



भारत हेवी इलेक्ट्रिकल्स लिमिटेड

(भारत सरकार का उपक्रम)

**BHARAT HEAVY ELECTRICALS LIMITED**

(A Govt. of India Undertaking)

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**TENDER CHANGE NOTE 02 (TCN – 02) DT: 02-11-2009**

WITH REFERENCE TO THE NIT, PUBLISHED IN THE WEB SITES FOR ERECTION, TESTING, COMMISSIONING OF CONTROL & INSTRUMENTATION WORK OF STATION, BOILER, TG AND THEIR AUXILIARIES ETC. FOR 1X250 MW SANTALDIH TPS, UNIT-6, PURULIA, W.B., FOLLOWING CHANGES MAY PLEASE BE NOTED AND COMPLIED WHILE SUBMITTING THE OFFER FOR THE SUBJECT JOB.

REF: TENDER DOCUMENT NO-PSER: SCT: SND-I1039:09

Based on the clarifications sought by the bidders, together with the corrections made by us, we are pleased to furnish the changes as per enclosed Annexure -1.

Because of the above changes, the due date of submission is hereby extended up to 16/11/2009.

**BIDDERS TO NOTE THAT ALL TCNS WILL FORM PART OF TENDER DOCUMENT**

**ALL OTHER TERMS & CONDITIONS OF THE TENDER SHALL REMAIN UNCHANGED.**

**SDGM (SCT)**

**ANNEXURE -1**

CLARIFICATIONS FURNISHED BY BHEL

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S/N	Doc. Ref	Cl.No	Page no	Addition / Deletion / Modification / clarification
	VOL-ID	8.2.1	10 of 40	The contractor shall submit the network positively within 30 days after receipt of LOI.
	VOL-ID	8.3.2	10 of 40	"PDS" may be read as PDF.
	VOL-ID	8.4.1	11 of 40	The cl no. 8.4.1 stands replaced by the following clause:  The successful bidder will have to establish computerized system to integrate with BHEL's existing system and requirement for Material management system and SOMS software system. Minimum 02 nos. Computers with at least <b>core 2 duo</b> processor @ 2.93 GHz, DG31 chip set, 2 GB RAM (single chip), 320-GB hard disc, DVD-RW Drive, Optical Mouse, MM keyboard, Internal modem, Intel high definition Audio with stereo speakers, 17" Digital <b>TFT</b> colour monitor, Integrated 10/100 LAN Card, Four high speed USB port, parallel & serial port, UPS with associated accessories, licensed soft-wares (like Window XP professional, MS Office 2003 and other software as per site requirement) and 2-nos Laser Printer (out of two, one number A-4 size colour Laser printer & one number A-3 size B&W Laser printer), Scanner-1no. along with power back-up system & operators are to be provided for this purpose during the period from start of contract till completion of contract period, including extension, if any. No separate payment shall be made on this account and the Quoted rate shall be inclusive of the same.
	VOL-ID	24.1	27 of 40	The cl no. 24.1 stands replaced by the following clause:  The contractor shall furnish soft copy of statement of material issued to him for the billing period along with each RA Bill and the contractor shall submit a final reconciliation statement of material after completion of job.
	VOL-ID	32.1	31 of 40	Following clause , 32.1 is added:  No Rate Revision is applicable for this contract.
	VOL-ID	34.4.1 & 34.4.2	32 of 40	The rate against clause no 34.4.1 to be read as Rs.30/man-hour and clause no. 34.4.2 to be read as Rs. 25/man-hour
	VOL-ID	Annexure-I (exclusion)	36 of 40	Following clause , 2.1.6 is added:  Thermo-wells seal welding is excluded.
	VOL-ID	Annexure-II	38 of 40	Following clause is added against clause no.59- Ferrule printing machines with sufficient cartridges are to be brought and maintained by the successful bidder on as required basis for the contract.
	VOL-ID	-Do-	39 of 40	The clause no.3 of note may be read as under:  The contractor may please note the periodical testing and calibration of the testing equipment are to be done at CMERI / Durgapur, ERIL / Calcutta, Regional research laboratories at / Guwahati / Jorhat / Bhubaneswar OR EQUIVALENT AUTHORISED AGENCY and copy of test certificates to be submitted to BHEL as per 'ISO' norms.
	VOL-ID	Annexure-III	39 of 40	Welding machine for thermo-wells is deleted.
	VOL-II	1.7.0.5	6 of 15	The clause no. 1.7.0.5 stands modified as under:  Copper conductor control cables shall be terminated directly into screwed type terminals provided in the equipment. Wherever control cables are to be terminated by means of terminal lugs, the same shall be of tinned copper compression type. BHEL shall supply lugs free of cost for sizes 2.5 Sq.MM and above.
	VOL-II	1.10.0	7 of 15	The material reconciliation to done by the bidder once for every month
	VOL-II	1.12.5.3	11 of 15	The clause may be read as under :  All accessories like thermo-well, Isolation valve and other fittings shall be placed/erected by successful bidder. Seal welding of thermowell with the tapping point shall be done by BHEL/other contractor.
	VOL-III	BOQ CUM PRICE SCH		The BOQ cum Price Schedule has been modified and enclosed as VOL-III A, Rev-01 alongwith preamble and Billing schedule. The earlier BOQ Cum Price schedule, Rev-0, stands cancelled
	NOTE	All other terms and conditions shall remain unaltered.		

