

TENDER SPECIFICATION

BHEL:PSSR:SCT: 1307

FOR

**Handling at Site Stores / Storage yard,
Transportation, Erection, Testing and
Commissioning of Control & Instrumentation
System for Unit- 1 of 1x500 MW Unit at
Kakatiya Thermal Power Project at Warangal Dist.
AP for APGENCO**

At

**KAKATIYA THERMAL POWER PROJECT
Chelpur Village, Warangal Dist, Andhra Pradesh.
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.

TENDER SPECIFICATION No. BHEL:PSSR:SCT: 1307

NAME OF THE WORK

Handling at Site Stores / Storage yard, Transportation , Erection,
Testing and Commissioning of Control & Instrumentation System
for Unit-1 of 1 x 500 MW Unit at Kakatiya Thermal Power Project
at Warangal Dsit. AP for APGENCO

RATE SCHEDULE

Issued to M/s

For and on Behalf of
BHARAT HEAVY ELECTRICALS LIMITED

Addl General Manager/Contracts

Place: Chennai – 600 035
Date:

(This tender document is not Transferable)

* Lump sum rate to be quoted per set

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SIGNATURE OF TENDERER

KAKATIYA TPP (1 X 500 MW)
RATE SCHEDULE FOR
ERECTION, TESTING AND COMMISSIONING OF C&I PACKAGE

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

SL.NO.	BOM REF.	DESCRIPTION	QTY	UNIT RATE	TOTAL RATE
ERECTION/COMMISSIONING OF LOCAL/FIELD MOUNTED INSTRUMENTS					
1.	A.1.1	PD Type Flow meter	2 sets*		
2.	A.1.2, A.2.1, A.3.1, A.4.2, A.4.7.5, B.1.1, C.1.1.1, D.3.2.1, E.2.1.1, E.3.1, F.1.2.1, F.1.5.2, F.1.6.1, F.2.1.9, F.2.4.3	Pressure Gauges/ Draft Gauges	470 Nos.		
3.	A.2.2, A.3.2, A.4.4, A.4.7.6, C.1.1.2, E.2.1.2	DP Gauges	28 Nos.		
4.	B.1.6	Thermocouple Assembly for APH	4 sets*		
5.	A.4.7.1, D.3.2.5, E.2.1.8, F.1.2.10, F.2.1.2	Thermocouple with thermowell	282 Nos.		
6.	A.4.8.1	MTM T/Cs of route length 10 to 14 Mtrs (6 mm OD)	20 Nos.		
7.	A.4.8.2	MTM T/Cs of route length 16 to 20 Mtrs (6 mm OD)	59 Nos.		
8.	A.4.8.3	MTM T/Cs of route length 22 to 26 Mtrs (6 mm OD)	102 Nos.		
9.	D.3.2.4	MTM Thermocouples, 30 Mtr – flexible type	53 Nos.		

* Lump sum rate to be quoted per set

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SIGNATURE OF TENDERER

SL.NO.	BOM REF.	DESCRIPTION	QTY	UNIT RATE	TOTAL RATE
ERECTION/COMMISSIONING OF LOCAL/FIELD MOUNTED INSTRUMENTS					
10.	A.1.3, A.3.3, A.4.3, A.4.7.4, B.1.2, B.2.2, C.1.1.3, D.3.2.2, E.2.1.6, E.3.3, F.1.2.2, F.1.5.5, F.1.6.4, F.2.1.3, F.2.4.2	Temperature Gauges with Thermowell (capillary/ stem type)	369 Nos.		
11.	B.1.3, B.2.1, D.3.2.3, E.1.1.1, E.2.1.7, E.4.1, F.1.2.8, F.1.5.4, F.1.6.3, F.2.1.1	RTDs with thermowell	276 Nos.		
12.	A.1.4, A.2.3, A.3.4, A.4.1, B.1.4, C.1.1.4, D.3.2.6, E.2.1.4, F.1.2.9, F.1.5.1, F.1.5.3, F.1.6.2, F.2.1.7	Pressure Switches	152 Nos.		
13.	A.1.7, A.2.4, A.3.5, A.4.5, C.1.1.5, D.3.2.7, E.2.1.5	DP Switches	55 Nos.		
14.	A.4.7.7	Flow Switches	3 Nos.		
15.	A.1.5, A.4.7.2, B.1.5, F.2.1.4	Temperature Switches	20 Nos.		
16.	A.1.6, C.1.1.6, E.3.2, F.2.1.11, F.2.4.1	Level Switches (float type)	33 Nos.		
17.	D.3.2.8, F.1.2.7	Level switches (capacitance type)	13 Nos.		
18.	D.3.2.9, F.2.1.12	Level Switches (conductivity type) with electrodes, vessels and electronic units etc.	4 sets*		
19.	F.2.1.13	Level Switches with amplifier, bar probe including interconnecting cable	7 sets*		
20.	D.3.2.11, E.2.1.3, F.1.2.4, F.2.1.5	Pressure Transmitters	227 Nos.		

