

V.I

PJM DESIGN AND APPLICATION OF AC STATION SERVICE FOR TRANSMISSION FACILITIES

1.0 SPECIFICATION

- 1.1 As a minimum requirement, AC station service systems and equipment shall be designed for the purpose intended and should support Clause II (Transmission System Design Criteria) and be specified to meet requirements of all applicable industry standards, including but not limited to ANSI, IEEE, NEMA, OSHA and NESC.
- 1.2 AC station service equipment is available in varying degrees of quality. Equipment installed in a transmission facility should be designed to operate reliability during the design life of the facility. This generally requires “utility grade” versus “industrial grade” quality products and specifications should reflect this need.
- 1.3 Low side interrupting devices should be breakers rather than fuses.
- 1.4 All copper electrical contact parts and conducting mechanical joints should be silver surfaced and aluminum electrical contact parts and conducting mechanical joints should be tin surfaced.
- 1.5 AC station service cables may be run in the same tray systems as other AC circuits 480 volts and below and with 125vdc control circuits, however, they should not be commingled with low level digital signal circuits and analog signal circuits.
- 1.6 AC circuits should be adequately sized and designed to limit voltage drop to no more than 5% continuous and 10% momentary.
- 1.7 The main power sources for the AC station service systems must be from independent supplies and/or separate power busses.

2.0 APPLICATION AND INSTALLATION

- 2.1 Loads are generally categorized by electrical size in determining the appropriate supply voltage. Typical voltages would be 480Y/277V, 208Y/120V, and 240/120V.
- 2.2 Service reliability further categorizes loads as they are allocated to service panels with (essential loads) and without backup or alternate supplies and transfer switches. All equipment critical to the operation of the transmission facility should be provided with backup station service. This would include power transformers, breakers, SCADA, telecommunications, battery chargers, fire pumps, oil pressure systems, motor-operated disconnect switches, etc.
- 2.3 Transfer switches may be installed internal or external to their associated switchboards, however, if they are located externally, they should be located adjacent to the switchboard to minimize the exposure of the single set of cables supplying the switchboard. For large electrical loads, such as a power transformer with oil pumps, dedicated transfer switches would be located at the power apparatus with primary and alternate power supplies with electrical and physical separation routed to the switch.

- 2.4 All devices connected to the AC station service system must be capable of operating continuously and properly without malfunction or overheating in the voltage range specified by the designer of the system.
 - 2.5 AC station service system components must be installed in accordance with manufacturer's instructions and applicable industry standards.
 - 2.6 All AC station service systems shall be adequately monitored and alarmed all voltage levels to assure that improper operation and abnormal conditions are reported for immediate corrective action.
 - 2.7 AC station service systems should be physically arranged to facilitate safe and effective inspection and maintenance.
 - 2.8 Critical transmission facilities should be provided with emergency engine-generator sets sized to carry essential loads considering a reasonable diversity factor. If not, facilities should be available for prompt connection of emergency generation. Remoteness of the location, adversity of weather conditions, refueling cycles, etc. should be considered in determining required fuel capacity.
- 3.0 MAINTENANCE
- 3.1 See Section V.L.2.I for maintenance requirements.