



BHARAT HEAVY ELECTRICAL LIMITED, JHANSI

Specification No.	9097	Rev-01
Item No.	SP/STEAM/9097	
Location	Boiler House	
Quantity	1 no.	

SPECIFICATION CUM COMPLIANCE CERTIFICATE OF GAS FIRED BOILER**NOTE:-**

- Vendor must submit complete information against clause no. 13.0 (Qualifying Condition). The offer meeting this clause would only be processed.
- Vendor to furnish the offer using this standard template of the specification. While furnishing the offer, no change is to be made in the first three columns (i.e. 'S. NO.', 'DESCRIPTION FOR BHEL REQUIREMENT' & 'ACTION BY VENDOR'). Only the "Offered" column and where applicable, the "Deviations" & "Remarks" Column of this format shall be filled in by the Vendor and submitted along with the offer. Inadequate / Incomplete, ambiguous, or unsustainable information against any of the clauses of the specifications/requirements shall be treated as non-compliance.
- The offer and all documents enclosed with offer should be in English language only.
- Wherever "vendor to specify 'or' suitable" is mentioned, suitable backup data or calculation or justification is required for establishing the suitability.
- Circuit diagram of the system offered is to be enclosed with proper writeup.

NAME & ADDRESS OF THE SUPPLIER :

TELEPHONE NOS.:

FAX NOS.:

E-MAIL ADDRESS :

SCOPE: DESIGN, MANUFACTURING, SUPPLY, INSTALLATION, COMMISSIONING AND TESTING/ PROVING FOR 10 MTPH CAPACITY GAS FIRED BOILER COMPLYING WITH SPECIFICATIONS AS BELOW

S.NO.	DESCRIPTION FOR BHEL REQUIREMENT	VALUE	ACTION BY VENDOR	OFFERED	DEVIATION/ REMARK
1.0	WORK PIECE MATERIAL				
1.1	This specification governs the quality requirements of Design, Manufacturing, Supply, Installation & Commissioning at BHEL JHANSI PLANT (with material/scope of supply) in all respect for 10 MTPH capacity Gas Fired Boiler. FOR SCOPE OF SUPPLY & WORK REFER POINT SR. NO. 2.0 TO 4.3		VENDOR TO NOTE & CONFIRM		
2.0	MATERIAL AND FACILITY AVAILABLE WITH BHEL: The below mentioned items of this plant are available and shall be provided by BHEL. The vendor will have to design the associated system accordingly and supply all the balance components to achieve the desired performance. <u>Vendor may visit the site before submitting the offer to assess the work, to analyse the technical requirement, to witness available items & the space available for installation of the boiler. Vendor will have to design the lay out such that all the supplied modules / equipment are accommodated in the available space only.</u>		VENDOR TO NOTE & CONFIRM		
2.1	DM Plant (15 KLPH capacity) water connection point available within 100 meter distance from proposed location. Items required for interconnection (pipeline, Valve, Tee, Union, NRV etc.) to be provided by Vendor.		VENDOR TO NOTE & CONFIRM		
2.2	Connection point in main Steam pipeline (going to shops) available within 50 meters distance from proposed location. Items required for interconnection (Pipeline, Isolation Valve, NRV, Drain module etc.) to be provided by Vendor.		VENDOR TO NOTE & CONFIRM		
2.3	Complete Civil Work will be in the scope of BHEL JHANSI (As per drawing submitted by vendor within 15 days after issuing of Purchase Order)		VENDOR TO NOTE & CONFIRM		
2.4	BHEL will provide single point air @4-6 bar and electric supply near the plant. Further distribution of these services as per requirement will be in the scope of vendor.		VENDOR TO NOTE & CONFIRM		
3.0	SCOPE OF WORK & SUPPLY				