* Lump sum rate to be quoted per set

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SIGNATURE OF TENDERER

SL.NO.	BOM REF.	DESCRIPTION	QTY	UNIT RATE	TOTAL RATE
ERECTION/COMMISSIONING OF LOCAL/FIELD MOUNTED INSTRUMENTS					
21.	F.2.1.17	Temperature Transmitters	2 Nos.		
22.	D.3.2.10, F.1.2.5, F.1.2.6, F.2.1.6, F.2.1.16	DP Transmitters for Flow / Level/ Differential Pressure	131 Nos.		
23.	E.2.1.9, F.2.1.10	Level Transmitters with probes, electronic units etc.	10 sets*		
24.	D.3.2.15	Electronic Water level indicator	2 sets*		
25.	A.4.7.8	Electronic Flow Transmitters	3 Nos.		
26.	F.1.6.5	Moisture Sensor Probes	2 Nos.		
27.	F.2.1.14	Position Transmitter for Extraction NRV	10 Nos.		
28.	A.3.8	Pneumatic Pressure Controllers with Pneumatic Transmitter	1 set*		
29.	A.1.9	Speed Regulator/ Air Lock Valves/ Air Sets	12 sets*		
30.	A.1.11, A.2.5, A.3.6, D.3.2.13	Air Filter Regulators	63 Nos.		
31.	D.3.2.12, E.2.1.11	I/P Converters	44 Nos.		
32.	A.3.7	Purge Meter cum DP regulator	24 Nos.		
33.	A.1.8	Flame Scanner Head Assembly	24 sets*		
34.	A.1.12	FSSS Local Oil Gun Maintenance Switch Box	12 Nos.		
35.	A.1.13	H.E.A. Excitor box Assembly with accessories	12 sets*		
36.	A.2.9	Burner Tilt Shear Pin Failure Indication Box	4 Nos.		
37.	A.2.10	Heavy Duty Limit Switch (for Burner Tilt)	16 Nos.		

* Lump sum rate to be quoted per set

SL.NO.	BOM REF.	DESCRIPTION	QTY	UNIT RATE	TOTAL RATE
ERECTION/COMMISSIONING OF LOCAL/FIELD MOUNTED INSTRUMENTS					
38.	A.3.9	Ultrasonic Coal Flow Monitor, along with accessories	8 sets*		
39.	A.4.6	ERV Controller with Pressure Switch	2 sets*		
40.	A.4.9	Electronic Water Level Indicator along with Display Units, Ascetor Unit and other accessories.	2 sets*		
41.	A.4.10	Sonic tube leak detection system along with Panel and other accessories.	1 set*		
42.	B.1.7	Rotor Stoppage System with accessories	2 sets*		
43.	B.1.8	ON/OFF Switch Box including light assembly	2 sets*		
44.	E.2.1.10	Speed measuring loop for BFPDT Governing System	6 sets*		
45.	D.3.9.1	Vibration Monitoring System (VMS) for Fans, Mills and Pumps, along with 66 sets of velocity type pick-ups, 1 No. Control Panel and other accessories.	1 set*		
46.	E.2.2.1	Vibration Monitoring System for BFP Drive Turbine With 16 Nos. probes, Monitor, and other accessories	2 sets*		
47.	E.1.1.5	Vibration Monitoring Panel for 2 TDBFPs, BP and 1 MDBFP & BP	1 No.		

