



An ISO 9001
Company

Bharat Heavy Electricals Limited

(High Pressure Boiler Plant)

Tiruchirapalli – 620014, TAMIL NADU, INDIA

CAPITAL EQUIPMENT / MATERIALS MANAGEMENT

ENQUIRY

NOTICE INVITING TENDER

Phone: +91 431 257 7421/ 7297

Email : vkaruna@bhel.in

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Web : www.bhel.com

TWO PART BID

Tender to be submitted in two Parts

Enquiry
Number:

2742000002

Enquiry
Date:

13.01.2020

Due date for submission
of quotation:

07.02.2020

You are requested to quote the Enquiry number date and due date in all your correspondence. This is only a request for quotation and not an order.

Please note that under any circumstances both delayed offer and late offers will not be considered. Hence vendors are requested to ensure that the offer should reach physically on or before 14.00 Hrs(IST) on the Date of tender opening. Tenders received after 14.00Hrs (IST) will not be considered for evaluation.

Item	Description	Quantity	(Indigenous Vendors) Matl. Will be Delivered to
10	Online Stack Emission Monitoring System as per the technical specification & commercial conditions applicable (To be downloaded from web site www.bhel.com or https://eprocure.gov.in/epublish/app)	01 Set	FOR, BHEL, Stores, PPPU, Tirumayam

Important points to be taken care during submission of offer

- 1) Material shall be delivered to (By Indigenous vendors): As stated above.
- 2) Delivery required 3 months from the date of purchase order.
- 3) Erection & Commissioning period required 3 Months from the date of intimation by BHEL to vendor for deputation of their Engineers for E&C.
- 4) EMD for this Tender will be (INR): 40,000.00
- 5) Compliance Forms. TMM/IND/03 A to be filled and enclosed along with the offer failing which, the offer will not be considered for evaluation.
- 6) All updates, amendments, corrigenda, etc., (if any), for each tender will be posted only on the above websites from time to time, as and when required, until each tender is opened. There will be no publication of such updates, amendments, corrigenda, etc., through newspapers or any other media.

BHEL's General guidelines / instructions (refer MM / CE / GENL / GENL / 001 – EMD) including bank guarantee formats and list of consortium banks, commercial terms check-list can be downloaded from BHEL web site <http://www.bhel.com> or from <https://eprocure.gov.in/epublish/app> under Enquiry reference 2742000002 .

Tenders should be submitted before 14.00Hrs (IST) on the due date
Tenders will be opened online at 14:30 hours on the due date
Tenders would be opened in presence of the tenderers who have submitted their offers and who may like to be present.

Yours faithfully,
For BHARAT HEAVY ELECTRICALS LIMITED

DGM / Capital Equipment / MM

V. KARUNAKARAN
Dy. General Manager
Capital Equipment / MM
BHEL / Tiruchirappalli - 620 014

Part A:- Pre-Qualification Criteria for Supply, Installation and Commissioning of Online Stack Emission Monitoring System

SI No	BHEL's Requirement	Vendor's Response
1	Only those vendors , who have supplied and commissioned at least ONE SET of "Online Stack Emission Monitoring System" in the past SEVEN years (as on original date of opening of Tender) and is presently working satisfactorily for more than one year after commissioning (as on original date of opening of Tender) should quote. Vendor to attach the proof of Purchase order/Work order along with the offer.	
2	Vendor has to submit at least ONE PERFORMANCE CERTIFICATE for satisfactory performance of "Online Stack Emission Monitoring System" as referred under clause 1 above, for a minimum period of one year from the date of commissioning (as on the original date of tender opening) from their customers. At least one Performance certificate from customer(s) to be submitted along with the offer.	
3	The BIDDER / VENDOR to furnish Reference List of Customers, with complete address, details of contact person, where such systems have been supplied in the past.	
4	Bidder to provide continuous service support to BHEL in case of service requests for supplied system in future. Details on Service-After-Sales facilities in India to be furnished.	

