



An ISO 9001
Company

Bharat Heavy Electricals Limited

(High Pressure Boiler Plant)

Tiruchirappalli – 620014, TAMIL NADU, INDIA

CAPITAL EQUIPMENT / MATERIALS MANAGEMENT

ENQUIRY

NOTICE INVITING TENDER

Phone: +91 431 257 7653

Fax :

Email : skaruna@bheltry.co.in

spsy@bheltry.co.in

kmk@bheltry.co.in

Web : www.bhel.com

TWO PART BID	Enquiry Number:	Enquiry Date:	Due date for submission of quotation:
Tender to be submitted in two Parts	2601700002	12.05.2017	14.06.2017

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 is reaching physically our office before 14.00 hrs on the Date of tender opening.

Item	Description	Quantity	(Indigenous Vendors) Matl. will be Delivered to
10	X R D Stress Analyser as per the technical specification & commercial conditions applicable (to be downloaded from web site www.bhel.com or http://tenders.gov.in)	1.00 No.	FOR, BHEL Stores, High Pressure Boiler Plant, Tiruchirappalli - 620014

Important points to be taken care during submission of offer

1. Material shall be delivered to: Indigenous Vendors: As stated above.
Foreign Vendors: CFR Chennai Seaport / Airport
2. Delivery required 7 Months including PDI from the date of purchase order.
3. Erection & Commissioning period required 2 Weeks 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) : 2,00,000.00
5. Compliance Form Nos.: TRY/IMP/01 & TRY/IND/01A 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 / 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 the Government tender website <http://tenders.gov.in> (public sector units > Bharat Heavy Electricals Limited page) under above Enquiry reference.

Tenders should reach us before 14:00 hours on the due date
Tenders will be opened 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

S.PARTHASARATHY
MANAGER
CAPITAL EQUIPMENT / MM
BHEL, TRICHY-620014.

PART - A**TENDER REQUIREMENTS FOR THE SUPPLY OF
'X R D STRESS ANALYSER'****SECTION – I: Qualifying Criteria**

The BIDDER has to compulsorily meet the Qualification Criteria indicated in Section 1 to get qualified. Otherwise the technical offer will not be considered.

S.No.	TENDER PARTICULARS	VENDOR's RESPONSE
1.1	VENDOR / Original Equipment Manufacturer (OEM) might have supplied & commissioned at least TWO number of complete "X R D Stress Analyzer System" of the offered model in the past TEN years (as on the date of opening of this Tender).	
1.2	VENDOR / OEM should quote, who have supplied and commissioned in the last TEN years (as on the date of this tender opening) at least ONE "X R D Stress Analyzer System" of the offered model : (i) in at least one country other than the country of origin to establish Vendor's global business activity. and (ii) atleast one number in India. The referred equipment / systems shall be presently working satisfactorily for more than one year from the date of commissioning (as on the original date of this tender opening). The name and contact addresses of the customers to whom the above said machine were supplied to be furnished with details.	
1.3	Vendor has to submit at least ONE PERFORMANCE CERTIFICATE for satisfactory performance of "X R D Stress Analyzer System" as referred under clause 1.2 above, for a minimum period of one year from the Date of Commissioning (as on the original date of this tender opening) from their customers in India or in any other country outside the country of origin, supplied and commissioned in the last TEN years.	

S.No.	TENDER PARTICULARS	VENDOR's RESPONSE
1.4	Performance Certificate in Original Form maybe sent directly to BHEL/Purchase through E-mail / TELEFAX directly by the Customer of the Vendor. The original certificate may be returned after verification by BHEL, if required. For obtaining the Performance Certificate, a suggestive format is provided in the enclosure ANNEXURE - A .	
1.5	BHEL reserves the right to verify the information provided by the Vendor for the referred machine at their referred customer's works. It shall be the responsibility of the vendor to facilitate the visit of BHEL's team at their referred customer works. The Travel, Board, and Lodging expenses for BHEL Personnel shall be borne by BHEL. In case the information provided by vendor is found to be false / incorrect, the offer shall be rejected. BHEL reserves the right to accept or reject the OEM'S based on the assessment of their technical and financial capability.	

SECTION – II

The BIDDER/VENDOR are requested to provide the following information:-

S.No.	TENDER PARTICULARS	VENDOR's RESPONSE
2.1	The VENDOR has to furnish Reference List of Customers, with complete address, details of contact person, where "X R D Stress Analyzer System" have been supplied in the past	
2.2	Specify details of the "X R D Stress Analyzer System" supplied to any other unit of BHEL, if any and to provide details on model and year of commissioning	
2.3	Details on SERVICE-AFTER-SALES Set-up in India including the Address of Agent / Service Centers In India.	
2.4	Any Additional data to supplement the manufacturing capability of the OEM for the subject equipment.	