* Lump sum rate to be quoted per set

SL.NO.	BOM REF.	DESCRIPTION	QTY	UNIT RATE	TOTAL RATE
ERECTION/COMMISSIONING OF LOCAL/FIELD MOUNTED INSTRUMENTS					
48.	E.1.1.6	Reverse Rotation Monitoring System for BFP & CEP Along with 3 Nos. Probes, monitor and other accessories	1 set*		
49.	D.3.7.1	Coal Bunker Level Monitoring System along with 56 sets of Sensors and other accessories.	1 set*		
50.	D.3.6.1	SOX/NOX/CO analyzer, along with Sample Handling System consisting of 1 No. local analyser cabinet and other accessories. The analyser to be installed at 35 ML of chimney	1 set*		
51.	D.3.6.2	O2 Analyser Along with Electronic Unit and other accessories.	2 sets*		
52.	D.3.6.3	Opacity Analyser to be installed at 75 ML of chimney. Including two Nos. of transceiver units, an air compressor unit and other accessories.	3 sets*		
53.	D.3.8.1	Steam and water analysis system, SWAS consisting of: Primary Cooler Rack: 2 Nos., Chiller Unit : 1 No., Wet Panel: 1 No., Dry panel: 1 No., Conductivity Racks: 2 Nos., sensors/ analysers and other accessories	1 set*		

* Lump sum rate to be quoted per set

SL.NO.	BOM REF.	DESCRIPTION	QTY	UNIT RATE	TOTAL RATE
ERECTION/COMMISSIONING OF UCB/ CONTROL ROOM MOUNTED INSTRUMENTS					
54.	D.3.3.3, D.3.3.4, D.3.3.5	Recorders- 3 point/ 6 point / 30 point	7 Nos.		
55.	D.3.3.1, D.3.3.2, F.1.7.1	Electronic /Digital Indicators (Bar Graph Indicators, Temperature Indicators etc.)	25 Nos.		
REMOVAL, CALIBRATION, REFIXING AND COMMISSIONING OF INSTRUMENTS					
56.	F.1.3.1	Pressure Gauges	13 Nos.		
57.	F.1.3.2	DP Gauges	2 Nos.		
58.	B.2.3, E.1.1.2, E.4.2, F.1.3.3	Temperature Gauges	52 Nos.		
59.	F.1.2.3, F.1.3.9	Flow Gauge/ Flow Meter with Contacts	7 Nos.		
60.	F.1.3.7	Pressure Switches	8 Nos.		
61.	F.2.1.8	DP Switches	12 Nos.		
62.	F.1.3.8	Level Switches	7 Nos.		
63.	F.1.3.10	Conductivity Cells	2 Nos.		
64.	F.1.3.5	Pressure Transmitters	5 Nos.		
65.	F.1.3.6	DP Transmitters	5 Nos.		
66.	F.2.1.15	Position Transmitters	18 Nos.		
67.	F.1.3.11	PW Conductivity Indicator	1 No.		

* Lump sum rate to be quoted per set

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SIGNATURE OF TENDERER

SL.NO.	BOM REF.	DESCRIPTION	QTY	UNIT RATE	TOTAL RATE
CALIBRATION (AS REQUIRED), ERECTION, REMOVAL AND NORMALIZATION					
68.	G.1.1	MTM thermocouple length 10 Mtrs	12 Nos.		
69.	G.1.2	Junction boxes - 12 way/ 6 way/ 24 way	10 Nos.		
70.	G.1.3	Compensating cables 2 P x 0.5 sq. mm	200 Mtrs		
71.	G.1.4	Compensating cables 6 P x 0.5 sq. mm	300 Mtrs		
72.	G.1.5	Pressure gauges	5 Nos.		
73.	G.1.6	Drum MTM thermocouple adaptor fabrication - 1/4 inch NPT(M) x 1/4 inch OD SS	2 sets*		
74.	G.1.7	16 P x 0.5 sq. mm cable for Teletel Drum level indication	500 mtrs		
75.	G.1.8	3c x 2.5 sq. mm power cable Teletel Drum level indication	100 mtrs		
76.	G.1.9	9 port lamp indication at control room and 9 port switching at Drum floor	1 set*		
77.	G.1.10	Switchboards with switches	3 Nos.		
ERECTION/COMMISSIONING OF PNEUMATIC POWER CYLINDERS (REGULATING TYPE)					
78.	A.2.11.1	For ID Fans I/L Control	2 Nos.		
79.	A.2.11.2	Cold Air Regulating Dampers	7 Nos.		
80.	A.2.11.3	Hot Air Regulating Dampers	7 Nos.		
81.	A.2.11.4, A.2.11.5	PA Fan/ FD Fan Vane Regulating Dampers	4 Nos.		
82.	A.2.11.6	Power Cylinders for SADC	64 Nos.		
83.	A.2.11.7	Dynavane Filter Bleed Air Damper	1 No.		

