

TENDER SPECIFICATION

BHEL: PSSR: SCT: 1438

FOR

Handling at Site Stores / Storage yard, Transportation to Site of Work, Erection, Testing and Commissioning of Electrical and Controls & Instrumentation works for 1x20MW CPP at

at

**PHASE-3, CPCL MANALI,
CHENNAI, TAMILNADU**

VOLUME -II

RATE SCHEDULE



BHARAT HEAVY ELECTRICALS LIMITED

(A Government of India Undertaking)

Power Sector – Southern Region

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

TECHNICAL CONDITIONS OF CONTRACT (TCC)

BHARAT HEAVY ELECTRICALS LIMITED
(A Government of India Undertaking)
Power Sector, Southern Region
690, Anna Salai, Nandanam, Chennai – 35

Tender Specification No. BHEL: PSSR: SCT: 1438

for

Handling at Site Stores / Storage yard, Transportation to Site of Work, Erection, Testing and Commissioning of Electrical and Controls & Instrumentation works for 1x20MW CPP at Phase-3, CPCL Manali, Chennai, TamilNadu

One set of Tender documents consisting of

- 1) TECHNOCOMMERCIAL BID - 2 copies
- 2) PRICE BID (Vol II) - 2 copies

Book Sl no

Issued to
M/s

Refer NIT for Last date of submission

Please note this tender document is not transferable

For and on behalf of
BHARAT HEAVY ELECTRICALS LIMITED

ADDL GENERAL MANAGER / CONTRACTS

Place: Chennai -35
Date:

1 X 20 MW CO-GEN CYCLE POWER PLANT, CPCL –CHENNAI (STAGE – III)
RATE SCHEDULE FOR ERECTION, TESTING AND COMMISSIONING OF
ELECTRICAL/ C&I / ILLUMINATION PACKAGE

Before filling the Rates, the bidder shall go through the detailed specification of all the items given in the Bill of Materials(BOM) as well as Scope of Work specified in Tender

SL NO	BOM REF	Description	Qty	UNIT RATE		TOTAL AMOUNT	
				In fig	In words	In fig	In words
1	A 1.1	GENERATOR TRANSFORMER 33.5 MVA, 11kV/7.07 kV, ONAF/ONAN Generator Transformer complete with all accessories.	1 No.				
2	B1.1	6.6 KV HT SWITCHGEAR PANELS 6.6 KV HT Switchgear-6.6 KV, indoor, metal clad, vacuum break switchgears with incomer ,outgoing feeders, B/C, Bus PT cubicle along with associated loose items. Switchgear consists of 32 Panels in suitable shipping sections	1 set				
3	C1.1	11 KV SEGREGATED PHASE BUSDUCT FOR GTG 11 kV, 2000 A, segregated phase bus ducts for GTG with PTSP Cubicle, NG Cubicle, Cable Panel, Phase & neutral side CTs, Line/Neutral Side open busbars, support structures, air drying equipment with accessories etc.	1 set				
4	C1.2	6.6 KV SEGREGATED PHASE BUSDUCT Size of the bus duct ; 1200x800	18 Mtrs				
5	C1.3	415 Volts LT BUS DUCT Size of the bus duct ; 1200x800mm ,50 MTR LENGHT APPR.	50 Mtrs				
6	C1.4	Station Auxiliary Transformer 2.5MVA,ONAN, 6.6/0.433 kV,	2 nos				
7	C1.5	Station lighting transformer 125 kVA,415/433 V,	2 nos				
8	C1.6	Emergency lighting transformer 25kVA,415/433V,	1 Set				

