

TENDER SPECIFICATION

BHEL: PSSR: SCT: 1558

FOR

Handling at site stores / storage yard, transporting to site, erection, testing & commissioning including supply and application of final painting of **Control & Instrumentation** works for **Unit-3** of 1x700 MW

at

Bellary Thermal Power Station,
Kudatini, Bellary Dist, Karnataka

VOLUME –II PRICE BID



BHARAT HEAVY ELECTRICALS LIMITED
(A Government of India Undertaking)
Power Sector – Southern Region
690, Anna Salai, Nandanam, Chennai – 600 035.

PRICE BID

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: 1558

for

Handling at site, transportation to site of work, erection, testing & commissioning including supply and application of final painting of Control and Instrumentation works for Unit-3 of 1x700 MW at Bellary Thermal Power Station, Kudatini, Bellary Dist, Karnataka.

One set of Tender documents consisting of

- 1) TECHNOCOMMERCIAL BID - 2 copies
- 2) PRICE BID - 2 copies

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For and on behalf of
BHARAT HEAVY ELECTRICALS LIMITED

GENERAL MANAGER / HR and SCT

Place: Chennai -35

Date:

TENDER SPECIFICATION BHEL PSSR SCT 1558

RATE SCHEDULE FOR ERECTION, TESTING & COMMISSIONING OF C&I PACKAGE FOR BELLARY 1 X 700 MW - UNIT 3								
SL.NO.	BOM REF.	DESCRIPTION	UNIT	QTY	Unit rate (Rs.)		Amount	
					In fig	In words	In fig	In words
ERECTION/COMMISSIONING OF LOCAL/FIELD MOUNTED INSTRUMENTS								
1	A 1.1	Mass Flow meter	sets*	2				
2	A4.2.4, A 4.10.1, A4.10.7, B1.1, C 1.1, D3.3.1, D3.3.2, E2.1.1, E2.1.2, E 3.1, G 1.2.2, G 1.4.2, G 1.5.1, G 2.1.5, G2.8.3	Pressure Gauges/ DP Gauges	Nos.	702				
3	A 4.2.3, A 4.10.3, B1.2, B 2.2, C 1.2, D 3.3.3, E 2.1.6, E 3.2, G 1.2.6, 1.4.5, G 1.5.4, G 2.1.9, G 2.8.2	Temperature Gauges with Thermowell (capillary/ stem type)	Nos.	445				
4	B1.5	Thermocouple Assembly for APH	sets*	4				
5	A2.1, A 4.2.1, B1.3, B2.1, D3.3.4, D3.3.5, E1.1.1, E1.1.2, E2.1.7, E2.1.8, E4.1, G1.2.10, G1.2.11, G1.4.4, G1.5.3, G2.1.1, G2.1.2	RTDs/ Thermocouples with thermowell	Nos.	710				
6	A 4.1.1, A 4.1.2, A 4.1.3, A 4.1.4, A 4.1.5,	MTM T/Cs of route length 10 to 18 Mtrs (8 mm OD)	Nos.	99				
7	A 4.1.6, A 4.1.7, A 4.1.8, A4.1.9,, A4.1.10, A 4.1.11, A4.1.12	MTM T/Cs of route length 19 to 25 Mtrs (8 mm OD)	Nos.	244				
8	A4.1.13, A4.1.14, A4.1.15, A4.1.16, A4.1.17, A4.1.18, A 4.1.19	MTM T/Cs of route length 26 to 34 Mtrs (8 mm OD)	Nos.	47				
9	A 4.10.2, A 4.10.8, B1.4, C1.3, D3.3.6, D3.3.7, E 2.1.4, E2.1.5, G1.2.3, G1.2.5, G1.4.1, G1.4.3, G1.5.2, G2.1.4, G 2.1.7	Pressure/ DP Switches	Nos.	157				
10	A4.10.4, G2.1.8	Temperature Switches	Nos.	6				
11	C1.4, E3.3, G2.1.11, G2.8.1	Level Switches (float type)	Nos.	31				
12	A 4.10.6, D 3.3.8, G1.2.9	Level switches (capacitance type)	Nos.	21				
13	D3.3.9	Level Switches (conductivity type) with electrodes, vessels and electronic units etc.	sets*	2				
14	A4.10.9, D 3.3.10, D 3.3.11, D3.3.12, D3.3.13, D3.3.14, E2.1.3, E3.5, G 1.2.1, G1.2.4, G1.2.7, G2.1.3, G2.1.6	Pressure Transmitters, DP Transmitters for Flow / Level/ Differential Pressure, level transmitters	Nos.	579				
15	E2.1.9, G2.1.10	Level Transmitters with probes, electronic units etc.	sets*	7				

