

TENDERER'S COPY

**TENDER NO.: DLI/PAN-I/R&M-C&I/07\_083**

**TENDER SPECIFICATION**

**FOR**

**R&M OF CONTROL & INSTRUMENTATION PACKAGE AND  
EXCITATION SYSTEM FOR 110MW UNIT-1 AT TAU DEVILAL  
TPS PANIPAT HARYANA**

**PART II – PRICE BID**



**Bharat Heavy Electricals Limited**  
(A Govt. Of India Undertaking)  
**Power Sector – Northren Region,**  
**Plot No. 25 , Sector - 16A ,**  
**Distt. Gautam Budh Nagar, NOIDA – 201 301.INDIA**



ISO 9001-2000, ISO 14001  
and OHSAS 18001 certified  
Company

Regional Service Centre

**Bharat Heavy Electricals Limited**

(A Govt. Of India Undertaking)

Power Sector – Northren Region,

Plot No. 25 , Sector - 16A ,

Distt. Gautam Budh Nagar, NOIDA – 201 301.INDIA

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**IMPORTANT NOTE**

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**THIS TENDER SPECIFICATION ISSUED TO:**

**M/S-----**

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**RATE SCHEDULE**

Sl.No.	Item/details	Unit	Qty.	Rate/unit	Total
1	DCS PANELS/FSSS/SADC /SOOT BLOWERS /RELAY LOGIC /SG PANELS. SIZE 750x800x2415 MM (WxDxH)	No.	48		
2	SAFE SHUT DOWN PANEL 1688X1100X2345 MM	No.	2		
3	RELAY PANELS	No.	0		
4	TRANSDUCER PANEL	No.			
5	UPS				
5.1	UPS PANELS	No.	3		
5.2	ACDB	No.	2		
5.3	Battery bank for UPS OR SMF battery	SET	1		
5.4	OR				
5.5	SMF-Battery	SET.			
5.6	By pass system	No.			
5.7	24 V DC system				
5.7.1	Charger and DCDB	No.	3		
5.7.2	SMF-Battery bank in rack	SET.	1		
6	CONTROL DESK Modifications, details as per scope. (Scope includes mounting of following items in 6.1 to 6.3 including Cutting of required sizes in existing desk painting etc	No.			
6.1	Mounting of mosaic title consoles	No.	2		
6.2	Mounting and wiring of control desk items-push buttons, lamps, switches etc.	No.	5		
6.3	Mounting and wiring of MCB, fuses & fuse bases, relay & relay bases and associated terminal blocks	No.	100		
6.4	Installation of following loose supplied items in the control desk/panels. Work includes making cut outs, fixing of instruments, calibration, internal wiring.	No.			
6.4.1	Bar graph indicators	No.	5		
6.4.2	Recorders (pen & point)	No.	6		
6.4.3	Electrical meters, totalizers, digital indicators	No.	10		
6.4.4	EWLI	No.	2		
7	Instruments scope includes calibration, mounting , fixing , clamping , complete erection .canopy etc if required				
7.0	TRANSMITTERS directly mounted with canopy, E/P converters for pressure/level/DPT	No.	160		
7.1	Temp. element				
7.1.1	RTD	No.	185		
7.1.2	Thermo couple	No.	107		
7.1.3	Solenoid valves	No.	4		
7.1.4	Installation of (including welding of stubs) of thermo-well stubs	No.	292		

7.2	Pressure switches	No.	94		
7.3	Pressure gauges	No.	187		
7.4	Temp. Switches	No.	6		
7.5	Temp. gauges	no	248		
7.6	DP Switches/gauges	No.	6		
7.7	Level switches	No.	4		
7.8	Displacement level transmitter	No.	1		
8	SWAS SYSTEM (ABB make)comprises the following panels/systems.				
8.1	WET PANEL/ Dry panel size 2000x500 x2100 mm ( WxDxH )	No.	2		
8.2	Primary rack etc 1200x500x1800 mm	No.	2		
8.3	CHILLER unit 100 % redundancy	No.	1		
8.4	<b>Erection &amp; commissioning of Air conditioner, Partitioning of existing SWAS room . The room dimension are 4000 (L)x 3000 (W)x3000(H) mm. The scope includes supply of Glass, Wood , Anodised Aluminium and the required carpentry work as per scope. Existing room will be modified /partitioned to accommodate new panels. Bidder may have a look at the room modified for unit -2 earlier. Similar portioning is to be done for unit-1 .</b>	No.	1		
8.5	Fixing of prefabricated LIR racks.	Nos	70		
8.6	Conductivity Analyzers- 4 nos, PH analyzers – 3 nos, dissolved oxygen- 1 no, Silica analyzers – 1 no . The above analyzers are being supplied loose. These are to be mounted in the panels supplied and assistance is to be provided for its commissioning. Cables for these instruments are prefabricated.	nos	10		
9	HMI SYSTEM consisting of the following items 9.1 to 9.8	lot	1		
9.1	NETWORK PANEL size 800x800x2415 mm ( WxDxH)	No	1		
9.2	PROGRAMMER STATION	No.	2		
9.3	MAX STORIAN PC WITH MONITOR	No.	2		
9.4	PRINTERS	No.	4		
9.5	Placement of PC and Printer tables in room size 1500x750x735 mm Godrej make	No	8		
9.6	MAX OPERATOR STATION	NO	4		
9.7	CRT desk size 5435x1195x824 mm	NO	1		
9.8	Placement of Other accessories, like UTP cables, Ethernet cables, Power distribution board,	Lot	1		
10	CO-monitor consisting of transmitter, Receiver, one number blower, junction box and PVC pipe to connect the blower				