Part B:- Technical Specification for Supply, Installation and Commissioning of Online Stack Emission Monitoring System for 40-MT LPG-fired furnace at BHEL, PPPU - Thirumayam		
SI No	BHEL's Desired Parameter/ Specification	Vendor's Comments
1.0	General Requirements	
1.1	<u>Existing system</u> An online real time stack monitoring system for monitoring the stack emission parameters of three stacks (2000 kVA DG set, 1000 kVA DG set and 70-MT LPG fired furnace). The monitored data is captured in a stack emission monitor which is further connected to a common PC through the existing network. The data is received and stored at the PC and is then uploaded on the internet as per the latest TNPCB guidelines for Online Continuous Monitoring System. At present, the data acquisition is done by software platform provided and maintained by Knowledge Lens Pvt. Ltd., Bangalore. <u>Present requirement</u> Supply and installation of a real time stack monitoring system for uploading of stack emission parameters of 40-MT LPG fired furnace. The monitored data has to be captured in the stack emission monitor which shall be connected to a common PC through the existing network. All necessary hardwares and softwares to capture the data, transmit it through the existing network, to receive and store the data at the PC and to upload it on the internet as per the latest TNPCB guidelines for Online Continuous Monitoring System as per the needs of TNPCB are in vendor's scope. <u>Note:</u> <i>This PC is already being used for collecting stack monitoring data for three existing stacks.</i>	
1.2	The entire work shall be carried out adhering to all relevant standards and regulations.	
2.0	Scope of Supply of Materials	
2.1	The vendor has to supply complete set of equipment as mentioned in the below list for the online monitoring system as required for normal functioning of the system.	

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2.2	Any item, hardware or software, additional to that specified below, required for obtaining satisfactory performance of the system is under vendor's scope. Any such item required for the system shall be clearly mentioned in the technical offer. Any item not mentioned in vendor's offer but found required during commissioning of the panel at BHEL, Thirumayam shall be supplied by the vendor without any extra cost.		
2.3	The system should consist of but not limited to the following items.		
A	Electrical Control Panel		
A.1	The gas analyzer and other accessories should be housed in a panel with following specifications: 1. Sheet metal thickness: minimum 2 mm 2. Panel dimension: Approx. 2000 mm (H) x 1200 mm (W) x 600 mm (D). 3. Toughened glass of suitable size should be provided at the front side for easy viewing. 4. Cooling fan of suitable rating should be provided in the panel. 5. Eye bolt should be provided in the panel for lifting. 6. Colour: RAL 7035 7. Protection: IP54		
B	Gas sampling probe - 1 Set		
B.1	Type	Hot extractive probe with flanged connection	
B.2	Ceramic filter	10 micron size	
B.3	Probe head	SS316	
B.4	Probe length	1000 mm +/-10%. Vendor to specify.	
B.5	Mounting	Flange mounting	
B.6	Flange connection	160 mm OD, 130 mm PCD (4 holes)	
B.7	Fluid	Gas	
B.8	Power supply	230 V AC, 50 Hz	
C	Ring Heater for Probe Head - 1 Set		
C.1	Power supply	230 V AC, 50 Hz	
D	Cylinder Interconnection Tube - 1 Set		

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SI No	BHEL's Desired Parameter/ Specification		Vendor's Comments
D.1	Size	OD: 6 mm; ID: 4 mm	
D.2	Material	PTFE	
E	Heated Sampling Line - 1 Set		
E.1	Process tube size:	3/8" OD, 0.04" thickness	
E.2	Process tube material	PTFE	
E.3	Power supply	230 V AC, 50 Hz	
E.4	Length	40 meter approx.	
F	SS Solenoid Valves - 1 Set		
F.1	Power supply	230 V AC, 50 Hz	
F.2	Type	2 way / 3 way	
F.3	Operation	Direct acting normally closed	
F.4	Mounting	Wall/ bracket mounting type	
F.5	Body	SS316	
F.6	Seat	NBR	
F.7	Enclosure of solenoid valve	Weatherproof, plug in type with IP67 protection	
F.8	Connection	1/4" NPT (F)	
F.9	Fluid	Gas	
F.10	Operating pressure	0-4 bar	
F.11	Fluid temperature	70 deg C	
G	Sample Gas Cooler - 1 Set		
G.1	Type	Refrigeration type gas cooler	
G.2	Temperature sensor element	RTD	
G.3	Power Supply	230 V AC, 50 Hz	
G.4	No. of sample coils	2 nos	
G.5	Sample coil material	SS316	
G.6	Sample inlet/ outlet	6 mm	
G.7	Condensate outlet size	10 mm	
G.8	Sample gas flow rate	10 LPM	
G.9	Sample outlet temperature	5-8 deg C	
G.10	Operating pressure	2.5 bar	

