

# **TENDER SPECIFICATION**

**BHEL: PSSR: SCT: 1336**

**FOR**

**Handling at Site Stores / Storage yard,  
Transportation to Site of Work, Erection,  
Testing and Commissioning of HT and LT  
Electrical Package for Unit – 5 -1x 210 MW  
set, Stage III,**

**at**

## ***Rayalaseema Thermal Power Project***

**(Muddanur) V.V.Reddy Nagar,  
Kalamalla Post, Cuddapah Dt, AP**

**PART – II PRICE BID**

**BOOK NO:**



**BHARAT HEAVY ELECTRICALS LIMITED**

**(A Government of India Undertaking)**

**Power Sector – Southern Region**

**690, Anna Salai, Nandanam, Chennai – 600 035.**



**Bharat Heavy Electricals Limited**

(A Govt. of India Undertaking)

Power Sector – Southern Region

EVR Periyar Building

690 , Anna Salai, Nandanam, Chennai – 600 035.

***TENDER SPECIFICATION NO:BHEL:PSSR:SCT:1336***

NAME OF WORK

**Handling at Site Stores / Storage yard, Transportation to Site of Work, Erection, Testing and Commissioning of HT and LT Electrical Package for Unit – 5 of 210 MW set, Stage III, RTPP Muddanur.**

PART II

**(PRICE BID)**

Issued to

M/s.

For and on behalf of  
BHARAT HEAVY ELECTRICALS LIMITED

Date :

Addl. General Manager/Contracts

**(This tender document is not transferable)**

**RAYALASEEMA TPP: STAGE III UNIT 5 (1 X 210 MW)  
RATE SCHEDULE FOR ELECTRICAL (HT & LT) PACKAGE**

Sl.No	BOM Ref No	Description	Qty	Unit Rate	Total Rate
		<b>TRANSFORMERS:</b>			
1.	A1.1	240 MVA Generator Transformer	1 set*		
2.	A1.2	31.5 MVA Station Transformer	1 set*		
3.	B1.1	16 MVA UAT Transformer ( 5A & 5B)	2 sets*		
4.	B1.2	2500 KVA Unit Service Transformers along with NGR (EPT-5A&5B)	2 sets*		
5.	B1.3	2000 KVA Station Service Transformers along with NGR (CWT2A,2B, CLWT 3A,3B)	4 sets*		
6.	B1.4	1600 KVA Unit Service Transformers along with NGR (UST5A(B) , 5B(B) , SST 3A,3B,3C,3D, ACT- 3A,3B )	8 sets*		
7.	B1.5	1000 KVA Station Service Transformers along with NGR (UST5A (T), 5B (T), DMCWT 3A,3B )	4 sets*		
8.	F2.1	VFD Transformers	4 sets*		
		<b>HT SWITCHGEAR :</b>			
9.	A2.1	Switchboard 5CA	1 set*		
10.	A2.2	Switchboard 5CB	1 set*		
11.	A2.3, A2.6, A2.8	Station Switchboard 0CA / 5CD/ 0CD	3 sets*		
12.	A2.4	Station Switchboard 0CB	1 set*		
13.	A2.5, A2.7	Boiler Switchboard 5CC / 0CC	2 sets*		

Sl.No	BOM Ref No	Description	Qty	Unit Rate	Total Rate
14.	A3.2	Bus Transfer Scheme panel (BTS)	2 Nos		
15.	A2.9	VFD Switchgear Panel	4 nos		
16.	A2.10	Earthing Trucks / Breakers	8 Nos		
		<b>BUSDUCTS</b>			
17.	B2.1	IP BUSDUCT (15.75 KV) Approximate length of Main Bus duct: 150 Mtrs, Approximate length of Tap off Bus duct : 62 Mtrs	1 set*		
18.	B2.2.1	6.6kV SP BUSDUCTS -1600A	230 Mtrs		
19.	B2.2.2	6.6kV SP BUSDUCTS – 2500 A	380 Mtrs		
20.	B2.2.3	6.6kV SP BUSDUCTS – 4000 A	8 Mtrs		
		<b>415V LOW VOLTAGE SWITCHGEAR/ CONTROL PANELS</b>			
21.	C2.1	Turbine PCC (5DA)	1 Set*		
22.	C2.2	Turbine Valve MCC (5DD)	1 Set*		
23.	C2.3	Boiler PCC (5DB)	1 Set*		
24.	C2.4	Boiler Valve MCC (5DE)	1 Set*		
25.	C2.5	Station Service PCC (0DA)	1 Set*		
26.	C2.6	Emergency MCC (0EA)	1 Set*		
27.	C2.7	Station Service PCC (0DC)	1 Set*		
28.	C2.8	Ventilation MCC (0DH)	1 Set*		
29.	C2.9	Ventilation MCC (0DI)	1 Set*		

