Tender No. IITT/MECH/08/2019-20/51  
16 April 2020

NOTICE INVITING TENDER FOR SUPPLY, INSTALLATION, TESTING AND COMMISSIONING OF ULTRASONIC PHASED ARRAY FOR FLAW DETECTION WITH ACCESSORIES (E-PROCUREMENT MODE ONLY)

Indian Institute of Technology Tirupati (IIT Tirupati) invites online bids (e-tender) in Two part bid system from reputed OEM / authorized distributors / authorized dealers for the following:

<table>
<thead>
<tr>
<th>Item Description</th>
<th>Quantity (approx.)</th>
<th>Estimated Cost (Rs.)</th>
<th>EMD (Rs.)</th>
<th>Tender Fee (Inclusive of all taxes in Rs.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Supply, installation, testing and commissioning of Ultrasonic Phased Array for Flaw Detection with Accessories</td>
<td>One</td>
<td>63,06,400/-</td>
<td>3,15,000/-</td>
<td>1,500/-</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>1 No</strong></td>
<td><strong>63,06,400/-</strong></td>
<td><strong>3,15,000/-</strong></td>
<td><strong>1,500/-</strong></td>
</tr>
</tbody>
</table>

The Tender Document can be downloaded from Central Public Procurement (CPP) Portal http://eprocure.gov.in/eprocure/app and bid is to be submitted online only through the same portal up to the last date and time of submission of tender.

Critical dates of tender:

<table>
<thead>
<tr>
<th>No.</th>
<th>Event Description</th>
<th>Date and time</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>Date and time of Online Publication/Download of Tenders</td>
<td>16.04.2020 18.00 hours</td>
</tr>
<tr>
<td>2</td>
<td>Bid submission start date &amp; time</td>
<td>16.04.2020 18.00 hours</td>
</tr>
<tr>
<td>3</td>
<td>Bid submission close date &amp; time</td>
<td>13.05.2020 15.00 hours</td>
</tr>
<tr>
<td>5</td>
<td>Opening of Technical bids</td>
<td>14.05.2020 15.00 hours</td>
</tr>
</tbody>
</table>
1. **ABOUT IIT TIRUPATI:**

   Indian Institute of Technology Tirupati (IIT Tirupati) is an Autonomous Institute under Ministry of Human Resource Development, Govt. of India.

2. **TECHNICAL SPECIFICATIONS: Schedule of Requirement**

   **01 Ultrasonic Phased Array for Flaw Detection with Accessories:**

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<td>I. Preamble: -</td>
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   IIT Tirupati – Department of Mechanical Engineering intends to establish an NDT (Non-Destructive Testing) Ultrasonic phased array flaw detector facility to carry-out research on Fibre Reinforced Composite materials and metal structures. The system will be used for both laboratory research work and studies in the field on FRP structures viz: - Wind turbines, gas turbines…etc. Since the system may be needed for field applications, the system must be portable and with minimum electronic connections. Given the multiple applications, extensive technical support from the vendor is required. Vendors (with local technical support in India) who have sufficient experience and expertise in flaw detection using phased array ultrasonic equipment may only submit their bids. It is mandatory that the bidder must have supplied the ultrasonic flaw detector system to IIT’s and/or any research laboratory/institutes in India involved with research studies on fiber reinforced composite structures, metallic and other civil structures. Performance certificates from the user institute/laboratory may be attached to the bid.

   **II. System Configuration**

   1. The system should have the facility to perform standard conventional dual-channel pulse-echo and through-transmission ultrasonic testing with normal beam, angle & dual transducers. The system should consist of a phased array module to handle 16 – 128 element phased array probes.
   2. The system should have fully-featured A-scan / B-Scan / C-Scan Display Support with a user-defined color scheme with a recording facility.
   3. System should have the Mini-lemo connector for the conventional UT probe or should provide adopter (3 no’s) for Mini to Micro-lemo connection.
   4. Signal Rectification: Full-wave, Positive Half-wave, Negative Half-wave, RF.
   5. System should have the ability to use both conventional and phased array mode simultaneously and should have touch screen dispaly to facilitate quick operation
   6. System should have TOFD capability for accurate amplitude-independent defect sizing.
   7. System should have capability to do channel group inspections and display (at least up to 8 groups inspections simultaneously).
   8. System should have software / hardware support to programmable array probes to perform linear scan with electronic movement of the ultrasonic beam along with the probes.
   9. System should have the facility for automatic probe recognition & set-up
   10. The system should have pulser / receiver with minimum 16 element apertures and number of elements to be 128 with 256 focal laws
   11. Pulser Voltage: maximum of 110 V per element for phased array mode and at least 320 V for conventional UT mode.
   12. Pulse width : Resolution of ~2.5 ns, adjustable from 25 ns to 600 ns
   13. Receiver gain : at least 0 to 70 dB in PA and at least 120 db in conventional UT
   14. Probe frequency range to be supported: minimum of 0.6 to 15 MHz in PA and 0.25 to 25 MHz or higher in conventional UT at -3 dB
   15. System digitising frequency : At least 400 MHz
   16. Pulse Repetition Frequency : max of 10 kHz or better and adjustable.
   17. Display resolution : 750 x 500 pixels or better
   18. Display Size : minimum of 25 cm (diagonal size) or higher
   19. Power Requirement : Should work with regular 240 V supply or should provide adapter for 240 V power supply connection. Also should have the battery backup facility for remote field usage.
   20. Communication port : USB-3, Ethernet 10/100, audio alarm, other ports supplier to specify.
21. Simplified phased array interpretation embedded software should be available for manual weld inspection for the spontaneous ultrasonic wave ray tracking display on screen & also to locate the position of the defects during analysis. Weld over lay image feature to be provided.

