

SECTION 26 13 13
MEDIUM-VOLTAGE CIRCUIT BREAKER SWITCHGEAR
METAL-CLAD, VACUUM, 38 kV

PART 1 - GENERAL

1.1 SCOPE

- A. This section includes medium-voltage metal-clad circuit breaker switchgear and its associated auxiliary equipment. The equipment shall consist of *[indoor] [outdoor, non-walk-in] [outdoor Shelter-Clad, single-aisle, walk-in]* switchgear with horizontal drawout, vacuum circuit breakers.

1.2 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions apply to this Section.

1.3 SUBMITTALS

- A. Submit shop drawings and product information for approval and final documentation in the quantities listed according to the Conditions of the Contract. All transmittals shall be identified by purchaser name, purchaser location and purchaser's order number.
- B. Approval documents shall include:
 - 1. General arrangement drawing showing dimensioned elevation and floor plan, foundation details and one-line diagram
 - 2. Panel arrangement drawing showing layout of devices on the panel doors
 - 3. Three-line diagrams
 - 4. Schematics
 - 5. Nameplate engraving drawings
 - 6. Electrical bill of material.
- C. Final documents shall include:
 - 1. Documents listed in 1.3.B above
 - 2. Wiring diagrams
 - 3. Recommended spare parts list for start-up support
 - 4. Instruction manual.

1.4 QUALITY ASSURANCE

- A. Manufacturer qualifications: The bidder must have at least 15-years experience in manufacturing medium-voltage metal-clad switchgear and circuit breakers. The manufacturer of the metal-clad switchgear assembly shall also be the manufacturer of the circuit breakers.
- B. Comply with requirements of latest revisions of applicable industry standards, specifically including the following:
 - 1. ANSI/IEEE C37.20.2 - Metal-Clad Switchgear
 - 2. ANSI/IEEE C37.04 - Rating Structure for High Voltage Circuit Breakers
 - 3. ANSI/IEEE C37.06 - Preferred Ratings for High Voltage Circuit Breakers
 - 4. ANSI/IEEE C37.90 - Relays and Relay Systems.

1.5 DELIVERY, STORAGE AND HANDLING

- A. Deliver in convenient shipping groups. Shipping groups shall not exceed 16 feet in length.
- B. Aisle for the outdoor, Shelter-Clad, single-aisle switchgear shall be shipped *[disassembled for erection in the field] [factory assembled, on a separate truck from the switchgear]*.
- C. Bus bars with associated hardware for connections between shipping groups shall be shipped inside one of the units in which shall be installed.

- D. Contractor shall store the equipment in accordance with manufacturer's recommendations.
- E. Contractor shall install temporary heaters, if necessary, to prevent condensation during storage.
- F. Contractor shall handle and move the switchgear in accordance with manufacturer's recommendations.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. *[The metal-clad switchgear assembly shall be as manufactured by SIEMENS or approved equal. Approved manufacturers are as follows:*

- 1. *SIEMENS*
- 2. *.]*

2.2 RATINGS

- A. System configuration: The switchgear shall be suitable for application in three-phase, *[60 Hz] [50 Hz], [grounded-neutral] [ungrounded]* system.

- B. Electrical ratings:

- 1. Circuit breaker and switchgear ratings shall be based on *[MVA class and ANSI/IEEE C37.04-1979]* or *["constant kA" ratings and ANSI/IEEE C37.04-1999]*. The first one is MVA class and the second and third are constant KA rated. *[Choose one of the three categories. Delete the other two.]*

- a. *[Interrupting class: 1,500 MVA*

- 1.) *Maximum design voltage (V): 38.0 kV*
- 2.) *Impulse withstand voltage: 150 kV*
- 3.) *Interrupting current (I) at maximum design voltage: 21 kA*
- 4.) *Voltage range factor (K): 1.65*
- 5.) *Maximum design voltage divided by K: 23.0 kV*
- 6.) *Interrupting current (IK) at V/K: 35 kA*
- 7.) *Short-time withstand current: 35 kA*
- 8.) *Momentary withstand and closing and latching current: 56 kA rms and 95 kA peak].*

