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 76 53 Fax : +91 431 252 00 31 Email : skaruna@bheltry.co.in Web : www.bhel.com

TWO PART BID Tender to be submitted in two Parts	**Enquiry Number:** **2631500007**	**Enquiry Date:** **09.09.2015**	**Due date for submission of quotation:** **30.09.2015**

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
10	**Digital Ultrasonic Flaw Detector** Sets as per the technical specification & commercial conditions applicable (to be downloaded from web site www.bhel.com or http://tenders.gov.in or https://bheleps.buyjunction.in)	**2 Nos.**

Important points to be taken care during submission of offer

1. This is an E-Tender issued online through our e-procurement site https://bheleps.buyjunction.in. The bidder should respond by submitting their offer online in our E-procurement platform.
2. The Vendor shall offer against the following requirement of BHEL :-

Delivery Period for Supply Portion	**03 months**
Duration for Completion of Erection & Commissioning (i.e. Delivery for Service Portion)	**10 days**

3. The Compliance form for Commercial Terms & Conditions to be filled and enclosed along with the offer failing which, the offer will not be considered for evaluation.

4. 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/EPROC/GENL/001-EMD, IND/02A, IMP/02) 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** Sr. Engineer / Capital Equipment / MM

C. SARANYA
Senior Engineer
MM / Capital Equipment
BHEL / Tiruchirappalli - 620 014.

PART A

QUALIFYING CRITERIA FOR THE SUPPLY OF DIGITAL ULTRASONIC FLAW DETECTOR

SECTION – I

The BIDDER / VENDOR has to compulsorily meet the following requirements to get qualified for submitting an offer for the Digital Ultrasonic Flaw Detector.

S. No.	REQUIREMENTS	VENDOR's COMMENTS
1.0	The BIDDER / VENDOR shall have a minimum of last **FIVE** Years of Continuous. Experience in the Design, Manufacture and supply of Digital Ultrasonic Flaw Detector. Vendor to indicate the actual no. of years of experience in this field.	
2.0	Only those vendors (OEMs), who have manufactured and commissioned at least **Two** Nos. of Digital Ultrasonic Flaw Detectors in the last five years (as on original date of opening of Tender) and such equipment is presently working satisfactorily shall quote.	
3.0	Vendor has to submit at least one Performance Certificate from any of their customers, for satisfactory performance of the quoted model of Digital ultrasonic Flaw Detector supplied to them with in the last five years and is working satisfactory for a minimum period of **one year** from the date of commissioning (as on original date of opening of tender). For obtaining the Performance certificate, a suggestive format is provided as Annexure I.	
4.0	BHEL reserves the right to verify the information provided by vendor. In case the information provided by vendor is found to be false/ incorrect, the offer shall be rejected.	

SECTION – II

Bidder to provide the following details:

S. No.	PARTICULARS	VENDOR's RESPONSE
5.0	Year of launch of the model quoted against this enquiry	
6.0	Number of "Digital Ultrasonic flaw detectors" supplied and commissioned till date in the quoted model	
7.0	The Bidder/vendor to furnish reference list of customers	
8.0	Details on SERVICE-after-SALES Set-Up in India including the addresses of Agents/Service Centers in India and Asia	

ANNEXURE I
PERFORMANCE CERTIFICATE FORMAT
(On Customer's Letter Head)

1. Supplier of the Equipment :
2. Make & Model of the Equipment :
3. SI No. of the equipment :
4. Month & Year of Commissioning :
5. Application for which Equipment is used :
6. Jobs Performed by the Equipment
    a. a. Job material :
    b. b. Job thickness :
7. Performance of the Equipment : Satisfactory/Not Satisfactory
   (Strike off whichever is not applicable)
8. After Sales Service : Satisfactory/Not Satisfactory
9. Any other remarks :

Contact details of issuing authority
Name & Designation:
Office No/Mobile no:
Email Id:

Signature and seal of authority
Issuing the performance certificate

PART B

TECHNICAL SPECIFICATION OF DIGITAL ULTRASONIC FLAW DETECTOR

Cl. No.	Particulars	BHEL SPECIFICATIONS	Bidder's OFFER [With Complete Technical Details]
1.0	**Area of Application**	Digital Ultrasonic Flaw detector is used for Testing of materials and welded structures made of Steel.	
2.0	**Principle of operation**	The Ultrasonic Flaw Detector works on the principle of Reflection of Ultrasounds at Interfaces of varying acoustic impedance. By using Piezoelectric Transducers, which can convert electric signals to ultrasonic vibrations, Ultrasound is sent to the test objects and the reflected Ultrasonic energy from the defects is converted back to electric signals, which in turn are displayed on the LCD screen.	
3.0	**Design base**	Compliant to EN 12668-1, IEC 60068-2-27, IEC-60068-2-6.	
4.0	**Pulse**	Spike or Tunable Square wave pulse. The pulse is to be electronically controlled on both rising and falling edges to maximize probe performance and increasing near surface resolution.	
4.1.	Pulse repetition frequency Transmitter –pulse rise time	15 Hz to 2000 Hz. <10ns with selectable high or low	
4.2.	Energy Settings	Supplier to specify	
4.3.	Pulse width	Adjustable from 30 to 500ns (0.1MHz)	
4.4.	Damping	50 to 400 Ω	
5.0	**Receiver**		
5.1.	Gain	0 to 100 dB with 0.5,1,2,6,12,20dB steps & user defined gain step adjustments	
5.2.	Total instrument Bandwidth	0.5 to 18 MHz	
5.3.	Digital Filter settings	User selectable narrow band and broad band filter options to be provided to optimize receiver performance	
5.4.	Rectification	Full wave, Positive half wave, Negative Half wave, RF	

Cl. No.	Particulars	BHEL SPECIFICATIONS	Bidder's OFFER [With Complete Technical Details]
5.5.	System linearity	Horizontal, Vertical and amplifier shall meet the requirements of ASME section V	
5.6.	Reject	0 to 80 % full screen height (supplier to specify)	
6.0	**Measurement**		
6.1.	Types	Thickness, Sound path, Projection, Depth, Amplitude, Time of flight for both Gates.	
6.2.	Echo to Echo	Standard	
6.3.	DAC / TVG Standard	Up to 15 points to be captured, ASME Section I, Section III, 100 dB dynamic Range, full gain, range and delay adjustments during set up, view switchable between DAC / TVG	
6.4.	CUSTOM DAC	With multiple DAC curves	
6.5.	DGS probe data	For time varied gain applications. DGS set ups to be built from DGS/ AVG diagram with standard probe data and user defined probe data. Defect size evaluation to be performed with predefined probe settings. Defect size to be directly displayed. Data sheet for each probe giving all technical details shall be furnished.	
6.6.	Amplitude measurement	0 to 100% full screen height with 0.25% resolution	
6.7.	Curved Surface correction	For Angle measurements.	
6.8.	X-Value correction	Beam index point to front of transducer	
7.0	**Gates**	Two fully independent Gates for Echo Height and Time of flight.	
7.1.	Gate start	Variable over entire display range	
7.2.	Gate width	Variable from Gate start to end of displayed range	
7.3.	Gate height	Variable from 2 to 95% full screen height	
7.4.	Alarms	Positive and Negative thresholds: Minimum Depth on Gate1 and Gate 2	

Cl. No.	Particulars	BHEL SPECIFICATIONS	Bidder's OFFER [With Complete Technical Details]
8.0	**Display**	"A" scan display (Rectified as well as RF mode) and Color Liquid Crystal Display with user defined, user selectable color schemes and brightness having split screen, full screen modes and Auto freeze facility. Supplier shall specify available display modes.	
8.1.	Base line break mode	All zero cross points on the RF wave form shall be shown as zero points in full wave mode.	
8.2.	Amplitude Grid mode	100% Amplitude display	
8.3.	Time base grid modes	Standard 0 to 10 major divisions, each having five equal minor divisions.	
9.0	**Instrument Input / Output**		
9.1.	USB port	For communication with PC/ Data cables /Flash drive/mouse etc.	
9.2.	SD card slot (optional)	SD card connector for easy data archival	
9.3.	LEMO Hardware I / O	Alarm outputs, Trigger In / Out	
9.4.	Data Storage	At least 1000 "A scan" data files storage capacity should be available. Supplier to specify the average size of a data file and also number of data files that can be stored.	
10.0	**Calibration**	Supplier to specify the calibration set up memory. At least 50 different calibration setups should be stored and recalled.	
10.1.	Automated distance Calibration	For velocity and zero offset	
10.2.	Test modes	Pulse echo, Dual or through transmission	
10.3.	Units	Millimeters, Inches	
10.4.	Range	5 mm to 5000 mm (steel)	
10.5.	Velocity	1000 to 10000 m/s.	
10.6.	Zero offset	Supplier to specify	
10.7.	Display delay	Supplier to specify	
10.8.	Refracted angles	10^0 to 85^0 in 0.1^0 resolution	