SIGNATURE OF BIDDER

SL NO	BOM REF	Description	Qty	UNIT RATE		TOTAL AMOUNT	
				In fig	In words	In fig	In words
9	C1.7	Generator Control Panel	1 No.				
10	C1.8	Generator Relay Panel with discrepancy recorder, PC etc.	1 No.				
11	C1.9	LT PCC 415 Volts ,3 Phase	1 No.				
12	C1.10	GT MCC 415 V, 3 phase	1 no.				
13	C1.11	BOP MCC 415 V,3 Phase.	1 no.				
14	C1.12	AC VENT MCC 415 V,3 Phase.	1 no.				
15	C1.13	HRSG MCC 415 Volts,3 phase	1 No.				
16	C1.14	GT DCDB, 125 V DC	1 no.				
17	C1.15	STN DCDB 110 V DC	1 No.				
18	C1.16	UPS DB 110 V AC	1 no.				
19	C1.17	MLDB 415 volts,3 Phase	1 No.				
20	C1.18	ELDB 415 volts,	1 No.				
21	C1.19	SCADA Marshalling Panel	1 No.				
22	C1.20	ECP Panel 5500x1000x2400 , 5000 kgs	1 No.				

SIGNATURE OF BIDDER

SL NO	BOM REF	Description	Qty	UNIT RATE		TOTAL AMOUNT	
				In fig	In words	In fig	In words
23	C1.21	BATTERY/ BATTERY CHARGER - 125 Volts DC system	1 No.				
24	C1.22	BATTERY/ BATTERY CHARGER - 110 Volts DC system	2 sets				
25	C1.23	40 KVA, 110 V UPS unit comprising of inverter, chargers, servo stabiliser, etc.	1 set				
26	C1.29,C1.30,C1.31,D3.1	Start/ Stop Push Button Stations (Weatherproof/Explosion proof)	75 Nos				
27	F.1.1	DG set- Erection of electrical panel, cabling and commissioning assistance.	1 No.				
28	C10.7	VFD Panel for Hitec Additiv Dosing	1 no.				
		HT Cables					
29	C2.1	1C x 630Sq.mm., 11 kV (UE) Armoured;	1200 mtrs				
30	C2.2	HT Termination kit for 1C x 630Sq.mm., 11kV (UE) Armoured;	24 Nos				
31	C2.3	3C x 185Sq.mm. , 6.6kV (UE) Armoured;	700 mtrs				
32	C2.4	HT Termination kit for 3C x 185Sq.mm. 6.6 kV (UE) Armoured;	20 Nos				
		Laying and Termination of LT Power Cables (1.1 kv Armoured Cu/Al. Conductor XLPE Insulated PVC/FRLS Outer sheathed)					
33	C3.1	1 C X 300 sq. mm, Cu	300 mtrs				
34	C3.2	1 C X 240 sq. mm, Cu	300				
35	C3.3	1 C X 120 sq. mm,CU	300				
36	C3.4	1 C X 70 sq. mm, Cu	200				
37	C3.5	1 C X 35 sq. mm, Cu	500				
38	C3.6	2 C X 4 sq. mm, Cu	200				
39	C3.14	3.5 C X 300 sq. mm, Al	500				
40	C3.15	3.5 C X 185 sq. mm, Al	500				
41	D4.6	3C X 120 SQ.MM	300				
42	C3.16	3.5 C X 95 sq. mm, AL	1500				

