

**TENDER SPECIFICATION**  
**NO: BHE/PW/PUR/PARST-ELE/604**

**FOR**

**HANDLING AT SITE STORES/STORAGE YARD, TRANSPORTATION TO SITE OF WORK, COMPLETE ERECTION, CHECKING OF CALIBRATION, TESTING, COMMISSIONING AND HANDING OVER OF ELECTRICAL PACKAGES VIZ., POWER TRANSFORMERS, ISOLATED PHASE BUS DUCT FOR GENERATOR TRANSFORMER, SEGREGATED PHASE BUS DUCT FOR STATION TRANSFORMER / UNIT AUX. TRANSFORMER, ELECTROSTATIC PRECIPITATOR, VARIABLE FREQUENCY DRIVE FOR ID FANS, GENERATOR CONTROL & PROTECTION PANELS, 6.6kV / 0.415 kV SWITCHGEAR BOARDS MCC, SOOT BLOWER SYSTEM, EXCITATION SYSTEM, 220 VOLT BATTERY SYSTEM, ELECTRICAL HOIST AND ASSOCIATED ITEMS FOR UNIT #2 of 250 MW**

**AT**

**MAHARASHTRA STATE POWER GENERATION CO. LTD.**

**PARAS THERMAL POWER PROJECT**

**DISTT-AKOLA, MAHARASHTRA**

**PART : II - REVISED PRICE BID**  
**(REVISION-02 )**



**BHARAT HEAVY ELECTRICALS LIMITED**  
(A Govt. of India Undertaking)  
POWER SECTOR - WESTERN REGION  
345, KINGS WAY - NAGPUR 440 001

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**NO: BHE/PW/PUR/PLT-ELE/604**

HANDLING AT SITE STORES/STORAGE YARD, TRANSPORTATION TO SITE OF WORK, COMPLETE ERECTION, CHECKING OF CALIBRATION, TESTING, COMMISSIONING AND HANDING OVER OF ELECTRICAL PACKAGES VIZ., POWER TRANSFORMERS, ISOLATED PHASE BUS DUCT FOR GENERATOR TRANSFORMER, SEGREGATED PHASE BUS DUCT FOR STATION TRANSFORMER / UNIT AUX. TRANSFORMER, ELECTROSTATIC PRECIPITATOR, VARIABLE FREQUENCY DRIVE FOR ID FANS, GENERATOR CONTROL & PROTECTION PANELS, 6.6kV / 0.415 kV SWITCHGEAR BOARDS MCC, SOOT BLOWER SYSTEM, EXCITATION SYSTEM, 220 VOLT BATTERY SYSTEM, ELECTRICAL HOIST AND ASSOCIATED ITEMS FOR UNIT #2 of 250 MW

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THESE TENDER DOCUMENTS CONTAINING PART-I TECHNICAL BID AND PART-II REVISED PRICE BID-REV-02, ARE ISSUED TO:

M/s.....  
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(THESE TENDER DOCUMENTS ARE NOT TRANSFERABLE)

FOR BHARAT HEAVY ELECTRICALS LIMITED

SR. MANAGER (PURCHASE)

PLACE: NAGPUR

DATE :

**TS : BHE/PW/PUR/PARST-ELE/604  
REVISED PRICE BID- PART-II  
(REVISION-02 ) DT:15/10/2008**

<b>Description of Work</b>	<b>TOTAL LUMP SUM AMOUNT</b>	
	In Figures (in Rupees)	In Words (in Rupees)
<b>SCOPE OF WORK AS SPECIFIED IN THE TENDER SPECIFICATION &amp; REVISED BOQ ATTACHED WITH THIS PRICE BID</b>		

**Note:**

1. Amount quoted shall be considered as the total lumpsum amount for the complete Revised BOQ ( Rate Schedule ) as given in here in this price bid. ( Refer page 1 to 5 ). Bidder has to quote only Lumpsum Rate in above Price Bid.
2. Individual item rates shall be calculated in proportion to the weightages specified in the Revised BOQ. ( i.e. individual item rate = Lumpsum price quoted X % weightage of item as specified in Revised BOQ divided by quantity as given in Revised BOQ)
3. Refer Clause 11.6.1 of tender specification for variation in quantity.