Cl. No.	Particulars	BHEL SPECIFICATIONS	Bidder's OFFER [With Complete Technical Details]
11.0	**Probes / Accessories** (for each equipment)	1) Longitudinal Probes a) 2MHz- Ø 24mm Qty: 2 Nos. b) 4MHz- Ø 10mm Qty: 2 Nos. Suitable standard cables (2m long) for above probes-Qty: 10 Nos.	
		2) Shear wave Probes a) 2MHz-45^0 Size: 20x22mm Qty: 2 Nos. b) 2MHz-60^0 Size: 20x22mm Qty: 2 Nos. c) 4MHz-45^0 Size: 8 x 9mm Qty: 6 Nos. d) 4 MHz-60^0 Size: 8 x 9mm Qty: 2 Nos. e) 4 MHz-70^0 Size: 8 x 9mm Qty: 5 Nos. Suitable standard cables (2m long) for above probes-Qty: 25 Nos.	
		3) Twin Crystal Probes a) 2MHz- Ø 10mm Qty: 2 Nos. b) 4MHz- Ø 10mm Qty: 4 Nos. Suitable standard cables (2m long) for above probes-Qty: 10 Nos.	
		Supplier should Furnish data sheet for probes with the crystal diameter, probe center frequency, Spectrum, roof angle of twin crystal probe etc. along with technical data sheet as per ASTM E-1065 with band width of operation for each probe shall be provided.	
11.1.	Cables	Supplier to specify the details of Power cables, Transducer connector cables etc.	
11.2.	Calibration Blocks	Vendor to provide the following blocks as per ASME standards and with calibration certificates for each block	
		1) V1 Steel block of Type-1 –Qty: 1 No.	
		2) V1 Steel block of Type-2 –Qty: 1 No.	
		3) V2 steel block-Qty: 1 No.	
11.3.	Calibration Certificate & Test Certificate	Supplier shall supply these certificates along with the equipment.	

Cl. No.	Particulars	BHEL SPECIFICATIONS	Bidder's OFFER [With Complete Technical Details]
12.0	**Software Options**	DAC, DGS / AVG	
13.0	**General features**		
13.1.	Weight	Shall be less than 3 kg	
13.2.	Transducer connections	LEMO type connections (Equipment side and transducer side)	
13.3.	Battery	Lithium ion / Nickel Metal Hydride / Alkaline C-Cells preferably. The system shall have the provision for Internal rechargeable battery with charger adapter. The battery after charging should work for minimum 6 hours before next recharging.	
13.4.	Power requirement	AC-mains, 200-240V (50Hz)	
13.5.	Environmental ratings	Temperature: 5 to 50 degree C Humidity: RH 20 - 80%	
14.0	**Scope of Supply**	1) Total Number of Ultrasonic flaw detectors (UFD) meeting BHEL Part A- technical specifications - **2 Nos.**	
		Following items shall be supplied compulsorily with the each UFDs (**total-2 sets**)	
		2) Probes as per clause 11.0	
		3) Cables as per Clause 11.0 and 11.1	
		4) Calibration blocks as per Clause 11.2	
		5) Battery as per clause 13.3	
		6) Battery charger	
		7) Calibration &Test Certificates as per Clause 11.3	
		8) Service tool kit	
		9) Optional / Compulsory Accessories	
		10) Installation, Commissioning & Performance Prove-Out and Training on Operation, Trouble Shooting & Maintenance	
		11) Operation and Maintenance manuals	

Cl. No.	Particulars	BHEL SPECIFICATIONS	Bidder's OFFER [With Complete Technical Details]
15.0	**Documentation in ENGLISH Language**	Three Copies (In English) of the Operation, Maintenance & Service Manuals containing Electric Schematics, Circuit Diagrams, Drawings, Trouble Shooting Charts, Mechanical Sub-Assemblies, Rating of Bought-Out Items, etc. shall be supplied, at the time of inspection by BHEL Engineers. In addition, two soft copies in CDs to be supplied.	
16.0	**Pre dispatch Inspection**	The system and accessories (consisting of the items) shall be offered for pre dispatch Inspection by BHEL at supplier's works.	
17.0	**Installation and commissioning**	The system and accessories (consisting of the items mentioned) is to be installed & commissioned at BHEL Works, by the Service Engineer of the SUPPLIER.	
18.0	**Performance Prove out**	Vendor to perform the job trails and to prove the performance of the equipment at BHEL works	
19.0	**Training on Operation & Maintenance**	Complete Training for BHEL Engineers is to be given on Operation & Maintenance of the OFFERED equipment at BHEL, after the successful commissioning of the Equipment & Accessories.	
20.0	**Guarantee**	The system and accessories (consisting of the items mentioned in the scope of supply) are to be guaranteed for its performance for 12months from the date of commissioning of the equipment at BHEL Works.	
21.0	**Service and Spares Support Requirements**	Vendor shall ensure after the guarantee period, through trained service personnel in India for next 5 years as and when need arise. Spares to be made available within the shortest time.	
22.0	**Annual Maintenance Contract - AMC**	Vendor to indicate whether Annual Maintenance services can be provided on contract after the guarantee period is completed	
23.0	**Safety and Quality Standards**	Supplier to ensure that Safety and Quality of system and accessories (consisting of the items mentioned in the scope of supply) shall conform to International Standards. Conformance certificate to be provided along with the equipment.	
24.0	**Price for accessories**	Separate rate shall be quoted for Optional / Compulsory Accessories	