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SL NO	BOM REF	Description	Qty	UNIT RATE		TOTAL AMOUNT	
				In fig	In words	In fig	In words
43	C3.7,C3.17,D4.5	3C / 3.5 C X 50 sq. mm, Al	1200 mtrs				
44	C3.8,C3.18	3 C / 3.5 C X 35 sq. mm, Al	2000 mtrs				
45	C3.9,3.10,3.19,3.20,D4.3,D4.4	3 C/3.5 C/4 C X 16/10/ sq. mm, Cu	6000 mtrs				
46	C3.11,C3.12,C3.21,D4.2	3 C/3.5C/4C X 4/6 sq. mm cu	14000 mtrs				
47	C3.13,C4.1,D4.1	3 C X 2.5 sq. mm, Cu	40000 mtrs				
		Termination of Following LT power cables (Separate termination rate is applicable for these cables only. For other power cables termination is part of laying work)					
48	C3.22	1 C X 70 sq. mm, Cu	10 Nos				
49	C3.23	1 C X 120 sq. mm	10 nos				
50	C3.24	1 C X 240 sq. mm, Cu	10 Nos				
51	C3.25	1 C X 300 sq. mm, Cu	10 Nos				
52	C3.26	3 C X 50 sq. mm, Al	20 Nos				
53	C3.27	3.5 C X 50 sq. mm, Al	20 Nos				
54	C3.28	3.5 C X 95 sq. mm, Al	20 Nos				
55	C3.29	3.5 C X 185 sq. mm, Al	20 Nos				
56	C3.30	3.5 C X 300 sq. mm, Al	20 Nos				
		Laying and termination of Control Cables (1.1 kv, Cu Armoured PVC insulated PVC/FRLS Outer Sheathed)					
57	C4.2,C4.3,D4.7	5 C /7C x 2.5 / 1.5 sq.mm	18500 mtrs				
58	C4.4,C4.5,D4.8	10 C/12 C X 2.5 sq. mm	26000m trs				
59	C4.6,C4.7,C4.8	16 C/19 C /24 C X 2.5 sq. mm	6500				
		Erection of Pre-fabricated cable trays including cover and accessories					
60	C5.1,C5.3,D5.3	Perforated/Ladder type cable tray, W=600 mm	4500 mtrs				

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SL NO	BOM REF	Description	Qty	UNIT RATE		TOTAL AMOUNT	
				In fig	In words	In fig	In words
61	D5.2,D5.5	Perforated/Ladder Type tray, 450 mm wide	50 mtrs				
62	C5.2,C5.4	Perforated/Ladder type cable tray, W=300 mm	2500 mtrs				
63	C5.5	150 mm (W) perforated cable tray	625				
64	D5.1,D5.4	Perforated Type/ladder tray, 100 mm wide	200 mtrs				
65	C5.6	50 mm (W) perforated cable tray	625 mtrs				
		Erection & Commissioning of C&I Package					
66	C1.24	MICROPROCESSOR BASED CO2 FIRE FIGHTING PANEL TO BE MOUNTED IN CONTROL ROOM	1 set				
67	E1.1	MARK-VI TURBINE CONTROL PANEL	1 set				
68	E1.2	Digital Automatic Voltage Regulator (DAVR) Panel,	1 set				
69	E1.3	DCS SINGLE CUBICLE maxDNA PANE	4 Set				
70	E1.4	SUITE OF TWO CUBICLE max DNA panels	5 set				
71	E1.5	SCADA ECS PANELS SUIT OF TWO CUBICLE max DNA panels	5 set				
72	E1.6	SCADA ECS PANELS SINGLE CUBICLE max DNA panels	4 Set				
73	E1.7	COMPUTER STATIONS ALONG WITH ACCESSORIES (PRINTERS,UPS and Furnitures ETC..)	16 Set				
74	E1.8,C10.9	OPERATOR CONTROL DESK	17 nos.				
75	E1.9	ETHERNET CABLE	500				
76	E1.10	OFC-LAYING OF FIBRE OPTIC CABLE THROUGH HDPE CONDUIT	500				
77	C1.25	INLET AIR FILTER PANEL	1 set				
78	C1.26	GT AUXILIARY PANEL	1 set				
79	C1.27	Vibration Monitoring system for GTG	1 set				
80	C1.28	Haz. Gas Monitor (110 V,ac) to be mounted on GT Aux Panel, 280X290X133	4 No				
		PLC Package					