* Lump sum rate to be quoted per set

SL.NO.	BOM REF.	DESCRIPTION	QTY	UNIT RATE	TOTAL RATE
ERECTION/COMMISSIONING OF PNEUMATIC ACTUATORS (ON/OFF TYPE)					
84.	A.2.13.1	Scanner Air Emergency Damper	1 No.		
ERECTION/COMMISSIONING OF MASTER SLAVE CLOCK SYSTEM					
85.	D.3.5.1	Master clock control panel	1 No.		
86.	D.3.5.2	Slave clock	20 Nos.		
87.	D.3.5.3	GPS Antenna along with around 100 Mtrs antenna cable from antenna to GPS Receiver	1 set*		
88.	D.3.5.4	RS232 Data Cable	1000 Mtrs		
89.	D.3.5.5	RG 58 Coaxial Cable	3,000 Mtrs		
90.	D.3.5.6	3C x 2.6 sq. mm Power Supply Cable for Slave Clock	1,500 Mtrs		
91.	D.3.5.7	GI Conduit pipe, 19 mm OD	1,000 Mtrs		
92.	D.3.5.8	Junction Boxes	10 Nos.		
ERECTION/COMMISSIONING OF MAIN UPS WITH ACDB AND BATTERY					
93.	D.3.13.1	2 x 80 KVA, UPS comprising of following panels: Servo controlled voltage stabilizer cubicle, Isolation Transformer Cubicle-1 & 2, UPS-1 & 2	1 set*		
94.	D.3.13.2	ACDB	2 Nos.		
95.	D.3.13.3	UPS Battery, NiCd, 192 cells, along with wooden rack, and other accessories	2 sets*		

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SL.NO.	BOM REF.	DESCRIPTION	QTY	UNIT RATE	TOTAL RATE
ERECTION/COMMISSIONING OF 24 V DC BATTERY & CHARGER					
96.	D.3.10.1	24V DC Battery Charger with DCDB for SG/TG and BOP	2 sets*		
97.	D.3.10.2	24V DC Battery for SG/TG and BOP	2 sets*		
98.	D.3.11.1	24V Battery Charger for CW Pump	1 set*		
99.	D.3.11.2	24V DC Battery for CW Pump	1 set*		
100.	D.3.12.1	24V Battery Charger for FOPH	1 set*		
101.	D.3.12.2	24V DC Battery for FOPH	1 set*		
ERECTION/COMMISSIONING OF PANELS					
102.	A.3.10	Gravimetric Feeder Panel	7 Nos.		
103.	C.1.3.1	Control Panel for HP Dosing System	1 No.		
104.	D.3.4.1	Alarm Annunciator Panels (Suite of 4 panels)	1 No.		
105.	D.3.4.2, D.3.4.3	Alarm Annunciator Panels/ Digital Buffer Cabinets (Suite of 2 panels)	2 Nos.		
106.	F.1.1.1	Generator Instrumentation Cabinet	1 No.		
107.	F.1.1.2	Gas Analyser Cabinet including sensor, analyser etc.	1 set *		
108.	F.1.1.3	Annunciation Cabinet	1 No.		

* Lump sum rate to be quoted per set

SL.NO.	BOM REF.	DESCRIPTION	QTY	UNIT RATE	TOTAL RATE
ERECTION/COMMISSIONING OF MMIPIS (DCS System)					
109.	D.1.1.1, D.2.1.1, D.2.1.2, D.3.1.1	Single Cubicle	11 Nos.		
110.	D.1.1.2, D.2.1.3, D.3.1.2	Suite of Two Cubicles	36 Nos.		
111.	D.1.1.3, D.2.1.4, D.3.1.3	Suite of Three Cubicles	7 Nos.		
112.	D.1.1.4	Suite of Four cubicles	1 No.		
113.	D.4.1.3	CRT Desk	1 set*		
114.	D.4.1.1	COMPUTER STATIONS Engineer Workstation, 'maxStorian' Station, Operator Work Stations, maxLINK Stations	18 sets*		
		Note: Rates quoted for PCs should be inclusive of associated furniture including PC tables, operator chairs, printer tables/consols etc.			
115.	D.4.1.3	Network Panels/ Link Panels	3 Nos.		
116.	D.4.2.1	Ethernet Cable	15,250 Mtrs		
117.	D.4.4.2	Power Cables: 4 C x 1.5 sq. mm cables	500 Mtrs		
118.	D.4.4.3	Laying of Fibre Optic Cable	2200 Mtrs		