**Erection, Testing, Commissioning of Control & Instrumentation work of  
Station, Boiler, TG and their auxiliaries etc. for 1 X 250 MW Unit # 6 Santaldih TPS, W.B.**

**TENDER NO-PSER:SCT:SND-I1039:09**

**BOQ CUM PRICE SCHEDULE**

**VOLUME – IIIA(Rev. 01)**

**PREAMBLE**

1	This preamble forms part of tender document and schedule of items. The tenderer should read this preamble carefully in rates for various items. Clauses under this preamble shall be read in conjunction with Volume-IB, IE , Volume – II and other tender sections as applicable.
2	The work shall be carried out strictly as per specifications, description of the items in these schedule and / or engineer's instructions.
3	Items of work provided in this schedule but not covered in this specification shall be executed strictly as per instruction of the engineer.
4	Unless specifically mentioned otherwise in the tender document, the tenderer shall quote for the finished items and shall provide for the complete cost towards power, fuel, tools, tackles, equipment, constructional plants, temporary works, labour, dismantling of all temporary piping, structures, valves, pumps, tanks & other misc. equipment, strengthening of roads/culverts/bridges etc. including arranging all clearances etc. required for carrying out different activities & tests, materials, levies, taxes(except service tax), transport, layout, repairs, rectification, maintenance till handing over, supervisions, colonies, shops, establishments, overheads, profits and all incidental items not specifically mentioned but reasonably implied and necessary to complete the work according to the complete tender document and this schedule.
5	The quantities of the various items mentioned in the rate schedule are approximate, based on very preliminary information and may vary to any extent or to be deleted altogether. The accepted rates of each item will remain firm throughout the period of execution including extension, for reasons whatsoever, as long as variation in the total value of the work executed under any part of the this contract including extra items, if any, but excluding any price variation remains within +/- 30 % (plus/minus thirty percent) of the awarded price.
6	The rates quoted shall be inclusive of cleaning of site of any vegetation, dressing , clearing of old structures and leveling etc. including fixing of grid pillars, benchmarks etc. required for commencement of site activities. No separate payment will be made towards the same.
7	Rates shall be quoted in figures and in words in clear legible writing. No overwriting is allowed. All scoring and cancellations should be countersigned and in case of illegibility the interpretation of engineer shall be final. All entries shall be in English language.
8	All works item wise shall be measured upon completion and paid for at the rates quoted and accepted as per BHEL approved payment schedule/billing break-up.
9	The tender shall be deemed to have visited site and made himself aware of all the site conditions, studied the specifications and details of work to be done within the time schedule attached and to have acquainted himself of the conditions prevailing at site.
10	No splitting of the job is envisaged. Decision of BHEL in this regard shall be final and binding to the bidders.
11	Engineer's decision shall be final and binding on the contractor regarding clarification of items in the schedule with respect to the other sections/volumes of the contract.
12	Size and weights of various items are mentioned in the attached BOQ cum rate/price schedule for reference purpose only & these shall not be taken into consideration for quoting/calculating amount in the rate schedule. These shall be utilised as per relevant sections of tender. Bidders shall quote for each item in the rate column, taking unit as mentioned in the quantity column. Rates shall be filled in both figures and words. Amount shall be calculated based upon these rates multiplied by the mentioned quantity for the respective items.
<b>Note : Bidders to note the following for quoting their rates :</b>	
	1) Only authorised persons of bidder having power should sign in the price bid. All the pages must be signed.
	2) For bid evaluation purpose (deciding L1), grand total price of all the items of price schedule shall be considered.
	3) Quoted rates shall be inclusive of all taxes, duties etc., except service tax as per tender terms. Service tax (as applicable) shall be payable / reimbursable extra as per tender terms.
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**VOLUME - IIIA (REV. 01)**  
**BOQ CUM PRICE SCHEDULE**  
**(TENDER NO-PSER:SCT:SND-I1039:09)**

**Job : Erection, Testing, Commissioning of Control & Instrumentation work of Station, Boiler, TG and their auxiliaries etc.  
for 1 X 250 MW Unit # 6 Santaldih Thermal Power Station, West Bengal**