**DATE**

**SIGNATURE & OFFICIAL SEAL OF BIDDER**

**BHARAT HEAVY ELECTRICALS LIMITED : PSWR : Nagpur**  
**T.S. No. BHE/PW/PUR/PARST-ELE/ 604**  
**Revised RATE SCHEDULE – Rev-02 (Page 1 of 5) DT:15/10/2008**

<b>Rate schedule for Electrical Works for 2 x 250 MW PARAS Project</b>				
SN	DESCRIPTION	TOTAL QTY	UOM	WEIGHTAGE
SI. No./ DESCRIPTION		QTY	UOM	
<b>SECTION-A: POWER TRANSFORMERS</b>				
A.1	Transportation up to foundation, Assembly, Testing & Commissioning of single phase 315 MVA 16.5/230 kV Generator Transformer including all accessories, piping, cabling etc. as described in Tender Specification.	1	No.	5.40%
A.2	Transportation from stores/ storage yard to erection site, assembly, testing & commissioning of 40/20/20 MVA, 3 phase 16.5/7.7/7.7 kV Unit Auxiliary Transformer including all accessories, piping, cabling etc as described in tender specification, including neutral grounding transformers 4 nos.	2	No.	4.72%
A.3	Transportation from stores/ storage yard to erection site , assembly, testing & commissioning of 50/25/25 MVA , 3 phase 230/7.7/7.7 kV Station Transformer including all accessories, piping, cabling etc as described in tender specification, including neutral grounding transformers 2 nos.	1	No.	3.04%
<b>SECTION-B: ISOLATED PHASE BUS DUCT FOR GENERATOR TRANSFORMER</b>				
B.1	Transportation from stores / storage yard to erection site, assembly, erection, welding, testing & commissioning of Isolated Phase Bus Duct (16.5 kV) for interconnection of Generator, Generator Circuit Breaker, isolator & Generator Transformer along with all accessories & auxiliaries as described in the Tender Specification.	1	Set	11.47%
<b>SECTION-C: SEGREGATED PHASE BUS DUCT 6.6 kV :-Lump sum rate for transportation from store /storage yard to erection site, erection, assembly, testing &amp; commissioning of Segregated Phase Bus Duct including support structure , equipments &amp; all accessories of the following area as per tender specification.</b>				
C.1	BD-1 FROM ST-1 TO SS1A-P3 APP LENGTH 33.18 METERS	1	Set	0.67%
C.2	BD-2 FROM ST-1 TO SS1B-P12 APP LENGTH 32.42 METERS	1	Set	0.61%
C.3	BD-3 FROM UAT-1A TO US1A-P3 APP LENGTH 87.03 METERS	1	Set	1.18%
C.4	BD-4 FROM UAT-1A TO US1C-P1 APP LENGTH 50.92 METERS	1	Set	0.84%
C.5	BD-5 FROM UAT-1B TO US1B-P15 APP LENGTH 88.56 METERS	1	Set	1.18%
C.6	BD-6 FROM UAT-1B TO US1D-P6 APP LENGTH 55.91 METERS	1	Set	0.67%
C.7	BD-7 AND BD-8 FOR BRIDGING SS1A TO US1C AND SS1B TO US1D	1	Set	0.67%
C.8	BD-9 FROM SS1A-P15 TO US1A-P1 APP LENGTH 15.29 METERS	1	Set	0.51%
C.9	BD-10 FROM SS1B-P1 TO US1B-P17 APP LENGTH 16.11 METERS	1	Set	0.51%
<b>SECTION-D: 6.6 kV INDOOR SWITCHGEAR. EACH BOARD CONSISTING OF VACUUM BREAKER TYPE VM 12, PT PANELS, AUXILIARY TRANSFORMER PANEL, BUS</b>				