SIGNATURE OF BIDDER

SL.NO.	BOM REF.	DESCRIPTION	UNIT	QTY	Unit rate (Rs.)		Amount	
					In fig	In words	In fig	In words
16	G2.6.1	Temperature Transmitters	No.	1				
17	G1.5.5	Moisture Sensor Probes	No.	1				
18	B2.3, G2.1.13	Position Transmitters	Nos.	42				
19	A3.3	Pneumatic Pressure Controllers with Pneumatic Transmitters etc..	Sets*	2				
20	A 1.2	Speed Regulator/ Air Lock Valves	sets*	20				
21	A1.3, A2.2, A3.1, D3.3.16	Air Filter Regulators	Nos.	48				
22	D3.3.15, E2.1.11	I/P Converters	Nos.	21				
23	A 2.3	I/P Converters with AFR assembly	Sets*	22				
24	A 3.2	Purge Meter cum DP regulator	Nos.	14				
25	A1.7	Flame Scanner Head Assembly	sets*	32				
26	A1.5	FSSS Local Oil Gun Maintenance Switch Box	Nos.	16				
27	A 1.6	H.E.A. Excitor box Assembly with accessories	sets*	16				
28	A 2.11	Burner Tilt Shear Pin Failure Indication Box	Nos.	4				
29	A2.12	Heavy Duty Limit Switch (for Burner Tilt)	Nos.	24				
30	A1.8	8 Nos. Flame scanner amplifier Racks	set*	1				
31	A 4.10.5,C 1.5, E 2.1.12, E3.4, G1.2.8, G 2.1.12	Level Gauge (direct mounting type)	Nos.	24				
32	C 1.6	Sight flow gauges/indicators	Nos.	53				

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SL.NO.	BOM REF.	DESCRIPTION	UNIT	QTY	Unit rate (Rs.)		Amount	
					In fig	In words	In fig	In words
	G2.1.14	Speed sensors/dectors		6				
33	A4.4	ERV Controller with Pressure Switch	sets*	4				
34	A 4.8	Sonic tube leak detection system along with Panel and other accessories.	set*	1				
35	A 3.5	Coal flow monitor (ultrasonic type)	Sets*	7				
36	B1.6	Rotor Stoppage System with accessories	sets*	2				
37	B 1.9	ON/OFF Switch Box including light assembly	Nos.*	2				
38	E2.1.10	Speed measuring loop for BFPDT Governing System	sets*	12				
39	D3.6.1	Control Cabinets, along with loose supplied items for Vibration Monitoring System for Pumps, Fans & Motors.	set*	1				
40	D3.6.2	Vibration Monitoring System for Pumps, Fans & Motors, along with 194 Nos. of Vibration Sensors,37 Nos of proximity probes,137 Nos. JB's and other accessories.	set*	1				
41	E2.2.1	Vibration Monitoring System for BFP Drive Turbine with 18 Nos. probes, Monitor, and other accessories	Sets*	2				
42	D 3.6.3	Coal bunker monitoring system (ultrasonic type)	set*	1				
43	D 3.6.4	CCTV system with panel, cables, monitor etc..	set*	1				
44	D 2.2.1	HART Management system with panels , monitor, loose items & accessories etc..	set*	1				
45	D 3.4.1	Low temperature O2 Analyser	sets*	11				
46	B 2.6	Opacity Analyser (near ESP)	sets*	4				
47	D3.4.2	Opacity Analyser (in situ) to be installed at 106 ML of chimney.	set*	1				
48	D3.4.3	SOX/NOX/CO analyzer to be installed at 76 ML of chimney	set*	1				