SL. NO.	DESCRIPTION	UNIT	QNTY	Unit Rate (in Rs.)	Total Amount (in Rs.)	Billing schdl. Ref.
			(A)	(B)	(C= A x B)	
<b>1.00</b>	<b>PANELS, CUBICLES &amp; HMI</b>					
1.10	DDCMIS Cabinet for Station C&I (750x750x2415 )	No.	50			6
1.11	DDCMIS Cabinet for Steam Generator (750x750x2415 )	No.	19			6
1.12	DDCMIS Cabinet for Turbogenerator (750x750x2415 )	No.	18			6
1.13	Interposing Relay Panel (800x800x2415 )	No.	3			6
1.14	Unit Control Panel (UCP) CWD 01 (3200 x 800 x 2345 )	No.	1			6
1.15	Generator Control Desk CWB01 (3200x800x2345)	No.	1			6
1.16	Network Interface Panel (800x800x2415) NWPA-01, NWPA-02, NWPL-01, NWPL-02, NWPS-01	No.	5			6
1.17	HART Mangement system conatining panel(1200x800x2415) & PC (1505x760x735)	No.	2			6
1.18	CCTV panel (1200x800x2415)	No.	2			6
1.19	UPS ACDB PANEL (1000x850x2400)	No.	2			6
1.20	UPS ACDB PANEL (800x850x2400)	No.	1			6
1.21	UPS ACDB WALL MOUNTED (650x300x550)	No.	4			6
1.22	UPS (2x105 KVA) Charger, Inverter: approx wt.6600Kgs, suit of 7 panels .	set	1			6
1.23	Battery with racks (Two battery bank each bank contains approx. 377 cells)	set	1			6
1.24	UPS System Battery Junction box (650x300x550) wall mounting	No.	2			6
1.25	Steam Leak detection Panel (800x800x2315) & PC	No.	1			6
1.26	ID/FD/PA/Mill/BFP/CEP Vib. Monitoring Panel (800x800x2415)	No.	9			6
1.27	Remote Gravimetric Feeder Panel (1400x510x 2365)	No.	6			6
1.28	LCP FOR CHEMICAL DOSING SYSTEM (700x 500x1600)	No.	1			6
1.29	LCP FOR CW SYSTEM (800x800x2400)	No.	1			6
1.30	EWLI Local Panel (600x600x350)	No.	4			6
1.31	EWLI Remote Display unit (99x234x78)	No.	6			6
1.32	ERV Control Box (400x350x270)	No.	2			6
1.33	Furnace Temperature Probe Local Starter (650x1000x300)	No.	1			6
1.34	Generator Instrumentation cabinet (1000x800x2200)	No.	1			6
1.35	Generator system annunciation cabinet (1000x800x2200)	No.	1			6

**VOLUME - IIIA (REV. 01)**  
**BOQ CUM PRICE SCHEDULE**  
**(TENDER NO-PSER:SCT:SND-I1039:09)**

**Job : Erection, Testing, Commissioning of Control & Instrumentation work of Station, Boiler, TG and their auxiliaries etc.  
for 1 X 250 MW Unit # 6 Santaldih Thermal Power Station, West Bengal**

SL. NO.	DESCRIPTION	UNIT	QNTY	Unit Rate (in Rs.)	Total Amount (in Rs.)	Billing schdl. Ref.
			(A)	(B)	(C= A x B)	
1.36	Gas Analyser Cabinet (1200x800x2110)	No.	1			6
1.37	SWAS Wet Panel (3300x2200x1400)	No.	1			6
1.38	SWAS Dry Panel (3600x2200x600)	No.	1			6
1.39	SWAS Chiller Panel (3040x1800x1350)	No.	1			6
1.40	SWAS Pimary Rack (1500x2000x600)	No.	1			6
1.41	SWAS Pimary Rack (600x2000x600)	No.	1			6
1.42	MAX Engineer Stations/Maxstorian stations (EWS): (1 Set comprises of 1 No. CPU , Printer, accessories and 1 No. Monitor)	Set	4			9
1.43	MAX operator Work Station (OWS) :computer consisting of CPU,Printer,Accessories and monitor)	Set	8			9
1.44	CRT Desk ( 700x1214x800)	No.	8			6
1.45	MAX Work Station (DeskTop) with Monitor, Printer & accessories: (1 No. each for Performance Calculation, Shift In-Charge, TSC & 2 Nos. for PWS, 2 nos. for CWPH, 2nos. For SCADA )	No.	9			9
1.46	MAX Link Work Station : (1 Set comprises of 2 No. CPU, Printer, accessories and 1 No. Monitor)	Set	2			9
1.47	MAX OPC Work Station : (1 Set comprises of 2 No. CPU,accessories,Printer, and 1 No. Monitor)	Set	1			9
1.48	Plant View Server Station: 1 Set comprises of 1 No. CPU , accessories,Printer and 1 No. Monitor	Set	1			9
1.49	Plant Wide Client Station (DeskTop):1 Set comprises of 1 No. CPU , accessories, Printer and 1 No. Monitor .	Set	20			9
1.50	Computerised Maintenance and Inventory Management System (CMMIS) Including Software and 1 No. Server & accessories	No.	1			9
1.51	TSI & VMS Server & Work Station containing Monitor & PC-4sets, printer-1no. and respective accessories.	set	1			9
1.52	Network Enclosures with Ethernet Switch & Accessories	No.	25			9
1.53	Router Switch for plant wide network	No.	1			9
1.54	Large Video Screen Control Station containing 67 inch Video screen and LVS Controller	No.	4			6

