

SECTION C-3:

ELECTRICAL SWITCHGEAR SPECIFICATIONS



Exponential
Engineering
Company

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PART 1 MEDIUM VOLTAGE EQUIPMENT SPECIFICATION

1.01 MEDIUM VOLTAGE EQUIPMENT

- A. The project shall be designed by a Nebraska Licensed Professional Engineer to comply with all City of Kimball, County, and State requirements and shall furnish the following at a minimum:
 - 1. Medium Voltage 15kV Switchgear assembly that includes:
 - a. Medium Voltage circuit breakers
 - b. Fuses
 - c. Voltage Transformers (VT's)
 - d. Current Transformers (CT's)
 - e. Protective Relays
 - f. The switchgear assembly shall be located indoors.
 - g. The switchgear shall be UL listed.
- B. Deliverables:
 - 1. Provide Construction Drawings and Specifications sealed by a Nebraska Licensed Professional Engineer.
 - 2. Drawings shall include but not be limited to the following:
 - a. Three-Lines
 - b. Protection and Control Schematics
 - c. Section Wiring Diagrams
 - d. Switchgear Panel Layout
 - e. Front View Elevations
 - f. Outline dimensions, connection and support points, weight, center of gravity, specified ratings and materials, anchoring details and details for conduit and cable entry and exit.
- C. Shipping, Handling, and Storage
 - 1. The equipment shall be handled and stored by Contractor in a controlled environment.
 - 2. If necessary, the switchgear shall be supported with shipping braces of sufficient strength and placement to allow lifting by sling(s) or rolling across uneven surfaces without damaging the switchgear. This bracing will not be required if the switchgear can be moved as described above without being deformed or causing undue stress to the equipment. The switchgear shall be protected such that during shipment it will not be damaged resulting from the entrance of dirt or moisture.
 - 3. Prior to shipping the switchgear, remove all temporary wiring installed in the factory for equipment testing.
 - 4. The crate/bracing/packaging shall be clearly labeled with the Contractor's control number, project name, purchase order number, and equipment destination.

PART 2 SWITCHGEAR

2.01 SWITCHGEAR DESIGN

- A. The medium voltage switchgear shall be designed and sealed by a Nebraska Licensed Professional Engineer and shall comply with the following:
 - 1. American National Standards Institute (ANSI):

- a. C12.1 – Code for Electricity Metering.
 - b. C37.06 – AC High-Voltage Circuit Breakers Rated on a Symmetrical Current Basis - Preferred Ratings and Related Required Capabilities.
 - c. C37.10 – Application Guide for AC High-Voltage Circuit Breakers > 1000 Vac Rated on a Symmetrical Current Basis.
 - d. C37.55 Metal-Clad Switchgear Assemblies - Conformance Test Procedures.
 - e. C39.1 – Requirements, Electrical Analog Indicating Instruments.
2. Institute of Electrical and Electronics Engineers (IEEE):
- a. 48 – Standard Test Procedures and Requirements for Alternating-Current Cable Terminations 2.5 kV through 765 kV.
 - b. C37.04 – Standard Rating Structure for AC High-Voltage Circuit Breakers Rated on a Symmetrical Current Basis.
 - c. C37.11 – Standard Requirements for Electrical Control for High-Voltage Circuit Breakers Rated on A Symmetrical Current Basis.
 - d. C37.20.2 – Standard for Metal-Clad and Station-Type Cubicle Switchgear.
 - e. C37.20.3 – Standard for Metal-Enclosed Interrupter Switchgear (1kV to 38kV).
 - f. C37.20.7 – Guide for Testing Switchgear Rated Up to 52kV for Internal Arcing Faults.
 - g. C57.13 – Standard Requirements for Instrument Transformers.
 - h. C37.90 – Standard for Relays and Relay Systems Associated with Electric Power Apparatus.
3. International Electrical Testing Association (NETA):
- a. ATS – Acceptance Testing Specifications for Electrical Power Distribution Equipment and Systems.
4. International Electrotechnical Commission (IEC):
- a. 61010 – Safety Requirements for Electrical Equipment for Measurement, Control, and Laboratory Use.
 - b. 61850 – Communication Networks and Systems for Power Utility Automation
 - c. 60044-7 – Instrument transformers - Part 7: Electronic voltage transformers
 - d. 60044-8 – Instrument transformers - Part 8: Electronic current transformers
 - e. 61869-10 – Instrument transformers - Part 10: Additional requirements for low-power passive current transformers
 - f. 61869-11 – Instrument transformers - Part 11: Additional requirements for low power passive voltage transformers
5. Underwriters Laboratories (UL):
- a. 508 – Standard for Industrial Control Equipment.
6. National Electrical Manufacturers Association (NEMA):
- a. SG 2 – High Voltage Fuses
 - b. SG 4 – Alternating - Current High Voltage Circuit Breaker
 - c. SG 5 – Power Switchgear Assemblies
7. National Electrical Code (NEC)
- B. The switchgear assembly mounted inside the building and the control power will be brought to the switchgear from the AC panel(s) and DC panel(s). The size and layout of switchgear assembly are to be determined by the Contractor and coordinated to accommodate the Owner's needs and to meet all code requirements. In addition, the switchgear must meet the following minimum requirements
1. Performance Requirements:
 - a. Design for protection circuits that facilitate monitoring and protection of the generator station.