Sl.No	BOM Ref No	Description	Qty	Unit Rate	Total Rate
30.	C2.10	Air conditioning MCC (0DG)	1 Set*		
31.	C2.11	ESP & Vent MCC (5DF)	1 Set*		
32.	C2.12	CW PCC (0DB)	1 Set*		
33.	C2.13	Fire fighting MCC (0DJ)	1 Set*		
34.	C2.14	DMCW PCC (0DK)	1 Set*		
35.	C2.15	Air Compressor PCC (0DL)	1 Set*		
36.	C2.16	Filter water P/H MCC (ODM)	1 Set*		
37.	C2.17	ACDB-12 Way	8 Sets*		
38.	C2.24	ACDB / DCDB -20 Way	8 Sets*		
39.	C2.25	ACDB / DCDB - 24 Way	8 Sets*		
40.	C2.18, C2.19	Turbine ACDB (5DG) / Boiler ACDB (5DH)	2 sets*		
41.	C2.20, C2.21	220V Unit DCDB (5FA) / 220V Station DCDB (0FA)	2 sets*		
42.	C2.22	Electrical control boards for compressor, cooling water pump and DMCP	3 Nos.		
43.	C2.23	Local Starter Panel	51 Nos.		
44.	D1.1	Soot Blower MCC	1 Set*		
45.	D1.2	FTP Local starter panels	1 No.		
46.	D1.3	D.C. Starter panel for Scanner air fan	3 Nos.		
47.	E1.1	L.T. Main Switch Board	1 Set.*		
48.	E1.2	Auxiliary Control Panel	2 Nos.		
49.	E1.3	Electronic Control Panel with Bapcon controllers	32 Sets*		
50.	E1.4	IOS PC with monitor, printers and other accessories etc.	1 set*		
51.	E1.5	Rapper Control Panel- with Rapcon controllers	2 Nos.		

Sl.No	BOM Ref No	Description	Qty	Unit Rate	Total Rate
52.	E1.6	Ash level indicator	64 Sets*		
53.	F1.1	Digital Automatic Voltage Regulator	1 set*		
54.	G.1.1	D.C. Starter Cabinet for DC Seal Oil Motor	1 Set.*		
55.	G.1.2	D.C. Starter Panels For EOPs, JOP	2 Sets*		
56.	G.1.3	Lub Oil Purification Equipment Panel	1 Set*		
57.	F7.1	Generator Control Panel (GCP)	1 No.		
58.	A3.1	Generator Relay Panel	1 No.		
59.	F7.2	Unit Auxiliary Control Board (UACB)	1 No.		
60.	F7.3	Station Auxiliary Control Board (SAB)	1 No		
		<b>VFD SYSTEM</b>			
61.	F2.2	DC Air cooled Reactor	4 sets*		
62.	F2.3	LCI Drive Panel	4 sets*		
63.	F2.4	Control Panel for VFD Drives	2 Nos.		
64.	F2.5	Contacto Panel for VFD Drives	4 Nos.		
65.	F2.6	MMI for VFD	1 set*		
		<b>BATTERY/ CHARGER</b>			
66.	C3.1	220 V DC Battery & Battery Charger	2 sets*		
67.	C3.2	Dual float cum boost Battery Charger	3 sets*		