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SL.NO.	BOM REF.	DESCRIPTION	UNIT	QTY	Unit rate (Rs.)		Amount	
					In fig	In words	In fig	In words
49	D 3.5.1	Steam and water analysis system, SWAS consisting of: Primary Cooler Rack: 2Nos., Chiller Unit:1 No., Wet Panel: 1 No., Dry panel: 1 Nos., Conductivity Racks: 1 No., sensors/ analysers and other accessories	set*	1				
Master and Slave Clock System								
50	D 3.14.1	Master clock control panel	Nos.	1				
51	D 3.14.2	Slave clock	Nos.	20				
52	D 3.14.3	GPS Antenna along with around 100 Mtrs antenna cable from antenna to GPS Receiver	sets	2				
53	D 3.14.4	Slave Booster	Nos.	3				
54	D 3.14.5	Line Driver / Receiver	Set	1				
ERECTION/COMMISSIONING OF UCB/CONTROL ROOM MOUNTED INSTRUMENTS								
55	G1.6.1	Electronic /Digital Indicators	Nos.	10				
56	G1.6.2	Bar Graph Indicators	Nos.	5				
57	G1.6.3,G1.6.4	Pressure /Temperature indicators(Moving coil type)	Nos.	3				
58	G 1.6.5	Vibration indicator with selector switch	Nos.	4				
REMOVAL, CALIBRATION, REFIXING AND COMMISSIONING OF INSTRUMENTS								
59	G1.3.1,G1.3.2	Pressure gauge/DP gauge	Nos.	15				
60	B2.7,E1.1.3,E4.2,G1.3.3	Temperature Gauges	Nos.	45				
61	G1.3.4,G1.3.5	Pressure/ DP Transmitters	Nos.	15				
62	G1.3.6,G1.3.12	Pressure/ DP Switches/Flow switches	Nos.	9				

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SL.NO.	BOM REF.	DESCRIPTION	UNIT	QTY	Unit rate (Rs.)		Amount	
					In fig	In words	In fig	In words
63	G1.3.7	Level Switches	Nos.	7				
64	G1.3.9	Conductivity Cells	Nos.	3				
65	G1.3.10	PW Conductivity Indicator	No.	1				
CALIBRATION (AS REQUIRED), ERECTION, REMOVAL AND NORMALIZATION FOR EDTA CLEANING								
66	H1.1	MTM thermocouple length 10 mtrs	Nos.	12				
67	H1.2	Junction boxes - 12 way/ 6 way/ 24 way	Nos.	10				
68	H1.3	Compensating cables 2 P x 0.5 sq. mm	Mtrs.	200				
69	H1.4	Compensating cables 6 P x 0.5 sq. mm	Mtrs.	300				
70	H1.5	Pressure gauges	Nos.	15				
71	H1.6	MTM thermocouple adaptor fabrication - 1/4 inch NPT(M) x 1/4 inch OD SS	Sets	2				
72	H1.7	16 P x 0.5 sqmm cable for Teletel Separator level indication	Mtrs.	500				
73	H1.8	3c x 2.5 sqmm power cable Teletel Separator level indication	Mtrs.	100				
74	H1.9	9 port lamp indication at control room and 9 port switching at Drum floor	Set	1				
75	H1.10	Switchboards with switches	Nos.	3				
76	H1.11	Dial Thermometers	Nos.	5				
ERECTION/COMMISSIONING OF PNEUMATIC POWER CYLINDERS (REGULATING TYPE)								
77	A.2.13.1	Power Cylinders for SADC (Weight 20 kg each)	Nos.	88				