* Lump sum rate to be quoted per set

SL.NO.	BOM REF.	DESCRIPTION	QTY	UNIT RATE	TOTAL RATE
ERECTION/TESTING OF LOCAL INSTRUMENT ENCLOSURES/ RACKS (LIE/LIR)/GAUGE BOARDS					
119.	D.3.19.1	LIE, type A of size: 1450 x 800 x 2300 mm; Approximate weight: 375 kg each	8 Nos.		
120.	D.3.19.2	LIE, type B of size: 1100 x 800 x 2300 mm; Approximate weight: 300 kg each	20 Nos.		
121.	D.3.19.3	LIE, type C of size: 700 x 600 x 2100 mm; Approximate weight: 250 kg each	1 No.		
122.	D.3.19.4	LIR, type A of size 2150 x 650 x 2150 mm; Approximate weight: 325 kg each	23 Nos.		
123.	D.3.19.5	LIR, type B of size 1650 x 650 x 2150 mm; Approximate weight: 250 kg each	16 Nos.		
124.	D.3.19.6	LIR, type C of size 1150 x 650 x 1600 mm; Approximate weight: 500 kg each	14 Nos.		
125.	E.1.2.1	LGB Assembly for Feed Water Service for BFP Approximate Size 1400 x 550 x 1900 mm ; Weight = 200 kg each.	3 Nos.		
126.	E.1.2.2	LGB Assembly for Seal and Cooling Water Service of Booster Pump & BFP Approximate Size 1400 x 550 x 1900 mm ; Weight = 200 kg each.	3 Nos.		
127.	E.1.2.3	LGB Assembly for Oil Service of TDBFP/ MDBFP Approximate Size 1400 x 550 x 1900 mm ; Weight = 200 kg each.	3 Nos.		

* Lump sum rate to be quoted per set

SL.NO.	BOM REF.	DESCRIPTION	QTY	UNIT RATE	TOTAL RATE
128.	E.1.2.4	LGB Assembly for CEP set Approximate Size 1400 x 550 x 1900 mm; Weight = 200 kg each.	1 No.		
129.	E.1.2.5	Local instrument rack (LIR) assembly for 2 TDBFPs Approximate Size 2000 x 650 x 2200 mm; Weight = 300 kg each.	1 No.		
130.	E.1.2.6	Local instrument rack (LIR) assembly for MDBFP Approximate Size 1200 x 600 x 2200 mm; 200 kg each.	1 No.		
131.	E.1.2.7	Local Instrument Rack (LIR) assembly for CEPs Approximate Size:1200 x 600 x 1500 mm; Weight = 200 kg	1 No.		
132.	E.1.2.8	Local Instrument Rack (LIR) assembly for CEPs Approximate Size:2000 x 650 x 2200 mm; 300 kg	1 No.		
ASSEMBLY AND ERECTION OF MOUNTING FRAMES					
133.	D.2.4.1 to D.2.4.9	Assembly and installation of Mounting Frames with loose supplied prefabricated materials like slotted angles, channels etc.	21 Nos.		

* Lump sum rate to be quoted per set

SL.NO.	BOM REF.	DESCRIPTION	QTY	UNIT RATE	TOTAL RATE
ASSEMBLY/WELDING/ERECTION OF INSTRUMENT RACKS (Assembly/welding and installation of Instrument Racks with loose supplied prefabricated materials like angles, channels etc. Total wt. of loose supplied items for 12 racks: Approx. 3 Tonnes.)					
134.	F.2.3.1	Rack of Size 2150 x 700 x 2150 (WXDXH) mm	10 Nos.		
135.	F.2.3.2	Rack of Size 1250 x 700 x 2150 (WXDXH) mm	2 Nos.		
LAYING, TERMINATION & TESTING OF CABLES					
136.	A.5.1.1	Flame Scanner Cable (2P x 1 sq. mm cable)	4,200 Mtrs		
		<i>PVC/FRLS, shielded, armoured Cu cables</i>			
137.	A.5.1.2, D.3.15.1, D.3.15.5	2P X 0.5 sq. mm cable	31,030 Mtrs		
138.	A.5.1.6	2 P x 1.5 sq. mm cable	7157 Mtrs		
139.	A.5.1.3, D.3.15.2, D.3.15.6, E.1.5.1	4P X 0.5 sq. mm cable	1,19,980 Mtrs		
140.	A.5.1.4, D.3.15.3, D.3.15.7	8P X 0.5 sq. mm cable	58,440 Mtrs		
141.	D.3.15.4, D.3.15.8	12 pair x 0.5 sq. mm cable	35,900 Mtrs		
142.	A.5.1.5	16 P X 0.5 sq. mm cable	600 Mtrs		
143.	E.1.5.2	4 Triad, 0.5 sq. mm cable	1000 Mtrs		
		<i>PTFE insulated cables</i>			
144.	D.2.2.1	2 pair x 0.5 sq. mm cable	6000 Mtrs		
145.	D.2.2.2	4 pair x 0.5 sq. mm cable	2000 Mtrs		