Sl.No	BOM Ref No	Description	Qty	Unit Rate	Total Rate
		<b>HT CABLES</b>			
68.	C4.1	3C x 185 sq.mm 6.35kV/ 11kVgrade, Al cable	10,000 Mtrs		
69.	C4.2	1C X 630 sq.mm 6.35kV/ 11kVgrade, Al cable	15,000 Mtrs		
70.	C4.3	1C x 630 sq. mm 3.3kV(Unearthed) grade Al cable	1,500 Mtrs		
		<b>Termination kits (Indoor Type)</b>			
71.	C5.1	1c x 630 sq. mm 6.35/11 kV grade	92 Nos.		
72.	C5.2	3c x 185 sq. mm 6.35/11 kV grade	80 Nos.		
73.	C5.5	1c x 630 sq. mm 3.3 KV grade	80 Nos.		
		<b>6.6 kV Straight through jointing kits</b>			
74.	C5.3	1c x 630 sq. mm	10 Nos.		
75.	C5.4	3c x 185 sq. mm	4 Nos.		
		<b>LAYING OF LT POWER CABLES (1.1 kV grade )</b>			
76.	C6.1	1 C X 630 sq. mm, Al, Armoured	12000 Mtrs		
77.	E5.3	2 C X 120 sq. mm, Al, Armoured	12000 Mtrs		
78.	C6.2	2 C X 35 sq. mm, Al, Armoured	2500 Mtrs		
79.	C6.3	2 C X 16 sq. mm, Al , Armoured	3000 Mtrs		
80.	C6.4	3 C X 185 sq. mm, Al, Armoured	7000 Mtr		
81.	C6.5, F3.1	3 C X 95 sq. mm, Al, Armoured	4650 Mtrs		
82.	C6.6,E5.2	3 C X 35 sq. mm, Al, Armoured	5550 Mtrs		
83.	F3.2	3C X 25 sq. mm, Al, Armoured	1600 Mtrs		

Sl.No	BOM Ref No	Description	Qty	Unit Rate	Total Rate
84.	C6.7	3 C X 16 sq. mm, Al, Armoured	7000 Mtrs		
85.	E5.1	3 C X 10 sq. mm Al, Armoured	4200 Mtrs		
86.	C6.8	3.5 C X 185 sq. mm, Al, Armoured	1000 Mtrs		
87.	E5.4	3 .5 C X 120 sq. mm Al, Armoured	500 Mtrs		
88.	C6.9	3.5 C X 95 sq. mm, Al, Armoured	3000 Mtrs		
89.	C6.10	3.5 C X 35 sq. mm, Al, Armoured	12000 Mtrs		
90.	C6.11	4 C X 16 sq.mm, Al, Armoured	12000 Mtrs		
91.	C6.12	1 C X 630 sq. mm, Copper Armoured	1000 Mtrs		
92.	C6.13	1C X 70 sq. mm, Copper, Armoured	1000 Mtrs		
93.	C6.14	2 C X 95 sq. mm, Copper, Armoured	5000 Mtrs		
94.	C6.15	2 C X 70 sq. mm, Copper, Armoured	1000 Mtrs		
		<b>TERMINATION OF LT POWER CABLES</b>			
95.	C16.1	1 C X 630 sq. mm, Al, Armoured	180 Nos.		
96.	E9.3	2C x 120 sq. mm, Al, Armoured	298 Nos.		
97.	C16.2	2 C X 35 sq. mm, Al, Armoured	6 Nos.		
98.	C16.3	2 C X 16 sq. mm, Al , Armoured	22 Nos.		
99.	C16.4	3 C X 185 sq. mm, Al, Armoured	120 Nos.		
100.	C16.5, F6.1	3 C X 95 sq. mm, Al, Armoured	88 Nos.		
101.	C16.6, E9.2	3 C X 35 sq. mm, Al, Armoured	66 Nos.		
102.	F6.2	3 C X 25 sq. mm, Al, Armoured	24 Nos.		
103.	C16.7	3 C X 16 sq. mm, Al, Armoured	90 Nos.		
104.	E9.1	3 C X 10 sq. mm, Al, Armoured	72 Nos.		

