SECTION-B 2.8

TRANSIENT-VOLTAGE SURGE SUPPRESSION

2.8.1 PREMABLE

A. TRANSIENT-VOLTAGE SURGE SUPPRESSION

1. This section of specification defines the technical requirements for Transient-Voltage Surge Suppression as specified in accordance with the requirements of the Contract Documents and codes.
2. Scope of work: Supply, Installation, Testing and commissioning of the Transient-Voltage Surge Suppression, complete as specified in the schedule of requirement meeting the intent of the Tender. This specification shall be used in conjunction with all drawings, Schedules of requirement and the attached BOQ.
3. The CONTRACTOR shall provide all accessories required to complete the installation.
4. The equipment shall comply with the technical specification and guaranteed technical particulars specified herein. Any deviations to the specification shall be clearly indicated clause by clause.
5. The components shall be designed to handle a maximum peak current (ISPD) of 75kA per line. Type 1 surge arrestors shall be provided to protect against dual 8/20 and 10/350µs waveforms to all MLTP panels or as noted on the SLDs and Contract Documents.

B. Ensure all equipment and systems are to provide electromagnetic compatibility within the systems and with any other systems installed in the same location.

C. The Contractor shall install cable containment systems in line with manufacturers recommendations and shall ensure all works are in line with recommended EMC mitigation measures in IEC 61000-5 (Installation and mitigation guidelines).

2.8.2 SUMMARY

A. General: This section of specification defines the technical requirements for Transient-Voltage Surge Suppression as specified in accordance with the requirements of the Contract Documents and codes.

B. Scope of work: Design, Manufacture, Assembly, Inspection, Testing at Manufacturer's Works, Delivery to Site and Commissioning of the Transient-Voltage Surge Suppression, complete as specified in the schedule of requirement meeting the intent of the Tender. This specification shall be used in conjunction with all drawings, Schedules of requirement and the attached BOQ. Scope of work includes Installation, testing and commissioning of work required for satisfactory operation.
   1. The SELLER shall provide all accessories required to complete the installation.

C. Section includes field-mounted TVSS for low-voltage up to 600 V power distribution and control equipment.
   The equipment shall comply with the technical specification and guaranteed technical particulars specified herein. Any deviations to the specification shall be clearly indicated clause by clause.

D. DEFINITIONS

   1. ATS: Acceptance Testing Specifications.
   2. SVR: Suppressed voltage rating.
   3. TVSS: Transient voltage surge suppressor(s), both singular and plural; also, transient voltage surge suppression.

E. Code & standards

   1. Electrical Components, Devices, and Accessories: Listed and labeled as per IS 732 1989 (reaffirmed 2005),, by a testing agency, and marked for intended location and application.
   2. Comply with IEEE C62.41.2 and test devices according to IEEE C62.45.
   3. Comply with UL 1284 and UL 1449.
   4. Comply with IS 732 / NBC.
   5. BS 7671 – 17th Edition Wiring Regulations

2.8.3 SUBMITTALS

A. Product Data: For each type of product indicated. Include rated capacities, operating weights, electrical characteristics, furnished specialties, and accessories.

B. Product Certificates: For TVSS devices, from manufacturer.
C. Operation and Maintenance Data: For TVSS devices to include in emergency, operation, and maintenance manuals.

2.8.4 QUALITY ASSURANCE

A. QA/QC shall be as per manufacturer's standard.

2.8.5 MANUFACTURERS

A. Approved Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to those listed in Section G.

2.8.6 CONSTRUCTION

TECHNICAL DATA

A. Surge Protection Devices:
   1. Comply with UL 1449.
   2. Modular design (with field-replaceable modules).
   3. Fabrication using bolted compression lugs for internal wiring.
   4. Integral disconnect switch.
   5. Arrangement with wire connections to phase buses, neutral bus, and ground bus.
   6. LED indicator lights for power and protection status.
   7. Audible alarm, with silencing switch, to indicate when protection has failed.
   8. Four-digit transient-event counter set to totalize transient surges.

B. Minimum single impulse current ratings, using 8-by-20-mic.sec waveform described in IEEE C62.41.2

2.8.7 DELIVERY, STORAGE, AND HANDLING

A. Deliver, store, and handle bus assemblies according to Standards' recommendations.

2.8.8 EXECUTION

2.8.8.1 EXAMINATION

A. Examine elements and surfaces to receive switchgear for compliance with requirements for installation tolerances, required clearances, and other conditions affecting performance. Proceed with installation only after unsatisfactory conditions have been corrected.

2.8.8.2 INSTALLATION

A. Install TVSS devices at service entrance on load side, with ground lead bonded to service entrance ground.

B. Install TVSS devices for panel boards and auxiliary panels with conductors or buses between suppressor and points of attachment as short and straight as possible. Do not exceed manufacturer's recommended lead length. Do not bond neutral and ground.

C. Provide multiple, circuit breakers as a dedicated disconnecting means for TVSS unless otherwise indicated.

2.8.8.3 CONNECTIONS

A. Tighten bus joints, electrical connectors, and terminals according to manufacturer's published torque-tightening values.

2.8.8.4 FIELD QUALITY CONTROL

A. Testing Agency: Engage a qualified testing agency to perform tests and inspections.

B. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect, test, and adjust components, assemblies, and equipment installations, including connections.

C. Verify that electrical wiring installation complies with manufacturer's written installation requirements.

D. Perform tests and inspections.

E. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect components, assemblies, and equipment installations, including connections, and to assist in testing.

F. Tests and Inspections:

Perform each visual, mechanical inspection and electrical test stated in Standards.

After installing TVSS devices but before electrical circuitry has been energized, test for compliance with requirements.

Complete startup checks according to manufacturer's written instructions.

G. TVSS device will be considered defective if it does not pass tests and inspections.

H. Prepare test and inspection reports.

2.8.8.5 CLEANING

A. Vacuum dirt and debris; do not use compressed air to assist in cleaning.

2.8.8.6 PROTECTION

A. Provide final protection to ensure that moisture does not enter bus assembly.

2.8.8.7 DEMONSTRATION

a) General: Manufacturer’s factory-authorized service representative to train Owner’s personnel in the operation of the Unit.

b) Equipment: Check operation of each unit with Owner’s personnel present and before Substantial Completion. Determine that operational systems and devices are functioning properly.

c) Instruction: Instruct Owner's personnel in proper use, maintenance, adjustment, and repair of each component.

END OF SECTION-2.8