- b. Design for switchgear medium voltage busses to allow paralleling of generators.

C. Medium Voltage Switchgear

1. The switchgear assembly shall be free standing, utilizing vertical steel structures assembled to form a single structure containing power buses, circuit breakers, fuses, and necessary auxiliary control devices along with specified relays, instrument transformers, and test switches of the number, rating and type shown on the one-line diagram and section front view drawings and indicated in the Technical Data Sheet.
2. The stationary assemblies and circuit breakers shall be constructed so that each circuit breaker is interchangeable with every other unit of the same rating and use.
3. Rear access shall be provided by hinged doors as indicated on the Technical Data Sheet.
4. Front access shall be provided by hinged doors.
5. Vertical sections shall be properly ventilated with louvers for cooling and to prevent moisture buildup. Ventilation openings shall be fitted with filters to inhibit the ingress of dust and debris.
6. Vertical sections shall be equipped with thermostatically controlled anti-condensation heaters if indicated on the Technical Data Sheet.
7. All doors and covers shall be fully gasketed.
8. A continuous silver-plated or tin-plated copper ground bus measuring $\frac{1}{4}$ " x 2" shall be provided for the full length of the switchgear assembly. The ground bus shall be capable of carrying the rated short circuit current of the installed circuit breakers for a minimum of 2 seconds.
9. Removable lifting provisions shall be provided which do not provide access to the interior of the switchgear when removed.
10. Contractor is responsible for coordinating all necessary alignment and interconnection between component sections. The entire assembly must be electrically and mechanically assembled into one single line-up prior to final inspection and shipment.
11. Power circuit breakers shall be shipped and packaged separately from the switchgear structure.
12. OPTIONAL: Provide an optional price adder to construct the switchgear assembly with ANSI type 2A arc resistance according to ANSI/IEEE C37.20.7.

D. Incoming Section

1. The incoming cable section shall be equipped and arranged per the Technical Data Sheet. Termination lugs shall be located at such a height that there is sufficient room for cable spreading and termination.
2. The incoming feed shall connect to the Main breaker, furnished per the One-Line diagram and the Technical Data Sheet.
3. Provide station class surge arresters as indicated on the Technical Data Sheet.

E. Main Bus

1. The main horizontal bus shall be rated per the Technical Data Sheet. Bus bars shall have a continuous current rating based on temperature rise and documented by design tests.
2. All joints shall be made with at least two bolts per joint.
3. The main bus shall be either copper or aluminum as indicated in the Technical Data Sheet.
4. Bus bars will be braced to withstand magnetic stresses developed by currents equal to main power circuit breaker close, carry, and interrupt ratings.
5. If indicated on the Technical Data Sheet, bolted connections shall be either tin or silver-plated.
6. If indicated on the Technical Data Sheet, the bus shall be fully insulated.
7. The bus supports shall be polyester glass.