SECTION – III

The BIDDER to note the following and comply with while submitting the OFFER :

S.No.	TENDER PARTICULARS	VENDOR's COMPLIANCE
3.1	The BIDDER shall submit the offer in TWO PARTS-Technical [with PART A & PART B] & Commercial and Price Bid.	
3.2	The Offer shall contain a comparative statement of Technical Specifications given by BHEL and the Offer Details submitted by the Bidder, against each clause. A just 'CONFIRMED' or 'COMPLIES' or 'YES' or 'NO-DEVIATION' or similar words in the technical comparative statement may lead to disqualification of the Technical Offer. In case of any deviations in any of the technical specifications, such deviations should be clearly specified in the comparative statement. All systems and sub systems proposed in the solution should be detailed in description with illustrations/photographs, if required	
3.3	The BIDDER shall assure a continuous support for SPARES and SERVICE for five years, from the date of commissioning of the equipment at BHEL Works.	
3.4	The Technical Offer shall be supported by Product Catalogue and Data Sheets in ORIGINAL and complete technical details / literature on the QUOTED MODELS of ' X R D Stress Analyzer System (s) '.	
3.5	The Commercial Offer (given with the Technical Offer) shall contain the Scope of Supply and the Un-Priced Part of the Price-Bid, for confirmation for the scope of supply.	
3.6	Earlier performance & field experience (service support) with BHEL (if any) will be a reckoning factor for the technical qualification of the OFFER. Vendor can quote of supply to BHEL units of systems of similar capability.	

ANNEXURE - A

Suggestive Format of Performance Certificate

The Performance should be certified by the customer on Customer's Letter Head and submitted along with the OFFER or sent directly to BHEL with the Tender Enquiry Number as the reference.

PERFORMANCE CERTIFICATE

1.0	Name / Type of the Equipment :	
2.0	Supplier's Name & Address	
3.0	Make & Model number of the XRD Stress Analyzer and other Major Accessories forming part of the main equipment	
4.0	Month & Year of Commissioning	
5.0	Application for which the Equipment is generally used	
6.0	MACHINE DETAILS :	
6.1	Size of the jobs performed in the machine	
	a) Component Thickness (minimum & maximum) in mm b) Component Diameter (minimum & maximum) in mm c) Component Materials	
7.0	Performance of the Machine (Please tick the appropriate option)	Satisfactory Non Satisfactory
8.0	Service after Sales Support given by the Vendor / OEM (Please tick the appropriate option)	Satisfactory Non Satisfactory
9.0	Other Remarks (if any)	
Date :		Signature & Seal of the Authority Issuing the Performance Certificate

PART B**TECHNICAL SPECIFICATIONS FOR 'X R D STRESS ANALYSER'**

S. No.	PARTICULARS AND BHEL SPECIFICATION		VENDOR's OFFER
1.0	PURPOSE & APPLICATION		
	a) The system is suitable for carrying out residual stress measurement and retained austenite using X ray diffraction technique. b) The equipment is intended to measure residual stresses and retained austenite on a welded plates and pipes with similar & dissimilar material combination. c) The equipment is intended to measure residual stresses and retained austenite in both lab and shop floor condition and should be portable. d) The equipment shall comply with following standards, SAE J784a – RS measurement ASTM E915 – RS measurement ASTM E2860-12 – RS measurement EN15305 – European RS measurement ASM Handbook Vol.11 – General guidelines SAE SP-453 – Retained Austenite Measurement ANSI N43.2 – Radiation Safety for X-ray Diffraction and Fluorescence Analysis Equipment.		
2.0	WORK PIECE / JOB DETAILS		
2.1	PIPE DIMENSIONS (GENERAL)		
	a) Range of Diameter (O.D)	50 mm to 1200 mm	
	b) Size of the pipe can be welded	600 mm to 6000 mm	
	c) Plate to plate	From 2 mm onwards	