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<b>EXTENSION CHAMBERS &amp; ACCESSORIES etc. EACH BREAKER IS HOUSED WITH CONTROL, METERING &amp; PROTECTION DEVICES; GCB</b>				
D.1	Switchgear Board SS-1A : consists of 13 panels, in 7 shipping sections. Overall dimension 12300 x 2651 x 2692. Each shipping section 3.0 MT approx	1	Set	1.35%
D.2	Switchgear Board SS-1B : consists of 12 panels, in 6 shipping sections. Overall dimension 11480 x 2651 x 2692. Each shipping section 3.0 MT approx	1	Set	1.18%
D.3	Switchgear Board US-1A : consists of 17 panels, in 9 shipping sections. Overall dimension 13940 x 2355 x 2692 . Each shipping section 3.0 MT approx	1	Set	1.18%
D.4	Switchgear Board US-1B : consists of 17 panels, in 9 shipping sections. Overall dimension 13940 x 2355 x 2692 . Each shipping section 3.0 MT approx	1	Set	1.18%
D.5	Switchgear Board US-1C : consists of 6 panels, in 3 shipping sections. Overall dimension 4920 x 2651 x 2692. Each shipping section 3.0 MT approx	1	Set	0.51%
D.6	Switchgear Board US-1D : consists of 6 panels, in 3 shipping sections. Overall dimension 4920 x 2651 x 2692. Each shipping section 3.0 MT approx	1	Set	0.51%
D.8	Switchgear Board AHP-1 : consists of 17 panels, in 8 shipping sections. Overall dimension 12300 x 2355 x 2692. Each shipping section 3.0 MT approx	1	Set	1.69%
D.9	Generator Circuit Breaker (location after generator but before GT) along with two nos earth switches, one isolator and control panel. Dimension of GCB 3700 x 5400 x 2605 mm, approx weight 7.04 MT	1	Set	0.67%
<b>SECTION-E: VARIABLE FREQUENCY DRIVE SYSTEM FOR ID FANS</b>				
E.1	Transportation from stores / storage yards to erection site , erection , assembly , testing & commissioning of VARIABLE FREQUENCY DRIVE of ID FANS consist of Load Converter Inverter Panels, Control Panels, Reactors, Transformers, Vacuum Breakers and associated accessories, as per tender specification.	1	Set	1.35%
<b>SECTION-F: DIGITAL AUTOMATIC VOLTAGE REGULATOR</b>				
F.1	Transportation from store / storage yard to erection site , Erection, Assembly, Testing & Commissioning of Digital Excitation Equipments / System , System consist of Regulation / Thyristor / field suppression panels & accessories as per tender specification.	2	Set	2.70%
<b>SECTION-G: GENERATOR, GT, ST &amp; UAT PROTECTION &amp; METERING PANELS, ETC</b>				
G.1	Transportation from stores / storage yard to erection site, erection, integrated electrical testing & commissioning (which comprises of relay testing, functional checks of control / protection circuit etc )of Generator, Generator Transformer, Unit Auxiliary Transformers & Station Transformer, "Control / Protection & Metering Panels", Over all dimension of each panels 1000x750x2295 mm, approx weight 500 Kg each	8	Set	5.40%

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G.2	Transportation from stores / storage yard to erection site, erection, integrated electrical testing & commissioning (which comprises of relay testing, functional checks of control / protection circuit etc )of Bus Transfer scheme panels, Over all dimension of each panels 1000x750x2295 mm, approx weight 500 Kg each	4	Set	10.80%
G.3	DC motor starter panels, etc (DC JOP, DC EOP, Seal oil panel), including resistance boxes. Approx weight 0.5 MT each.	3	Nos	0.20%
<b>SECTION-H: SOOT BLOWER SYSTEM ::TRANSPORTATION FROM STORES / STORAGE YARD TO ERECTION SITE, ASSEMBLY, ERECTION, TESTING, &amp; COMMISSIONING OF 415 VOLT ELECTRICAL SYSTEMS OF SOOT BLOWERS COMPRISING OF SOOT BLOWER LT MCC WITH ACCESSORIES ALONG WITH COMMISSIONING OF THE SOOT BLOWERS (ERECTION OF THE SOOT BLOWERS EXCLUDED FROM THIS CONTRACT)</b>				
H.1	Soot Blower Motor Control Center, double front, overall dimension 9700(W)x2450(H)x1000(D), WT 12T, shall be supplied in eight to ten loose shipping sections	1	Set	0.84%
H.2	Testing & Commissioning of Wall, Long Retractable, Air Heater Soot Blower	76	No	1.54%
H.3	Testing & Commissioning of Furnace temperature probe (including solenoids, thermocouple, etc)	1	No	0.05%
<b>SECTION-J: ELECTROSTATIC PRECIPITATOR (ESP): TRANSPORTATION FROM STORES UPTO WORK SITE, PRE-ASSEMBLY, ERECTION, TESTING, COMMISSIONING, ETC. OF ELECTRICAL SYSTEMS AND EQUIPMENTS AS UNDER</b>				
J.1	Auxiliary Control Panel, Overall Dimension 5250X500X2450 mm, Weight of each panel 4.3 MT and supplied in loose shipping sections	4	Set	1.03%
J.2	Electronic Control Panel, Overall dimensions 700X650X2080mm, Weight of each panel 0.3MT. Electronic modules / rotary switches, etc along with cables and connectors, shall be supplied loose for mounting in the panel at site	32	Set	1.51%
J.3	STATCON PANEL Overall dimension 1000X650X2000 mm, Weight of each panel 0.3 MT One number STATCON Electronic module for each panel (along with cables) connectors size 250 x200x200 mm shall be supplied loose for mounting in the panel at site	4	Set	0.13%
J.4	RAPPER CONTROL PANEL Overall dimension 1000X650X2000 mm, Weight of each panel 0.3 MT. 4 Nos. RAPCON Electronic modules for each panel (along with cables connectors ) size 250 x200x200 mm shall be supplied loose for mounting in the panel at site	4	Set	0.22%
J.5	IOS PANEL overall dimension 1000x650x2000 mm Weight of panel 0.3 MT along with loose accessories such as IOS PC, Computer Furniture, Data Logger PC, Printer -2 Nos. PC termination box, peripheral cables etc.	1	Set	0.04%
J.6	Junction Boxes ( Power) 500x200x360 mm approx.	50	Nos.	0.30%
J.7	Junction Boxes (Control) 480 x200 x300 mm approx	50	Nos.	0.24%
J.8	Ash Level Indicator comprising of level probe with extension lagging pipe, Electronic Unit, Interconnecting Cabling, Conduit, etc.	128	Set.	2.16%
J.9	Opacity Monitor Consisting of Transmitter & Receiver, Electronic Unit, Air Blower unit, Weather Proof housings, Junction boxes, flexible hoses, mounting flanges with pipe for Transmitter, Receiver & Air blower, interconnec-ted cables etc. for mounting on ESP outlet duct.	4	Set.	0.19%

