

2.4 TRANSIENT VOLTAGE SURGE SUPPRESSION (TVSS) SYSTEM

- A. Furnish and install a Transient Voltage Surge Suppression (TVSS) System as herein specified and as shown on the Drawings. TVSS devices shall be as manufactured by Current Technology or Liebert.
- B. The TVSS devices shall be of a parallel multi-staged hybrid design and shall be UL Listed according to UL Standard 1449 Second Edition. The single pulse surge current capacity and minimum repetitive surge current capacity shall be verified by an independent nationally recognized testing laboratory. The minimum repetitive test impulse shall be a 1.2 X 50 usec, 20 KV open circuit voltage and 8 X 20 usec, 10 KA short circuit current Category C3 bi-wave at one minute intervals. After testing the suppression module shall not degrade more than 10% of the pre-test clamping voltage. Test data shall be acquired and supplied as indicated in NEMA LS-1-1992. Summary data is not acceptable. Actual test logs are mandatory. This information shall be provided by the contractor as part of the approval. The complete system shall comply with Local, State and National Codes. The enclosure shall be a NEMA 4/12.
- C. The primary transient voltage surge suppression network shall be a high energy shunt network, capable of dissipating the energy associated with a lightning strike. Each suppression element in the TVSS shall be individually fused to ensure that the failure of a single component or the operation of a single fuse remains isolate and does not render the entire mode inoperative. All fuses shall be UL Listed per UL 248-1. The TVSS shall be capable of withstanding the full single pulse surge current capacity for every mode without operating or failure of any fuse. The following modes of protection shall be provided: line-to-line; line-to-ground; line-to-neutral; and neutral-to-ground. Service entrance devices shall have a rating of 200,000 amperes of tested single pulse surge current capacity per mode. Non-service entrance devices shall have a rating of 80,000 amperes of tested single pulse surge current capacity per mode.
 - 1. Each TVSS device shall have an integral disconnect switch that is electrically/mechanically interlocked so that the enclosure door can only be opened with the disconnect in the off position. Devices other than service entrance can be connected to a distribution/overcurrent device in lieu of the above.
- D. For service entrance devices the TVSS shall include a integral digital monitoring package. The included monitoring package shall give instantaneous readings of true RMS phase voltage, N-G voltage, N-G current, % protection and fuse status. In addition, the following events shall be stored in memory: sags, surges outages and transient disturbances. The monitoring system shall include an audible alarm with a back-up battery feature.
- E. The TVSS system shall include Form C dry contacts that are activated by loss of phase or failure of the TVSS system.

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- A. All wiring shall be in accordance with the manufacturer's recommendations and shall be performed in compliance with the National Electric Code and all applicable state and local codes.
- B. The TVSS shall be connected direct to the protected bus. The NEC ten foot tap rule shall be utilized. The conductors shall be tie wrapped and routed directly to the connection point, no 90 degrees bends shall be utilized.
- C. For service entrance devices the suppression unit shall be attached directly to the enclosure that contains the bus to be protected. Electrical attachment shall be direct to the bus that is to be protected. Tap rules shall be followed and overcurrent protection shall be omitted.
- D. The manufacturer shall provide detailed installation drawings and wiring diagrams.
- E. The manufacturer shall warranty the TVSS system for a period of seven years.