* Lump sum rate to be quoted per set

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SIGNATURE OF TENDERER

SL.NO.	BOM REF.	DESCRIPTION	QTY	UNIT RATE	TOTAL RATE
146.	D.2.2.3	5 Core x 1.5 sq. mm control cable	1000 Mtrs		
	<i>Compensating Cables</i>				
147.	D.2.2.4, D.2.2.5	2 Pair x 0.5 sq. mm compensating cables	7000 Mtrs		
148.	A.5.1.7, D.3.15.9, D.3.15.12	2 pair x 1.0 sq.mm / 1.3 sq.mm compensating cable	7,100 Mtrs		
149.	D.3.15.10	4 pair x 1.0 sq.mm compensating cable	7,000 Mtrs		
150.	D.3.15.11	6 pair x 1.0 sq.mm compensating cable	15,000 Mtrs		
	<i>PVC, FRLS, Armoured Control Cables</i>				
151.	A.5.1.8	4 C x 1.5 sq. mm, control cable	10700 Mtrs		
152.	A.5.1.9	10 C x 1.5 sq. mm, control cable	5600 Mtrs		
153.	A.5.1.10	19 C x 1.5 sq. mm, control cable	3400 Mtrs		
154.	A.5.1.11	2 C x 2.5 sq. mm, control cable	3400 Mtrs		
	<i>Power Cables</i>				
155.	D.3.16.1	1 C x 630 sq.mm, Cu cables	700 Mtrs		
156.	D.3.16.2	1 C x 95 sq.mm, Cu cables	2200 Mtrs		
157.	D.3.16.3	1 C x 16 sq.mm, Cu cables	10,000 Mtrs		
158.	D.3.16.4	2 C x 6 sq.mm, Cu cables	15,000 Mtrs		
ERECTION OF CABLE TRAYS & DUCTS					
	<i>Perforated Type Cable Trays</i>				
159.	A.5.2.4, D.3.17.1, E.1.5.3	50 mm wide Cable Tray	3,455 Mtrs		

* Lump sum rate to be quoted per set

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SIGNATURE OF TENDERER

SL.NO.	BOM REF.	DESCRIPTION	QTY	UNIT RATE	TOTAL RATE
160.	A.5.2.1, D.3.17.2	100 mm wide Cable Tray	8,000 Mtrs		
161.	A.5.2.2, E.1.5.4	150 mm wide Cable Tray	1370 Mtrs		
162.	A.5.2.3	300 mm wide Cable Tray	500 Mtrs		
<i>Cable Ducts With Covers</i>					
163.	D.2.3.1	60 x 60 x 1000 mm	200 Nos.		
164.	D.2.3.2	180 x 100 x 1000 mm	100 Nos.		
165.	D.2.3.3	250 x 100 x 1000 mm	100 Nos.		
ERECTION OF JUNCTION BOXES/PB BOXES					
166.	A.5.3.1, C.1.2.1, D.3.18.1, E.1.4.2	Junction Boxes, 12 way	46 Nos.		
167.	A.5.3.2, C.1.2.2, D.3.18.2, E.1.4.1	Junction Boxes, 24 way	113 Nos.		
168.	A.5.3.3, C.1.2.3, D.3.18.3	Junction Box, 36 way	53 Nos.		
169.	A.5.3.4, D.3.18.4, F.2.7.4	Junction Box, 48 way	20 Nos.		
170.	D.2.5.1, D.3.18.5	Junction Boxes, 64 way	87 Nos.		
171.	D.3.18.6	Junction Boxes, 72 way	17 Nos.		
172.	F.2.7.3	Junction Box, 80 way	2 Nos.		
173.	D.3.18.7	Junction Boxes, 96 way	5 Nos.		
174.	F.2.7.1	Junction Box (Pedestal and Proximeter JB)	15 Nos.		