S. No.	PARTICULARS AND BHEL SPECIFICATION		VENDOR's OFFER
2.0	WORK PIECE / JOB DETAILS		
2.2	MATERIAL SPECIFICATION		
	a) Inconel b) Grade P-91 Steel c) Aluminum d) Titanium e) Stainless Steel		
3.0	X R D STRESS ANALYZER		
3.1	Goniometer		
3.2	The goniometer shall be suitable for automated measurement in lab as well as for field measurements.		
3.3	The goniometer shall be mounted on a magnetic or suitable anchoring system with arrangements to ensure the parallelism.		
3.4	The goniometer shall have suitable devices for mounting of X-ray tube and detectors and shall be calibrated as per ASTM standards.		
3.5	The goniometer shall have programmable provision for selection of ψ angles over a range of -60° to $+60^\circ$ minimum for measurement in multi exposure $\sin^2(\psi)$ and omega methods.		
3.6	The goniometer shall have an integrated and in-built ϕ rotation axis over a range of -180 to $+180^\circ$ for tri axial stress measurement.		
3.7	The goniometer shall have programmable provision to set and operate the system with oscillation angles over a minimum range of 0 to 6° .		
3.8	The goniometer shall have suitable provision for fixing the distance between the x-ray source and sample surface and to align and set the sample normal to the source.		
3.9	The goniometer shall have indication for "X-ray on" and "Back ground subtraction" shall be provided with suitable screens for safety.		
3.10	X-ray beam spot indication through the collimator		

S. No.	PARTICULARS AND BHEL SPECIFICATION	VENDOR's OFFER
4.0	X-RAY TUBES	
4.1	X-ray tubes with Chromium, Manganese, copper, cobalt and Titanium shall be provided for measurements in different materials enlisted.	
4.2	The X-ray tubes shall have a minimum capacity of 200w to provide 30KV and 6.7mA current during measurement.	
4.3	The tubes shall be of water cooled type with appropriate circulating type cooling system such that it can be operated in tropical environments on a continuous basis.	
4.3	The tubes shall be suitable for measurement on the inner diameter side of the small diameter pipes	
4.4	The tubes shall be provided with a minimum cable length of 5 meters.	
5.0	DETECTORS	
5.1	Two position sensitive detectors with fast and accurate measurement of 2θ over a suitable range.	
5.2	The detectors shall be mounted on suitable arc shaped guides for easy positioning.	
5.3	Detector housing shall have provision for fixing the appropriate filters.	
6.0	X-RAY GENERATOR WITH CIRCULATION TYPE COOLING SYSTEM	
6.1	The X-ray generator shall be designed to be operated under tropical climate and ambient temperatures of the order of 45°C.	
6.2	The generator shall be provided with suitable circulating type cooling system	
7.0	COMPUTER BASED CONTROLLER & SOFTWARE	
7.1	The system should be fully computer controlled by Windows based Lap top computer. Laptop computer is part of the system and the laptop shall be supplied with pre-installed relevant software.	
7.2	The control shall include calibration, setting of X-ray Tube currents, start up and shut down, mode selection, selection of psi (ψ) and (ϕ) phi angles, oscillation magnitude, exposure times, setting of measurement parameters, automatic measurement and post processing.	
7.3	The system shall be provided with suitable software for data acquisition and data processing with all standard peak shift calculation methods as per latest standards. The data shall be displayed on-line graphically during measurement for both the detectors.	

S. No.	PARTICULARS AND BHEL SPECIFICATION	VENDOR's OFFER
7.0	COMPUTER BASED CONTROLLER & SOFTWARE	
7.4	The software shall have capability for post processing on off-line mode for different modes of calculation of peak shift methods.	
7.5	The software shall have provision to compute tri-axial stress and retained austenite from the measured data.	
7.6	The software shall have provision for data storage and retrieval in all standard formats including EXCEL format.	
7.7	The software shall have suitable library data on selection of suitable tubes and 2 θ positions for various materials to be analyzed.	
7.8	The software shall have the provision for taking hardcopy of the test results.	
7.9	A laser printer shall be supplied along with the system to have hard copy of the results.	
8.0	REFERENCE AND CALIBRATION MATERIALS	
8.1	Suitable stress free powder material sample shall be provided for calibration.	
8.2	Similarly Suitable reference samples with known stress values shall be provided along with the system for calibration.	
9.0	COLLIMATORS AND FILTERS	
9.1	The system shall be supplied with replaceable type collimators of sizes 1, 2, 3, 4 mm.	
9.2	Suitable k (alpha) filters shall be provided with the appropriate Target tubes (Filters for Chromium, Manganese, copper, cobalt and Titanium).	
10.0	FIELD MEASUREMENT	
10.1	Field measurement stand to enable x,y,z movements including tripod with arm arrangements	
11.0	ELECTRO POLISHING KIT	
11.1	A portable electro polishing kit shall be supplied along with the Stress analyzer for surface preparation of the sample prior to measurement.	
11.2	Adequate quantum of polishing materials and chemicals shall be supplied along with the system	