S.NO.	DESCRIPTION FOR BHEL REQUIREMENT	VALUE	ACTION BY VENDOR	OFFERED	DEVIATION/ REMARK
3.1	DESCRIPTION				
3.1.1	Boiler shall be horizontal, three pass, fully wet back, smoke tube steam boiler, with reversal chamber, Hinged ceramic lined front doors, smoke chamber with soot cleaning door, one Manhole, two head hole on the boiler shell to inspect the internal of the boiler, one access opening at the back of the IRC to inspect the internal of the furnace, fusible plug for mechanical safety to prevent the boiler from overheating, automatically controlled, with dual block oil cum gas fired burner capable of firing Natural gas and LDO, Skid mounted.		VENDOR TO CONFIRM & SUBMIT THE CATALOG		
3.1.2	Boiler shall be complete with all structure, air ducting, piping, valves, mountings, fittings, filters, accessories, controls etc..		VENDOR TO CONFIRM		
3.1.3	Boiler construction should be in accordance with the latest revision of Indian Boiler Regulations 1950. All materials used should be approved and tested as per relevant existing codes. All the welded joints should be as per code requirement.		VENDOR TO CONFIRM		
3.1.4	Boiler should be designed and constructed to generate steam at minimum efficiency of 92 % on net calorific value (NCV) basis. Efficiency should be demonstrated as per standard BS - 845 part1 - indirect method.		VENDOR TO CONFIRM		
3.2	TECHNICAL SPECIFICATION				
3.2.1	Boiler Type	Three pass wet back smoke tube boiler	VENDOR TO CONFIRM		
3.2.2	Design Code	IBR	VENDOR TO CONFIRM		
3.2.3	Capacity Steam Output F & A 100 °C (Min.)	10000 kg/hr	VENDOR TO CONFIRM		
3.2.4	Design Pressure (Min)	10.5 kg/cm2 (g)	VENDOR TO CONFIRM		
3.2.5	Safety valves (1 & 2) set pressure	kg/cm2 (g)	VENDOR TO SPECIFY		
3.2.6	Efficiency on NCV as per BS845 on 100% NG firing only (With HRU) (Min.)	92%	VENDOR TO CONFIRM		
3.2.7	Dryness Fraction (Min.)	98%	VENDOR TO CONFIRM		
3.2.8	Heat Output	kcal/hr	VENDOR TO SPECIFY		
3.2.9	Volumetric Heat Release Rate	kcal/hr.m3	VENDOR TO SPECIFY		
3.2.10	Fuel	NG	VENDOR TO CONFIRM		
3.2.11	NCV of fuel considered -NG	8500 kcal/NM3	VENDOR TO CONFIRM		
3.2.12	Fuel consumption at maximum output - NG	Nm3/h	VENDOR TO SPECIFY		
3.2.13	Fuel supply rate - pressure and flow rate	m bar & kg/hr	VENDOR TO SPECIFY		
3.2.14	Electric Supply: AC, 3Phase, 415+/-5%V, 50+/-3% HZ, 4 Wire System		VENDOR TO NOTE		
3.2.15	Feed water pump motor	kw	VENDOR TO SPECIFY		
3.2.16	FD fan motor	kw	VENDOR TO SPECIFY		
3.2.17	Heating surface area - Boiler	M ²	VENDOR TO SPECIFY		
3.2.18	Length	mm	VENDOR TO SPECIFY		
3.2.19	Width	mm	VENDOR TO SPECIFY		
3.2.20	Height	mm	VENDOR TO SPECIFY		
3.2.21	Approx. Dry weight	Kgs	VENDOR TO SPECIFY		
3.2.22	Flooded weight	Kgs	VENDOR TO SPECIFY		
3.2.23	Burner turn down ratio	1:3 or better	VENDOR TO CONFIRM & SPECIFY		

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3.2.24	Safety valve (inlet/Outlet) size	mm	VENDOR TO SPECIFY		
3.2.25	Quantity of safety valves (Min 2 nos.)	Nos	VENDOR TO SPECIFY		
3.2.26	Main stop valve size	NB	VENDOR TO SPECIFY		
3.2.27	Blow down valve size	NB	VENDOR TO SPECIFY		
3.2.28	Auxiliary valve size	NB	VENDOR TO SPECIFY		
3.2.29	Water level gauge - Twin column type, size	NB	VENDOR TO SPECIFY		
3.2.30	Flue gas-outlet-flange - dimensions	mm	VENDOR TO SPECIFY		
3.2.31	Flue gas duct dia	mm	VENDOR TO SPECIFY		
3.2.32	Feed water pump (Vertical multistage stainless steel centrifugal pump)	Type/make	VENDOR TO SPECIFY		
3.2.33	Feed water pump head	M	VENDOR TO SPECIFY		
3.2.34	Feed water flow	LPM	VENDOR TO SPECIFY		
3.2.35	Total connected load	kw	VENDOR TO SPECIFY		
3.2.36	Chimney height	M	VENDOR TO SPECIFY		
3.2.37	Type of foundation		VENDOR TO SPECIFY		
3.2.38	Foundation for feed water pump		VENDOR TO SPECIFY		
3.3	SCOPE OF SUPPLY				
3.3.1	Gas fired package boiler shall be complete with all accessories as specified such as fuel system, feed water system, economizer, drain & vent piping, FD fan, chimney, flue gas ducting, structure, insulation, boiler mountings, motors, starters, electrical cabling, instruments & control etc.. Foundation bolts for all items shall be supplied.		VENDOR TO CONFIRM		
3.3.2	Finned Tube Economizer with casing, tubes & headers and stubs & attachments		VENDOR TO CONFIRM		
3.3.3	Two nos. feed water pump of adequate capacity and rating complete with motor, starters etc..Piping from feed water header (of DM water storage tank) to Pump Inlet, required Valves and Strainer in the feed water line; Feed water piping from feed water pumps to inlet of Economizer & from economizer outlet to Shell inlet; Pressure gauges at outlet of pumps; Isolation valves for pressure gauges.		VENDOR TO CONFIRM & SPECIFY		
3.3.4	In case offered feed water pump is not capable to meet hydraulic test requirement in line with IBR. One no. pump of adequate capacity and rating complete with motor, Piping, required Valves, pressure gauge with isolation valves and Strainer etc. in the feed water line shall be provided for hydraulic testing of boiler pressure parts in line with IBR requirement.		VENDOR TO CONFIRM & SPECIFY		
3.3.5	In Gas firing system the burner offered shall be Pressure jet burner of step less modulation type. The burner fires the gas into the furnace. A flame sensor on the burner as a part of flame failure safety control; Burner with combustion air fan, Servomotors for gas valve, air damper & combustion head optimizer Ignition transformer and Ignition electrodes, Gasket for burner flange; Gas flow meter, VFD on FD Fan shall be provided.		VENDOR TO CONFIRM		
3.3.6	Gas Train to regulate the Gas Pressure from 2.5 bar to 100-150 mbar. Gas Train should consist of double shut off valves, Automatic leakage detector for main gas valves (pressure switch) Ignition gas valve (Pilot Valve), Pressure switches for gas (min, max), Gas Filter, Safety Relief Valve, Gas flow control valve etc. to meet the requirement of boiler.		VENDOR TO CONFIRM		
3.3.7	One forced draft combustion air fan with flexible duct at suction & discharge of the fan shall be provided with air regulating assembly and all other accessories.		VENDOR TO CONFIRM		
3.3.8	Feed Water Tank of minimum 30 KL capacity with supporting structure, Atmospheric Deaerator Head & Steam injection system.		VENDOR TO CONFIRM		
3.3.9	LP dosing system consists of Dosing pump with 100 ltrs. tank, valves and fittings, Motorized Agitator		VENDOR TO CONFIRM		