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SL. NO.	DESCRIPTION	UNIT	QNTY	Unit Rate (in Rs.)	Total Amount (in Rs.)	Billing schdl. Ref.
			(A)	(B)	(C= A x B)	
1.55	CCTV system Server containing PC & Monitor 3 sets	No.	3			9
1.56	Installation of PC and Printer, Monitor with accessories	No.	2			9
1.57	Wall mounted LIU	No.	5			3
	Note: Fixing of spike buster, power socket, I/O box etc for respective PC, Server, Monitor, Printer etc shall be carried out within quoted rate of respective items.					
<b>2.00</b>	<b>FIELD RACKS AND ENCLOSURES</b>					
2.10	Transmitter Enclosures ( LIE ) (2000x1500x2300) -500 Kg	No.	35			7
2.11	Transmitter Racks ( LIR ) (1800x800x2000) -300Kg	No.	55			7
2.12	Local Gauge Board (LGB) Assembly for Feed Water & Sealing Cooling Water service for BFP	No.	3			7
2.13	Local Gauge Board (LGB) assembly for oil service of BFP	No.	3			7
2.14	Local Gauge Board (LGB) Assembly for CEP	No.	1			7
<b>3.00</b>	<b>FIELD INSTRUMENT</b>					
3.10	Electronic Pressure Transmitters	No.	280			7
3.11	Electronic DP Transmitters	No.	25			7
3.12	Bypass Rotameter	No.	3			7
3.13	Electronic Level Transmitters Capacitance Type	No.	5			7
3.14	Displacement type level transmitters	No.	12			7
3.15	Ultra Sonic Level Transmitter	No.	3			7
3.16	Position Feedback Transmitter (Control valves, Scoop etc)	No.	75			7
3.17	Pressure Gauge	No.	270			7
3.18	Differential Pressure Gauge	No.	30			7
3.19	Temperature indicator Gauge type/ Gauge cum Switch type	No.	250			7
3.20	Level gauge	No.	15			7
3.21	Level Indicator	No.	4			7
3.22	Pressure Switch	No.	150			7
3.23	Differential Pressure Switch	No.	50			7

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**Job : Erection, Testing, Commissioning of Control & Instrumentation work of Station, Boiler, TG and their auxiliaries etc.  
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SL. NO.	DESCRIPTION	UNIT	QNTY	Unit Rate (in Rs.)	Total Amount (in Rs.)	Billing schdl. Ref.
			(A)	(B)	(C= A x B)	
3.24	Limit Switch	No.	200			7
3.25	Level Switch (Float / Displacement / Capacitance / Conductivity Type)	No.	50			7
3.26	RTD (PT - 100)	No.	200			7
3.27	Miniature RTDs (thrust bearing)	No.	24			7
3.28	Thermocouple - K Type/ R Type/ S Type etc	No.	120			7
3.29	6 MM OD SS sheathed type K, MTMTCs of Route Length - 12 Mtrs.	No.	5			7
3.30	6 MM OD SS sheathed type K, MTMTCs of Route Length - 14 Mtrs	No.	10			7
3.31	6 MM OD SS sheathed type K, MTMTCs of Route Length - 16 Mtrs	No.	50			7
3.32	6 MM OD SS sheathed type K, MTMTCs of Route Length - 18 Mtrs	No.	42			7
3.33	6 MM OD SS sheathed type K, MTMTCs of Route Length -20 Mtrs	No.	25			7
3.34	6 MM OD SS sheathed type K, MTMTCs of Route Length -22 Mtrs	No.	4			7
3.35	Flowmeter	No.	3			7
3.36	Coal Flow Monitor comprising of sensor, JB and cabling between sensor to JB	No.	6			7
3.37	Mass Flowmeter and its remote sensing element	No.	2			7

<b>4.00 TSI AND VIBRATION MEASURING EQUIPMENT</b>						
4.10	Shaft vibration pick-up, Differential Pick-up	No.	150			7
4.11	Bearing Vibration pick-up	No.	14			7
4.12	Proximity sensor/speed sensor/Key phasor	No.	50			7

<b>5.00 JUNCTION BOXES:</b>						
5.10	12 way	No.	60			3
5.11	24 way	No.	125			3
5.12	36 way	No.	50			3
5.13	48 way	No.	25			3
5.14	64 way	No.	40			3
5.15	72 way	No.	10			3
5.16	96 way	No.	25			3

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SL. NO.	DESCRIPTION	UNIT	QNTY	Unit Rate (in Rs.)	Total Amount (in Rs.)	Billing schdl. Ref.
			(A)	(B)	(C= A x B)	
<b>6.00</b>	<b>MISC. ITEMS:</b>					
6.10	Local Pneumatic Controller with mechanical transmitter (Dynavane)	No.	1			7
6.11	Electro Pneumatic (E/P) Converter	No.	70			7
6.12	Air Filter Regulator - 1/4 inch	No.	100			7
6.13	Air Filter Regulator -1 inch	No.	20			7
6.14	1/4" SIZE HOSE prefabricated type	No.	64			7
6.15	1" SIZE HOSE prefabricated type	No.	20			7
6.16	HEA EXCITER BOX	No.	12			6
	<b>(Materials for SADC system station fabrication e.g. tees, cross, socket, nipple, reducer, union etc. of SS-316 are to be supplied by the bidder within his quoted rate.)</b>					
6.17	Fab. & erection of Air header for SADC Power cylinder with 1/2" to 2" GI/SS pipe, and valves etc. (1 I/L, 14 O/L, drain & vent).	No	5			5
6.18	Fab. & erection of Air filter station for SADC Power cylinder with 1" GI/SS pipe, and valves and air filter regulator	No	4			5
6.19	Fab. & erection of dust collector / catch pot	No	5			5
6.20	Fab. & erection of pneumatic junction box	No	10			5
6.21	Fab. & erection of structural steel (Angle, Channel, flat, plate etc.)	MT	20			5
6.22	Fabrication & erection of canopy (structural matl. And GI/SS sheet will be provided by BHEL free of cost)	MT	2			5
6.23	Accoustic Transducer along with PRE-Fab cable and Field Amplifier boxes.	No.	18			7
6.24	Accoustic Wave Guard assembly	No.	18			7
6.25	Colour Camera with power supply unit & accessories including PAN & tilt, control receiver ,Control Transmitter.	No.	20			7
6.26	Scanner head Assembly	No.	12			7
6.27	Local Gun maintenance switch	No.	12			7
6.28	12 port pr. Vessel for EWLI	No.	4			7

