

For Emarizy
Item #1, 4 & 5

ANNEXURE-I

INDENT NO. 140620112 DATED-28.05.2022

W.O. NO. 72044N (NTPC-PATRATU), 72249N, 72255N (NTPC-BARH)

SPECIFICATION FOR VERTICAL MOUNTED OFF CIRCUIT TAP SWITCH

| Sl NO | Technical Requirements | Suppliers Confirmation | | | | | | | | | | | | |
|---------------|--|------------------------|------------|---|-----|---|-----|---|-----|---|-----|---|-----|--|
| 1 | General: 630Amp. 11KV Class, 5-Position ,3-Phase (liner) type Off Circuit Tap Switch With Operating Handle At Bottom site for Vertical Mounting with Bevel gear Arrangement, Limit Switch, And Other Necessary Accessories Required For Operation of OCTS. The switch should be rugged in construction and robust in design with best quality of material and workmanship .It should conform to following technical specification and all the requirements of governing IEC60214-1. | | | | | | | | | | | | | |
| 2 | Trfr Data: MVA : 16 MVA Rated Voltage : 11kV Rated current : 630 Amp. Positions : 5-Positions No. of Phases : 3-Phase Frequency : 50 Hz Tapping range : +5% To -5% Variation on (HV Positions) Connection : Delta | | | | | | | | | | | | | |
| 3 | Tap Switch Data: (i) Maximum Current Rating of Contact : 511 Amp. (ii) Step Voltage : 275V (iii) No. of Phases : 3-Phase (iv) No. of Position : 5 (v) Short circuit with stand time : 3 sec. (Vi) Lead joints as per table given below: <div style="display: flex; justify-content: space-around; align-items: flex-start;"> <div style="text-align: center;"> <p>Phase Diagram</p> </div> <div style="border: 1px solid black; padding: 5px;"> <table border="1"> <thead> <tr> <th>Tap Position.</th> <th>Lead Joint</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Z-7</td> </tr> <tr> <td>2</td> <td>Z-6</td> </tr> <tr> <td>3</td> <td>Z-5</td> </tr> <tr> <td>4</td> <td>Z-4</td> </tr> <tr> <td>5</td> <td>Z-3</td> </tr> </tbody> </table> </div> </div> | Tap Position. | Lead Joint | 1 | Z-7 | 2 | Z-6 | 3 | Z-5 | 4 | Z-4 | 5 | Z-3 | |
| Tap Position. | Lead Joint | | | | | | | | | | | | | |
| 1 | Z-7 | | | | | | | | | | | | | |
| 2 | Z-6 | | | | | | | | | | | | | |
| 3 | Z-5 | | | | | | | | | | | | | |
| 4 | Z-4 | | | | | | | | | | | | | |
| 5 | Z-3 | | | | | | | | | | | | | |
| 4 | Test Voltages | | | | | | | | | | | | | |

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| | | Power Frequency (rms) | Lightening Imp. Micro Sec | 1.2/50 |
|---|--|---|------------------------------|--------|
| | (i) | Tap Switch to Earth | 28kV | 75 kVp |
| | (ii) | Between Phases | 28kV | 75 kVp |
| | (iii) | Line End | 28kV | 75 kVp |
| | (iv) | Across Range | 18kV | 49 kVp |
| | (v) | Between Steps | 10kV | 40 kVp |
| 5 | Provisions: | <p>The tap switch must have following provisions:</p> <ul style="list-style-type: none"> a) Tap position indication b) End limit stops c) Pad locking arrangement d) Leak proof stuffing box e) Smooth operation of tap switch to be ensured. f) Lead No. on fixed & moving contacts as per table given above to be engraved or painted on each phase board. g) Switch should be suitable to mount in vertical position and smooth operation from external tank wall. h) Limit Switch. | | |
| 6 | Surface treatment & protection: | <ul style="list-style-type: none"> i) Fixed & moving contacts shall be silver plated minimum thickness of silver plating should be 15 micron. ii) All steel parts to be mounted inside transformer tank should be protected with Epilux-4 varnish to HE std.5371. iii) External parts should be chromium plated and passivated /power coated suitably to avoid rusting in saline & humid atmosphere. | | |
| 7 | Shipment: | <p>The switch shall be supplied in suitable packing to avoid any damage. Any damage if occurred during transport, same shall be made good within one-week time by the supplier free of cost.</p> | | |
| 8 | Drawing & Documents | <p>Following details drawings/documents required along with quotation in triplicate for our review at technical evaluation and for final approval at order execution stage.</p> <ul style="list-style-type: none"> a) Outline general arrangement. b) Mounting arrangement of Tap switch & handle arrangement. c) Type test/routine test reports conducted on similar rating of OCTS. | | |
| 9 | Test Schedule: | <p>Following checks/Tests shall be conducted on the tap switch at supplier's / BHEL works.</p> <ul style="list-style-type: none"> a. Construction & dimensional checks as per approved drawings including silver plating of 15 Microns minimum. b. Contact resistance measurement on all positions by milli volts method. c. Mechanical operation test for 500 cycles shall be performed, each cycle consists of complete operation 1 to 5 & 5 to 1. d. Contact resistance measurement after 500 cycles of mechanical operation & check the healthiness of contact. Variation should not be more than + 5%. e. Leakage proof test on stuffing box applying 1Kg/Sq Cm oil pressure. f. Insulation resistance measurement Test. g. Power frequency test keeping the switch inside transformer oil. | | |

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| | Power Frequency Voltage (rms) |
|---------------------|-------------------------------|
| Tap switch to Earth | 28kV |
| Between Phases | 28KV |
| Between step | 10kV |
| Across Range | 18kV |
| Line End | 28kV |

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|-----|--|
| 10 | Apart from above, other general requirements applicable for OCTS may be accepted as per ultimate user/ Customer. |
| 11. | Vendor to submit OCTS DRAWINGS for BHEL Approval. |

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Pawan Kumar
Dy. Engineer (TRE)