



An ISO 9001
Company

Bharat Heavy Electricals Limited

(High Pressure Boiler Plant)

Tiruchirappalli – 620014, TAMIL NADU, INDIA

CAPITAL EQUIPMENT / MATERIALS MANAGEMENT

ENQUIRY	Phone: +91 431 257 79 38 Fax : +91 431 252 07 19 Email : tvenkat@bheltry.co.in Web : www.bhel.com
NOTICE INVITING TENDER	

TWO PART BID	Enquiry Number:	Enquiry Date:	Due date for submission of quotation:
Tender to be submitted in two Parts	2620900219	06.10.2009	07.11.2009

You are requested to quote the Enquiry number date and due date in all your correspondences. 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	Portable Ultrasonic Flaw Detector with Probes as per the technical specification & commercial conditions applicable (to be downloaded from web site www.bhel.com or http://tenders.gov.in)	1 No.

Important points to be taken care during submission of offer:

1. Delivery required 5 months from the date of purchase order.
2. Grace period of 1 month beyond the above delivery period will be considered.
3. Check-list to be filled and enclosed along with the offer failing which, the offer will not be considered for evaluation.
4. Technical Specification of Part B SI.No.24.0: Annual Maintenance Contract – AMC
“The BIDDER has to QUOTE (as an optional, which may or may not be ordered along with equipment) for AMC with detailed scope of work. Order against this tender for the equipment will be finalised without AMC only. Prices for AMC charges shall be quoted in separate sealed cover.

BHEL's General guidelines / instructions 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 Enquiry reference “2620900219”.

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 Manager / Capital Equipment / MM
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PART A**QUALIFYING CRITERIA FOR THE SUPPLY OF
PORTABLE ULTRASONIC FLAW DETECTOR WITH B, C, D, P-Scan and TOFD facility****Qty: 1 No.****SECTION – I**

The BIDDER / VENDOR has to compulsorily meet the following requirements to get qualified for submitting an offer for the Ultrasonic flaw detector..

S. No.	REQUIREMENTS	VENDOR's COMMENTS
1.0	The BIDDER / VENDOR shall have a minimum of TWO Years of Continuous Experience in the Design, Manufacture of Ultrasonic Imaging system. Indicate the actual experience.	
2.0	The BIDDER / VENDOR shall have supplied at least one number of Ultrasonic Imaging system within the last five years. Indicate the number of equipment (of QUOTED MODEL) sold in India & Other Countries.	
3.0	Reference List of Customers and Performance Certificate from CUSTOMERS (minimum ONE Customers) with full contact details of CONTACT PERSON.	
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.	
5.0	DELIVERY - The bidder shall quote the best possible delivery. However the delivery shall not exceed 5 months with an additional grace period of 1 month. The additional grace period will attract a penalty which is explained in the commercial terms of the enquiry. The delivery period shall be reckoned from date of purchase order to despatch from the vendor works.	

SECTION – II

S. No.	PARTICULARS	VENDOR's RESPONSE
6.0	Number of Years of Experience of the BIDDER/ VENDOR in the field of design, manufacture and supply of 'Ultrasonic Imaging system '	
7.0	YEAR of LAUNCH of the Model quoted against this ENQUIRY	
8.0	Is there any other model launched after the quoted Model? Otherwise, indicate the likely year in which the next model is likely to be launched	
9.0	Number of Ultrasonic Imaging systems supplied, installed and commissioned till date, in the QUOTED MODEL	
10.0	Number of Ultrasonic Imaging system supplied, installed and commissioned till date for the following category of CUSTOMERS (within INDIA): a) Government Organisations b) Private Sector Companies [Large Scale Industries]	
11.0	Number of Ultrasonic Imaging system supplied, installed & commissioned till date in the following Category (around the GLOBE) : a) Universities b) R&D Labs c) Reputed Heavy Engineering Works/Manufacturing firms	
12.0	Details of Design Set-Up and Technology Back-Up assured for the PRINCIPAL Equipment Maker	
13.0	Details on International Standards followed in Design of the System	
14.0	Comprehensive Details on Performance Testing - of the Equipment quoted, to be ensured in presence of BHEL Executives, prior to dispatch from Supplier's Works	
15.0	Details of Quality System followed (Kindly furnish the salient aspects of the QA system followed)	
16.0	Details on SERVICE-after-SALES Set-Up in India including the addresses of Agents/Service Centers in India and Asia	
17.0	Any Additional Data to supplement the manufacturing capability of the BIDDER	