* Lump sum rate to be quoted per set

RS -17

SIGNATURE OF TENDERER

SL.NO.	BOM REF.	DESCRIPTION	QTY	UNIT RATE	TOTAL RATE
175.	D.2.5.2, D.2.5.3, F.2.7.2, A.4.8.4, A.4.8.5	Thermocouple Junction Boxes/ RJCBs	61 Nos.		
176.	A.4.8.6	Power Distribution Boxes for RJCBs	2 Nos.		
177.	A.5.3.5, D.2.5.4	Push Button Boxes/ Fire Protection Switch Box	7 Nos.		
ERECTION/TESTING OF IMPULSE PIPES					
178.	F.1.8.5, F.2.6.7	AS Pipe, 13.5 x 2.6	64 Mtrs		
179.	F.1.8.2	21.3 x 2.3 AS pipe	250 Mtrs		
180.	F.2.6.6	AS pipe, ½" SCH 40 (21.3 x 2.77)	485 Mtrs		
181.	E.2.3.3	AS Pipe, ½" SCH 80	660 Mtrs		
182.	D.3.14.1	AS P22- ½" NB XXS , P22	600 Mtrs		
183.	D.3.14.2	AS Pipe, ¾" SCH 80, P22	250 Mtrs		
184.	F.1.8.4, F.2.6.1	CS pipe, 13.5 x 2.6	440 Mtrs		
185.	E.1.3.1	CS pipe, 16 x 2.6	1500 Mtrs		
186.	F.1.8.1, F.2.6.3	21.3 x 2.3 CS pipe	710 Mtrs		
187.	A.5.5.1, C.1.4.1, D.3.14.4, E.2.3.1	CS pipe, ½" SCH 80	5500 Mtrs		
188.	D.3.14.5	CS Gr C- ½" NB SCH 160	1200 Mtrs		
189.	D.3.14.6	CS Gr B- ¾" NB SCH 80	2,100 Mtrs		
190.	A.5.5.2, D.3.14.3	CS pipe, 1" SCH 80	1900 Mtrs		
191.	E.2.3.2	CS Pipe, 60.3 x 3.91	100 Mtrs		
192.	F.2.6.2	CS Tube DN-80	20 Mtrs		

* Lump sum rate to be quoted per set

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SIGNATURE OF TENDERER

SL.NO.	BOM REF.	DESCRIPTION	QTY	UNIT RATE	TOTAL RATE
193.	E.2.3.5	SS tube, 6 x 1.5 mm	60 Mtrs		
194.	E.2.3.4	SS tube, 12.7 x 2.1 mm	300 Mtrs		
195.	F.1.8.6, F.2.6.5	SS pipe, 13.5 x 2.6 mm	81 Mtrs		
196.	F.1.8.3, F.2.6.4	SS Tube, D=21.3 x 2.6	1130 Mtrs		
197.	D.3.14.7	A213 TP 316 – ½” NB SCH40 SS	1,000 Mtrs		
198.	D.3.14.8	A312 TP 316 ¾” NB SCH80 SS	750 Mtrs		
199.	D.3.14.9	A312 TP 316 ¾” NB SCH160 SS	750 Mtrs		
ERECTION OF EARTHING MATERIALS, HOSES, TUBES, CLAMPING MATERIALS etc.					
200.	A.5.4.1	Soft Galvanized wire-1.219	1700 Mtrs		
201.	D.3.20.5	GI Wire, 8 SWG	2500 Mtrs		
202.	A.1.10	OD 8 mm Copper Tube	25 Mtrs		
203.	D.3.20.4	¼" OD x 1mm thick SS 316 tube	170 Mtrs		
204.	A.2.6	¼" OD PVC Sheathed Copper Tube	2,300 Mtrs		
205.	A.2.7	1" size Teflon Hose of 3M length	4 Nos.		
206.	A.2.8	¼" size Teflon Hose of 2M length	64 Nos.		
FABRICATION/ERECTION OF STRUCTURAL STEEL					
207.	A.5.4.2, D.3.20.1, E.1.6.1, E.2.2.3	Structural Steel for fabrication of supports/ LIRs	25 MT		
ERECTION/TESTING OF GI PIPE (HEAVY DUTY)					
208.	C.1.5.1, D.3.20.2	NB 15 x 3.25/ ½" pipes	4950 Mtrs		
209.	C.1.5.2, D.3.20.3	NB 25 x 4.05/ 1" pipes	850 Mtrs		