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SL.NO.	BOM REF.	DESCRIPTION	UNIT	QTY	Unit rate (Rs.)		Amount	
					In fig	In words	In fig	In words
78	A.2.13.2	ID, FD & PA Fans Blade Pitch Control Damper (Approx.Weight 90 kg each)	Nos.	6				
79	A.2.13.3	Cold Air Regulating Dampers (Approx. Weight 95 kg each)	Nos.	7				
80	A.2.13.4	Hot Air Regulating Dampers (Approx.Weight 175 kg each)	Nos.	7				
81	A.2.13.5	Dynavane Filter Bleed Air Damper (Approx.Weight: 100 kg)	No.	1				
ERECTION/COMMISSIONING OF PNEUMATIC ACTUATORS (ON/OFF TYPE)								
82	A.2.14.1	Scanner Air Emergency Damper (Approximate weight: 60 Kg)	No.	1				
ERECTION/COMMISSIONING OF UPS/ BATTERY/ BATTERY CHARGER WITH DBs								
83	D 3.2.5	RODM plant - 7 KVA UPS - 2 x100 % , with ACDB, Bypass Servo controlled voltage stabiliser with redundant battery back up, battery rack etc ..	Set*	1				
84	D.3.7.1	2x150 KVA UPS comprising of SCVS cubicle ,UPS panel 4 Nos, Input Isolation transformer, Battery isolation box etc.	Set*	1				
85	D.3.7.2	ACDB	Nos	2				
86	D.3.7.3	860AH UPS Battery, NiCd,192 cells, along with MS rack, and other accessories	sets*	2				
87	D 3.7.4	24 V DC Battery with 12 cells , racks , accessories	Set*	1				
88	D 3.7.5	24V DC Battery charger - float cum boost chargers 1&2, alongwith DCDBs(2 nos.) , interconnecting cables etc..	Set*	1				
ERECTION/COMMISSIONING OF PANELS								
89	A 3.4	Gravimetric Feeder Panel	Nos.	7				
90	A 3.6	Pulveriser Dynamic classifier VFD cabinet	Nos.	7				
91	A 4.5	HWL 1&2 and MEF control valve panel	No.	1				
92	A 4.6	Furnace flame viewing system - local panel	No.	1				

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SL.NO.	BOM REF.	DESCRIPTION	UNIT	QTY	Unit rate (Rs.)		Amount	
					In fig	In words	In fig	In words
93	A 4.7	Furnace flame viewing system - remote control panel	No.	1				
94	B 1.7	Air heaters A& B Main control panel	No.	1				
95	B 1.8	Air heaters A & B Leakage control system sector plate drive panel	Nos.	6				
96	G1.1.1	Gas Analyser Cabinet including sensor, analyser etc.	Nos.	2				
97	G1.1.2	Generator End Winding Vibration Monitoring System	No.	1				
98	G1.1.3	Moisture Measurement System for Generator	set*	1				
99	G1.1.4	Grounding Brush Monitor	No.	1				
ERECTION/COMMISSIONING OF DCS PACKAGE								
100	D2.1.1, D2.1.2, D3.1.1, D 3.2.1, D 4.4, D 6.5, G 2.5.1, G 2.5.2, G2.5.3, G2.5.4	Single Cubicles	Nos.	22				
101	D1.1.1, D 2.1.3, D 3.1.2, D 3.1.4, D 3.2.2, D6.1, D6.2	Suite of Two Cubicles	Nos.	31				
102	D1.1.2, D 3.1.3, D3.1.5, D3.2.3	Suite of Three Cubicles	Nos.	21				
103	D1.1.3	Suite of Five cubicles	Nos.	1				
104	D4.1	Unit Control desk	No.	1				
105	D4.2	67" Large Video Screen along with CPU and other loose supplied items.	set*	1				
106	D 6.4	52" industrial grade LCD monitor (SCADA system)	Nos.	2				
107	D3.2.6, D4.3, D 6.3	Computer Stations : Engineer Workstation, 'maxStorian' Station, Operator Work Stations, maxLINK Stations, etc.	sets*	22				
108	D 5.1	PADO system - servers, work stations, and accessories	Set*	1				