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SI No	BHEL's Desired Parameter/ Specification		Vendor's Comments
G.11	Refrigerant	R134a	
H	Membrane Pump - 1 Set		
H.1	Power supply	230 V AC, 50 Hz	
H.2	Wetted part	PTFE, PVDF	
H.3	Diaphragm	EPDM	
H.4	Inlet/ outlet	1/8" BSP (F)	
H.5	Fluid	Gas	
H.6	Discharge pressure	0.5 bar	
H.7	Suction pressure	100 mbar	
H.8	Max. free flow	9.5 lpm	
I	Peristaltic Pump - 1 Set		
I.1	Power supply	230 V AC, 50 Hz	
I.2	Flow rate	1-65 ml/min	
I.3	RPM	5 to 80	
J	Air Filter Regulator - 1 Set		
J.1	Mounting	Panel mounting type	
J.2	Function	Regulation and filtering	
J.3	Bowl material	Aluminium	
J.4	Filter element	Sintered Bronze	
J.5	Pore size	5 micron	
J.6	Inlet/ outlet connection	1/4" NPT (F)	
J.7	Fluid	Air	
J.8	Max flow	200 lpm	
K	Temperature Indicator cum Controller - 1 Set		
K.1	Power supply	100 to 240V AC, 50Hz	
K.2	Display	Alphanumeric LCD display.	
K.3	Front panel protection	IP 66	
K.4	Make	Fuji	
K.5	Model	PXE4TAY2-1Y000-E	
L	Condensate Monitor with Switching Unit - 1 Set		
L.1	Mounting	After sample pump	

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SI No	BHEL's Desired Parameter/ Specification		Vendor's Comments
L.2	Function	Check for any moisture carry over to the analyzer	
L.3	Filter	Paper filter	
L.4	Fitting	SS316	
L.5	Size	1/4" NPT (F)	
M	Flow Monitor - 1 Set		
M.1	Range	7-70 LPH	
M.2	To be supplied along with needle valve		
N	NO₂/ NO converter - 1 Set		
N.1	Mounting type	Indoor surface mounting	
N.2	Temperature controller	Built-in type	
N.3	Conversion efficiency	90% or higher	
N.4	Gas flow rate	0.5 lpm max.	
N.5	Ambient temperatue	Up to 45 deg C	
N.6	Power supply	230 V AC, 50 Hz	
N.7	Gas conditioning	Gas with dust and drain removed at temperature of 150 deg C or lower	
N.8	Make and model	Fuji Electric; Model: ZDL04	
O	PLC		
O.1	Make	Siemens	
O.2	Model	Logo 230 RC	
O.3	Part No	6ED1 052-1FB00-0BA6	
O.4	Power supply	230 V AC, 50 Hz	
P	Ethernet Converter - 1 Set		
P.1	Make	ICP DAS, Taiwan	
P.2	Model	tGW series	
P.3	Input type	RS485	
P.4	Output type	Ethernet	
P.5	Power supply	12-48 V DC	
Q	Un-interrupted Power Supply - 1 Set		
Q.1	UPS of minimum 1 kVA rating along with batteries should be supplied by the vendor for the entire panel.		

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SI No	BHEL's Desired Parameter/ Specification		Vendor's Comments
R	Zero Gas Cylinder with Regulator		
R.1	Item	Gas cylinder for zero calibration of Nox, Sox and CO	
R.2	Gas	Nitrogen	
R.3	Capacity of cylinder	10 litre	
R.4	Nitrogen purity	99.999%	
R.5	Argon	<5 ppm	
R.6	Oxygen	<2 ppm	
R.7	Moisture	<2 ppm	
R.8	CO + CO2	<0.5 ppm	
S	Span Gas Cylinder with Regulator		
S.1	Item	Gas cylinder for span calibration of Nox and Sox	
S.2	Cylinder material	Aluminium	
S.3	Cylinder capacity	10 litre	
S.4	Cylinder valve	IS: 3224 LH (Female)	
S.5	Sulphur Dioxide	1200 - 1350 ppm	
S.6	Nitric Oxide	1200 - 1350 ppm	
S.7	Nitrogen	Balance	
T	Span Gas Cylinder with Regulator		
T.1	Item	Gas cylinder for span calibration of CO	
T.2	Cylinder material	Carbon steel	
T.3	Cylinder capacity	10 litre	
T.4	Cylinder valve	IS: 3224 LH (Female)	
T.5	Carbon Monoxide	800-900 ppm	
T.6	Nitrogen	Balance	
3	Scope of Work		
3.1	The vendor shall make ports in the chimney for installing probe for gas analyser and transmitters and receivers of dust monitor. A few additional ports shall also be provided for regular inspection in future.		
3.2	The vendor shall install gas analyser probe and transmitter and receiver of dust monitor at the specified ports in the chimney.		