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J.10	Start Stop Push Button Station Dimensions 180X200X210 mm weight 5 Kg	70	Nos.	0.26%
J.11	Thermostats including Calibration.	68	Nos.	0.50%
J.12	50 x 6 mm GI earthing flat	1000	Mtrs.	0.44%
J.13	30 X 5 mm GI earthing flat	1500	Mtrs.	0.40%
J.14	3.15 mm GI earthing wire	1000	Mtrs.	0.05%
J.15	½" GI flexible conduit	4000	Mtrs.	1.08%
<b>SECTION-K: ELECTRICAL HOIST DSL CABLE TRAILING SYSTEM Transportation of material from Stores/ storage yard to erection site, Erection, Assembly, Testing &amp; Commissioning of misc. Electrically Operated Hoist for ID, FD, PA Fans, Coal Mills, ESP etc.</b>				
K.1	The hoist work comprises, erection, Testing Commissioning of Switch Fuse Unit, Cable Guide Trolley, Dog chain or Angle / I beam support arrangement, Real Insulators, Limit Switches , Trailing Cable, Testing of Control Panel, Motor and Assistance during Final Load test as described elsewhere in Tender.	12	Nos.	1.30%
<b>SECTION-M: MISC. ITEMS :</b>				
M.1	Junction Boxes (12WAY, 24WAY, 48WAY, 64WAY ETC.)	50	No.	0.27%
M.2	Structural Steel fabrication & installation ( MS angle, Channel, Plate etc)	25	MT	2.29%
<b>SECTION-N: ONLY TESTING &amp; COMMISSIONING</b>				
N.1	Hopper Heater, Support Insulator Heater, Shaft Insulator Heaters for ESP	1568	Nos.	5.03%
N.2	High Voltage Rectifier Transformers (70 KV peak, 1200 mA) including oil filtration.	32	Nos.	1.40%
N.3	Electrically (LT) Operated Valves, Dampers and Gates with Actuators, Limit Switches etc. (Regulating & ON/OFF Type).	325	Nos.	3.29%
N.4	Oil Centrifuge (includes erection of only Control panel / board and loop cabling)	1	No	0.05%
N.5	Testing and commissioning of 6.6 KV and 2.4 KV HT motors including dryout	18	Nos	0.61%
N.6	Testing and commissioning of 415 V LT motors including dry out	100	Nos.	3.37%
N.7	Generator system testing as per clause no. 4.3.11.2A	1	Set	0.67%
N.8	3 phase heater of control fluid/oil system	1	No.	0.02%
<b>SECTION-P: LT POWER CABLES (Generally Unarmoured)</b>				
P.1	2 X 120sqmm Aluminium	9000	meter	1.82%
P.2	3 X 10sqmm Aluminium	100	meter	0.01%
P.3	3 X 25 sqmm Aluminium	600	meter	0.08%
P.4	3 X 6 sqmm Aluminium	2400	meter	0.29%
<b>SECTION-Q: LT CONTROL CABLES (Generally Unarmoured, Screened or Unscreened)</b>				
Q.1	1C/2C 1.5/2.5 sqmm Copper	11250	meter	0.76%
Q.2	3C/4C/5C 1.5/2.5 sqmm Copper	42725	meter	4.04%
Q.3	6C/7C 1.5/2.5 sqmm Copper	5325	meter	0.57%
Q.4	8C/9C/10C 1.5/2.5 sqmm Copper	19825	meter	2.14%
<b>SECTION-R: CABLE TRAY (LADDER TYPE)</b>				

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R.1	450 mm	500	Mtrs.	0.24%
R.2	300 mm	500	Mtrs.	0.21%
R.3	150 mm	950	Mtrs.	0.32%
<b>SECTION-S: CABLE TRAY (PERFORATED TYPE)</b>				
S.1	450 mm	100	Mtrs.	0.06%
<b>GRAND Total in %</b>				<b>100.00%</b>

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