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109	G 2.7.1	HMI system (Siemens supply) - servers, work stations and accessories	Set*	1				
110	D 3.2.4 , D4.5	Network Enclosures (Wall Mounted type), along with loose supplied Ethernet switches.	Nos.	3				
ERECTION/TESTING OF LOCAL INSTRUMENT ENCLOSURES/ RACKS (LIE/LIR)/GAUGE BOARDS								
111	A 6.3	Local instrument enclosure size : 1200(W) x 725(D) x 2185(H), aprox. Wt. 380 Kg each	Nos.	1				
112	D.3.8.1	Local Instrument Enclosures (Type - D) Size: 1600(W) x 800(D) x 2200 (H) mm; Approximate weight: 1000 kg each	Nos.	2				
113	D.3.8.2	Local Instrument Enclosures (Type - A) Size: 1450(W) x 800(D) x 2200 (H) mm; Approximate weight: 900 kg each	Nos.	10				
114	D.3.8.3	Local Instrument Enclosures (Type - B) Size: 1100(W) x 800(D) x 2200 (H) mm; Approximate weight: 600 kg each	Nos.	12				
115	D.3.8.4	Local Instrument Enclosures (Type - C) Size: 700(W) x 600(D) x 2200 (H) mm; Approximate weight: 400 kg each	Nos.	12				
116	A 6.1	Local instrument racks : (LIR 06 to LIR 18) size : 1650(W) x 800 (D) x 2150 (H), aprox. Wt. 400 Kg each	Nos.	13				
117	A 6.2	Local instrument racks : size : 1200(W) x 725(D) x 1800 (H), aprox. Wt. 180 Kg each	Nos.	5				
118	D.3.8.5	Local Instrument Racks (Type - D) Size: 1600(W) x 650(D) x 2200(H) mm; Approximate weight: 700 kg each	Nos.	3				
119	D.3.8.6	Local Instrument Racks (Type - A) Size: 1400(W) x 650(D) x 2200(H) mm; Approximate weight: 600 kg each	Nos.	23				
120	D.3.8.7	Local Instrument Racks (Type - B) Size: 1100(W) x 650(D) x 2200(H) mm; Approximate weight: 400 kg each	Nos.	21				
121	D.3.8.8	Local Instrument Racks (Type - C) Size: 800(W) x 650(D) x 1500(H) mm; Approximate weight: 250 kg each	Nos.	7				

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122	E 2.2.3	Open type transmitter racks Size : 2000 x 1250 x 600 mm	Nos.	12				
123	E1.5.1,E1.5.2,E1.5.3,E1.5.4	LGB Assembly for BFPs/ CEPs (along with instruments) Approximate size 1400 x 550 x 1900 mm; 200 kg	Nos.	8				
124	E1.5.5,E1.5.6,E1.5.7	LIR assembly for BFPs/ CEPs (along with transmitters) Approximate Size 2000 x 650 x 2200 mm; 300 kg	Nos.	5				
ASSEMBLY AND ERECTION OF JB MOUNTING FRAMES								
125	D 2.6.1. TO D 2.6.9	Assembly and installation of Mounting Frames with loose supplied prefabricated materials like slotted angles, channels etc.	Nos.	54				
ASSEMBLY / WELDING / ERECTION OF PRESSURE INSTRUMENT RACKS								
126	G2.2.1,G2.2.2,G2.2.3	Assembly/welding and installation of Instrument Racks with loose supplied prefabricated materials of suitable size, like angles, stands etc. Total wt. of loose supplied items (for 7 racks): Approx. 2 Tonnes	Nos.	7				
LAYING , TERMINATION & TESTING OF POWER /CONTROL/INSTRUMENTATION CABLES								
127	A 5.1.1	Flame scanner cable (2P x 1 sq.mm)	Mtrs.	9000				
128	A 5.1.2	1P x 1.31 sq.mm/ 1P x 1.5 sq.mm cable	Mtrs.	2020				
129	A5.1.3, A 5.1.4, A5.1.5, B 3.1.1, D 2.3.1, D3.9.5, D 3.9.10, F2.1 , G2.9.3, G2.9.7	2Px 0.5 sq.mm /2P x 1.5 sq.mm cable	Mtrs.	85800				
130	A 5.1.6, A 5.1.7 , B 3.1.2, B3.1.3, D 2.3.2, D3.9.6, D3.9.11, D3.9.8 , D3.9.9, D3.9.13, E1.4.1, F1.1, F2.2 , G2.9.1,G2.9.4	4Px 0.5 sq.mm/ 4PX1.5 Sq.mm / 2T X 0.5.sq.mm cable	Mtrs.	224140				
131	A 5.1.8, A 5.1.9, B3.1.4, B3.1.5, D3.9.7, D3.9.12, F1.2, F2.3, G2.9.2 , G2.9.5	8P x 0.5 sq.mm cable	Mtrs.	176200				
132	A 5.1.10, A 5.1.11, F1.3, F2.4, G2.9.6	12P x 0.5 sq.mm cable	Mtrs.	26600				
Control & Power cables								
133	A 5.1.12,A 5.1.13, D3.9.14,D3.14.8	2C X 1.5.SQ.MM/2.5 SQ.MM , 3CX1.5/2.5 SQ.MM	Mtrs.	11570				
134	D 2.3.3,D 4.7	4C X 1.5.SQ.MM/2.5 SQ.MM , 5CX1.5/2.5 SQ.MM	Mtrs.	2000				