F. Circuit Breakers

1. The circuit breakers shall be horizontal electrically-operated draw out (EODO) type, capable of being withdrawn on rails. The breakers shall be operated by a motor-charged stored energy spring mechanism, charged normally by a universal electric motor and in an emergency by a manual handle. The primary disconnecting contacts shall be silver-plated copper.
 2. Each circuit breaker shall contain three vacuum interrupters separately mounted in a self-contained, removable self-aligning pole unit. The vacuum interrupter pole unit shall be mounted on glass polyester supports for 15kV class as appropriate. A contact wear gap indicator for each vacuum interrupter, which requires no tools to indicate available contact life, shall be easily visible when the breaker is removed from its compartment. The current transfer from the vacuum interrupter moving stem to the breaker main conductor shall be a non-sliding design. The breaker front panel shall be removable when the breaker is withdrawn for ease of inspection and maintenance.
 3. The secondary contacts shall be silver-plated and shall automatically engage in the breaker operating position. Secondary contacts shall be capable of being manually engaged in the breaker test position.
 4. Interlocks shall be provided to:
 - a. Prevent closing of a breaker between operating and test positions
 - b. To trip breakers upon insertion or removal from the stationary structure
 - c. To discharge stored energy mechanisms upon insertion or removal from the stationary structure
 - d. To prevent the circuit breaker from disconnecting from the main bus stabs unless the circuit breaker is open
 5. The breaker shall be secured positively in the switchgear between and including the operating and test positions.
 6. The breaker control switch handles flush mounted on the panels shall be wired to allow closing and tripping of the breaker in either the test or fully racked in positions.
 7. Breakers shall be electrically operated by 125VDC control voltage.
 8. Each circuit breaker shall be provided with a Mechanism-Operated Control auxiliary switch (MOC switch). Breakers shall have a 6-stage switch containing six "a" (normally open) and six "b" (normally closed) contacts. All spare contacts shall be wired to terminal boards.
 9. Each circuit breaker shall be provided with a Truck-Operated Contact auxiliary switch (TOC switch) indicating the circuit breaker element position. Breakers shall have a 6-stage switch containing six "a" (normally open) and six "b" (normally closed) contacts. All spare contacts shall be wired to terminal boards.
 10. Circuit breaker operating mechanism shall be completely trip-free both mechanically and electrically. Mechanical tripping of a closed circuit breaker shall be possible with the front cubicle door closed.
 11. Control power and control circuit wiring shall be connected to the power circuit breaker by means of a front-connected umbilical cord and plug. This plug shall be mechanically interlocked. The plug shall not be removable while the circuit breaker is in the connected position. The circuit breaker cannot be inserted without the plug in place.
 12. Each circuit breaker shall have a mechanical operations counter.
 13. Each circuit breaker shall have four (4) wheels to allow for easy maintenance and movement.
 14. No lift truck, rails, ramps, channels, or transport device of any kind shall be required in order to move a circuit breaker from floor level to the fully connected position.
- G. OPTIONAL: Contractor to provide a separate bid adder for Integral Motorized Racking Device:
1. Each circuit breaker compartment shall be provided with an integral motorized racking device accessory with the following features:

- a. Allow moving the breaker between the connect and disconnect positions from a distance of up to 30 feet via a handheld pendant, with the breaker compartment door closed.
- b. The system shall be designed such that it allows manual racking of the circuit breaker using the levering crank accessory. Manual racking operation shall disable the motorized racking accessory.
- c. 125VDC power for the motorized racking accessory shall be supplied by the station DC system.