- b. *[Interrupting class: 31.5 kA*

- 1.) *Maximum design voltage (V): 38.0 kV*
- 2.) *Impulse withstand voltage: 150 kV*
- 3.) *Interrupting current (I) at maximum design voltage: 31.5 kA*
- 4.) *Voltage range factor (K): 1.0*
- 5.) *Short-time withstand current: 31.5 kA*
- 6.) *Momentary withstand and closing and latching current: 50 kA rms and 85 kA peak].*

- c. *[Interrupting class: 40 kA*

- 1.) *Maximum design voltage (V): 38.0 kV*
- 2.) *Impulse withstand voltage: 150 kV*
- 3.) *Interrupting current (I) at maximum design voltage: 40 kA*
- 4.) *Voltage range factor (K): 1.0*
- 5.) *Short-time withstand current: 40 kA*
- 6.) *Momentary withstand and closing and latching current: 62 kA rms and 104 kA peak].*

- C. Circuit breaker rated interrupting time *[five-cycles] [three-cycles]*.

- D. Switchgear main bus continuous current *[1,200 A] [2,000 A] [3,000 A]*.

2.3 SWITCHGEAR GENERAL CONSTRUCTION

- A. The switchgear enclosure shall be of metal-clad construction as described in ANSI/IEEE standards.
- B. The switchgear shall be factory assembled into convenient shipping groups and tested. The switchgear shall be of a coordinated design so shipping groups shall be easily connected together at the site into a continuous lineup. Necessary shipping split connecting busbars, boots and hardware shall be furnished and shall be attached to the switchgear in the approximate locations where they shall be needed.
- C. The switchgear assembly shall consist of one or more vertical sections, each of which shall have a main bus compartment and two vertically stacked equipment cells. The lower cells shall be arranged for circuit breakers or auxiliary devices or shall be blank as indicated in the detailed specification. The upper cells shall be arranged for auxiliary devices or shall be blank as indicated in the detailed specification.
- D. Each main bus compartment shall contain copper bus bars **[silver-plated at electrical connection points] [tin-plated at electrical connection points]**, three-phase, three-wire, fully insulated with heat shrink tubing or equivalent. Bus connection joints shall be insulated with preformed PVC boots held together with nylon hardware for easy installation and removal during servicing. Taped joints are not permitted except in unusual joint configurations. The ground bus shall be bare **[silver-plated] [tin-plated]** copper; at least ¼ by two inches and shall extend the full length of switchgear.
- E. Each circuit breaker compartment shall contain a racking mechanism, circuit breaker operated (not racking mechanism operated) automatic shutters and safety interlocks.
- F. Each circuit breaker cell shall also include:
1. Hinged front panel.
 2. Primary and secondary disconnecting devices.
 3. Control circuit cutout device.
 4. Terminal blocks, control wiring and control power buses.
 5. Manual latch to retain circuit breaker in withdrawn position.
 6. Compartment top mounted sliding type secondary disconnects to facilitate inspection of mating of contact from the front and easy accessibility for troubleshooting. Secondary disconnects using plug and socket arrangement with umbilical cord, as well as disconnects not visible for inspection, are not permitted.
 7. Provision shall be made for closed door racking with a manual racking handle. Mechanical position indication shall be visible with door closed.
 8. Racking mechanism shall be simple to install and operate. Racking mechanism using a chain to transmit motion from one side to the other side is not permitted. Provision for installing up to three padlocks shall be integral with the racking mechanism to assure positive position locking of the circuit breaker.
- G. Each auxiliary cell shall include the following:
1. Hinged front panel, suitable for relays and instruments
 2. Necessary terminal blocks, control wiring and control power buses
 3. Device markers.
- H. Switchgear construction shall facilitate floor roll-out of circuit breakers in the lower cells. Guide channels shall be provided for smooth circuit breaker roll-in.
- I. Each vertical indoor section shall be approximately 48" width x 130" depth x 110" height.
- J. The steel used in the structure and panels shall be chemically cleaned, hot phosphate treated, rinsed and oven-dried and shall be given an electrostatically applied coat of ANSI 61 polyester paint.
- K. Enclosure **[Pick one of the following three enclosure types. Delete the other two. The paragraph selected should match the decision made in Section 1.1.A]**
1. **[The indoor enclosure shall be constructed of bolted sheet steel material.]**