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3.3.10	Supply of Inter connecting piping, Drain & vent piping for safety valve discharge to atmosphere, Boiler air vent to atmosphere, Shell drain & Continuous blow down to blow down pit, Mobrey and gauge glass drain, Common drain to blow down pit, Sample Cooler (two points) with piping for Blow Down piping, fittings etc.,		VENDOR TO CONFIRM		
3.3.11	Items required for installation, commissioning & start up of boiler		VENDOR TO CONFIRM		
3.3.12	Insulation & cladding on boiler;flue gas duct, steam piping,water piping,drain vent piping		VENDOR TO CONFIRM		
3.3.13	Self-supported chimney made out of MS sheet of 30-rint height with suitable diameter.Chimney shall be complete with step ladder up to 30 mtrs.-awiation lamp-(Neon)-lighting arrester-wind cutter/spiral wings- necessary foundation bolts & platforms at suitable heights. Chimney to be painted with heat resistance anti corrosive paint.		VENDOR TO CONFIRM		
3.3.14	ELECTRICAL CONTROL PANEL Power cum control panel, free standing type conforming to IP 42 with MCB/MCCB. The panel should be made out of 14 / 16 SWG CRCA sheets, metal clad, dust and vermin proof, powder coated, Siemens gray color and with neoprene gaskets. Panel wiring with PVC 2.5 sqmm, copper wire 1.1 KV and having all standard accessories. Power & Control section physically isolated with partition plate, power section provided with a main incomer Isolating switch with MCCB, required switch gears for all the feeders housed in the power section, burner management system along with necessary start stop button, auxiliary contactor, and control circuit of all motors, indication lamps & hooter for the alarm, thermal Overload Relays, MCB's and Contactors should be housed in the control section.		VENDOR TO CONFIRM		
3.3.15	All outgoing Power & Control cables shall be in the scope of vendor. Power cabling from control panel to all drive motors for boiler, cable armoured with copper conductor. Control cabling from control panel to boiler mounting instruments, cable armoured with copper conductor. Supply of complete termination hardware. Power cable (minimum 150 meters length) as main incomer to Electrical Control Panel shall also be in the scope of vendor. BHEL shall provide one nearby source of sufficient current rating.		VENDOR TO CONFIRM		
3.3.16	Earthing GI flat 25mm x 3mm & 50mm X 6mm and supply of complete material for earth pits.		VENDOR TO CONFIRM		
3.3.17	Cable tray for above cabling		VENDOR TO CONFIRM		
3.3.18	Structural supports for cabling tray,ducting, piping		VENDOR TO CONFIRM		
3.3.19	Ladder & catwalk to operate the valves & fittings mounted on the boiler		VENDOR TO CONFIRM		
3.3.20	Accessories - List to be provided		VENDOR TO SUBMIT		
3.3.21	Mountings & Fittings - List to be provided		VENDOR TO SUBMIT		
3.3.22	PLC BASED CONTROL PANEL The PLC Control Panel shall comprise of centralized Hot-Redundant Fallsafe dual CPU in fully wired panel with pluggable type DIN rail mounted interposing relays in a ready to connect state to the field I/Os. Redundant power supply at each level (such as CPU rack, I/O Racks), together with all Panel Accessories.		VENDOR TO CONFIRM		
3.3.23	PLC Panel Enclosure: 1 no. a) A fully wired electrical control panel of suitable size housing complete PLC system, I/O modules, power supplies, relays contactors, fuse, TB etc. along with other accessories as per requirement. b) The TBs, relays, modules installed in the panel should be properly tagged, wires should have printed ferrules, all control cable should be properly dressed and routed through cable trays. c) Aux 240VAC single phase socket point inside PLC panel should be provided. d) Panel illumination LED lamp 20W through door close switch for each section. e) Input Supply 415 VAC, Suitable 415V/230V Isolation Transformer shall be provided. f) Panel AC: Rittal make Panel AC of suitable capacity.		VENDOR TO CONFIRM		