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135	A 5.1.14, B 3.1.6	7C X 1.5/2.5 SQ.MM control cable	Mtrs.	3900				
136	A 5.1.15	10C X 1.5/2.5 SQ.MM control cable	Mtrs.	500				
137	A 5.1.16	16C X 1.5/2.5 SQ.MM control cable	Mtrs.	4200				
138	A 5.1.17	19CX 1.5/2.5 SQ.MM control cable	Mtrs.	6200				
139	A 5.1.18	4C X 4 Sq.mm control cable	Mtrs.	300				
140	A 5.1.19	20C X 4 sq.mm control cable	Mtrs.	300				
141	A 5.1.20	3C x 2.5 sq.mm copper power cable	Mtrs.	2100				
142	A 5.1.21	3C x 6 sq.mm copper power cable	Mtrs.	2100				
Compensating cables								
143	A 5.1.22, D2.3.4 , D3.9.1, D3.9.2	2P X 0.5 Sq.mm to 2.08 sq.mm Compensating cable	Mtrs	37600				
144	D3.9.3, D3.9.4	4 Pair /6 Pair compensating cable	Mtrs	23000				
145	D 3.14.9, D4.6	Ethernet Cable	Mtrs.	7000				
146	D3.14.6	RG 58 Coaxial Cable	Mtrs.	2000				
147	D3.14.7	RS 232 /485 Data Cable	Mtrs.	800				
148	D4.8, D5.2, D6.6	Fibre optical Cable (laying , clamping, dressing and splicing)	Mtrs.	29400				
ERECTION OF CABLE TRAYS & DUCTS								
149	A5.2.1,D3.10.1, E1.4.2	50 mm wide Cable Tray	Mtrs.	4680				
150	A5.2.2,D3.10.2	100 mm wide Cable Tray	Mtrs.	5650				

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151	A5.2.3, E1.4.3	150 mm wide Cable Tray	Mtrs.	3420				
152	A5.2.4	300 mm wide Cable Tray	Mtrs.	100				
CABLE DUCTS WITH COVERS								
153	D2.5.1	60 x 60 x 1000 mm	Nos.	200				
154	D2.5.2	180 x 100 x 1000 mm	Nos.	100				
155	D2.5.3	250 x 100 x 1000 mm	Nos.	100				
ERECTION OF JUNCTION BOXES/PB BOXES								
156	A5.3.1,A 5.3.2,B 2.4 , C2.1, C2.,2, D2.4.2 D3.11.1,D3.11.2,D3.11.3,D3.14.11, E1.3.1,G 2.4.1, G 2.6.2	Junction Boxes, 6 way to 36 way, including RJCBs	Nos.	299				
157	A5.3.3,A5.3.4, D2.4.1, D3.11.4	Junction Box, 48 way to 72way including RJCBs	Nos.	210				
158	A 2.10 , A 4.3, B 2.5, G 2.6.3, G 2.6.4	Push Button Boxes/Fire push buttons/Emergency stop push buttons	Nos.	15				
ERECTION/TESTING OF IMPULSE PIPES								
159	D.3.12.1	ASTM A335 P91 1/2" NB SCH 160	Mtrs.	800				
160	A 5.5.4	AS pipe 26.7 x 3.91 mm	Mtrs.	150				
161	C 3.1	AS pipe Dia 21.3 x 3.73 Thk	Mtrs.	150				
162	G 1.7.2, G 2.3.7	AS pipe 21.3 x 2.3 /21.3 X 2.77	Mtrs.	560				
163	G.1.7.5, G 2.3.8	AS pipe 13.5 x 2.6	Mtrs.	155				
164	D.3.12.2	ASTM A335 P22 1/2" NB SCH 160	Mtrs.	620				
165	D.3.12.3	ASTM A335 P22 1/2" NB SCH 80	Mtrs.	140				