	to transmitter and blower to receiver. The weights of transmitter, receiver and blower are approx. 11Kg, 7Kg, 15Kg respectively. The CO monitor is to be mounted in the duct leading to Chimney at about 2 m height.	No.	2		
11	TRANSMITTER ENCLOSURE	No.			
12	Fabrication of local racks if required to accommodate various instruments	tons.	2		
13	Turbine supervisory system consisting of the following. The scope includes dismantling of existing pickups , erection of new pick ups , calibration in position etc				
13.1	Sensors for axial shift - 3nos, diff expansion- 6nos, Overall expansion -4 nos, eccentricity -3nos,	Nos	18		
13.2	Remote panel	No.	1		
13.3	Speed 3 nos, vibration 12nos,	No.	16		
13.4	Control desk items fixing ( if required)	set	1		
13.5	Mounting of gear wheel mechanism	No.	1		
14	Erection and commissioning of following Analyzers-				
	Flue gas analyzer/oxygen analyzer/opacity meters /SO2 Analyzer/Nox analyzer/CO Analyzer with accessories and standard calibration units /cylinders	No.	8		
	<b>Sub total-1</b>				
15	Erection of impulse lines, cables, junction boxes, cable trays Impulse lines laying work includes provision of supports, routing, necessary branching with equal TEEs, reducers ,couplings , catch points, welding of root valves, socket welding and mounting with U clamps, hydraulic testing and painting work to include along with required welding consumables and paint, erection materials will be supplied. Welding should be carried out with qualified and certified welders. Refer installation schemes for instruments CE/415/PTPS/INS				
15.1	A 335 P22 ½” NB SCH 160	m	400		

15.2	A 312 SS 316 PIPE SCH160	m	200		
15.3	A 312 TP316 ½” NB SCH 40	m	300		
15.4	A 106 GR C ½” NB SCH 160	m	600		
15.5	A 106 GR C ½” NB SCH 80	m	2500		
15.6	A 106 GR C ¾” NB SCH 80	m	1700		
16	Structural Steel-fabrication, installation and painting	Ton	3		
16.1	<b>Impulse line E &amp; C Charges –Subtotal 2</b>				
17	Laying and termination of Cables (armored / unarmored), copper conductor overall shielded including tagging, Ferruling, lugging and Glanding. <b>Lugs , ferrules, tags, tying belts etc of reputed make are to be arranged by sub Bidder. Glands will be supplied by BHEL. If the BHEL supplied glands quantities are not sufficient, Bidder will arrange for double compressor glands of similar quality and makes as per sizes below</b>				
17.1.	Comet/dowell make or any other standard make glands double compression type for cable sizes having overhaul cable diameter 9.5 mm to 15 mm	No	50		
	Glands for overhaul Cable dia.15.5 mm to 21 mm	No	15		
	Glands for overhaul Cable dia.21.5 mm to 27 mm	No	10		
	Glands for overhaul Cable dia.36 mm Cabel sizes 1Cx300 sq mm	No	25		
17.1.1	12Pair X 0.5 Sq.mm, FRLS, Unarmored	m	4500		
17.1.2	4Pair/6P/8P ,7/0.3 X 0.5 SQmm,650 V armored/ unarmoured, I/O, ATC	m	23000		
17.1.3	1Pair /2P X 0.5SQmm,FRLS Armored/unarmoured	m	50000		
17.1.4	Compensating cables/ TC cables	m			
17.1.5	K type 2 pair and 4 Pair, 0.5 Sq mm ARM T/ C extension cable	m	7000		
17.1.6	RX type 2 pair 0.5 sq mm ARM, T/C extension cable	m	500		
17.1.7	8Pair, KX type o.5 sq mm, T/C extension	m	1000		
17.2	Control cables, armored	m			
17.2.1	2C X 1.5/2.5Sq.mm, FRLS, HRPVC	m	13500		
17.2.2	4C X 1.5/2.5Sq.mm	m	850		
17.2.3	14C x 1.5/2.5Sqmm	m	750		
17..3	Power cables, aluminum/copper armored	m			
17.3.1	6C x 4Sq.mm	m	300		
17.3.2	3C x 6Sq.mm AI	m			
17.3.3	6C x 6Sq.mm	m	300		
17.3.4	1C x 16Sq.mm, FRLS, PVC	m	600		
17.3.5	4C x 25Sq.mm	m	300		