Enclosure Acceptable Make: Rittal/BCH/ABB/Schneider

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3.3.24	<p>PLC CPU Rack:</p> <p>The fault tolerant PLC shall comprise of the following:-</p> <ul style="list-style-type: none"> i) Hot-Redundant Fallsafe CPUs: 2 Nos ii) Independent Power Supply module for CPU: 2 Nos. iii) CPU racks: 2 Nos. iv) Memory Card suitable to project requirement.: 2 Nos. v) Backup battery for the CPUs: 2 Nos. <p>PLC acceptable makes: Siemens /ABB/Allen-Bradley only.</p>		VENDOR TO CONFIRM		
3.3.25	<p>PLC Input, Output Rack:</p> <p>The PLC I/O Rack shall comprise of the following:-</p> <ul style="list-style-type: none"> i) I/O Rack Power Supply Module: As per requirement ii) 24 VDC Digital Inputs : As per requirement iii) 24 VDC Digital Outputs: As per requirement iv) Analog Input 16 bit resolution: As per requirement v) Analog Outputs 16 bit resolution: As per requirement. x) Input/Output rack suitable for above I/O's. <p>Note: All field Connections to be wired to PLC Inputs/Outputs shall be routed through fused TB's having fuse failure indicator.</p>		VENDOR TO CONFIRM		
3.3.26	<p>Accessories of PLC:</p> <p>The PLC shall be supplied with the following accessories:</p> <ul style="list-style-type: none"> i) Interface for Tele-diagnostic service support through internet for-troubleshooting of PLC system. ii) PLC programming software with communication adapters/cables, Lifetime license key/dongle, CD etc. including all software required to program PLC and HMI stations, third party device. 		VENDOR TO CONFIRM		
3.3.27	<p>DIN rail mounted PLC-INTERFACE Relay:</p> <p>All the PLC outputs shall be wired to the field, through PLC-INTERFACE Relay for protection against interference currents or interference voltages on the control side. Consisting of basic terminal block with Push-in connection and plug-in miniature relay with power contact of 6A and 10 A, 230 V AC changeover contact as per requirement.</p> <p>Typical specs shall be as follows:</p> <ul style="list-style-type: none"> a) Coil Voltage: 24VDC b) Contact Single Changeover Contact (Main contact silver tin oxide (AgSnO2), lead contact tungsten) <p>Acceptable makes: Phoenix Contact/Siemens/ABB/Schneider/Allen-Bradley.</p>		VENDOR TO CONFIRM		
3.3.28	<p>2kVA x 2 nos Online UPS system for PLC panel & SCADA: 1 No.</p> <ul style="list-style-type: none"> a) UPS Type: True Sinewave Online UPS. b) Backup: 60 Min c) Battery: Sealed SMF battery bank. (inclusive) d) Technology: IGBT based control. e) Input: 230VAC, 1-ph, +/-10% f) Output: 230VAC+-1% Sinewave. g) Battery Rack: suitable for housing all SMF batteries. h) Other accessories: I/O cables, battery isolators and AC power distribution board. i) Acceptable makes <p>- UPS make- Microtek/Luminous/Emerson/APC/Aplab.</p> <p>- Battery make- Exide, Yuasa, Panasonic. only.</p>		VENDOR TO CONFIRM		