H. Protective Relays

1. Refer to the drawings and this specification for manufacturer and catalog number of the control and relay equipment to be furnished and installed in each switchgear section. Quote protective relays on a "no substitute" basis.
2. Contractor shall furnish and install, in the metal-clad switchgear, the quantity, type, and rating of protective relays and test switches as indicated on the drawings.
3. All relays shall have screw terminal type connections. Connectorized relay terminals are not acceptable.
4. Each terminal block, terminal, relay, fuse block and other auxiliary device shall be labeled to coincide with the identification indicated on the drawings.
5. All relays and equipment mounted on the front of the switchgear shall be flush mounted.

I. Instrument Transformers

1. Current Transformers

- a. Ring type current transformers shall be furnished as indicated in the drawings.
- b. Thermal and mechanical ratings of the current transformers shall be coordinated with the circuit breakers.
- c. Location of the current transformers on the bus side and line side of the 15kV breaker units shall be front accessible to permit adding or changing current transformers without removing high-voltage insulation connections.
- d. Shorting terminal blocks shall be furnished on the secondary of all current transformers.
- e. Current transformers shall have relaying accuracy class and metering burden rating and accuracy as required for the associated devices and as indicated on the drawings and in the Technical Data Sheet.
- f. Current transformer accuracies shall be such as to provide satisfactory performance for the burdens to be applied.
 - 1) In the case of metering equipment, the generator currents will sum for a single input current to the revenue meter.
 - 2) In the case of relay equipment, for the maximum fault current for which the switchgear is designed.

2. Voltage Transformers

- a. Voltage transformers of the quantity and ratings indicated shall be supplied.
- b. Voltage transformers with associated primary fuses shall be mounted in draw-out drawers contained in an enclosed auxiliary compartment. Rails shall be provided as applicable for each drawer to permit easy inspection, testing and fuse replacement. Shutters shall isolate primary bus stabs when drawers are withdrawn.
- c. Voltage transformer connections shall be phase-to-ground on a wye system with a dual ratio secondary winding as follows:

Nominal System Voltage

12.47kV wye grounded

Phase-to-Ground Ratios

7200V:120V (60:1) and 7200V:120V (60:1)

- d. The accuracy class and burden shall be in conformance with ANSI C57.13 for relay transformers and metering transformers.
- e. Voltage transformers shall be rated to accommodate the burden of relaying and metering equipment connected.

J. Switchgear Wiring Requirements

1. Wiring diagrams shall be of the point-to-point type. Terminal point tabulations are not acceptable.
2. Panels shall be wired with switchboard type extra flexible stranded tinned copper wire with gray SIS insulation rated for 600-volt service and which passes the VW-1 vertical flame test.
3. Current transformer circuits shall use minimum No. 10 AWG copper conductor.
4. All other circuits shall use minimum No. 14 AWG copper conductor.
5. All wire terminations shall be made with ring-tongue terminal connectors. Fork-tongue U-type wire connectors are specifically not allowed and shall not be used as a replacement for ring-tongue terminal connectors.
 - a. Ring-tongue terminal connectors shall be ring type, tin plated copper.
 - b. The crimping tool used to apply these terminal connectors shall require full compression before relieving, or as recommended by the manufacturer of the ring-tongue terminal connectors being furnished and installed by the Contractor.
6. Exposed wiring shall be formed into compact groups bound together and firmly supported. Wires shall be bundled by use of nylon cable ties at intervals required to provide a neat appearance. Exposed wiring shall be run straight, horizontally, or vertically with short-radius right-angle bends. Self-adhesive tie mounts shall not be used.
7. All instrument transformer secondary control wiring shall be armored where it passes through primary compartments.
8. Hinge wiring shall be twisted around the longitudinal axis of the wire, wherever possible, instead of being bent laterally.
9. Each wire shall be protected from abrasion where it leaves a channel or wireway. Grommets shall be provided at all holes and all elliptical slots furnished for wires and cables, including holes provided for Contractor-furnished wires and cables.
10. Splices are not permitted in the wiring.
11. All connections shall be made at device studs or terminal blocks. A maximum of two connections per terminal stud will be used. All wiring between various devices shall be performed by the most direct method rather than looping back and forth.
12. Circuit/conductor designations as used on the schematic and wiring diagrams shall be machine lettered with permanent black ink on a white marking sleeve at every wire termination. Do NOT heat shrink the marking sleeve. Designations shall be point to point type designations.
 - a. The tubing shall be printed with a machine printer designed by the manufacturer to be used for labeling the tubing.
 - b. The marking sleeves shall be equivalent to: Brady BPSPT-187-1-WT
 - c. The sleeves shall be slipped onto each conductor before attaching the ring-tongued terminal connector.
 - d. The marking sleeve shall be positioned so it can be read after the conductor is terminated.
13. All test switches shall be wired such that sources (current transformer, voltage transformer and other output/input devices) is wired to the bottom terminals. Relay terminals shall be wired to the top of the test switch.