17.3.6	1C x 70Sq.mm, FRLS,PVC	m	700		
17.3.7	1C x 120Sq.mm, AI	m			
17.3.8	3C x 95Sq.mm, AI	m			
17.3.9	1C x 300Sq.mm, copper	m	500		
17.4	1C x300Sq.mm, Copper,	m			
17.5	Termination of LT power cable size 1c, 300 Sq mm including cost of lugs.	No	40		
17.5.1	1C x 120Sq.mm	No,			
17.5.2	1C x 300Sq.mm	No.			
17.5.3	1C x 630Sq.mm	No			
17.6	PRE FABRICATED CABLES WITH CONNECTORS (FOR SEE)Length of 20M				
17.6.1	Pulse cabling ( prefabricated )	Runs	12		
17.6.2	Interconnecting cables ( prefabricated )	Runs	3		
17.7	Termination of HT power cable including cost of HT termination kit. (Raychem make )//lugs	no	18		
17.7.1	XLPE, 1C x 300Sq.mm 11 kV,	m	150		
17.7.2	XLPE, 3cX 120 Sq mm	m	150		
17.7.3	<b>If any additional cable/ gland/tray does not fall in any category , rates of next higher sized cable/gland/tray will be considered for payment</b>				
17.7.4	GI Plica Conduit with fittings upto 1” size	No	25		
17.7.5	GI Plica Conduit with fittings more than 1” size	No	15		
17.7.6	<b>E&amp;C Charges for cabling- Sub Total-3</b>				
18	Junction boxes installation and fixing in field				
18.1	12-way	No.	80		
18.2	24-way	No.	80		
18.3	36 way	no	35		
18.4	48 way	no	35		
18.5	64 way	no	20		
	<b>Junction boxes Erection Charges Sub total-4</b>				
19	Impulse lines				
19.1	GI pipes/copper tubing / SS tubing	Unit			
19.2	2” NB	m	20		
19.3	1” GI/SS/CS pipes	m	16		
19.4	½ “ GI/SS/CS pipes	m	23		
20	6mm/ 8 mm tubing of CU/SS /CS	m	20		
21	Cable trays				
	Cable trays-perforated/ladder	Unit			
	50 mm-75mm-100mm	m	4500		
	75 mm	m			
	100 mm	m			
	150 mm	m	25		
	300 mm--450 mm	m	100		
	450 mm	m			

	600 mm	m	5		
	Cable trays-Ladder	m			
	300 mm	m	10		
	600 mm	m	5		
	<b>Sub Total-5</b>				
22	Installation and commissioning of Actuators -electrical /pneumatic along with P/I converters	No	40		
23	Servicing of existing Actuators	no	60		
	<b>Sub Total-6</b>				
<b>Sl.No.</b>	<b>Item/details</b>	<b>Unit</b>	<b>Qty.</b>	<b>Rate/unit</b>	<b>Total</b>
24	Electronic earth pit preparation for SEE and Station . C &I along-with all materials	no	3		
	<b>Sub total-7</b>				
25.	<b>Rendering commissioning assistance by way of deployment of experienced and skilled team as per directions of BHEL engineer.</b>				
	<b>Engineers</b>	Man-month	10		
	<b>Electricians and Instrumentation fitters</b>	Man-months	14		
	<b>The composition of the team can be changed within the stipulated man-months as per site requirements</b>				
26.	<b>A) Providing one computer operator and one helper for BHEL site office for entire site duration</b>	Man-months	8		
	<b>B) Providing one lap top computer and one desk top computer with latest configuration and peripherals like DVD writer, printer etc along with its maintenance for the complete duration of job , Providing data internet card for internet connectivity, Providing 2 nos internet enabled activated mobile phones for the entire site duration for use by BHEL staff.</b>	monthly	4		
27	<b>A) Civil Construction of excitation room on the TG floor including cost of all materials bricks/iron etc. Supply and installation of Light fittings / conduiting / wiring /Switch-boards fixing etc. All glass doors , aluminum frames/ doors etc will be arranged by Bidder. Room size is 10000x6000x5500 mm (LxDxH) with a partition in between Bidder may visit site to see</b>	Lump sum	1		