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SL NO	BOM REF	Description	Qty	UNIT RATE		TOTAL AMOUNT	
				In fig	In words	In fig	In words
81	C10.8	Interlock PLC (BOP) Panels, 500 kgs	6 nos				
82	C10.10	Interlock PLC (BMS) Panels, 500 kgs	4 nos				
83	C10.1	EPABX System, 1200 X 800 X 2200 mm	4 nos				
84	C10.2	EPABX Telephone sets installation in office, house & other buildings	72 nos				
85	C10.3	Public address system (1200X800X2200)	1 no				
86	C10.4	PA Field call stations	42 nos				
		Laying and Termination of Signal Cables					
87	C10.17,C10.18,C10.19,C10.20,C10.21,C10.22,C10.25,D4.9,D4.10,D4.11	1P /2P /1T/2T X 1.5/0.9/0.5 sq.mm (individual & overall shielded) Intrinsic/Non-Intrinsic /Thermocouple cable	56000 mtrs				
88	C10.16,C10.23,C10.26	4P/6P X 0.5/0.9/1.5 sq.mm (individual & overall shielded) Intrinsic safe/Non-Intrinsic safe/Thermocouple cable	33000 mtrs				
89	C10.12,C10.13,C10.14,C10.15C10.27,D4.12	8P/10P/12P/6T/8T X 0.5/0.9/1.5 sq.mm (individual & overall shielded) Intrinsic safe/Non-Intrinsic safe/Thermocouple cable	80000 mtrs				
90	C10.11,C10.24,C10.28,C4.9	18P /20 P/10 TX 0.5 /0.9/1.5 sq.mm	9000 mtrs				
		Fabrication and Erection of Structural Steels for tray support,base frame,instruments,instrument JB's support etc.					
91	C6.1,C6.2,C6.3,D6.1,D6.2	ISMC 100 X 50 X 6 mm Channels, ISA 65 X 65X 6 mm Runner angles,ISA 50X50X6 mm Runner Angles etc	60 MT				
		Plant Earthing & Lightning Protection Materials					
92	C7.1	75 X 10 mm GI Strips	500				
93	C7.2	50 X 6 mm GI Strips	500				
94	C7.3	35 X 6 mm GI Strips	500				

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SL NO	BOM REF	Description	Qty	UNIT RATE		TOTAL AMOUNT	
				In fig	In words	In fig	In words
95	D3.4	25 x3.15mm GI Flat	500				
96	C7.4,D3.5	8 SWG GI Wire	500				
97	C7.5	16 SWG GI Wire (stranded)	100				
		Plant Illumination Package					
98	C8.1	Well glass luminaire along with non integral control gear box suitable for the use with HPMV 125 W lamps(IP 66)	50 nos				
99	C8.2	Flameproof Well glass luminaire suitable for hazardous area Group IIA & IIB Zone 2 along with non integral gear box suitable for use with HPMV 125 W lamp(IP 65)	20 nos				
100	C8.3	Well glass luminaire along with non integral control gear box suitable for the use with HPMV 100 W lamps(IP 65)	20 nos				
101	C8.4	2 meter pole along with accessories	80 nos				
102	C8.5	Industrial metal clad type 6/16A socket with switch	5 nos				
103	C8.6	Flameproof Well Industrial metal clad type 5/15A socket with switch suitable for hazardous area group IIA & IIB Zone 2	5 nos				
104	C8.7	63A TPN welding receptables (safe area)	5 nos				
105	C8.8	63A TPN welding receptables (flameproof area)	5 nos				
106	C8.9	6 way AC Outdoor Lighting Panels (apprx. Dimension 1000X800X200), apprx. 30kg	2 nos				
107	C8.10	12 way AC Outdoor Lighting Panels (apprx. Dimension 1000X800X200), apprx. 30kg	1 no				
108	C8.11	6 way DC Outdoor Lighting Panels	1 no				
109	C8.12	20 mm dia. GI Conduit	200				
110	C8.13	50 mm dia. GI Conduit	200				
111	C8.14	Lighting JB 3 way/4 way	20 nos				
112	C8.15	HRSB Stack Lighting -Refer BOQ for details	1 set				
113	C8.16	GT Stack Lighting- Refer BOQ for details	1 set				
114	C8.17	GT Enclosure Lightning - Refer BOQ for details	1 set				
		Supply of following items					