2. ***[Outdoor, Shelter-Clad, single-aisle, walk-in enclosure. Single-aisle design shall consist of indoor type circuit breakers and auxiliary cells located in weatherproof steel housing having an operating aisle space of sufficient size to permit withdrawal of the circuit breakers for inspection, test and maintenance. The following shall be included:***
 - a. ***Outdoor enclosure: Painted steel, weatherproof construction; integral structural-steel base frame with factory-applied asphalt undercoating; and equipped with the following features:***
 - 1.) ***Structural design and anchorage adequate to resist loads imposed by 100-M.P.H. wind***
 - 2.) ***[Adequate incandescent lighting controlled by means of three-way wall switches at each access door] [Fluorescent aisle lights with low-temperature ballasts, controlled by three-way wall switches at each access door]***
 - 3.) ***Space heaters in each vertical section, operating at ½ rated voltage, sized to prevent condensation***
 - 4.) ***Louvers equipped with screens and filters, arranged to permit air circulation while excluding exterior dust and rodents***
 - 5.) ***Aisle of sufficient width to permit circuit breaker withdrawal, disassembly and servicing in the aisle***
 - 6.) ***Aisle access doors at each end with outside padlocking provisions and interior panic bars***
 - 7.) ***Two duplex receptacles with integral ground fault protection, one at each aisle access door***
 - 8.) ***[Thermostatically controlled aisle heater] [Thermostatically controlled exhaust fan]***
 - 9.) ***[Thermally insulated aisle, walls and roof]***
 - 10.) ***Additional workspace [48"] [96"] [144"] wide at one end of the switchgear lineup***
 - 11.) ***[Exterior door area lighting consisting of halogen fixtures] [Photocell operated]***
 - 12.) ***[Exterior rotating alarm light]***
 - 13.) ***[Battery operated exit signs above doors].***
3. ***[Outdoor non-walk-in enclosure.***
 - a. ***Non-walk-in design shall consist of indoor circuit breaker and auxiliary units located in a weatherproof painted steel housing, with structural-steel base frame and factory-applied asphalt undercoating; and equipped with the following features:***
 - b. ***Structural design and anchorage provisions adequate to resist loads imposed by 100-M.P.H. wind***
 - c. ***Each unit equipped with an exterior full height hinged front door with provision for padlocking and two inner hinged doors***
 - d. ***Space heaters in each vertical section, operating at ½ rated voltage, sized to prevent condensation***
 - e. ***Louvers equipped with screens and filters and arranged to permit air circulation while excluding exterior dust and rodents***
 - f. ***One lamp in each cell with one on-off switch per section***
 - g. ***One utility duplex receptacle with integral ground fault protection in each section].***

2.4 COMPONENTS

- A. Instrument transformers: Comply with ANSI/IEEE C57.13 and ANSI/IEEE C37.20.2.
 1. Voltage transformers (VTs): Secondary voltage rating of 120 V and accuracy class of 0.3 with burdens of W, X, Y and Z. The VT primary fuses shall be mounted on a rollout tray. The VTs shall be stationary mounted behind the fuse rollout tray. Each tray must accommodate up to three fuses. The auxiliary cell shall be equipped with automatic