SECTION – III

The BIDDER / VENDOR has to comply with the following, for accepting the Technical Offer for scrutiny by the Purchaser:

S.No.	REQUIREMENTS	VENDOR's COMPLIANCE
18.0	The BIDDER / VENDOR shall submit the offer in TWO PARTS - Technical [with PART A & PART B] & Commercial and Price Bid. The Technical Offer shall be in line with the BHEL Technical Specifications and the Guidelines or Annexure mentioned, wherever applicable.	
19.0	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.	
20.0	The BIDDER / VENDOR shall assure a continuous support for SPARES and SERVICE for FIVE Years, from the date of commissioning of the equipment at BHEL Works.	
21.0	The Technical Offer shall be supported by Product Catalogue and Data Sheets in ORIGINAL and complete technical details of 'Bought-Out-Items' with copies of Product Catalogue and Selection Criteria	
22.0	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 of Scope of Supply.	
23.0	The reference List of Customers shall be accompanied with the details (Phone Number / E-Mail ID) of the CONTACT PERSON for cross reference by BHEL	

PART B**PORTABLE DIGITAL ULTRASONIC FLAW DETECTOR AND RECORDER WITH B-SCAN, C-SCAN, D-SCAN, P-SCAN, TOFD INSPECTION AND IMAGING CAPABILITIES**

S.No	Particulars	BHEL SPECIFICATIONS	Bidder's offer
1.0	Area of Application	Ultrasonic Imaging system with B, C, D and P-Scan is used for detection, sizing and characterization of critical flaws in Long Seam, Cir Seam and Full throat nozzle welds in thick wall Boiler components like Drums, Headers, Pipes etc.. Conventional Pulse Echo and through transmission A-Scan based inspection, B-scan cross sectional Imaging and recording of defects for longitudinal and shear wave inspection-B scan horizontal plane-view imaging and recording of defects, TOFD (Time of Flight Diffraction) inspection – RF B scan and D-Scan imaging.	
2.0	Principle of operation	Pulse Echo contact Technique and Time of Flight Diffraction Technique(TOFD)	
3.0	Pulser	As per clauses 3.1 to 3.7	
3.1	Pulse type	Preferably Square Wave Pulse – Supplier to specify.	
3.2	Pulse rise	Supplier to specify.	
3.3	Pulse Voltage	Supplier to specify.	
3.4	Pulse width	Supplier to specify	
3.5	Modes	Single / Dual	
3.6	PRF	15-5000 Hz - Supplier to specify	
3.7	Damping	25Ohms min to 1000 Ohms max	
4.0	Receiver	As per clauses 4.1 to 4.5	
4.1	Gain	0 to 100dB- controllable in 0.5 dB resolution	
4.2	Frequency Bandwidth	0.35 to 35MHz Wide Band/34 sub bands	

S.No	Particulars	BHEL SPECIFICATIONS	Bidder's offer
4.3	Rectification	Full wave, Positive half wave, Negative Half wave, RF.	
4.4	Reject	0-99% screen height controllable in 1% resolution	
4.5	Signal Filtering	Supplier to specify.	
5.0	Measurement	Type-Thickness, Sound path, Projection, Depth, Amplitude, Time of flight for both Gates.	
5.1	DGS	Standard library for 18 probes/unlimitedly expandable	
5.2	DAC / TCG Standard	Up to 50 points captured, ASME Section I, Section III, 110 dB dynamic Range, full gain, range and delay adjustments during set up, view convertible between DAC / TVG.	
5.3	TOFD	Both time based (real time clock) and true to location mode of the data recording, A scan record with TOFD map, Offline evaluation of TOFD map, Defect pattern recognition and sizing using TOFD.	
5.4	Amplitude measurement	0 to100% full screen height with 0.25% resolution	
6.0	Display	Rectified (Positive, Negative and Full wave) and RF display, Signal's spectrum (FFT), Real Time B-Scan display. Color Liquid Crystal Display, user selectable color schemes and brightness, and split screen and full screen modes.	
6.1	Imaging modes	Thickness profile B-scan, cross sectional B-scan, Plane view C-B scan. TOFD Display: Adjustable for brightness and contrast gray scale color palette.	