S. No.	PARTICULARS AND BHEL SPECIFICATION	VENDOR's OFFER
12.0	SPARES, CONSUMABLES AND ACCESSORIES	
12.1	Radiation meter, enclosures for the system, one additional X-ray tube with Cr target (for steel and Al) and Mn target, Radiation barriers, different fuses required each in twenty numbers, one spare remote emergency stop button arrangements, 10 spare bulbs for warning light	
12.2	Spares for two years trouble free operation of the total system. Unit wise cost of all the items must be provided with offer.	
12.3	One additional portable electro polishing kit shall be supplied as spare.	
12.4	Input Power supply- 230V AC, 50 Hz.	
13.0	SAFETY FEATURES	
	The equipment shall meet the requirements of relevant ANSI standards and should include the following: a) Fail safe "X-ray on" and "Shutter open" lights b) Automatic shut down if shutter stuck, opened or removed, tube shielding is loose or removed, cooling water temperature too high or its flow is disturbed. c) The goniometer shall have indication for "X-ray on" and shall be provided with suitable screens for safety. d) The goniometer shall be provided with suitable screens to protect the personnel in associated with the measurement. e) Travel cases/protective cases to be supplied for the transportation to field measurements	
14.0	EQUIPMENT INSPECTION & ACCEPTANCE "AT VENDORS WORKS"	
14.1	The equipment and Accessories, before dispatch the system, the complete pre-dispatch inspection will be carried out by the BHEL executive at the manufacturer's site which included carrying out all the functional test, testing on samples & acceptance criteria The testing trials shall be carried out on materials as recommended by BHEL using all the goniometers proposed to be supplied. All the materials and consumable needed for the trials shall be arranged by the vendors only	Vendor to offer

S. No.	PARTICULARS AND BHEL SPECIFICATION	VENDOR's OFFER
15.0	DOCUMENTATION	
14.1	The following documents in English language should be supplied along with the machine :- Hard Copies : 3 sets :- In CD form : 1 Set 1. Operating manuals of complete system. 2. Operation and Maintenance manual of all accessories 3. Programming manual of the machine 4. Maintenance manuals with all assembly drawing of machine assemblies. sub-assemblies with parts list 5. Electrical wiring Drawing – power & control circuits. 6. Maintenance & Interface manuals for machine control system 7. Microprocessor / complete printed circuit board schematic indication check points for electronic controls. 8. Complete list of alarm log, error code, error messages and remedies and on line fault diagnostic to be provided by the vendors, 9. Trouble shooting chart for main and all sub-system 10. Parameter selection software, file handling and display recording. Serial and USB ports to be ensured. 11. Preventive maintenance check list for Electrical and mechanical system. 12. Complete list of spares for machine, along with item part no/ specification/type /model and make and adders of the sub-vendor.	Vendor to offer
16.0	MACHINE ERACTION AND COMMISSIONING	
16.1	The manufacturer shall be responsible for the installation of the machine at BHEL/Trichy.	
16.2	All handling tools and mechanical / electrical help required for the installation and commissioning shall be provided by the BHEL.	
16.3	The required material and consumable for carry out prove out trials at BHEL/Trichy will be provided by the BHEL	
16.4	After successfully commissioning of the system prove out trials to be carried out considering actual application (specially material, diameter & thickness)	

S. No.	PARTICULARS AND BHEL SPECIFICATION		VENDOR's OFFER
16.0	MACHINE ERACTION AND COMMISSIONING		
16.4	After successfully commissioning of the system prove out trials to be carried out considering actual application (specially material, diameter & thickness)		
16.5	The supplier shall impart training to BHEL's machine operator and maintenance crew in operation and maintenance during commissioning of the machine at BHEL works, for 5 working days. It includes Safety, Operational of the machine PC based System & Operation, Trouble – Shooting, software application, all special features of the machine, electrical/mechanical/ electronics system etc.		
16.6	The manufacturer shall be responsible for providing the technical assistance for the machine during commissioning & training through its expert only		
17	GAURANTEE:		
17.1	Performance Guarantee to be given for 12 months from the date of commissioning or 18 months from the date of dispatch whichever is earlier (for any failure of any parts, sub-systems, components or equipment as a whole)		
18.0	GENERAL POINTS		
18.1	Machine Model Number and other related details	Vendor to provide	
18.2	Total connected Load (in kVA)	Vendor to specify	
18.3	Total weight of the machine & Accessories	Vendor to specify	
18.4	General Arrangement drawings	Vendors to provide	
18.5	Calibration certificates for all machines, meters and equipment to be provided by the vendor	Vendor to provide	
18.6	All electronic controls for integrated controller / drives that need stabilized supply shall be provided with suitable voltage stabilizer	Vendor to specify	
18.7	Sea worthy & rigid packing for all items of complete machine, control system, all accessories and other supplied items to avoid any damage / loss in transit. When machined is dispatch in container, all small loose items shall be suitably packed in boxes	Vendor to confirm	