V. S.

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S.NO.	DESCRIPTION FOR BHEL REQUIREMENT	VALUE	ACTION BY VENDOR	OFFERED	DEVIATION/ REMARK
3.3.29	<p>HMI TOUCH PANEL AND ASSOCIATED ITEMS FOR CONTROL DESK:</p> <p>Fully configurable 17" color HMI Touch Panel is to be installed on the Control panel. They shall be supplied housed in a Sheet Metal/Moulded PVC enclosure such that it ergonomically gells with surrounding. In addition one 27" All-in-One Desktop PC with laser color printer 30 ppm will be required for overall operation and monitoring of Boiler and PLC programming/troubleshooting & report generation. The HMI Panel and 27" All-in-One Desktop PC shall communicate with PLC over Ethernet.</p> <p>Detailed Specifications and Scope of Supply for HMI and its communication network are as under:</p>		VENDOR TO CONFIRM		
3.3.30	<p>Fully configurable 17" color HMI Touch Panel: 1 Nos</p> <p>This HMI shall be suitable for configuring MIMIC Screens for Independent Control, Visualisation & Metering of boiler and its associated auxiliary equipment. MIMICS of Functions like boiler steam pressure control, drum water level control, burner sequence control, controlled shutdown, flame failure monitoring, burner interlock, Feeder ON/Off, alarms and interlocks, Flue gas temperature and all Line instrumentation parameters, Feedbacks, selections, D/D/O/A/AO values, steam parameters, Gas usage metering, Steam totaliser values etc of Boiler system are to be configured on the HMI & SCADA panel. The typical specification for HMI shall be as under:</p> <p>a) Display: Widescreen TFT, 16 million colors, LED backlighting. b) Size: 17" c) Resolution (W x H in pixels): Minimum 1,280 x 800 d) MTBF ⁹¹ backlighting (in h): Minimum 80,000 Hrs e) Process Functionality: Process Pictures, Tags, Vector Graphics, Bar charts, Trend diagram, Faceplates. f) Connectivity: With standard PLC over ethernet/Profinet g) Programming/Configuration: With any SCADA or dedicated software. h) Input Power Supply 230VAC/24VDC. If 24VDC model is offered, suitable Regulated Power supply shall be considered for HMI i) Acceptable makes: Siemens /ABB/Allen-Bradley only. Further PLC, HMI & SCADA should be of same make</p>	VENDOR TO CONFIRM			
3.3.31	<p>27" All-in-One Desktop PC:</p> <p>a) This PC shall be used for overall display of selection, control and status of boiler & Auxiliary equipments's. Necessary MIMIC screens will have to be configured for the purpose as per BHEL requirement during commissioning. This PC shall be equipped with licenced fully functional SCADA package for display, configuration and online diagnostics of the PLC System by Operator /Engineer. This PC shall also communicate with PLC over Ethernet/Profinet.</p> <p>Typical Specification of All in One 27" FHD Desktop PC shall be (11th Generation Core i7 Processor/ 16GB RAM/1TB SSD/2GB Integrated Graphics/OS : Windows 10 + MS Office).</p> <p>Acceptable make of PC: Dell/HP/Lenovo</p> <p>Acceptable make of PRINTER: Dell/HP/Epson/Samsung/Sony.</p> <p>b) A 55 inch 4K-UHD monitor/TV for use with above PC via HDMI/display port to show SCADA Screen in Large scale view.</p> <p>Acceptable makes: Samsung/LG/Sony.</p>	VENDOR TO CONFIRM			
3.3.32	<p>Operator Desk with pedestal drawers & 2 well cushioned revolving chairs. Acceptable makes: Godrej</p>	VENDOR TO CONFIRM			
3.3.33	<p>Wiring Accessories:</p> <p>All the accessories like Cable glands, Cable markers, Ferrules, Lugs, Legends for Control & Signalling devices, as per requirement shall be in scope of vendor.</p>	VENDOR TO CONFIRM			
3.3.34	<p>Other Instruments</p> <p>Steam totaliser Flow Meter Feed Water totaliser Flow Meter Oxygen Analyzer Online stack monitoring system (Sox, Nox) Drum Level Controller Pressure Transmitter on Shell Fluke Digital Multimeter Fluke clamp meter LAN Crimper & Tester x 1 nos each.</p>	VENDOR TO CONFIRM & SPECIFY			

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S.NO.	DESCRIPTION FOR BHEL REQUIREMENT	VALUE	ACTION BY VENDOR	OFFERED	DEVIATION/ REMARK
3.4	SCOPE OF WORK & SERVICES INSTALLATION & COMMISSIONING OF THE BOILER The erection of the items as supplied under this specification is the responsibility of vendor, to the satisfaction of BHEL. Erection shall be carried out according to well-established practices. Providing erection tools tackles, Hoists, derricks, slings scaffolding, rigging tools, welding sets, instruments, appliances, consumables etc. required for erection, inspection, testing and commissioning to accomplish the work, providing complete supervisory personnel, ensuring pre-commissioning checks, trial run of all rotating equipment shall be in the scope of vendor.		VENDOR TO CONFIRM		
3.4.2	IBR Approval of boiler upto provisional firing order shall be in the scope of vendor.		VENDOR TO CONFIRM		
3.4.3	All IBR formalities at site and its registration shall be in the scope of vendor.		VENDOR TO CONFIRM		
3.4.4	PLC/SCADA/HMI PLC Programming as per BHEL requirement for safe selection, control and visualisation of Supplied 10 MTPH Boiler and its associated Auxiliaries/equipments from SCADA control desks & HMI.		VENDOR TO CONFIRM		
3.4.5	Design and development of HMI Screens for Boiler operation, Visualization and control, MIMIC Screens shall be ergonomically designed having Complete realtime information of critical parameters. Separate Screens shall also be provided for DI/DO/AI/AO live status in SCADA for troubleshooting purposes.		VENDOR TO CONFIRM		
3.4.6	Faults/Error Messages will have to be configured for easy fault identification and diagnosis.		VENDOR TO CONFIRM		
3.4.7	Commissioning and proveout of complete system. All interlocks to be checked and validated for their effective functioning by physical operation.		VENDOR TO CONFIRM		
	3.5 PREFERRED MAKES OF THE BOUGHT OUT COMPONENTS:				
	ITEM	MAKE			
	3.5.1	MECHANICAL			
1	Feed pumps	Grundfos/ KSB/ LUBI/CNP/ Xylem	VENDOR TO SPECIFY		
2	Direct Water level gauge	Levcon/Pune Techrol	VENDOR TO SPECIFY		
3	IBR Plates	SAIL/ JINDAL	VENDOR TO SPECIFY		
4	Tubes (ERW)	TATA/TPI	VENDOR TO SPECIFY		
5	Burner	Unigas/ URETI/ Combustion Concept/Thermax Oertli/ Forbes Marshall	VENDOR TO SPECIFY		
7	IBR valves	KSB L&T/Uniklinger/Forbes Marshall/Rushas	VENDOR TO SPECIFY		
8	Safety valves	Fainger Laser/Uniklinger/ Forbes Marshall/Darling meusco	VENDOR TO SPECIFY		
9	Blow down valves	Flosteer/Uniklinger/ Forbes Marshall/ Darling meusco	VENDOR TO SPECIFY		
	3.5.2	ELECTRICAL			
1	Motors	ABB / Siemens / GE / Bharat Bijlee / Marathon / Kirloskar Electric / Crompton Greaves	VENDOR TO CONFIRM/ SPECIFY		
2	Relays / Circuit Breakers / MCCB / MCB / Contactors / Lamps / PB / SFU / Timers / Fuses	ABB / Siemens / GE / L&T / Schneider / Legrand	VENDOR TO CONFIRM/ SPECIFY		
3	Switches	Kaycee / Salzer / ABB	VENDOR TO CONFIRM/ SPECIFY		
4	Meters	AE / Secure / Rishabh / Schneider / L&T	VENDOR TO SPECIFY		