	<b>unit -2 excitation room for size and bill of materials and other details</b>				
	<b>B) Bidder has also to arrange for supply and installation of air conditioning window type 2 Tx 6 nos corresponding to 12 tonnes capacity of reputed make i.e Blue star/Hitachi/Voltas/General/Marshall along with stablisers.</b>	no	6		
28	<b>Supply and making of glass and aluminium partition for MMI &amp; Computer room (within the control room ) size 4500x5800x3000 mm including supply of glass , wood , aluminum frames etc . Bidder may visit site to see unit -2 Computer room size and bill of materials and other details</b>	Lump sum	1		
	<b>Charges for items 25 to 28 – Sub total-8</b>				
29	Static excitation system				
	Regulation panels/FB panel/FF panels size 1150x1200x2295 mm ( WxDxH)	no	3		
	Thyristors panels size 680x1200x2295	no	3		
	Dry type Transformer on wheels with Cubicle size 2850x1500x2550	No	2		
	Control room/ desk - fixing of loose items	set	1		
	High voltage test kit arrangement and HV test of HV cables	no	6		
	<b>SEE panel erection and commissioning charges-Sub total-9</b>				
30	Dismantling, removal and shifting of materials and handing over at stores /customer				
	Description	Unit	Qty.		
30.10	Panels dismantling				
	DDC panels	No.	25		
	Relay, MCC panels	No.	7		
	SEE Panels	No.	2		
	Turbine Supervisory equipment and related cables including panels	set	1		
	Removal of thermo-well stubs along with thermo-wells	no	25		
	<b>Field Instruments dismantling</b>				
30.11	Transmitters	No.	120		
	Pr. /Temp/DP Switches	No.	75		
	Gauges	No.	300		
	Removal of thermo-well stubs along with thermo-wells	No.	175		
	Control room indicators, alarm windows, meters	No.	100		
	Recorders, totaliser, digital indicators	No.	24		
	PBs, lamps, switches	No.	150		
	Old ABB Consoles	No.	22		

30.12	Cables removal				
30.13	Removal of cables that are to be replaced Cables are to be removed from panels and cable trays				
30.14	Control cables of sizes 0.5/1.0/1.5/2.5 sq.mm	m	50000		
30.15	LT Power cable <3C x 120 mm	m	2000		
30.16	LT Power cable 3Cx 120>x<3C X 300mm	m	3500		
30.17	HT cable	m	200		
	Impulse lines	m	2500		
	Cable trays				
	Perforated up to 150mm	m	700		
	300, 450, 600 mm	m	500		
	<b>Dismantling charges – Sub total-10</b>				
	Summary of Estimation of R & M works at PANIPAT UNIT 1				
	Sub total-1				
	Sub total-2				
	Sub total-3				
	Sub total-4				
	Sub total-5				
	Sub total-6				
	Sub total-7				
	Sub total-8				
	Sub total-9				
	Sub total -10				
<b>31</b>	<b>Total</b>				
<b>Note 1</b>	<p><b>The quantity mentioned for installation are indicative and shall be used for arriving the rate for each item. The quantity is likely to vary by 15% -20 % on either side (+/-), as the job is R &amp; M in nature. Hence the final settlement shall be done as per the actual installed/commissioned or dismantled as the case may be.</b></p> <p><b>Due to very nature of the job , there may be wide variations (in actual numbers/ meters ) in case of items to be dismantled . Final payment will be made on the basis of actual numbers/running meters dismantled.</b></p> <p><b>Identification/classification of the items and quantity shall be certified by BHEL Site Engineer for billing purpose. In all such cases the BHEL engineer decision is final and binding.</b></p>				

<b>Note 2</b>	<b>Civil construction is to be carried out for excitation room , Partition for computer room (within the control room) and partition for SWAS room within the existing room. Bidder is advised to visit site and to see Unit-2 for the sizes of rooms and other bill of materials required before submitting his quotation. The rates to be quoted shall include the building materials.</b>
<b>Note 3</b>	<b>Payments against glands will be made only if additional glands are to be arranged and supplied by Bidder. If quantities supplied by BHEL are sufficient then Bidder will not supply glands and as such no payment will be made against this item .</b>
<b>Note- 4</b>	<b>Bidders must quote for unit rates only where Quantities are mentioned. Where no quantity is mentioned , rate need not be quoted.</b>
<b>Note- 5</b>	<b>In the event of reverse auction, the relevant terms indicated in Tender-Notice shall be applicable.</b>

**General Notes:**

1. In case of omission in quoting any rate, the evaluation will be done considering the highest quoted rate obtained against that item but the work, if awarded, will be on the lowest quoted rate obtained against that item.
2. The rate shall be entered in figures as well as in words. In case of difference in rates between words and figures, the lesser of the two will be treated as valid rate.
3. The bidders shall enter both 'Unit Rate' & 'Amount'. In case of any mismatch between 'Total Amount based on Unit Rate' & 'Total Amount as quoted', the lower of the two shall be considered for evaluation and award.

(Signature and seal of tenderer)