

H.T. SWITCHGEARA. 6.6KV SWITCH GEAR PANEL:

Vacuum Circuit Breaker, 630A, 250MVA, Incoming: 1 No., Outgoing: 2 Nos.,

Constructional Features: The Switchgear shall be Indoor type, Metal Clad, Floor Mounted and of simple robust construction suitable for use in underground metaliferous mines.

- 1) Different panels of it shall consist of stationary type, self-support, sheet steel cubicles with ventilating louvers within which either draw out type circuit breaker shall be provided as per our single line diagram.
- 2) The switchgear cubicle shall have structural steel framework enclosed on all sides and top by sheet steel of minimum 2.5mm thickness.
- 3) Each cubicle shall be provided with the front access door with handle and lock and removable back cover.
- 4) The compartment shall be so constructed that failure of one equipment does not affect the adjacent one. Each cubicle shall be separated from adjacent one by grounded sheet steel barrier.
- 5) Each cubicle should be provided with thermostatically controlled space heater.
- 6) The switchgear shall have water / moisture proof and dust tight arrangement.
- 7) The main bus of the switchgear section shall be of high conductivity copper liberally sized with high safety factor for specified current rating with maximum temp. limited to 85°C i.e. 45°C rise over 40°C of ambient temperature. The bus and connections shall be well supported and braced as to be capable of safety with standing short ckt corresponding to a fault level of 250MVA (symmetrical at 6.6KV) and also to take care of any thermal expansion.
- 8) Three phase bus bar shall be adequately spaced and bus bars and connections shall be fully insulated for working voltage with adequate phase & ground clearance.
- 9) Insulating sleeves and cast resin shrouds shall be provided for bus bars and joints respectively.
- 10) All bus connections, joints and taps shall be silver-plated. Bimetallic connectors shall be furnished for the connection of dissimilar metal connection.
- 11) Bus bars shall be colour coded for easy identification.
- 12) The bus bar chamber shall be provided with inter panel barrier with epoxy cast seal off bushing through which the buses will pass through so as to prevent fire from one panel to other panel.

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Attended

- 13) The switchgear shall be so constructed that it can be disassembled in sections and transported easily as well as it should be possible to lower it into our mines through our vertical shaft Accordingly the switchgear shall be supplied in various sections and the provision of bus bar links shall be made. The dimensions should suit to our requirement.
- 14) Control voltage isolation shall be provided for each cubicle by means of control fuses.

B. 6.6KV – Circuit Breaker

The breaker shall be triple pole vacuum circuit breaker three phase indoor metal clad draw out type mounted on carriage.

- 1) Each breaker shall be provided with
 - a) An Emergency mechanical on / trip.
 - b) Mechanical on / off indication.
 - c) Operation counter.
 - d) Mechanical spring charge indication.
- 2) Each breaker shall have three positions
 - a) Service
 - b) Test and
 - c) Dis-connected
- 3) The design of the breaker shall be such that it will be possible to close the front access door in each of the three above positions.
- 4) Operating mechanism shall be electrical and shall comprise motor wound spring charge, trip free mechanism with anti-pumping feature and shunt trip. The operating mechanism shall be suitable for 110V, AC. In addition, facility for manually charging of spring and manual closing / tripping of the breaker shall also be provided. Spring charging shall take place automatically after each breaker closing operation.
- 5) In addition to aux-contacts required for normal breaker close, open and indications, required no. of aux-contacts with a minimum no. of 4 – pairs N/O and 4 – pairs of N/C electrically separate auxiliary contacts shall be furnished.
- 6) For safety of operation, maintenance and testing of the breaker mechanical interlock shall be provided to prevent.
 - a) A close circuit breaker being isolated or inserted from, into the service position.
 - b) Closing and Opening of the breaker in an intermediate position between service and test position and test and disconnected position.
- 7) Automatic safety shutter shall be provided to completely cover the primary disconnection when the breaker is withdrawn.

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Recommended Makes of Components:

- 1. Meter : AE / IMP / Schneider Electric
- 2. Energy Meter : L&T / Jaipur Maxwell / Secure
- 3. VCB Make : Jyoti / L&T / BHEL / ABB / Andrew Yule
- 4. Earth Leakage Relay : PROK DV's / Prayog
- 5. Power Pack Unit with Battery Backup and Transformer Based: Make - GOGATE
Input - 110V AC, Output - 110V DC

G) Protection:

Incoming Feeder (CT Ratio: 200-100/1/1A)

- 1. Relay - Over Current Relay - 02 Nos. } CDG 61, Alstom Make IDMT Relay
- 2. Earth Fault Relay - 01 No. }
- 3. Tripping Relay (Lockout) / Master Trip Relay - 01 No. - Alstom Make VAJH - 13
- 4. Sensitive Earth Fault Relay Non-Self Resetting Type with CBCT - Make: PROK DV's / Prayog
Current Setting 0.1 to 1Amps, Time Setting 0.1 to 1 Sec.