S.No	Particulars	BHEL SPECIFICATIONS	Bidder's offer
6.2	Freeze (A-Scans and Spectrum Graphs)	Freeze All – A-Scans and Spectrum Graphs / Freeze Peak – A-Scans / All measurements functions, manipulating Gates, etc. Otherwise provision to extract A-scans from the collected Data. - Supplier to specify.	
7.0	Gates	At least 2 Independent Gates - Supplier to specify	
7.1	Gate Start and Width	Controllable over whole range - Supplier to specify	
7.2	Gate Threshold	Preferably 5-95 % of A-Scan height controllable in 1 % resolution - Supplier to specify	
8.0	Outputs	LAN / USB / PS 2/ SVGA - Supplier to specify. RF Output Port-Supplier to specify. Data Storage Capacity-Supplier to specify	
9.0	Compatibility with the external devices	Supplier to specify	
10.0	Operating System	Supplier to specify	
11.0	General	As per clauses 12.1 to 12.8	
11.1	Weight	Less than 5kg.Supplier to specify.	
11.2	Housing	Supplier to specify.	
11.3	Dimensions	Supplier to specify.	
11.4	Transducer connections	BNC or Number 1 Lemo	
11.5	Battery	Lithium ion, Nickel Metal Hydride, and Alkaline C-Cells. The system shall have the provision for Internal rechargeable battery with charger adapter. The battery after charging should work for minimum 5 hours.	
11.6	Power requirement	AC – mains, 200 – 240V, 50 Hz	

S.No	Particulars	BHEL SPECIFICATIONS	Bidder's offer
11.7	Image analysis Software	Supplier to specify the details of the software used for analysis.	
11.8	Computer for Measurement and Analysis	On board / External. CPU-Processor speed minimum 1GHz.RAM- Minimum 512 MB(upgradeable).Hard Disc-Minimum 40GB(upgradeable).Display monitor-14'' colour daylight readable, TFT / LCD monitor, External communication ports-LAN,USB X2,SVGA, Flash memory- 4GB. Supplier to specify.	
12.0	Encoder	One axis mechanical encoder for B / D scan and TOFD scan with probe connector. Time based or True to location. Encoder Interface-Built in Interface for incremental mechanical encoder.	
12.1	Air borne encoder	Air borne encoder for monitoring of probe coordinate	
13.0	Scanner	Manual scanner along with probe adopters for TOFD inspection Supplier to specify- <ul style="list-style-type: none"> • Scanner Dimensions • Scan range • Scan resolution • Arm Length to accommodate to maximum thickness range. • Pre-amp band width • Pre-amp gain • Scan speed 	