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SL. NO.	DESCRIPTION	UNIT	QNTY	Unit Rate (in Rs.)	Total Amount (in Rs.)	Billing schdl. Ref.
			(A)	(B)	(C= A x B)	
6.29	Transportation of loose accessories of computer table from store and assistance for assembling at site (fixing of i/o box, spike buster, switch socket etc. as required.)	No.	40			9
6.30	Transportation of loose accessories of printer table from store and assistance for assembling at site	No.	35			9
6.31	Transportation of loose accessories of computer chair from store and assistance for assembling at site	No.	50			9
6.32	Transportation of loose accessories of almira from store and assistance for assembling at site	No.	10			9
6.33	Digital Clock (600x200x200) of GPS clock system	No.	12			7
<b>7.00</b>	<b>ANALYTICAL INSTRUMENTS</b>					
7.10	Oxygen (O <sub>2</sub> ) Analyser	No.	5			7
7.11	Flue Gas Analyser (SO <sub>x</sub> + NO <sub>x</sub> + CO <sub>2</sub> + CO) Analyser - In Situ Type comprising of compressor, sensor, calibration box, local display unit etc.	No.	1			7
7.12	Conductivity Analyser	No.	15			7
7.13	Dissolved Oxygen (DO) Analyser	No.	2			7
7.14	Hydrazine Analyser	No.	1			7
7.15	Sodium Analyser (2 Channel)	No.	1			7
7.16	pH Analyser	No.	6			7
7.17	Phosphate Analyser	No.	2			7
7.18	Silica Analyser (3 Channel)	No.	1			7
7.19	Gas analyser (Generator Hydrogen)	No.	1			7
7.20	Dew Point Monitoring system across generator drier (Installation of Sampling station, sensor etc)	Set	1			7
7.21	Opacity Monitor - In Situ Type (comprising of transceiver, JB's, retroreflector, blower with hose, thermocouple etc.)	Set	1			7

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**Job : Erection, Testing, Commissioning of Control & Instrumentation work of Station, Boiler, TG and their auxiliaries etc.**  
**for 1 X 250 MW Unit # 6 Santaldih Thermal Power Station, West Bengal**

SL. NO.	DESCRIPTION	UNIT	QNTY	Unit Rate (in Rs.)	Total Amount (in Rs.)	Billing schdl. Ref.
			(A)	(B)	(C= A x B)	
<b>8.00</b>	<b>PIMPULSE PIPE AND COPPER TUBING</b>					
8.10	ASTM A 312 TP 316 1/2 " Nb Sch 40S	mtr.	600			4
8.11	ASTM A106 Gr C 1/2 " Nb Sch 80	mtr.	1400			4
8.12	ASTM A106 Gr C 3/4 " Nb Sch 80	mtr.	500			4
8.13	ASTM A106 Gr C 1/2 " Nb Sch 160	mtr.	700			4
8.14	ASTM A335 P22 1/2 " Nb XXS	mtr.	550			4
8.15	ASTM A312 TP 316 1/2 " Nb Sch 160S	mtr.	750			4
8.16	ASTM A106 Gr C 1 " Nb Sch 80	mtr.	100			4
8.17	1/2" Sch 80, CS impulse pipe	mtr.	500			4
8.18	1" Sch 80, CS impulse pipe	mtr.	300			4
8.19	1/2" Sch 160, CS impulse pipe	mtr.	250			4
8.20	3/4"Sch 80 Impulse Pipe, Matl. ASTM-A335	mtr.	250			4
8.21	3/4"Sch 80 Impulse Pipe, Matl ASTM-A106	mtr.	1200			4
8.22	Impulse Pipe above 3/4" upto 2":	mtr.	100			4
8.23	GI Pipe NB15 X 3.25 (IS 1239 GAL)	mtr.	500			4
8.24	Pneumatic Copper Tubes 1/4"	mtr.	2330			4
8.25	Copper Tubes above 1/4" upto 12mm	mtr.	100			4
8.26	Copper Tubes above 12mm upto 1"	mtr.	100			4
8.27	S.S.Pipe above 1/4" upto 3/4"	mtr.	1400			4
8.28	S.S. Tube upto 1/4"	mtr.	400			4
8.29	Impulse pipe for pr. Instruments CS 16 X2.6 ( BFP -600mtr, CEP-165 mtr. )	mtr.	800			4
8.30	Impulse pipe for pr. Instruments CS 13.5X2.9 ( <b>by argon welding.</b> )	mtr.	1500			4
<b>9.00</b>	<b>CABLES :</b>					
9.10	UTP cable for Max System	mtr.	14000			2
9.11	Fibre optic cable -Only Laying	mtr.	25000			2
9.12	2Px 0.5sq.mm (Armoured/Unarmoured, Overall/ I&OA shielded)	mtr.	30000			2
9.13	2Tx 0.5sq.mm (Armoured/Unarmoured, Overall/ I&OA shielded)	mtr.	2000			2
9.14	4Px 0.5 sqmm (Armoured/Unarmoured, Overall/ I&OA shielded)	mtr.	50000			2