K. Switchgear Terminal Block Requirements

1. Terminal blocks shall be provided for terminating all power and control wiring. Terminal blocks shall be rated at 600-volts, screw terminals with white marking strips showing terminal numbers.
2. Connectorized or modular terminal blocks are specifically not allowed and shall not be used as a replacement for screw type terminal blocks.
3. Arrangement and location of the blocks shall be such that incoming and outgoing cables can be supported and all wiring to the blocks shall be completely accessible without having to remove other devices for accessibility.
4. Circuit/conductor designations as shown on the schematic and wiring diagrams shall be machine lettered, stamped, engraved, or neatly marked with permanent black ink on the white marking strip on the terminal block.
5. The terminals shall be arranged so that the conductors in each cable are grouped together to the fullest extent possible. Terminals for common circuits shall be jumpered and one conductor run to adjacent protective relay panels to reduce the number of conductors. Adjacent terminals on the same terminal block shall be used for the three-phase leads and neutral from each set of current and voltage transformers.
6. Terminal blocks installed in current transformer secondary wiring between the current transformer and all connected devices shall be GE EB27 series terminal blocks. Each set of current transformer cables shall be terminated on 4-pole shorting terminal blocks.
7. 12-pole terminal blocks shall be GE EB25 series terminal blocks.
8. Where possible, 10 percent spared unused terminals shall be furnished on each terminal block for circuit modifications.

L. Switchgear Nameplate Requirements

1. Nameplates shall be furnished to include all device names on the front of the panel.
2. The protective relay panel designation shall also be placed on the inside of each protective relay panel, using a nameplate identical to that located at top of the exterior side of the panel.
3. Nameplates, stencils, KRPY-type labels, or neat lettering giving the device function number and wiring diagram location designation shall also be placed on the back of the panels adjacent to each device.
4. Nameplates shall meet the following requirements:
 - a. All engraving shall be centered, unless otherwise specified.
 - b. Nameplate material shall be laminated phenolic resin sheet either 1/16 or 3/32 inch thick (as specified or required) cut to size with square edges.
 - c. Nameplate material shall have semi-matte, buffed, or satin finish black surfaces.
 - d. All nameplate material shall be suitable for exposure to direct sunlight without fading.
 - e. Nameplate material shall have a white center.
 - f. All lettering shall be flat groove type cut through the black surface to military specification MIL-P-78A and Federal Specification L-P-509A.
 - g. The Contractor shall use gothic lettering.
 - h. All mounting holes shall be 1/8 inch diameter.
 - i. All edges shall be beveled.

M. Special Requirements

1. The depth of the finished equipment shall be sufficient to allow for entrance, bending, and termination of power cables. Individual units shall be provided for top or bottom entrance as specified. A minimum of 26 inches of clearance between terminal pads and the cable entrance shall be provided.
2. OPTIONAL: Provide a separate line item adder in the proposal for furnishing the switchgear with infrared viewports. The viewports shall consist of a window of infrared-transparent material and be

situated to enable viewing of the incoming line and outgoing feeder terminations. The viewport for the feeder terminations shall not be located on the side of any section.