* Lump sum rate to be quoted per set

SL.NO.	BOM REF.	DESCRIPTION	QTY	UNIT RATE	TOTAL RATE
210.	C.1.5.3	NB 40 x 4.05	110 Mtrs		
211.	C.1.5.4	NB 50 x 4.05	400 Mtrs		
212.	C.1.5.5	NB 100 x 5.4	160 Mtrs		
CHECKING & COMMISSIONING OF THE FOLLOWING ERECTED BY OTHER AGENCY					
213.	E.4.3.2	Pulveriser Lub Oil Skid	7 sets*		
214.	B.2.5.1	Lub Oil Skids For FD/ ID/ PA Fans	6 sets*		
215.	B.1.10	Air Preheater Skids	4 sets*		
216.	E.1.1.7	Hydraulic Coupling of MDBFP	1 set*		
217.	F.2.5	Condenser Vacuum Pump, including CVP PLC and related field instruments	2 sets*		
218.	A.3.11.1	Feeder Mounted C&I Equipment along with Feeder Integral Cabinet	7 sets*		
219.	A.4.11.2	Direct Water Level Gauges	2 Nos.		
220.	A.2.13.7	Burner Tilt Power Cylinders	4 Nos.		
221.	A.2.13.2, A.2.13.3, A.2.13.4, A.2.13.5, A.2.13.6, E.4.3.3	Pneumatic Actuators of ON/OFF Type	63 Nos.		
222.	A.1.15	Pneumatic Valves: Trip Valves	47 Nos.		
223.	A.1.16, A.4.11.3, C.1.6.1, E.2.1.13	Pneumatic Valves: Control Valves	41 Nos.		
224.	F.2.8	NRV Valves, Stop Valves, Control Valves, HP/LP Bypass Valves	40 Nos.		
225.	B.1.9	Solenoid Valves	2 Nos.		

* Lump sum rate to be quoted per set

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SIGNATURE OF TENDERER

SL.NO.	BOM REF.	DESCRIPTION	QTY	UNIT RATE	TOTAL RATE
226.	E.2.1.12	Position Transmitters	8 Nos.		
227.	A.2.14.1	Furnace Temperature Probe (Cr-Al Thermocouples)	2 Nos.		
228.	B.2.4, E.1.1.4, E.4.3.1, F.1.4.1 → F.1.4.18	Checking the healthiness of Temperature Elements (RTDs)	418 Nos.		
229.	A.4.7.3, A.4.11.1, F.1.3.4, F.2.8.2	Flow Indicators/ Flow Meters/ Flow Switches	10 Nos.		
230.	D.3.2.14	Checking of Bypass Rotameters	14 Nos.		
231.	A.1.14, A.3.11.2, A.3.11.3, F.2.8.3	Checking of Limit Switches	137 Nos.		
232.	E.1.1.3	Checking of BFP motor speed switch	2 Nos.		
233.	A.5.6.1	Commissioning of bidirectional motors, including loop checking	80 Nos.		
234.	A.5.6.2, F.2.8.4	Checking the operation of LT Motors from DCS	300 Nos.		
	<i>Instrument Racks Removal, calibration and refixing of rack mounted instruments, checking solenoid valves, drives, including wiring on the rack etc.</i>				
235.	E.2.2.2	Governing Console Board for BFPDT	2 sets*		
236.	F.2.2.1	Governing System Control Rack for Main Turbine	1 set*		
237.	F.2.2.2	LP Bypass Rack	1 set*		
238.	F.2.2.3	Supply Unit Racks for HP Valve-1, HP Valve-2, IP Valves	3 sets*		

* Lump sum rate to be quoted per set

SL.NO.	BOM REF.	DESCRIPTION	QTY	UNIT RATE	TOTAL RATE
239.	F.2.2.4	Seal Oil Rack	1 set*		
240.	F.2.2.5	Stator Water Rack	1 set*		
241.	F.2.2.6	Seal Oil Level / Pr Txr Instrument Rack	1 set*		
242.	F.2.2.7	Stator Water DP Instrument Rack	1 set*		
243.	F.2.2.8	H2 Dryer Unit	1 set*		
244.	F.2.2.9	Gland Steam And Seal Steam Oil Supply Units	2 sets*		
245.	F.2.2.10	TD BFP Pump Coupling Engage Oil Supply Unit	2 sets*		

* Lump sum rate to be quoted per set

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SIGNATURE OF TENDERER

NOTE TO RATE SCHEDULE:

1. The quantities indicated in columns 4 & 5 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.
Tenderers are requested to quoted their rates, only in the price bid (part II) provided by BHEL.