Sl.No	BOM Ref No	Description	Qty	Unit Rate	Total Rate
105.	C16.8	3.5 C X 185 sq. mm, Al, Armoured	20 Nos.		
106.	E9.4	3.5C x 120 sq. mm, Al, Armoured	40 Nos.		
107.	C16.9	3.5 C X 95 sq. mm, Al, Armoured	20 Nos.		
108.	C16.10	3.5 C X 35 sq. mm, Al, Armoured	40 Nos.		
109.	C16.11	4 C X 16 sq. mm, Al, Armoured	40 Nos.		
110.	C16.12	1 C X 630 sq. mm, Copper Armoured	50 Nos.		
111.	C16.13	1C X 70 sq. mm, Copper, Armoured	35 Nos.		
112.	C16.14	2 C X 95 sq. mm, Copper , Armoured	200 Nos.		
113.	C16.15	2 C X 70 sq. mm, Copper , Armoured	24 Nos.		
		<b>LAYING &amp; TERMINATION OF LT POWER/ CONTROL CABLES</b>			
114.	C6.17, D3.2, D.4.1, E6.1, F3.3, F.4.1	2 C X 1.5 sq.mm / 2.5 sq. mm, Copper , Armoured	29,190 Mtrs		
115.	C7.1, C7.8, D.4.2, E6.2, C6.18, D3.1	3 C X 1.5 sq. mm/ 2.5 sq. mm, Copper, Armoured	145,000Mtr		
116.	C6.19, F4.2	4 C X 1.5 sq mm/ 2.5 sq. mm, Copper, Armoured	9400 Mtrs		
117.	C7.2	5 C X 2.5 sq. mm	35000Mtr		
118.	C7.3, E6.3	7 C X 2.5 sq. mm	29000Mtr		
119.	C7.4, E6.4	10 C X 2.5 sq. mm	57750Mtr		
120.	C7.5, C7.9	12 C X 1.5 sq. mm/ 2.5 sq. mm	35000 Mtrs		
121.	C7.6	16 C X 2.5 sq. mm	10000Mtrs		

Sl.No	BOM Ref No	Description	Qty	Unit Rate	Total Rate
122.	C7.7, C7.10,C7.12	19 C/20 C X 1.5 sq. mm /2.5 sq. mm	17,300Mtrs		
123.	F.4.3, C7.11	Earthing Cable, 1 C x 16 sq .mm, PVC, Cu	4000 Mtrs		
124.	C6.16	2 C X 6 sq. mm, Copper, Armoured	9000 Mtrs		
125.	D3.3	3 C X 6 sq. mm, Cu, Armoured	1000 Mtrs		
126.	C6.20	4 C X 6 sq. mm, Cu, Armoured	1000 Mtrs		
		<b>LAYING &amp; TERMINATION OF SCREENED CABLES ( Type F/Type G)</b>			
127.	F5.1, F5.4	2P x 0.5 sq. mm cable	1880 Mtrs		
128.	F5.2, F5.5	4P x 0.5 sq. mm cable	2880 Mtrs		
129.	F5.6	8 P x 0.5 sq. mm cable	2440 Mtrs		
130.	F5.3, F5.7	12P/14P x 0.5 sq. mm cable	1100 Mtrs		
131.	E6.5	4 C X 1.5 sq mm	6500 Mtrs		
132.	F5.8	3C X 50 sq mm	150 Mtrs		
133.	F5.9	3C X 2.5 sqmm	100 Mtrs		
		<b>CABLE TRAYS COMPLETE WITH COUPLER PLATES, FASTENERS etc.</b>			
134.	C8.1,E4.1	Ladder type, 600 mm wide	15750 Mtrs		
135.	C8.2,E4.2	Ladder type, 450 mm wide	4750 Mtrs		
136.	C8.3,E4.3	Ladder type, 300 mm wide	4000 Mtrs		
137.	C8.4,E4.4	Ladder type, 150 mm wide	8000 Mtrs		

Sl.No	BOM Ref No	Description	Qty	Unit Rate	Total Rate
138.	C8.5	Perforated Type, 600 mm wide	700 Mtrs		
139.	C8.6	Perforated Type, 450 mm wide	200 Mtrs		
140.	C8.7	Perforated Type, 300 mm wide	150 Mtrs		
141.	C8.8	Perforated Type, 150 mm wide	2500 Mtrs		
142.	C8.9, D.5.1	Perforated Type, 100 mm wide	4375 Mtrs		
143.	C8.10	Perforated Type, 50 mm wide	3000 Mtrs		
		<b>STRUCTURAL STEEL FOR SUPPORT</b>			
144.	C9.1, E8.1	Structural Steel for fabrication of supports (ISA - 50, ISMC – 100, ISMC - 150 etc.)	152 MT		
		<b>RIGID / FLEXIBLE CONDUITS</b>			
145.	C10.1	80 mm dia GS Rigid Conduit	50 Mtrs		
146.	C11.1	50 mm dia GI Flexible Conduit	250 Mtrs		
		<b>MARSHALLING BOXES / JUNCTION BOXES/ LOCAL START STOP PUSH BUTTONS</b>			
147.	C12.1	Galvanized MS marshalling box 6 way	3 Nos.		
148.	C12.2	Galvanized MS marshalling box 12 way	2 Nos.		
149.	C13.1, C13.2, E3.1	Local Push Button Station (Type –A&B)	413 Nos.		
150.	E3.2	Power Junction Boxes for hopper heaters/ support insulator heaters/ shaft insulator heaters	45 Nos.		