N. Miscellaneous

1. Provide a separate line item adder in the proposal for furnishing spare equipment with the switchgear.
 - a. Furnish one (1) spare set of fuses for each rating of fuses in the switchgear.
 - b. Furnish two (2) each of all special tools required to install, operate, and maintain the equipment.
 - c. Furnish one (1) lot of Contractor's recommended spare parts.
 - d. Furnish one (1) lot of Contractor's recommended consumables and parts required for testing and commissioning.
 - e. Provide four (4) 1-pint aerosol cans of touch-up paint for the switchgear.

PART 3 SWITCHGEAR TESTING

3.01 SWITCHGEAR TESTING

A. Factory Acceptance Testing:

1. Each circuit breaker shall be tested for proper adjustment and operation prior to shipment. The circuit breaker shall be given a minimum of 100 mechanical operations. Test reports shall be available upon request.
2. Each vacuum interrupter shall receive a vacuum integrity test by means of the system AC high potential test prior to shipment.
3. Each circuit breaker shall have a contact timing and contact motion velocity test.
4. Each circuit breaker shall be identified with an individual serial number permanently mounted on the breaker by means of a metal nameplate.
5. Contractor shall maintain permanent records of each circuit breaker produced and the production test results.
6. Component bill of material shall be checked for proper quantity, description, and part number.
7. Physical dimensions shall be checked against approved drawings.
8. Equipment shall be subjected to a primary current injection procedure to determine proper operation of all current sensitive components.
9. Equipment shall be subjected to a primary voltage injection procedure to determine proper operation of all voltage sensitive components.
10. Complete assembly shall have a low frequency withstand (an AC high potential) test performed to assure insulation system integrity.
11. Contractor shall have in place a system of recording, correcting, and verifying resolution of discrepancies discovered during the inspection and testing process.
12. Certified production test reports indicating satisfactory completion of all inspection and test procedures shall be available upon request.
13. Contractor shall perform the following tests which may be required to be performed in the physical or virtual presence of the CONTRACTOR and/or Engineer. Contractor shall notify the Contractor and Engineer at least two (2) weeks in advance of the proposed date of any testing.
 - a. Testing shall be performed in accordance with the production testing section of the latest revision of ANSI/IEEE C37.21.
 - b. Pre-functional test checkout (general workmanship, wire continuity, insulation, etc.)
 - c. DC Control Circuit Functional Tests

- d. AC Control Circuit Functional Tests
 - e. AC Sensing Circuit (VT's, CT's) Functional Tests
 - f. All wiring shall be verified per the drawings
- B. If testing or inspection reveals or causes any defects in any materials furnished by the Contractor, the Contractor shall remedy or repair, at the Contractor's sole cost and expense, the defects and perform retesting and inspection in accordance with the requirements of this specification.

PART 4 TECHNICAL DATA SHEET

Contractor to fill out Technical Data Sheet and submit with bid proposal.

| TECHNICAL DATA SHEET INDOOR 15KV SWGR Description | Units | Specified | Contractor's Information |
|------------------------------------------------------------------|--------------|-------------------------|-------------------------------------|
| Manufacturer | -- | By Contractor | |
| Location of manufacturing facility | -- | By Manufacturer | |
| Shipping method | -- | By Manufacturer | |
| Required Delivery Date | -- | By Contractor | |
| Service Conditions | | | |
| Service Conditions | -- | -- | -- |
| Location | -- | Kimball, NE | |
| Maximum ambient temperature | °F | 120 | |
| Minimum ambient temperature | °F | -10 | |
| Seismic zone rating | -- | Low | |
| Elevation | feet | 4,715 | |
| Maximum wind speed | mph | N/A | |
| Snow and ice loading | Yes/No | No | |
| System Description | | | |
| System Description | -- | -- | -- |
| Voltage Class | kV | 15 | |
| Nominal voltage | kV | 12.47 | |
| Frequency | Hz | 60 | |
| Phase configuration | -- | Three-phase, three-wire | |
| System grounding | -- | Grounded | |
| Switchgear Assembly Ratings/General Requirements | | | |
| Switchgear Assembly Ratings/General Requirements | -- | -- | -- |
| BIL (sea level, adjust for altitude) | kV | 150 | |
| Available fault current, 3- ϕ symmetrical | amperes | 15,000 | -- |
| Main bus | -- | -- | -- |
| Material | Cu/Al | Cu | |
| Fully insulated | Yes/No | Yes | |
| Continuous current rating | amperes | 1,200 | |
| Momentary current | amperes | 25,000 | |