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166	E1.2.1, G 1.7.4, G1.7.7, G2.3.3	CS pipe , Dia 13.5 x 2.6 /16 x 2.6/ 17.2 x 1.8	Mtrs.	645				
167	C 3.2,C 3.3, E 2.3.1,G 1.7.1,G 2.3.4	CS pipe 21.3 x 2.3 , 21.3 x 3.73, 21.3 x 4.78	Mtrs.	1670				
168	C.3.4	CS pipe Dia 21.3 x 7.47 Thk	Mtrs.	30				
169	A.5.5.2	CS pipe 26.7 x 3.91 mm	Mtrs.	500				
170	A.5.5.3, G2.3.2	CS pipe 33.4 x 4.55 mm/33.7 x 3.38	Mtrs.	802				
171	E.2.3.2	CS Pipe, 60.3 x 3.91	Mtrs.	120				
172	G.2.3.1	Carbon Steel Tube D= 88.9X4	Mtrs.	20				
173	D.3.12.4	ASTM A106 Gr C 1" NB SCH 80	Mtrs.	100				
174	D.3.12.5	ASTM A106 Gr C 3/4" NB SCH 80	Mtrs.	4200				
175	D.3.12.6	ASTM A 106 Gr C, 1/2" NB Sch XXS	Mtrs.	1100				
176	D.3.12.7	ASTM A106 Gr C 1/2" NB SCH 160	Mtrs.	500				
177	D.3.12.8	ASTM A106 Gr C 1/2" NB SCH 80	Mtrs.	6650				
178	E.2.3.4,G.1.7.6,G.2.3.6	SS pipe, 12.7 x 2.1 mm/13.5 x 2.6	Mtrs.	1526				
179	G.1.7.3, G2.3.5	SS pipe 21.3 x 2.3 /21.3X 2.77	Mtrs.	1180				
180	C.3.5	SS pipe Dia 26.7 x 7.82 Thk	Mtrs.	60				
181	D.3.12.9	ASTM A312 TP316 1/2" NB SCH 40	Mtrs.	1750				
182	D.3.12.10	ASTM A213 TP 316H PIPE 1/2" SCH 160	Mtrs.	400				

SIGNATURE OF BIDDER

SL.NO.	BOM REF.	DESCRIPTION	UNIT	QTY	Unit rate (Rs.)		Amount	
					In fig	In words	In fig	In words
183	D.3.12.11	ASTM A213 TP 316H PIPE 1/2" SCH 40	Mtrs.	1000				
184	E2.3.3	Cr-Al Pipe 21.3 x 3.73	Mtrs.	660				
ERECTION OF EARTHING MATERIALS								
185	A 5.4.2	GI Flat 50 x 6 mm	Mtrs.	250				
186	A 5.4.3	GI wire 1.219 mm dia	Mtrs.	1700				
ERECTION OF HOSES, TUBES etc.								
187	A 1.4, A 2.4, A 2.5, A2.6 . D 3.13.4	Copper Tube/SS Tube, OD 8 mm /1/4"/ 3/4 "/1"	Mtrs.	3671				
188	E.2.3.5	SS tube, 6 x 1.5 mm	Mtrs.	60				
189	A 2.7	½" size Teflon Hose of 2M length	Nos.	101				
190	A 2.8	1" size Teflon Hose of 3M length	Nos.	4				
191	A 2.9	1/2" SS braided teflon hose	Nos.	10				
192	A 5.5.1, D3.14.10	GI pipe/GI conduit pipe 19mm OD.	Mtrs.	315				
ERECTION/TESTING OF GI PIPE (HEAVY DUTY)								
193	D3.13.2	½" NB heavy duty GI pipes	Mtrs.	4500				
194	D3.13.3	1" NB heavy duty GI pipes	Mtrs.	150				
FABRICATION/ERECTION OF STRUCTURAL STEEL								
195	A5.4.1,B 3.2, D 3.13.1, E 1.6.1, E 2.2.2, G 2.10	Structural Steel for fabrication of supports/ LIRs/ canopy	MT	31				
CHECKING & COMMISSIONING OF THE FOLLOWING ERECTED BY OTHER AGENCY								
196	B1.8.2,B2.8.2,B2.8.3,B2.8.4, E4.3.2	Lub Oil Skids for Pulveriser, FD/ ID/ PA Fans, Air Preheater	sets ^s	17				