**VOLUME - IIIA (REV. 01)**  
**BOQ CUM PRICE SCHEDULE**  
**(TENDER NO-PSER:SCT:SND-I1039:09)**

**Job : Erection, Testing, Commissioning of Control & Instrumentation work of Station, Boiler, TG and their auxiliaries etc.  
for 1 X 250 MW Unit # 6 Santaldih Thermal Power Station, West Bengal**

SL. NO.	DESCRIPTION	UNIT	QNTY	Unit Rate (in Rs.)	Total Amount (in Rs.)	Billing schdl. Ref.
			(A)	(B)	(C= A x B)	
9.15	8Px 0.5sq.mm (Armoured/Unarmoured, Overall/ I&OA shielded)	mtr.	25000			2
9.16	12Px 0.5sq.mm (Armoured/Unarmoured, Overall/ I&OA shielded)	mtr.	6000			2
9.17	16Px 0.5sq.mm (Armoured/Unarmoured, Overall/ I&OA shielded)	mtr.	1000			2
9.18	24Px 0.5sq.mm (Armoured/Unarmoured, Overall/ I&OA shielded)	mtr.	1500			2
9.19	4Px 1.0sq.mm I&OA shielded armoured	mtr.	1000			2
9.20	2Px 16 AWG K type I&OA shielded armoured	mtr.	4000			2
9.21	4Px16 AWG K type I&OA shielded armoured	mtr.	4000			2
9.22	8Px16 AWG K type I&OA shielded armoured	mtr.	8000			2
9.23	2Px16 AWG R type I&OA shielded armoured	mtr.	1500			2
9.24	4Px16 AWG R type I&OA shielded armoured	mtr.	500			2
9.25	Flame Scanner Shielded Cable	mtr.	3000			2
9.26	2 pair 1.5 sq.mm shielded cable	mtr.	5000			2
9.27	4C x 1.5 SQ.mm. Control Cable	mtr.	1000			2
9.28	2C x 2.5 SQ.mm Copper Power Cable	mtr.	2000			2
9.29	3C x 2.5 SQ.mm Copper Power Cable	mtr.	27000			2
9.30	5C x 2.5 SQ.mm. Control Cable	mtr.	14000			2
9.31	7C x 2.5 SQ.mm Control Cable	mtr.	2500			2
9.32	10C x 2.5 SQ.mm. Control Cable	mtr.	12000			2
9.33	19 core 2.5 sq.mm control cable	mtr.	2300			2
9.34	3 core 6.0 sq.mm power cable	mtr.	2000			2
	Note (For Sl. 9.00) : Insulated copper lugs of std quality, Number ferrules by machine printed ,Tags ,ties are to be supplied by the Bidder. Gland will be supplied by BHEL free of Cost.					

<b>10.00</b>	<b>CABLE TRAYS AND ACCESSORIES:</b>					
10.10	GI CABLE TRAY – 50 mm Width	mtr.	2000			1
10.11	GI CABLE TRAY – 100 mm Width	mtr.	500			1
10.12	GI CABLE TRAY – 150 mm Width	mtr.	650			1
10.13	GI CABLE TRAY - 300 mm Width	mtr.	70			1
10.14	GI CABLE TRAY with cover (For UTP Cable) – 100 MM Width	mtr.	2000			1

**VOLUME - IIIA (REV. 01)**  
**BOQ CUM PRICE SCHEDULE**  
**(TENDER NO-PSER:SCT:SND-I1039:09)**

**Job : Erection, Testing, Commissioning of Control & Instrumentation work of Station, Boiler, TG and their auxiliaries etc.  
for 1 X 250 MW Unit # 6 Santaldih Thermal Power Station, West Bengal**