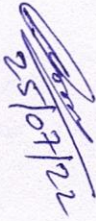
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5	PLC, SCADA, HMI	Siemens / ABB / Allen-Bradley	VENDOR TO CONFIRM/ SPECIFY		
6	Control & Power Cables	KEI / Havells / Polycab / Finolex / Gemscab / Cords	VENDOR TO CONFIRM/ SPECIFY		
7	Desktop PC	Dell / HP / Lenovo	VENDOR TO CONFIRM/ SPECIFY		
3.5.3	INSTRUMENTS				
1	Temp. gauges	E&H/Baumer/Honeywell/Wika/Yokogawa	VENDOR TO CONFIRM/ SPECIFY		
2	Pressure gauges	E&H/Baumer/Honeywell/Wika/Yokogawa	VENDOR TO CONFIRM/ SPECIFY		
3	Thermocouples	E&H/Baumer/Honeywell/Wika/Yokogawa	VENDOR TO CONFIRM/ SPECIFY		
4	Pressure Switch	E&H/Baumer/Honeywell/Wika/Yokogawa	VENDOR TO CONFIRM/ SPECIFY		
5	Pressure Transmitter	Wika/Edward/Pfeiffer/honeywell/Yokogawa	VENDOR TO CONFIRM/ SPECIFY		
6	RTD	E&H/Baumer/honeywell/Wika/Yokogawa	VENDOR TO CONFIRM/ SPECIFY		
7	Fusible Plug		VENDOR TO SPECIFY		
8	Level Gauge	Honeywell/Yokogawa	VENDOR TO CONFIRM/ SPECIFY		
9	Level switch	E&H./Truman/Honeywell	VENDOR TO CONFIRM/ SPECIFY		
10	Limit switch	BCH/Siemens/ABB/L&T/Honeywell	VENDOR TO CONFIRM/ SPECIFY		
11	Draught gauge	Wika/Switzer/honeywell/yokogawa	VENDOR TO CONFIRM/ SPECIFY		
12	Vortex Flow meter(Steam & water)	ABB/Yokogawa/Honeywell/E&H	VENDOR TO CONFIRM/ SPECIFY		
13	Digital Multimeter	Fuke/Hiooki/keysight	VENDOR TO CONFIRM/ SPECIFY		
3.5.4	If the party is offering any item of equivalent make other than mentioned above the same should be clearly indicated in the offer and will be accepted only in case specifically approved by BHEL.				
4.0	TESTS/ PERFORMANCE PROVE OUT:				
4.1	Vendor to prove the performance of the boiler as per specifications & IBR requirement.				
4.2	The boiler shall be tested for continuous full load operation as well as on fluctuating load operation and for part time and continuous duty operation.				
5.0	SAFETY ARRANGEMENTS Following safety features in addition to other standard safety features should be provided on the boiler.				
5.1	Boiler should have adequate and reliable safety interlocks / devices to avoid damage to the workpiece and the operator due to the malfunctioning or mistakes. Boiler functions should be continuously monitored and alarm / warning indication through lights / alarm number and audio alarm with message (on panels) should be available.				
5.2	A detailed list of all alarm / indications provided on Boiler should be submitted by the vendor with the offer.				
5.3	All the pipes, cables etc. on the Boiler should be well supported and protected.				