- shutters and grounding fingers that remove any static charge from the windings before allowing operator access to the VTs. The fuse rollout tray shall be arranged so that fuses can be accessed with fuse rollout tray in the disconnect position without removal of the rollout tray from the cubicle.
2. Current transformers (CTs): Ratios as indicated; burden and accuracy class as per ANSI, suitable for connected relays, meters and instruments. The CTs shall be bushing mounted. Each circuit breaker bushing shall be able to accommodate two standard accuracy CTs or one high-accuracy CT. The CT secondary wiring shall be connected to shorting terminal blocks with ring tongue terminations.
 3. AC control power shall be furnished from: ***[Pick one of the next two paragraphs. Delete the other. Then, make decisions within the remaining paragraph.]***
 - a. ***[An internally mounted dry-type transformer, including primary and secondary fuses. Control Power Transformer (CPT) shall be [15 kVA single phase] [25 kVA single phase] [50 kVA single phase] [15 kVA three phase] [30 kVA three phase] [45 kVA three phase]. The primary fuses for the CPT shall be mounted on a rollout tray.]***
 - b. ***[An externally mounted transformer, including primary fuses shall be drawout tray mounted in the switchgear. CPT shall be [75 kVA three phase] [112.5 kVA three phase].]***
 4. Suitable automatic transfer scheme is required when control power transformers are provided on the incoming side of the main circuit breakers in double-ended installations, to transfer the secondary load should one incoming supply fail.
- B. Multifunction digital-meters shall be UL-Listed or UL-Recognized, microprocessor-based units suitable for three- or four-wire systems. Units shall be mounted on the instrument compartment door and as follows:
1. For incoming monitoring for main circuit breakers, SIEMENS model ***[9200] [9300] [9330] [9350] [9500] [9600] [9700]*** multifunction power meter with ***[Profibus] [Modbus] [DNP3.0]*** communication protocol shall be provided.
 2. For feeder circuit breakers, SIEMENS model ***[9200] [9300] [9330]*** multifunction power meter with ***[Profibus] [Modbus] [DNP3.0]*** communication protocol shall be provided.
- C. Multifunction protective relaying. Microprocessor-based three-phase relays shall be UL-Listed or UL-Recognized and shall be provided as follows:
1. Main circuit breakers.
 - a. The relays shall be SIEMENS 7SJ63 or bay controller or equivalent. The relays shall include the following protection functions: 50/51, 50N/51N, 67/67N, 27, 59 and 81O/U.
 - b. The relays shall provide trip circuit supervision of the main circuit breaker and alarm on circuit failure.
 - c. The relays shall provide monitoring of the CT and VT circuits and alarm on circuit failure.
 - d. The relays shall provide demand alarms, VAR alarms and power factor alarms.
 - e. The relays shall provide complete metering including amperes, volts, watts, VARs, kWh, power factor, frequency, with demand and min/max information for all current and power quantities.
 - f. The relays shall provide a graphic mimic display visually indicating the position (open/closed) of the circuit breaker, protection function trip and metering data.
 - g. The relays shall provide four programmable function keys to replace toggle switches. The relays shall provide 15 programmable LEDs.
 - h. The relays shall provide key locking to prevent unauthorized switching either local or remote.
 - i. The relays shall be capable of internally performing main-tie-main auto-transfer and auto-restore functions.
 - j. The relays shall have programmable logic capabilities to permit use in protection and control systems. Programming software must be compliant with IEC 61131 standard for PLC programming.

- k. The relays shall have a modular communications processor to permit field change between Modbus RTU, Profibus-DP, Profibus-FMS, DNP3.0 and IEC 61850 protocols. The relays shall be able to support either RS-485 or fiber-optic communications.
- l. The relays shall provide IRIG-B time synchronization for sequence-of-events recording time stamping.
- m. The relays shall provide complete sequence-of-events recording, time stamped in milliseconds. The relays shall provide oscillography (waveform) capture, with configurable pre- and post-fault data capture times.
- n. The relays shall recognize and alarm CT open-circuit or short-circuit conditions.
- 2. Bus protection – full differential.
 - a. The relays shall be SIEMENS 7VH60 or equivalent, high-impedance differential type. The relays shall provide 87B protection function.
 - b. The relays shall have a fast operating time (15 ms).
 - c. The relays shall have LED alarm indicator.
 - d. The relays shall have adjustable maximum voltage pickup setting by a jumper between 60 V and 240 V.
- 3. Feeder protection – advanced overcurrent with communications.
 - a. The relays shall be SIEMENS 7SJ61 or equivalent. The relays shall provide with the following protection functions: 50/51, 50N/51N, 49 and 46.
 - b. The relays shall have four analog CT inputs.
 - c. The relays shall provide trip circuit supervision of the feeder circuit breaker and alarm on trip circuit failure.
 - d. The relays shall be capable of being used in a reverse interlocking bus protection scheme.
 - e. The relays shall provide demand alarms.
 - f. The relays shall have four programmable function keys to replace control switches.
 - g. The relays shall have programmable logic capabilities to permit use in protection and control systems. Programming software must be compliant with IEC 1131 standard for PLC programming.
 - h. The relays shall have a modular communications processor to permit field change between Modbus RTU, Profibus-DP, Profibus-FMS, DNP3.0 and IEC 61850 protocols and must be able to support either RS-485 or fiber-optic communications.
 - i. The relays shall provide complete sequence-of-events recording, time stamped in milliseconds. The relays shall provide oscillography (waveform) capture, with configurable pre- and post-fault data capture times.
 - j. The relays shall recognized and alarm CT open-circuit or short-circuit conditions.
- 4. Feeder protection – transformer protection.
 - a. The transformer differential protection relays shall be SIEMENS 7UT61 or equivalent. The relays shall provide the following protection functions: 87, 87N, 50/51, 50/51G, 49, 46 and 50BF.
 - b. The relays shall have modular communication for simple integration into SCADA systems. The communication protocol shall be [\[Profibus\]](#) [\[Modbus\]](#) [\[DNP3.0\]](#) [\[IEC 61850\]](#).
 - c. The transformer differential relays shall have a through-fault restraint setting to prevent tripping due to high current external faults.
 - d. The relays shall provide complete sequence-of-events recording, time stamped in milliseconds. The relays shall provide oscillography (waveform) capture, with configurable pre- and post-fault data capture times.
- D. Provision for future circuit breakers: Equip compartments designated as “future” with rails, mounting brackets, supports, primary bushings, shutters and bus connections.
- E. Control wiring: Factory installed, complete with bundling and protection where necessary and complying with the following:

1. Extra-flexible conductors for wires across hinges and for interconnections between shipping units. Control and secondary wiring shall be at least No. 14 AWG.
2. Conductors sized according to NFPA 70.
3. Internal wiring shall be carried in inter-unit wiring area, which protects the wires. The wires shall be bundled, tie-wrapped and secured to metal anchors. Wire ties with self-sticking tape shall not be permitted.

2.5 VACUUM CIRCUIT BREAKERS

- A. Vacuum circuit breakers: Drawout mounted units using three individual vacuum interrupters and including the following features:
 1. Circuit breaker design shall operate at rated voltage to interrupt fault current within its rating within ~~[five-]~~ ~~[three-]~~ cycles of trip initiation.
 2. Contact-wear indicator shall be readily visible from the rear of the circuit breaker.
 3. Four minimum spare auxiliary contacts shall be provided. Additional contacts shall be provided on the cell wall as specified.
 4. Operating mechanism shall be electrically charged, mechanically and electrically trip-free and stored-energy operated.
 5. Closing velocity of moving contacts shall be independent of both control voltage level and operator.
 6. Design of mechanism shall permit manual charging of mechanism.
 7. Control power shall be ~~[250 Vdc for closing and tripping]~~ ~~[125 Vdc for closing and tripping]~~ ~~[48 Vdc for closing and tripping]~~ ~~[230 Vac for closing, 230 Vac with capacitor tripping]~~ ~~[120 Vac for closing, 120 Vac with capacitor tripping]~~.
 8. The operating mechanism shall be front accessible so that it is not necessary to work under the circuit breaker or tip it over in order to perform maintenance.
 9. A single visual check, such as a contact erosion indicator, shall be sufficient to verify both spring pressure and contact wear. The contact erosion indicator shall be identical across all circuit breaker ratings. Confusing maintenance procedures, such as separate contact erosion and wipe measurements, shall not be permitted.
 10. Circuit breaker tripping provisions shall include shunt trip coil for tripping with protective relays, lockout relays, control switch or manual command signal from the relay. The circuit breaker shall include mechanical push button for manual tripping.
 11. Circuit breaker closing provisions shall include close (spring release) coil for closing by electrical signal from control circuitry, control switch or manual command signal from the relay. The circuit breaker shall include mechanical push button for manual closing.
 12. Current transfer path from the interrupter moving stem to the circuit breaker pole-mounted finger cluster shall be flexible copper laminations with long mechanical life. Brush, roller or wiping contacts shall not be permitted.
 13. Vacuum interrupters and circuit breaker shall be manufactured and warranted by the same manufacturer.
 14. Vacuum interrupter design shall limit the chopping currents to below 5 A to obviate the need for surge protection against switching transients during fault interruption for most loads.
- B. The circuit breakers shall be floor rollout that permits convenient insertion and withdrawal of the vacuum circuit breakers in the lower cells (of switchgear not on a raised pad) without the use of lift truck, ramp or dolly.
- C. The vacuum circuit breakers shall be designed to be used in switchgear cells of the same design and short-circuit rating but different voltage or continuous ratings, as long as the voltage and continuous current ratings of the circuit breaker shall be equal to or higher than required by the cell. 2,000 A and 3,000 A circuit breakers shall be designed to be used in 1,200 A cells.
- D. It shall be possible to test the circuit breaker in the TEST position inside the cell without the use of additional cables or couplers.
- E. The switchgear manufacturer shall cycle each circuit breaker through at least 200 mechanical on-off operations as a part of routine production tests.