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3.3	The vendor shall properly lay heated tracing line and associated cables from the chimney to control room for SOx, NOx analyzer and dust monitor control panel.	
3.4	The vendor shall supply and fix platform at designated height of the chimney to enable easy access of the probes for future maintenance. Supply of MS material with rail and scaffolding material (if required) to carry out erection activity at chimney is under the scope of the vendor.	
3.5	All works related to inserting the probes in to the chimney will be in vendor's scope. Vendor should bring all tools and consumable items required for mounting the probes and routing of various cables and tubes. Only welding machine, gas cutting machine and welding electrodes will be issued by BHEL at free of cost, if required. Three phase/ single phase power points will also be provided by BHEL at the respective control room of the furnace.	
3.6	Complete set of equipment for the online monitoring system such as stack emission monitors, data acquisition hardware, HMI/ operator interfaces and online data uploading system, signal/protocol converters, power supply units, wires, switchgears, controlgears, cables, connectors and other accessories as required for normal functioning of the system are in vendor's scope.	
3.7	All required softwares for the system such as data acquisition, HMI, data logger, data concentrator, web uploading, web application etc. are in vendor's scope. The scope shall include provisions for continuous data collection from the field instruments, interfacing with the data acquisition system already available at BHEL and hosting the same to the TNPCB server. The dedicated broadband connection will be provided by BHEL. <i>Note: The existing software is provided and maintained by M/s Knowledge Lens Pvt Ltd, Bangalore. Any assistance, if required, for interfacing of furnace parameters to their software and uploading the same to TNPCB server may be obtained by the bidder from the said software vendor.</i>	
4	BHEL's Scope	
4.1	BHEL will provide desktop PC (along with UPS) and broadband connection with following specifications	

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SI No	BHEL's Desired Parameter/ Specification		Vendor's Comments
4.1.1	Operating system	Windows 7 professional version.	
4.1.2	System type	64 bit operating system.	
4.1.3	Processor	Intel i5-2400 CPU @ 3.10 GHz.	
4.1.4	RAM	4 GB	
4.1.5	Monitor	17" LCD monitor.	
4.1.6	Accessories	Keyboard, mouse.	
4.1.7	Broadband connection	Uplink speed: 1 Mbps	
4.2	BHEL shall provide gas analyzer and dust monitor for suspended particulate matter (1 no each) conforming to the following specifications:		
4.2.1	Gas analyzer	Make and model: FUJI, ZRE	
4.2.2	Dust Monitor for Suspended Particulate Matter	<u>Make and model:</u> Dust and opacity meter: TGI-DA100 Controller unit: TGI-DA101 Sender: TGI-DA102 Receiver: TGI-DA103 Auto cleaner: TGI-DA104	
5	Documentation		
5.1	Documents to be sent along with the offer		
5.1.1	Technical datasheets of all the hardwares.		
5.1.2	Circuit diagram/ block diagram and P&I diagrams.		
5.2	Documents to be supplied with materials		
5.2.1	Three sets of following documents (hard copies) in English should be supplied. One copy in		
5.2.2	O&M manuals of all Bought out items like signal converter, probe, sample gas coolers, pumps, PLC, NO2/NO converter etc.		
5.2.3	Detailed drawings of the system.		
5.2.4	Complete master list of parts (BoM) used in the system.		
5.2.5	Drawings showing all interconnections in block level and circuit level.		
5.2.6	The supplier should produce valid calibration and test certificates for all the instruments and the supplier should provide details of the sources from where we can get the certificates in future.		

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SI No	BHEL's Desired Parameter/ Specification	Vendor's Comments
6.0	The bidders are suggested to make a site visit to BHEL, Thirumayam before quoting, to assess the existing stack monitoring system and to study how the panels are interfaced with the stack monitoring PC.	
	Before going for manufacture, the supplier has to get drawing approval from BHEL.	
7.0	Pre-Dispatch Inspection	
7.1	Pre-dispatch inspection shall be carried out at supplier's works. The supplier should produce the wiring diagrams and all the test reports of the components used in the panel during the pre-dispatch inspection. During the pre-dispatch inspection, the supplier has to energize the panel and demonstrate the functioning of the internal components available in the panel.	
8	Erection & Commissioning of the Online Stack Monitoring System	
8.1	The supplier has to take full responsibility for carrying out the erection, start up, testing of stack emission monitoring system and all other supporting equipment.	
8.2	All required tools, equipment and instruments for erection and commissioning should be brought by the supplier.	
8.3	Commissioning spares required for commissioning of the stack monitoring system shall be brought by the supplier on returnable basis.	
8.4	The supplier has to accommodate the gas analyzer and the dust monitor (which will be given by BHEL as per 4.2 above) in their panel and do the necessary connections to integrate with the panel.	
9	Acceptance (tests/ activities to be performed by vendor after commissioning)	
9.1	Vendor should demonstrate all features of the complete system to BHEL personnel.	
9.2	Supplier's representatives should impart training for BHEL personnel regarding operation and maintenance of the online stack monitoring system.	
9.3	The supplier has to co-ordinate with TNPCB officials /software vendor and should demonstrate the functioning (performance prove out) of the system as per their requirement.	

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SI No	BHEL's Desired Parameter/ Specification	Vendor's Comments
10.0	Guarantee: The vendor should offer guarantee for all the hardware and software components for minimum 12 months from the date of acceptance by BHEL.	