SL. NO.	DESCRIPTION	UNIT	QNTY	Unit Rate (in Rs.)	Total Amount (in Rs.)	Billing schdl. Ref.
			(A)	(B)	(C= A x B)	
10.15	GI CABLE DUCT - upto 100 mm width	mtr.	3000			1
10.16	GI CABLE DUCT - above 100 mm below 300 mm width	mtr.	500			1
10.17	GI CABLE DUCT - above 300 mm below 500 mm width	mtr.	200			1
10.18	1/2" OD Pliable Conduit	mtr.	500			1
10.19	Fixing of 1/2" PVC Casing with cap at floor or wall for UTP cable dressing	mtr.	1000			1
10.20	Fixing of 1" PVC Casing with cap at floor or wall for UTP cable dressing	mtr.	1000			1
<b>11.00</b>	<b>CALIBRATION/ COMISSIONING (Erection excluded)</b>					
11.10	SADC power cylinders	No.	56			11
11.11	Burner tilt Power cylinder	No.	4			11
11.12	HEA power cylinder	No.	12			11
11.13	Power cylinder for scoop	No.	5			11
11.14	Power cylinder (on-off type)	No.	55			11
11.15	Power cylinder (regulating type)	No.	27			11
11.16	Control valves (ON-OFF)	No.	86			8
11.17	Open/ Close type cont valve (pneumatic) for fuel oil station at AB, CD & EF elevation.	No.	42			8
11.18	Control valves (Regulating)	No.	50			8
11.19	Extraction NRV/Spray water control valve	No.	5			8
11.20	Gland steam control valve	No.	2			8
11.21	HPBP Pr. & temp. control valve	No.	4			8
11.22	HPBP spray block valve	No.	1			8
11.23	Bidirectional Electrical actuator	No.	43			8

**VOLUME - IIIA (REV. 01)**  
**BOQ CUM PRICE SCHEDULE**  
**(TENDER NO-PSER:SCT:SND-I1039:09)**

**Job : Erection, Testing, Commissioning of Control & Instrumentation work of Station, Boiler, TG and their auxiliaries etc.  
for 1 X 250 MW Unit # 6 Santaldih Thermal Power Station, West Bengal**

SL. NO.	DESCRIPTION	UNIT	QNTY	Unit Rate (in Rs.)	Total Amount (in Rs.)	Billing schdl. Ref.
			(A)	(B)	(C= A x B)	
11.24	LP Bypass spray Control valve with Feedback Transmitter	No.	2			8
11.25	Removal, calibration, re-mounting and commissioning of instruments for Skid. Each skid will have minimum of 05 no. instruments e.g. PG/PS/TG/DPI /DPS/TS/RPM meter with probe/LS/LG /FS/FI etc. Dressing of capillary & cables if any, repair of Cu-tube/impulse pipe, if any, changing of terminals of JB. if any, is also included.	No.	20			10
11.26	Gravimetric Feeder Local Cont. Panel ( 1320 x 375 x 1500)	No.	6			6
11.27	Reverse Rotation Monitoring system	No.	3			7
11.28	Local Speed Indicator	No.	5			7
<b>12.00</b>	<b>PG TEST ITEMS :</b>					
12.10	1/2" Impulse Pipe	mtr.	800			10
12.11	Compensating Cable (2C, Core size upto 2.5 sqmm) laying & termination	mtr.	1350			10
12.12	2C, Core size upto 2.5 sqmm cable laying & termination	mtr.	3000			10
12.13	4C, Core size upto 2.5 sqmm cable laying & termination	mtr.	3000			10
12.14	Pre-fab cable from Data logger to computer	mtr.	50			10
12.15	Junction Box	No.	80			10
12.16	Thermocouple	No.	45			10
12.17	Pr. / vacuum / DP Transmitters	No.	70			10
12.18	Data logger	No.	1			10
12.19	Manometer	No.	10			10
12.20	Thermowell	No.	100			10
12.21	PRT (Pt. Resistance thermometer)	No.	90			10
12.22	Barometer	No.	1			10
12.23	Power meter / transducer	No.	10			10
	<b>GRAND TOTAL PRICE OF ALL ITEMS AS ABOVE</b>					

**GRAND TOTAL PRICE IN WORDS : RUPEES** \_\_\_\_\_

## ANNEXURE-V

(Billing schedule)

**Activities covering erection, testing & commissioning of C&I package of Station, Boiler & Turbine and its auxiliaries of santaldih 1X 250 MW ( unit # 6)**

**TENDER NO-PSER:SCT:SND-I1039:09**

### **BILLING SCHEDULE**

Sl. No.	Description of work	% of unit rate
<b>1</b>	<b>Cable tray, accessories &amp; supporting structure</b>	
	1.1 Fab. as reqd. fixing in position, painting etc. complete in all respect	60%
	1.2 Laying of cables on trays	15%
	1.3 Dressing and clamping & tagging of cable	8%
	1.4 Tray covering	7%
	1.5 Trial run of unit	5%
	1.6 Handing over of unit	5%
	<b>Total =</b>	<b>100%</b>
<b>2</b>	<b>Cable laying</b>	
	2.1 Laying of cables	60%
	2.2 Termination of cables & tagging	15%
	2.3 Trial run/commissioning of connected equipment/system	8%
	2.4 Dressing and clamping of cable	7%
	2.5 Trial run of unit	5%
	2.6 Handing over of unit	5%
	<b>Total =</b>	<b>100%</b>
<b>3</b>	<b>Junction box/Push button station (local)</b>	
	3.1 Erection including fabrication of supporting frame	60%
	3.2 Fixing/testing of terminal block	15%
	3.3 Commissioning of connected equipment	8%
	3.4 Painting of supporting frame, name plate fixing	7%
	3.5 Trial run of unit	5%
	3.6 Handing over of unit	5%
	<b>Total =</b>	<b>100%</b>
<b>4</b>	<b>Conduit/impulse pipe/other pipe/copper tube/SS tube etc.</b>	
	4.1 Laying including fabrication/erection of supporting structure	45%
	4.2 Completion of erection including end connection	30%
	4.3 Dressing, clamping and tagging	8%
	4.4 Testing & commissioning of associated equipment/system	7%
	4.5 Trial run of unit	5%
	4.6 Handing over of unit	5%
	<b>Total =</b>	<b>100%</b>
<b>5</b>	<b>Misc. Structural steel support /Canopy</b>	
	5.1 Fabrication of support /Canopy	45%
	5.2 Erection of support /Canopy	30%
	5.3 Painting of support /Canopy	8%
	5.4 Completion of erection of connected equipment /Canopy	7%
	5.5 Trial run of unit /Canopy	5%
	5.6 Handing over of unit /Canopy	5%
	<b>Total =</b>	<b>100%</b>