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SL NO	BOM REF	Description	Qty	UNIT RATE		TOTAL AMOUNT	
				In fig	In words	In fig	In words
115	C9.8	Trefoil clamps for single core cables-25 mm wide 8 SWG Aluminium strips	400 nos				
116	C9.9	11 kv/6.6 kv danger boards, hand gloves and first aid boxes as per requirement to meet statutory obligations for all the panels erected by the agency	1 set				
117	C9.10	Rubber mats for HT Switchgear , 1.2m X 2m (thickness shall meet standards specified in I S)	15 nos				
118	C9.11	Rubber mats for LT Switchgear room, 1.2m X 2m (thickness shall meet standards specified in I S)	30 nos				
		Field Instruments					
119	D1.10	Local Gauge Board of size 1100X650X2150mm	8 nos				
120	D2.4	Electronic Water Level indicator	2 set				
121	C11.10,D3.2,C15.5,C16.4	Instrument Junction Boxes, 12/24/48/60 ways terminals, explosion proof/ weather proof	120 nos				
122	C11.11	Canopies-Instruments and Junction Boxes	200				
123	C11.1	Control valve & ON/OFF Valves (commissioning only)	30 nos				
124	C11.2,,D1.1	Pressure Gauges	54 nos				
125	C11.3,C11.5,D1.3 ,D1.4	Pressure, Temperature,DP& FLOW Transmitters	103 nos				
126	C11.4,D1.2	Temperature guages along with thermowell	60 nos				
127	C11.8	Mass Flow Meters	4 nos				
128	C11.9	Radar level transmitters (for HSD/Naphta storage tanks)	6 nos				
129	C11.7,D1.7,D1.6, D1.8	RTDs with flanged wells,Thermocouples with flanged well	68 Nos				
130	D1.5	Thermocouples (Gas Path, W/O Well)	14 nos				
131	D1.9	MTM Thermocouples	39 nos				
132	C11.6	Air filter Regulators	20 nos				
		GT/HRSG/BOP Instruments (Removal(if applicable), calibration, checking and erection)					
133	C14.1	Solenoid for inlet air system	75 nos				
134	C14.2	Temperature Switches	13 nos				
135	C14.3	Vibration sensors (seismic)	11 nos				
136	C14.4	Shaft Vibration sensors	16 nos				
137	C14.5	Temperature rise type fire detectors	9 nos				
138	C14.6	Pressure switches	35 nos				

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SL NO	BOM REF	Description	Qty	UNIT RATE		TOTAL AMOUNT	
				In fig	In words	In fig	In words
139	C14.7	Limit Switches	12 nos				
140	C14.8	Magnetic pickups	12 nos				
141	C14.9,C12.7	Pressure transmitters	26 nos				
142	C14.10,C12.8	Pressure/ DP switches	9 nos				
143	C14.11,C12.5	DP Transmitters	18 nos				
144	C14.12	LVDT's	2 nos				
145	C14.13,C12.6	Thermometers/Temperature gauges	20 nos				
146	C14.14,C12.1	Pressure Guages	65 nos				
147	C14.15,C12.4	DP Guages	30 nos				
148	C14.16	Thermocouples (including thermowell as applicable)	45 nos				
149	C14.17	Hazardous gas sensor (Naphta)	9 nos				
150	C14.18	Fire detectors (RTDs for generator)	12 nos				
151	C14.19	Flame Scanners	2 nos				
152	C14.20	Ignitor with Excitor Probes	2 nos				
153	C12.2	level transmitters	6 nos				
154	C12.3	level switches	4 nos				
		Impulse pipes					
155	C13.1	SS Pipe 33.4 x 3.4 mm	100				
156	C13.2	SS Pipe 12.7 x 2.1 mm	400				
157	C13.3	SS Pipe 21.3 x 3.7 mm	400				
158	C13.4	SS Tube 6 X 1 mm	100				
159	C13.5	AS Pipe 21.3 X 4.74 mm	200				
160	C13.6	CS Pipe O.D 21.3	200				
		CO2 FIRE DETECTION SYSTEM					
161	C15.1	Manual call points	6 nos				
162	C15.2	Hooters	4 nos				
163	C15.3	Pressure switches	6 nos				
164	C15.4	Solenoid valves	6 nos				
		Analysers					
165	C10.5	SWAS ANALYSER	1 set				
166	C10.6	GT Stack Analyser	1 set				
167	D2.1	HRSG Chimney Smoke Density Analyser	1 set				
168	D2.2	HRSG Chimney CO + SO2 + NOX + HC Analyser	1 set				
169	D2.3	SWAS ANALYSER of HRSG system	1 set				
		Erection of Miscellaneous items					

