ATS configurations are intentionally designed to briefly (for a few cycles) parallel the generation equipment with the normal source upon load transfer from generator to normal source. That load transfer method may result in minimal disturbance or effect on the load. If continuous parallel operation of generation equipment and the source is desired, paralleling switchgear or paralleling equipment with appropriate protection is required.

(B) Bypass Isolation Transfer Switches. Means shall be permitted to bypass and isolate the transfer equipment. Where bypass isolation transfer switches are used, inadvertent parallel operation shall be prevented.

Δ (C) Automatic Transfer Switches. Automatic transfer switches shall be electrically operated and mechanically held.

N (D) Redundant Transfer Equipment. If emergency loads are supplied by a single feeder, the emergency power system shall include redundant transfer equipment or a bypass isolation transfer switch to facilitate maintenance as required in 700.3(C) without jeopardizing continuity of power. If the redundant transfer equipment or bypass isolation transfer switch is manual (or nonautomatic), then it shall be actively supervised by a qualified person when the primary (automatic) transfer equipment is disabled for maintenance or repair.

Exception: The requirement for redundancy with the transfer equipment shall not apply where any of the following conditions exist:

- (1) All processes that rely on the emergency system source are capable of being disabled during maintenance or repair activities without jeopardizing the safety to human life.
- (2) The building or structure is unoccupied and fire protection systems are fully functional and do not require an alternate power source.
- (3) Other temporary means shall be permitted to be substituted for the emergency system.
- (4) A written emergency plan that includes mitigation actions and responsibilities for qualified persons to address the recognized site hazards for the duration of the maintenance or repair activities shall be developed and implemented. The emergency plan shall be made available to the authority having jurisdiction.

(E) Use. Transfer equipment shall supply only emergency loads.

Informational Note: Transfer equipment that supplies emergency loads provides separation of this load type from any others and is independent of any equipment used to combine or parallel sources.

The alternate power source can supply emergency loads as well as other loads. However, the emergency system transfer switch is limited to supplying emergency loads. Legally required standby loads and optional standby loads (covered by Articles 701 and 702) require separate transfer switches. A typical emergency system transfer switch is shown in Exhibit 700.1.

(F) Documentation. The short-circuit current rating of the transfer equipment, based on the specific overcurrent protective 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* 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