S.NO.	DESCRIPTION FOR BHEL REQUIREMENT	VALUE	ACTION BY VENDOR	OFFERED	DEVIATION/REMARK
5.4	All the rotating parts used on Boiler Plant should be statically & dynamically balanced to avoid undue vibrations and well protected with safety guards.		VENDOR TO CONFIRM		
5.5	Emergency switches at suitable locations as per International Norms are to be provided.		VENDOR TO CONFIRM		
5.6	Oil & water pipe lines should not run with electrical cable in the same tray / trench.		VENDOR TO CONFIRM		
5.7	Required PPEs shall be used by all the workers engaged by vendor at site from start of work till completion and other safety arrangements like lifeline, safety net, fire extinguisher shall be arranged by vendor at his own cost as per requirement.		VENDOR TO CONFIRM		
6.0	ENVIRONMENTAL PERFORMANCE The Boiler shall conform to the following factors related to environment:				
6.1	Maximum noise level shall be 85 dB at normal load condition, 1mtr. away from the Boiler with correction factor for back ground noise, if necessary. This will be measured as per International standards like DIN 45635-16. Supplier to demonstrate compliance to noise level, if so required.		VENDOR TO CONFIRM		
6.2	If any safety / environmental protection enclosure is required, it should be built in the plant by the VENDOR.		VENDOR TO CONFIRM		
7.0	ERECTION AND COMMISSIONING				
7.1	All the erection and commissioning will be carried out by vendor with his own labour in BHEL-Jhansi. Laying & termination of all power & control cables shall be in the scope of vendor.		VENDOR TO CONFIRM		
7.2	Tools & tackles, equipments and consumables like paint, welding electrodes, gas, hardwares etc required for work to be brought by supplier		VENDOR TO CONFIRM		
7.3	Supply, fabrication & erection of required structures, plat form and ladders to be done by vendor as per site requirement.		VENDOR TO CONFIRM		
7.4	Supply and application of various paints for lines and components as per the approved colour code and labeling (letter/number embossed metal plates) of the Plants to be done by vendor.		VENDOR TO CONFIRM		
7.6	E&C of the boiler shall be completed within 6 weeks from the date of intimation to the vendor by BHEL.		VENDOR TO CONFIRM		
7.7	Erection and commissioning schedule must be submitted before start the work for approval in line with time schedule indicated by BHEL (Complete activity Bar Chart with no. of days required to complete the desired work).		VENDOR TO CONFIRM		
8.0	GENERAL				
8.1	GA drawing, single line diagram, foot print of complete system showing all individual systems and BOM must be submitted with tech. offer for the evaluation.		VENDOR TO SUBMIT		
8.2	Any thing else which is required to prove the performance of boiler upto the satisfaction of BHEL as per specification will be in the scope of vendor without any extra cost.		VENDOR TO CONFIRM		
8.3	Any deviation to the scope and conditions to be mentioned pointwise.		VENDOR TO CONFIRM		
8.4	After placement of order by BHEL, the vendor to complete detailed designs and submit the drawings/data sheets with complete Bill of material along with rating, specification of all equipments/ components.		VENDOR TO CONFIRM		
8.5	Scope of work includes installation & commissioning of all supplied item/ items required and any additional work & material required to operate the plant in auto & manual mode will be in the scope of vendor with out any extra cost.		VENDOR TO CONFIRM		
8.6	All required instruments should be calibrated through OEM or NABL certified agencies.		VENDOR TO CONFIRM		
8.7	Supply should complete within 05 months from the date of drawing approval by BHEL.		VENDOR TO CONFIRM		
8.8	Predispach inspection will be carried out by representative of BHEL for all components, assemblies etc. at suppliers works.		VENDOR TO NOTE & CONFIRM		
8.9	Quality Assurance Plan to be submitted by vendor alongwith offer		VENDOR TO CONFIRM & SUBMIT		
8.10	List of mandatory spares (with unit price having validity of 3 years) to be submitted along with the offer.		VENDOR TO CONFIRM & SUBMIT		
9.0	DOCUMENTATIONS				