Transformer Feeder (CT Ratio: 60/1/1A)

- 1. Relay - Over Current Relay - 02 Nos. } CDG 61, Alstom Make IDMT Relay
- 2. Earth Fault Relay - 01 No. }
- 3. Tripping Relay (Lockout) / Master Trip Relay - 01 No. - Alstom Make VAJH - 13
- 4. Sensitive Earth Fault Relay Non-Self Resetting Type with CBCT - Make: PROK DV's / Prayog
Current Setting 0.1 to 1Amps, Time Setting 0.1 to 1 Sec.
- 5. Auxiliary Relay (110V DC) for BCH/OTI/WTI Alarm and Trip, Hand Reset -
Make: Alstom, Model - VAA - 33

Spare Out going Feeder (CT Ratio: 100/1/1A)

- 1. Relay - Over Current Relay - 02 Nos. } CDG 61, Alstom Make IDMT Relay
- 2. Earth Fault Relay - 01 No. }
- 3. Tripping Relay (Lockout) / Master Trip Relay - 01 No. - Alstom Make VAJH - 13
- 4. Sensitive Earth Fault Relay Non-Self Resetting Type with CBCT - Make: PROK DV's / Prayog
Current Setting 0.1 to 1Amps, Time Setting 0.1 to 1 Sec.

Prayog

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Terms & Conditions

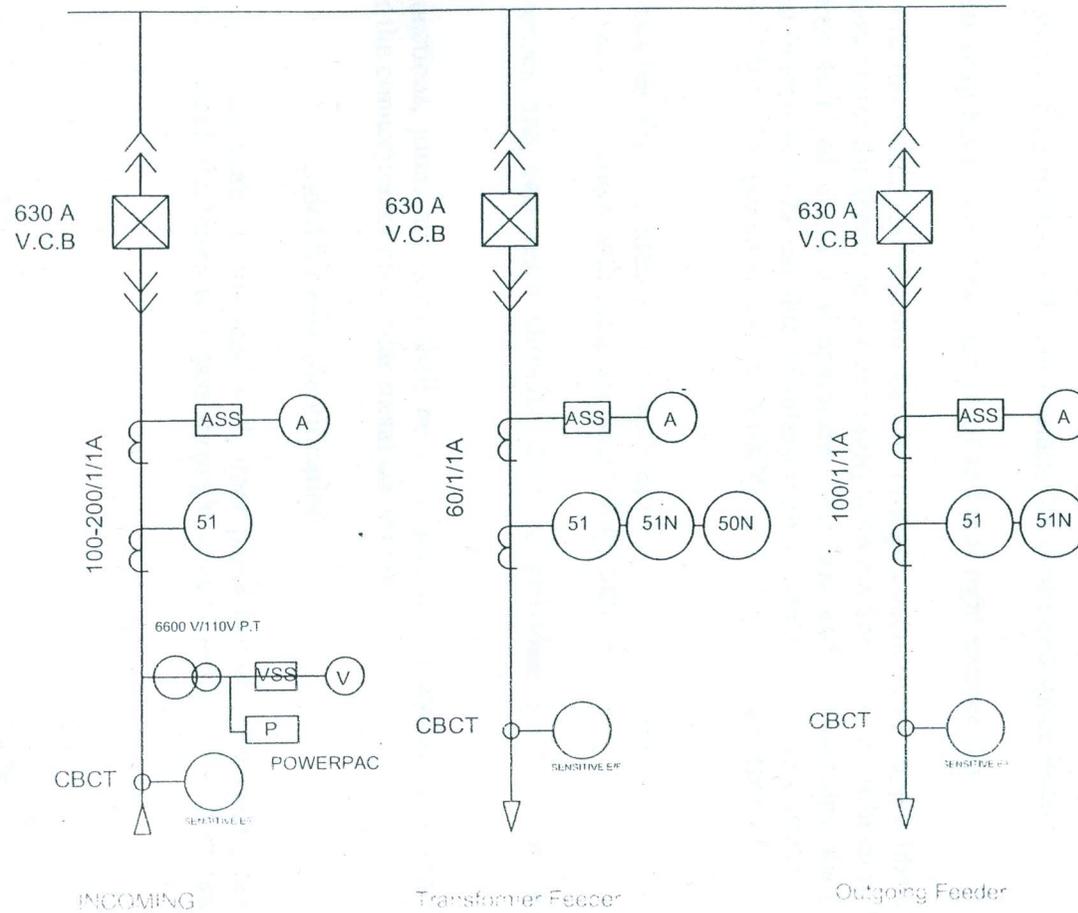
1. The tender shall be two parts i.e. Technical & Commercial Part and Price Part.
2. The Scope of Supply should also include supervision of Commissioning.
3. The Vacuum Circuit Breakers shall be supplied with maintenance trolley.
4. The equipment shall be supplied with a warranty of 12 months from the date of Commissioning.

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6.6 KV H.T SWITCHGEAR

6.6 KV 250 MVA H.T COPPER BUS



LEGEND

- ASS — (A) AMMETER WITH SELECTOR
- (51) OVER CURRENT RELAY
- (51N) EARTH FAULT RELAY
- (50N) INSTANTANIOUS EARTH FAULT RELAY
- () POTENTIAL TRANSFORMER
- VSS — (V) VOLTMETER WITH SELECTOR
- ← ⊠ → DRAWOUT TYPE V.C.B
- () SENSITIVE EARTH FAULT RELAY
- (P) POWER PACK UNIT

URANIUM CORPORATION OF INDIA LTD.

(A Govt. of India Enterprise)

Narwapahar Mine

Drawn By: J. N. Murthy

Handwritten: 24/10/18

Handwritten: 25/10