## ANNEXURE-V

(Billing schedule)

**Activities covering erection, testing & commissioning of C&I package of Station, Boiler & Turbine and its auxiliaries of santaldih 1X 250 MW ( unit # 6)**

**TENDER NO-PSER:SCT:SND-I1039:09**

### **BILLING SCHEDULE**

Sl. No.	Description of work	% of unit rate
<b>6</b>	<b>Control panel/cubicle/desk/ups/transmitter rack/Insert / UPS / Battery / PLC</b>	
6.1	Receipt from store/yard, transportation to place of erection, placement, alignment including fabrication & erection of supporting frame	45%
6.2	Fixing of loose items/instruments, charging	30%
6.3	Loop testing and commissioning, Auto control commissioning	8%
6.4	System commissioning	7%
6.5	Trial run of unit	5%
6.6	Handing over of unit	5%
	<b>Total =</b>	<b>100%</b>
<b>7</b>	<b>Instrument/equipment</b>	
7.1	Receipt of material, calibration/testing, checking, erection including fabrication and erection of supporting frame	60%
7.2	Charging, local testing/commissioning & tagging	15%
7.3	Remote testing/loop commissioning, Auto control commissioning	8%
7.4	System commissioning	7%
7.5	Trial run of unit	5%
7.6	Handing over of unit	5%
	<b>Total =</b>	<b>100%</b>
<b>8</b>	<b>Control valve (excluding erection of valve but including erect. of accessories)</b>	
8.1	fixing loose components like AFR, tubing etc including fabrication & erection of supports	25%
8.2	Local testing, checking, calibration, Remote testing & commissioning	40%
8.3	Loop testing and commissioning, Auto control commissioning	18%
8.4	System commissioning	7%
8.5	Trial run of unit	5%
8.6	Handing over of unit	5%
	<b>Total =</b>	<b>100%</b>
<b>9</b>	<b>Plant monitoring system</b>	
9.1	Placement and alignment, Interconnection of equipment & peripherals, cable laying & termination and fixing of loose items	30%
9.2	Charging, Initialisation and configuring, Signal checking	20%
9.3	Pre-commissioning, Commissioning	35%
9.4	System commissioning	5%
9.5	Trial run of unit	5%
9.6	Handing over of unit	5%
	<b>Total =</b>	<b>100%</b>

**ANNEXURE-V**

(Billing schedule)

**Activities covering erection, testing & commissioning of C&I package of Station, Boiler & Turbine and its auxiliaries of santaldih 1X 250 MW ( unit # 6)**

**TENDER NO-PSER:SCT:SND-I1039:09**

**BILLING SCHEDULE**

<b>Sl. No.</b>	<b>Description of work</b>	<b>% of unit rate</b>
10	<b>Activities covering testing &amp; commissioning only</b>	
10.1	Fixing loose components	15%
10.2	Local testing, checking, calibration, Remote testing & commissioning	50%
10.3	Loop testing and commissioning, Auto control commissioning	20%
10.4	System commissioning	5%
10.5	Trial run of unit	5%
10.6	Handing over of unit	5%
	<b>Total =</b>	<b>100%</b>
11	<b>Power Cylinders</b>	
11.1	Fabrication & erection of supports, erection of power cylinder, levelling & alignment, grouting etc.	25%
11.2	Local testing, checking, calibration, Remote testing & commissioning	40%
11.3	Loop testing and commissioning, Auto control commissioning	20%
11.4	System commissioning	5%
11.5	Trial run of unit	5%
11.6	Handing over of unit	5%
	<b>Total =</b>	<b>100%</b>

**Note:**

01. Out of the above break up for progressive payment, 5% of the unit rates shall be retained from each RA bill which will be released in the following manner-
  - a. This 5% shall be released after the guarantee period is over.
  - b. However, this balance 5% can be released against submission of bank guarantee in the prescribed 'form' which shall be kept valid for the specified period. This bank guarantee is separate from the bank guarantee towards security deposit and the bank guarantee towards security deposit cannot be utilised for this purpose. The security deposit will be refunded as per relevant clause of GCC.
02. Site-in-charge, BHEL, at discretion, may further split up the above percentage and effect payment to suit the site conditions, cash flow requirement, according to the progress of work.