SIGNATURE OF BIDDER

SL.NO.	BOM REF.	DESCRIPTION	UNIT	QTY	Unit rate (Rs.)		Amount	
					In fig	In words	In fig	In words
197	F3.3,F3.4,F3.5, F 3.6	LP Dosing Skids	sets ⁵	5				
198	E1.7.2	Hydraulic Coupling of MDBFP	set ⁵	1				
199	G3.1	Condenser Vacuum Pump, including CVP PLC and related field instruments	sets ⁵	2				
200	A3.7.1	Gravimetric Feeders	sets ⁵	7				
201	A4.9.1	Direct Water Level Gauges	Nos. ⁵	2				
202	A2.15.1, A 2.15.2	Burner Tilt /Sofa tilt Power cylinders	Nos. ⁵	12				
203	A2.15.3,A2.15.4,A2.15.5, A2.15.6,A 2.15.7, A2.15.8 , E4.3.3,E4.3.4	Pneumatic Actuators of ON/OFF Type	Nos. ⁵	69				
204	A1.9.2	Pneumatic Valves: Trip Valves	Nos. ⁵	59				
205	A1.9.3,A4.9.2, C4.1,E2.4.1,F3.1	Pneumatic Valves: Control Valves	Nos. ⁵	63				
206	G3.3	NRV Valves, Stop Valves, Control Valves, HP/LP Bypass Valves	Nos. ⁵	40				
207	B1.8.1,G3.6	Solenoid Valves	Nos. ⁵	32				
208	E2.4.2,G3.4	Position Transmitters	Nos. ⁵	27				
209	B2.8.1, E 1.7.1, E4.3.1, G1.3.13	Checking the healthiness of Temperature Elements (RTDs)	Nos. ⁵	436				
210	A 4.2.2, A4.2.5 , A4.10.10, A4.10.11, G1.3.8, G1.3.11	Flow Indicators/ Flow Meters/ Flow Switches/Flow elements	Nos. ⁵	42				
211	A1.9.1, A 3.7.2,G3.5	Checking of Limit Switches	Nos. ⁵	160				
212	A2.15.9, F 3.2	Electrical actuators for valves/Dampers, including loop checking	Nos. ⁵	463				
INSTRUMENT RACKS <i>Removal, calibration and refixing of rack mounted instruments, checking solenoid valves, drives, including wiring on the rack etc.</i>								

SIGNATURE OF BIDDER

SL.NO.	BOM REF.	DESCRIPTION	UNIT	QTY	Unit rate (Rs.)		Amount	
					In fig	In words	In fig	In words
213	E2.4.3	Governing Console Board for BFPDT	sets [§]	2				
214	G3.2	Oil Centrifuge Unit	Nos. [§]	2				
215	G3.7	Hydraulic Speed Control Equipment Rack	set [§]	1				
216	G3.8	LP Bypass Control Rack	set [§]	1				
217	G3.9	Supply Unit Racks for HP Valve-1, HP Valve-2, IP Valves	sets [§]	3				
218	G3.10,G3.11	Seal Oil Rack / Stator Water Rack	set [§]	2				
219	G3.12,G3.13	Seal Oil Level / Pr Transmitter Instrument Rack, Stator Water DP Instrument Rack	set [§]	2				
220	G3.14	H2 Dryer Unit	set [§]	1				
221	G3.15,G3.16	Gland Steam And Seal Steam Oil Supply Units / TD BFP Pump Coupling Engage Oil Supply Unit	sets [§]	4				
	TOTAL							

NOTE TO RATE SCHEDULE :

- 1 The rate schedule ID given above may be linked with the Rate schedule ID in the chapter 9 of Technical conditions of contract .
- 2 The price bid contains the consolidated list of rate schedule ID with brief description of items.
- 3 The rate are to be filled only in the price bid
- 4 Before filling the rates in the price bid, the bidder shall go through the detailed specification of all items of BOQ as well as scope of work as specified in the relevant clauses of this document.
- 5 The qty indicatd in the BOQ /Price bid is approximate only and is liable for variation. . Payment will be as per actual qty erected/commissioned as certified by BHEL engineer.
- 6 * **Lumpsum rate to be quoted**
- 7 [§]**Rate to be quoted for Checking/Commissioning only**

SIGNATURE OF BIDDER