Sl.No	BOM Ref No	Description	Qty	Unit Rate	Total Rate
151.	E3.3	Control Junction Boxes for hopper thermostat, start stop PBs, ALI	22 Nos.		
152.	D2.2	Junction boxes-24 way	4 Nos.		
153.	D2.1	Junction boxes-12 way	4 Nos.		
		<b>LIGHTNING PROTECTION SYSTEM</b>			
154.	C14.1	GS Flat, 25 X 4 mm	2500 Mtrs		
155.	C14.2	20 mm dia GS Rod for Vertical Air Termination	35 Nos.		
156.	C14.3	Test Links	25 Nos.		
157.	C14.4	Excavation, laying of 40mm MS round rod and weld between lighting earth electrode and test link down conductor and reconditioning of earth	50 Mtrs		
		<b>ABOVE GROUND EARTHING MATERIALS</b>			
158.	C15.5	GI Flat 100 x 16 mm	1500 Mtrs		
159.	C15.1	GS Flat 65 x 10 mm	4200 Mtrs		
160.	E7.1	GI Flat 50 x 6 mm	4000 Mtrs		
161.	E7.2	GI Flat 30 x 5 mm	500 Mtr		
162.	C15.2	GS Flat 25 x 4 mm	1300 Mtrs		
163.	C15.3, E7.3	8 SWG GI Wire	7000 Mtrs		
164.	C15.4	Treated Earth pits	50 sets*		
		<b>HEATING ELEMENTS</b>			
165.	E2.1	Testing, Termination and dressing of Heating Elements for Hopper	768 Nos.		

Sl.No	BOM Ref No	Description	Qty	Unit Rate	Total Rate
166.	E2.2	Testing Heating elements for support insulator heater	128 Nos.		
167.	E2.3	Testing Heating elements for shaft insulator heater	32 Nos.		
168.	E2.4	Testing Thermostats for hopper heaters.	16 Nos.		
169.	E2.5	Testing Thermostat for support insulators	2 Nos.		
		<b>COMMISSIONING of the following erected by Mechanical Contractor</b>			
170.	G.2.3	210 MW Generator H.V. testing, meggering of Bushings & Accessories, resistance measurement, meggering including dry out of generator.	1 No.		
171.	G.2.4	6.6 KV Motors (BFP, PA Fan, ID Fan, CE Pump, Mills, FD, CWP, ACWP, Hydrant Main Pump, Spray Main Pump )	26 Nos.		
172.	C17.1	LT Drives- Unidirectional (including DC )	280 Nos.		
173.	C17.2	LT Drives- Reversible (including DC)	220 Nos.		
174.	C17.4, C17.5, C17.6	Control Panels for Hydrogen /Ammonia/ Phosphate Dosing system	3 Nos.		

Sl.No	BOM Ref No	Description	Qty	Unit Rate	Total Rate
175.	D6.1	Soot Blower Motors (WB, LRB, AH)	138 Nos.		
176.	D6.2, E10.2, C17.3	Hoists/cranes/monorail/elevator	15 Nos.		
177.	E10.1	LT Drives of ESP	68 Nos.		
178.	E10.3	ESP Transformer	32 Nos.		
179.	G.2.1	Exciter drier/heater	1 set*		
180.	G.2.2	Generator Air Drier	1 set*		

**TOTAL CONTRACT VALUE Rs.**

**in words**

NOTE TO RATE SCHEDULE :

1. The quantities indicated are approximate and are likely to vary during execution. The work executed Shall be measured and payment will be made for actual quantity erected.
2. The Tenderer is expected to fill up the rate column after satisfying all terms and conditions of Tender Specification.
3. Tenderers are requested to quote their rates, only in the price bid (part II) provided by BHEL. Quoting of rates in any other form / formats will not be entertained.