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				In fig	In words	In fig	In words
170	C9.1	MCT Frames WITH MULTI SIZE BLOCKS	40 sq m				
171	C9.2	Fire break coatings for HT/LT power cables	50 sq.m				
172	C9.3	Fire proof material for sealing of wall/floor openings and panel boards	50 sq.m				
173	C9.4	Fire proof material for sealing of cable entry through conduits/trenches	50 sq.m				
174	C9.5	GI conduits of 100 /150/200 mm dia. Shall be medium duty, class-B type. Galvanizing thickness shall be minimum 75 microns	100 mtrs				
175	C9.6	Hume pipes for cable at road crossing (200 NB) shall comply to IS:458	100 mtrs				
176	C9.7	PVC Conduits of 200 mm dia.	100 mtrs				
177	C16.1	2" GI Pipe for transmitter and JB mounting & Support set up	200 m				
178	C16.2	Explosion proof power/control junction boxes (for DD & GD), 50 kg each.	4 Nos				
179	C16.3	Explosion proof PB junction boxes (for DD & GD)	2 nos				
180	C16.5,C16.6	1", 0.5" conduits for wiring solenoids	250 mtrs				
181	C16.7,D3.3	6mm/ 1/4" SS Tube	200				
182	C16.8	12 mm OD SS tubes	50 mtrs				
183	C16.9	Enlarging of flame proof motor terminal box gland holes, rethreading to suit cable glands.	15 Nos				
184	C16.10	Fixing of 12 Nos fire detectors in GT enclosure, running of 20 m 1" GI pipe with supports, wiring with PTFE cable for fir detectors.	1 set				
185	C16.11	Removal of exhaust thermocouples from JB's, relocation of JB's, replacing the terminals with ceramic and reconnecting thermocouples for two JB's.	1 set				
186	C16.12	Fixing of 4 Nos fire detectors in Offbase enclosure, running of 20 m 1" GI pipe with supports, wiring with PTFE cable for fir detectors.	1 set				
	G.1.0	Commissioning of the following equipment erected by others					
187	G.1.1	Meggering of Generator Bushing ,Generator, including of commissioning of generator	1 set				
188	G.1.2	Electric actuators	80 Nos				
189	G.1.3	Meggering and dry out of LT drives	50 Nos				
190	G.1.4	Control Valves	30 Nos				

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				In fig	In words	In fig	In words
191	G.1.5	Hoists	2 nos				
		Total					
NOTE TO RATE SCHEDULE:							
	1. The quantities indicated in Qty column are approximate and are liable for variation and alteration at the discretion of BHEL. The work executed shall be measured and priced at unit rate quoted by the contractor and accepted by BHEL.						
	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 quoted their rates, only in the price bid (Vol II) provided by BHEL. Quoting of rates in any other form / formats will not be entertained.						
	4. Tenderers are requested to affix their company seal and authorised signature in all pages .						

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