| TECHNICAL DATA SHEET INDOOR 15KV SWGR Description | Units | Specified | Contractor's Information |
|----------------------------------------------------------|------------|-------------------------------------------------------------------------|-----------------------------|
| Cable Entry | -- | Bottom, All Sections | |
| Incoming Cable Terminations (Section 1) | -- | Capacity for two sets of 3-1/C 500kCM AL 15kV, 133% Insulation | |
| Generator Cable Terminations (Sections 2, 3, 4 and 5) | -- | Per Contractor Sizing | |
| Feeder Cable Terminations (Sections 7 and 8) | -- | Capacity for one set of 3-1/C 500kCM AL 15kV, 133% Insulation | |
| Surge Arresters | -- | Yes, incoming Section 1 only | |
| Rear access, bolted covers or hinged doors | -- | Hinged | |
| Feeder Breaker Configuration | -- | Bottom / One-High | |
| Finish top coat color | -- | ANSI 70 gray | |
| Configure for future expansion | Yes/No | Yes | |
| Section space heaters | Yes/No | Yes | |
| Switchgear for outdoor installation | Yes/No | No | |
| Sheltered aisle or non-walk-in | -- | Non-walk-in | |
| NEMA enclosure rating | -- | 1 | |
| Bus Contact Areas | Silver/Tin | Silver | |
| Revenue Metering | | | |
| Revenue Metering | -- | -- | -- |
| Metering required | Yes/No | Yes, combined for all 4 Generators | |
| Communications required | Yes/No | TBD | |
| Communications protocol | -- | TBD | |
| Circuit Breakers | | | |
| Circuit Breakers | -- | -- | -- |
| Rated Maximum Voltage | kV | 15 | |
| Rated Continuous Current | A | Main: 1200 Feeder: 1200 | |
| Frequency | Hz | 60 | |
| Rated Voltage Factor (k) | - | 1.0 | |
| Power Frequency Withstand | kV, rms | 45 | |
| Basic Impulse Level (BIL) | kV, peak | 110 | |
| Interrupting Capability | kA | 25 | |

| TECHNICAL DATA SHEET INDOOR 15KV SWGR Description | Units | Specified | Contractor's Information |
|-----------------------------------------------------------------|-----------|-------------------------------------------------|-----------------------------|
| Interrupting Time (3 or 5 cycles) | Cycles | 3 | |
| Closing and Latching Capability | kA, peak | 65 | |
| Control Voltages | V | 125VDC | |
| Spring Charging Motor or Power Supply | V (ac/dc) | 125VDC | |
| Dual Trip Coils | Yes/No | No | |
| Switchgear Assembly Physical Characteristics | | | |
| Overall dimensions, est. (L×W×H) | inches | By Manufacturer | |
| Weight, est. | pounds | By Manufacturer | |
| Largest dimension for shipping, est. (L×W×H) | inches | By Manufacturer | |
| Heaviest piece for shipping, est. | pounds | By Manufacturer | |
| External Power available | | | |
| AC voltage | V, phases | 240/120VAC, 1Φ | |
| DC control voltage | V | 125VDC | |
| Electronic drawing file format | -- | Adobe Acrobat, AutoCAD (Current Versions) | |
| Special requirements for this proposal | | | |
| Floor or subfloor assembly with removable plates field drilling | -- | No | -- |
| Furnish spare sets of fuses (3-phase) as noted | -- | Yes | |
| Separate Optional line items required for proposal: | | | |
| Integral Motorized Racking Device Accessory, Section 2.01G | \$ | -- | |
| ANSI type 2A arc resistance, Section 2.01C.12, Section 2.01G | \$ | -- | |
| IR compatible viewports, Section 2.01M.2 | \$ | -- | |

END OF SECTION