S.NO.	DESCRIPTION FOR BHEL REQUIREMENT	VALUE	ACTION BY VENDOR	OFFERED	DEVIATION/ REMARK
9.1	Complete P&I diagram (electrical, mechanical, hydraulic, pneumatic, water and steam circuit). General arrangement, terminal point/ hook up drawing, foundation drawing for all equipment, Boiler house drawing, electrical interfacing drawing (as commissioned) shall be provided in 03 nos. hard copies & 01 no's soft copy.		VENDOR TO CONFIRM		
9.2	Complete technical literature /brochure with specifications of all supplied bought-out items shall be provided in 03 nos. hard copies		VENDOR TO CONFIRM		
9.3	Operation, maintenance and Spare parts manual to be submitted alongwith supply in 03 nos. hard copies & 01 no's soft copy.		VENDOR TO CONFIRM		
9.4	Complete Electrical Schematic Drawings. PLC-Project backup file. HMI & SCADA project backup file in Soft copies with comments in English. PDF copy of PLC Ladder and screens of HMI/SCADA. all loaded in one USB 32GB Pen drive. Ghost image backup of SCADA PC for system restoration in case of PC's hard disk failure. A spare hard disk loaded with above Ghost image file is to be supplied. Note: *All the documentation/backup files etc shall be "As finally Commissioned" **PLC project backup should not be password Protected.		VENDOR TO CONFIRM		
9.5	A complete set of IBR drawings and documents certified by the Inspecting Authority of the State of its origin. Boiler IBR Folder at the time of dispatch (original)		VENDOR TO CONFIRM		
9.6	Test certificates - After placement of P.O. and at the time of commissioning conformance to be provided.		VENDOR TO CONFIRM		
10.0	GUARANTEE Material (against any manufacturing and design defect) and work carried out & performance shall be guaranteed for the period of 24 months from the date of commissioning.		VENDOR TO CONFIRM		
10.2	Performance guarantee runs shall be conducted as per BS 845 part1 -1987 indirect test method after one month of continuous trouble free operation/ trail operation.		VENDOR TO CONFIRM		
10.3	Any defect due to faulty material / bad workmanship shall be rectified free of cost to the entire satisfaction of BHEL.		VENDOR TO CONFIRM		
11.0	TRAINING Boiler operational training (auto and manual) shall be provided by vendor to BHEL operators at site.		VENDOR TO CONFIRM		
11.1	Maintenance training shall be provided (Mechanical, Electrical and Electronics) by vendor to concerned BHEL persons.		VENDOR TO CONFIRM		
11.2	PLC & SCADA Project backup/store/online diagnosis training shall be provided by vendor to Electronics maintenance.		VENDOR TO CONFIRM		
11.3	Minimum 5 Days Training on supplied PLC and SCADA system for 2 BHEL engineers at authorized training center of OEM of PLC /SCADA within India shall be provided. Training charges shall be borne by vendor. Travel, boarding & lodging shall be in BHEL scope.		VENDOR TO CONFIRM		
11.4	AMBIENT CONDITIONS & THERMAL STABILITY: Boiler and all supplied items should work trouble free and efficiently under following operating conditions and should give specified accuracies. POWER SUPPLY : Voltage : 415 V -10%, +10%. Frequency - 50 Hz +1.5Hz, -1.5Hz No. of phases - 3, no neutral Ambient Conditions - Temperature = 5 to 50 degree celsius, Relative Humidity: 95 % (Vendor to confirm that Boiler is suitable for above).		VENDOR TO CONFIRM		
12.0	AMBIENT CONDITIONS & THERMAL STABILITY: Boiler and all supplied items should work trouble free and efficiently under following operating conditions and should give specified accuracies. POWER SUPPLY : Voltage : 415 V -10%, +10%. Frequency - 50 Hz +1.5Hz, -1.5Hz No. of phases - 3, no neutral Ambient Conditions - Temperature = 5 to 50 degree celsius, Relative Humidity: 95 % (Vendor to confirm that Boiler is suitable for above).		VENDOR TO CONFIRM		
12.1	Weather conditions are tropical, Atmosphere may be dust laden during some part of the year. Boiler shall be kept in the Boiler house. Max. temperature variation is up to 25 deg Celsius in 24 hours. (VENDOR to confirm that Boiler is suitable for above).		VENDOR TO CONFIRM		
12.2	Weather conditions are tropical, Atmosphere may be dust laden during some part of the year. Boiler shall be kept in the Boiler house. Max. temperature variation is up to 25 deg Celsius in 24 hours. (VENDOR to confirm that Boiler is suitable for above).		VENDOR TO CONFIRM		
13.0	QUALIFYING CONDITION :				

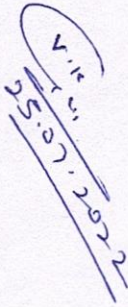
S.NO.	DESCRIPTION FOR BHEL REQUIREMENT	VALUE	ACTION BY VENDOR	OFFERED	DEVIATION/ REMARK
13.1	Only Original Equipment Manufacturers (OEMs) or their Authorized Dealers/Partners meeting the following conditions are eligible to participate in the tender: (a) The vendors, submitting the quotation, should have supplied and commissioned at least 1 nos. 10 MTPH or higher capacity Gas Fired Boiler in the past seven years from date of opening of this tender can participate. Or Indian Vendors who have a running Collaboration/ Joint Working arrangement with Foreign Manufacturer [meeting above specified qualifying conditions mentioned in 13.1 (a)] can also participate. Such Indian Vendors (OEMs) shall have to submit a back-to-back guarantee from their foreign partner for satisfactory performance of the offered plants and collaboration certificate/ joint venture documents to be submitted along with offer.		Vendor to confirm & furnish		
13.2	The following information is to be submitted by the VENDOR about the company where such plant has been supplied. This is required from all the VENDORS for qualification of their offer.		Vendor to Confirm		
13.2.1	Name of the customer / company where such Plant is installed (unpriced copy of purchase order to be furnished in line with point no. 13.1)		Vendor to furnish		
13.2.2	Name, designation, Complete postal address, Phone no. and E-mail address of the contact person of the customer.		Vendor to furnish		
13.2.3	Year of commissioning.		Vendor to furnish		
13.2.4	Application for which plant has been supplied.		Vendor to furnish		
13.2.5	Performance certificate from the customer of the Boiler supplied in line with point no. 13.1 regarding satisfactory performance of supplied Boiler for minimum two years after commissioning.		Vendor to furnish		
13.2.6	BHEL reserves the right to verify information or visit the place of installation of customer as indicated by VENDOR. In case the information is found to be false / incorrect, the offer shall be rejected.		Vendor to note & confirm		

SATISH SONI/ MANAGER



25/07/22

VIVEK KUMAR GUPTA/ MANAGER



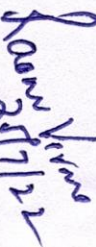
25/07/22

HIRENDRA RAUT/ SR. MANAGER



25/07/22

RAANU VERMA/ SR. MANAGER



25/07/22