2.6 ACCESSORIES

- A. Manual racking crank.
- B. Manual spring charging crank.
- C. *[Circuit breaker test cabinet separately mounted and containing pushbuttons for circuit breaker closing and tripping, fuses and secondary coupler with cable.]*
- D. *[Secondary test coupler to permit testing of circuit breaker outside the assembly.]*
- E. *[Lift truck for removing circuit breakers or fuse rollout trucks not located at floor level.]*
- F. *[Lift sling.]*
- G. *[Electric racking motor assembly and control station.]*
- H. *[Fifth wheel device for convenient handling of circuit breakers.]*
- I. *[Six spare fuses of each type and rating of fuse used. Include spares for voltage transformer fuses and control power fuses.]*
- J. *[One spare indicating lamp of each type installed.]*
- K. *[½ pint of touchup paint matching enclosure finish.]*
- L. Contact lubricant.
- M. *[Ground and test device, manually operated, suitable for phasing out, testing and grounding switchgear bus or feeder when the device is installed in place of circuit breaker shall include the following:*
 - 1. *Six primary disconnect studs with [four-hole connection pads] [ground brackets] on the disconnect studs.*
 - 2. *Padlock provisions on the doors of the test device in order to prevent access to a live circuit or a circuit that the user does not intend to ground or test.]*
- N. *[Ground and test device, electrically operated, suitable for phasing out, testing and grounding switchgear bus or feeder when the device shall be installed in place of circuit breaker and shall include the following:*
 - 1. *Interchangeable with drawout, medium-voltage circuit breakers to provide interlocked electrical access to either bus or feeder; electrically operated.*
 - 2. *Remote-control station with [30] [40] [50] foot long coupler cable.*
 - 3. *Suitable interlocks to facilitate safe procedures.*
 - 4. *Test wells arranged to allow testing for presence of voltage on each of the 6 disconnects.*
 - 5. *Two devices shall be furnished, one for grounding the upper terminals and one for grounding the lower terminals through the power operated ground making switch.]*
 - 6. *Padlocks shall be provided on the doors of the test device in order to prevent access to a live circuit or a circuit which the user does not intend to ground or test.]*

PART 3 - EXECUTION

3.1 INSTALLATION

- A. General: Electrical contractor or switchgear installer shall install switchgear in accordance with manufacturer's written instructions and the following specifications.

3.2 ADJUSTMENTS AND CLEANING

- A. Remove debris from switchgear and wipe dust and dirt from all components.
- B. Repaint marred and scratched surfaces with touch up paint to match original finish.

3.3 INSPECTION

- A. Check tightness of all accessible mechanical and electrical connections to assure they are torqued to the minimum acceptable manufacturer's recommendations.
- B. Check all installed switchgear for proper grounding, fastening and alignment.

3.4 FIELD QUALITY CONTROL

- A. Field inspection and testing shall be performed by *[the installing contractor.] [a testing firm under separate contract to owner.]*
- B. Visually inspect for physical damage.
- C. Perform site tests as specified in manufacturers' instruction manuals.
- D. Touch-up paint to repair any damaged surfaces using manufacturer-furnished paint. Leave remaining touch-up paint with owner.
- E. Verify operation of interlocks.
- F. Perform power-frequency withstand voltage tests in accordance with ANSI/IEEE C37.20.2, clause 6.5.

3.5 WARRANTY

- A. Equipment manufacturer shall warrant that all goods supplied are free of non-conformities in workmanship and materials for one year from date of initial operation, but not more than 18 months from date of shipment.

3.6 START-UP SERVICE

- A. Switchgear manufacturer shall provide a factory-authorized service representative for a period of two days to train Owner's maintenance personnel in the following:
- B. Procedures and schedules related to startup and shutdown, troubleshooting, servicing and preventive maintenance.
- C. Review data in the instruction manuals. Refer to Division 1 Section *["Contract closeout."] ["Operation and maintenance data."]*
- D. Schedule training with Owner with at least three week's advance notice.

3.7 *[FIELD SERVICE]*

- A. *Switchgear manufacturer's own field service office (same name as the manufacturer) shall be located not more than a three hour drive from the installation site.]*

END OF SECTION