

July 19, 2016

DEDSTF Substation Meeting

## Title of Section II

### Original wording:

Design Criteria for Electrical Facilities Connected to the PJM 500kV, 345kV and 230kV Transmission System

### Proposed wording:

Section II – Design Criteria for Electrical Facilities Connected to the PJM 765kV, 500kV, 345kV, 230kV, 161kV, 138kV, 115kV and 69kV Transmission System

## AC Station Service

### Original wording:

Two independent sources with automatic throwover (emergency generators may be required where black start capability is required).

### Proposed wording:

There must be two AC sources in which a single contingency cannot de-energize both the primary and back-up station services. An automatic throwover switch with an auxiliary contact for SCADA alarm is required to provide notification of loss of primary station service.

Distribution lines shall not be used as a primary source.

Station service transformers shall be protected by surge arresters.

Emergency generators may be required where black start capability is required.

~~For existing stations, any new station service connections (center-tapped ground, corner ground, etc.) must match the existing station service connections.~~

Due to the large auxiliary loads in 765kV and large EHV stations, multiple station service load centers may be required. The relay protective scheme must be selective and remove from service only the faulted station service transformer.

All station service transformers shall have high side overcurrent protection (via a fuse or a bus protection scheme if the transformer is solidly connected to the bus).

## DC Supply

### Original wording:

Separate batteries for primary and back up protection are desired. 8 hour capacity required for all control batteries, and they should be fed with 2 independently supplied chargers.

### Proposed wording:

Separate batteries for primary and back up protection are required. An 8 hour capacity is required for all control batteries, and they must be fed with 2 independently supplied chargers. Provisions must be made to facilitate the replacement of a failed charger or battery bank. The station batteries are to be sized in accordance with the latest version of IEEE-485 Recommended Practice for Sizing Lead-Acid Batteries for Stationary Applications or IEEE-1115 Recommended Practice for Sizing Nickel-Cadmium Batteries for Stationary Applications. The battery charger shall be able to supply the station DC power requirement and at the same time to bring the station battery to “fully charged” condition in less than 24 hours following a prolonged discharge period due to an AC power failure.

## Grounding Design

### Original wording:

1 ohm or less

### Proposed wording:

The station ground grid shall be designed in accordance with the latest version of IEEE Std. 80, Guide for Safety in AC Substation Grounding. The fault current calculations should include future improvements which would increase the fault current. It is recommended to use a growth factor of 20% if growth is expected and specific information is not available to include in the calculations.