S.No	Particulars	BHEL SPECIFICATIONS	Bidder's offer
14.0	Transducers	<p>Longitudinal and Shear wave Piezo electric transducers-</p> <p>1) Longitudinal Probes-</p> <p>(i) Single crystal</p> <p>a) 2MHz-2 Nos</p> <p>b) 4MHz-2Nos</p> <p>(ii) 4 MHz Twin Cristal probe</p> <p>2) Shear wave Probes-</p> <p>a) 2 MHz-45⁰-1 No.</p> <p>b) 4MHz-45⁰-1 No.</p> <p>c) 2 MHz-60⁰-1 No.</p> <p>d) 4MHz-60⁰-1 No.</p> <p>e) 2 MHz-70⁰-1 No.</p> <p>f) 4MHz-70⁰-1 No.</p> <p>3) TOFD probes</p> <p>a) ½” 2MHz- 2Pair (2 Nos. / pair)</p> <p>b) ½” 5MHz-2Pair (2 Nos. / pair)</p> <p>c) ¼” 10MHz-2Pair (2 Nos. / pair)</p> <p>Supplier should quote TOFD / Pulse Echo wedges suitable to use with the probes for TOFD and Pulse Echo with suitable probe holder.</p> <p>Supplier should specify the crystal diameter, probe centre frequency, along with technical data sheet as per ASTM E-1065 with Band width of operation.</p> <p>Supplier should study the area of application as per clause 1.0 of the tender scope and quote the requirement accordingly.</p>	

S.No	Particulars	BHEL SPECIFICATIONS	Bidder's offer
14.1	Calibration Certificate and Test Certificate	Supplier shall supply these certificates along with the equipment.	
14.2	Reference Blocks	<ol style="list-style-type: none"> 1. Reference block for Ultrasonic Imaging applicable to inspection of planar butt welds, scanning from both sides, with artificial flaws-1 No. 2. Reference block for Ultrasonic Imaging applicable to inspection of circumferential butt welds, scanning from both sides, with artificial flaws-1 No. 3. Reference block for Ultrasonic Imaging applicable to inspection of butt welds for defects transversal to weld, with artificial flaws-1 No. <p>Supplier to specify the details of the Reference blocks suitable for the applications as per clause 1.0.</p>	
15.0	Cables	Supplier to specify the details of Power cables, Transducer connector cables, Computer connector cables, Scanner cables etc.	

S.No	Particulars	BHEL SPECIFICATIONS	Bidder's offer
16.0	Scope of Supply	1) Ultrasonic Imaging system with B,C,D and P-Scan and TOFD facility as per this specification 2) Encoder as per clause 12.0 & 12.1 3) Transducers as per clause 14.0 4) Calibration & Test Certificates 14.1 5) Reference blocks as per 14.2 6) Cables as per Clause 15.0 7) Service tool kit 8) Optional/Compulsory Accessories 9) Installation, Commissioning & Performance Prove-Out and Training on Operation, Trouble Shooting & Maintenance 10) Operation, Maintenance & Service manuals	
17.0	Inspection	If warranted, the overall system and accessories shall be offered for Inspection to BHEL Engineers at vendor's works. The performance of the system shall be demonstrated using reference blocks.	
18.0	Performance Prove-Out at BHEL	On supply of the equipment it is essential to Demonstrate the satisfactory performance of the system to meet the applications as per clause 1.0.	
19.0	Installation and commissioning	The Ultrasonic Imaging system and accessories is to be installed & commissioned at BHEL Works, FREE OF COST, by the SUPPLIER.	
20.0	Documentation in ENGLISH Language	3 Copies (In English) of the Operation, Maintenance & Service Manuals, and CD/DVD containing Soft copy shall be supplied along with the system.	

S.No	Particulars	BHEL SPECIFICATIONS	Bidder's offer
21.0	Performance Guarantee	The Ultrasonic Imaging system and accessories are to be guaranteed for its performance for a period of one year from the date of commissioning.	
22.0	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 arises. Spares to be made available with shortest possible time.	
23.0	Training on Operation & Maintenance	Complete Training (Free of cost) for minimum one week at BHEL, is to be given on Operation & Maintenance of the system after the successful commissioning of the Equipment & Accessories.	
24.0	Annual Maintenance Contract – AMC	The BIDDER has to QUOTE (as an optional, which may or may not be ordered along with equipment) for AMC with detailed scope of work.	
25.0	Spares for Main Equipment & Accessories	BIDDER has to list down the critical SPARES under Mechanical, Electrical & Electronic Category for the Main Equipment & Accessories for Equipment Operation.	
26.0	Price for accessories	Separate rate shall be quoted for Optional / Compulsory Accessories	