

## ANNEXURE-I I

INDENT NO. 140620127 DATED-04.06.2022 ITEM NO.02  
W.O.NO.72357A17700 M/S:-WBPDCL (SAGARDIGHI) ✓✓

### SPECIFICATION FOR VERTIICAL MOUNTED OFF CIRCUIT TAP SWITCH

Sl NO	Technical Requirements	Suppliers Confirmation										
1	<b>General:</b> 400Amp. 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, Five Digit Mechanical Counter 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	<b>Trfr Data:</b> MVA : 5 MVA Rated Voltage : 11kV Rated current : 400 Amp. Positions : 5-Positions No. of Phases : 3-Phase Frequency : 50 Hz Tapping range : +5% To -5% Variation on (HV Positions) Connection : Delta											
3	<b>Tap Switch Data:</b> (i) Maximum Current Rating of Contact : 159.49 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; align-items: flex-start;"> <div style="flex: 1;"> <p>Phase Diagram</p> </div> <div style="flex: 1; margin-left: 20px;"> <p>Tap Position.      Lead Joint</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tbody> <tr><td style="text-align: center;">1</td><td style="text-align: center;">Z-7</td></tr> <tr><td style="text-align: center;">2</td><td style="text-align: center;">Z-6</td></tr> <tr><td style="text-align: center;">3</td><td style="text-align: center;">Z-5</td></tr> <tr><td style="text-align: center;">4</td><td style="text-align: center;">Z-4</td></tr> <tr><td style="text-align: center;">5</td><td style="text-align: center;">Z-3</td></tr> </tbody> </table> </div> </div>	1	Z-7	2	Z-6	3	Z-5	4	Z-4	5	Z-3	
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4	<b>Test Voltages</b>											

		Power Frequency (rms)	Lightening Imp. 1.2/50 Micro Sec
(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	2kV	20 kVp
5	<b>Provisions:</b>	<p>The tap switch must have following provisions:</p> <ul style="list-style-type: none"> <li>a) Tap position indication</li> <li>b) End limit stops</li> <li>c) Pad locking arrangement</li> <li>d) Leak proof stuffing box</li> <li>e) Smooth operation of tap switch to be ensured.</li> <li>f) Lead No. on fixed &amp; moving contacts as per table given above to be engraved or painted on each phase board.</li> <li>g) Switch should be suitable to mount in vertical position and smooth operation from external tank wall.</li> <li>h) Limit Switch.</li> <li>i) Five Digit Mechanical Counter.</li> </ul>	
6	<b>Surface treatment &amp; protection:</b>	<ul style="list-style-type: none"> <li>i) Fixed &amp; moving contacts shall be <b>silver plated</b> minimum thickness of silver plating should be 15 micron.</li> <li>ii) All steel parts to be mounted inside transformer tank should be protected with Epilux-4 varnish to HE std.5371.</li> <li>iii) External parts should be chromium plated and passivated /power coated suitably to avoid rusting in saline &amp; humid atmosphere.</li> </ul>	
7	<b>Shipment:</b>	<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	<b>Drawing &amp; Documents</b>	<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"> <li>a) Outline general arrangement.</li> <li>b) Mounting arrangement of Tap switch &amp; handle arrangement.</li> <li>c) Type test/routine test reports conducted on similar rating of OCTS.</li> </ul>	
9	<b>Test Schedule:</b>	<p>Following checks/Tests shall be conducted on the tap switch at supplier's / BHEL works.</p> <ul style="list-style-type: none"> <li>a. Construction &amp; dimensional checks as per approved drawings including silver plating of 15 Microns minimum.</li> <li>b. Contact resistance measurement on all positions by milli volts method.</li> <li>c. Mechanical operation test for 500 cycles shall be performed, each cycle consists of complete operation 1 to 5 &amp; 5 to 1.</li> <li>d. Contact resistance measurement after 500 cycles of mechanical operation &amp; check the healthiness of contact. Variation should not be more than + 5%.</li> <li>e. Leakage proof test on stuffing box applying 1Kg/Sq Cm oil pressure.</li> <li>f. Insulation resistance measurement Test.</li> <li>g. Power frequency test keeping the switch inside transformer oil.</li> </ul>	

	Power Frequency Voltage (rms)
Tap switch to Earth	28kV
Between Phases	28KV
Between step	2kV
Across Range	18kV
Line End	28kV

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.

*Pawan*  
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