22. Real-time averaging - of the 2, 4, 8, 16 for PA Channels 2, 4, 8, 16, 32, 64 for UT Channels

23. Filtering - low-pass, band pass, and high-pass filters for PA & UT Channels

24. Number of alarms : at least -3.

25. Data, reference, and measurement cursors for defect sizing

26. Storage devices - Flash card / SDHC of 2 GB or higher, standard USB storage devices

III. Probes & other Accessories

1. Phased Array Probe-1
2. Phased array probe, 0.5 MHz, Linear Array, with suitable wedge, to inspect up to 50mm thick FRP materials
3. Two axis X-Y encoded scanner with vacuum cup for flat or slightly curved surfaces with facility to mount probe mentioned in 1.a. with minimum stroke of 36 inches on both axis, 5 meters’ encoder cable.
4. Phased Array Probe 2.25MHz of 64 elements and compatible 0 degree wedge to inspect composites. Probe should have at least 2 metre cable length and should come with holder for above scanner
5. Phased array Roller wheel type probe 5 MHz frequency of 64 elements. Cable length should be at least 2 meter
6. Conventional ultrasonic probe of 2.25MHz, to be screwed in 45deg, 60deg and 70deg shear wave wedges and corresponding cable for machine
7. Conventional ultrasonic probe of 1MHz, to be screwed in 45deg, 60deg and 70deg shear wave wedges and corresponding cable for machine
8. Conventional ultrasonic probe of 2MHz wideband sensor, to be used for 0 degree applications and corresponding cable for machine
9. Dual 4 MHz probe for normal beam inspection and corresponding cable for machine

IV. General Requirements

1. Ultrasonic system quoted should support to raw ultrasonic data storage for the research applications and necessary software needed for raw data processing, FFT analysis etc to be quoted as an optional.
2. A calibration block to be quoted for acceptable performance demonstration of supplied items
3. Two hard copies of detailed technical, maintenance and operating manuals along with circuit diagrams addition to one soft copy, in English should be provided.
4. Installation and specific application training should be duly arranged by the supplier for a period of minimum 5 days. The integration, installation and commissioning of the system at IIT Tirupati is sole responsibility of supplier.
5. Warranty for a period of at least 12 months. Spares and service to be made available at least for a period of five years. Software/ hardware updates if any within the warranty period have to be supplied free of cost.

The supplier should have supplied minimum 5 No’s similar systems to reputed R & D Labs & Premier Educational Institutes/organizations in India. Details (telephone number with address and contact person) pertaining to these organizations should be given to us. Customer satisfaction certificate in this regard is preferred.

3. TENDER FEE & EARNEST MONEY DEPOSIT DETAILS:

(a) Tender Fee of Rs. 1,500/- (Rupees One thousand and five hundred only) should be submitted through ECS (Bank transfer / NEFT / RTGS) in favour of Indian Institute of Technology Tirupati.

(b) EMD of Rs. 3,15,000/- (Rupees Three Lakhs and Fifteen Thousand only) should be submitted ECS (Bank transfer / NEFT / RTGS) in favour of Indian Institute of Technology Tirupati.
(c) Bank A/c Details for crediting EMD/Tender Fee:

Name : Indian institute of Technology Tirupati Main Account  
Bank : State Bank of India  
Account No. : 35523338208  
IFSC Code : SBIN0006677  

(d) Micro and Small Enterprises (MSEs) firms as defined in MSE Procurement Policy issued by Department of Micro, Small and Medium Enterprises (MSME) or the firms registered with the Central Purchase Organisation or the concerned Ministry or Department or Start-ups as recognized by Department of Industrial Policy & Promotion (DIPP) for all these items only, are exempted from Tender fee/EMD. However, they have to enclose valid self-attested registration certificate(s) along with the tender to this effect.

(e) The bidders who seeks exemption from Tender fee/EMD as per clause no. (d) above, if they withdraw or modify their bids during the period of validity, or if they are awarded the contract and they fail to sign the contract, or to submit a performance security before the deadline defined in the request for bids document, they will be suspended for the period of three years or as decided by the competent authority from being eligible to submit bids for contracts with the entity that invited the bids.

(f) EMD of all unsuccessful bidders (if any) will be returned after finalization of the tender. EMD of the successful bidder will be returned only after receipt of Security Deposit towards Performance Guarantee.

(g) In case of successful tenderer, the EMD (if any) may be adjusted towards the Performance Security deposit on request.

(h) The amount of EMD (if any) is liable to be forfeited, if the tenderer withdraws from the offer after submission of the tender or after the acceptance of the offer and fails to remit the Performance Security Deposit.

(i) No interest will be paid on the EMD (if any) / Performance Security deposited / remitted.

(j) The Bidders will have to upload scanned copy of Payment details towards EMD/Tender fee and the same will be accepted only on verification and confirmation by the Institute. Any delay in credit will not be entertained by the Institute. (As per the format attached in Annexure – I)

4. ELIGIBILITY CRITERIA:

4.1. Statutory Documents:

a) The Bidder should give self-declaration certificate for acceptance of all terms & conditions of tender documents. A duly completed certificate to this effect is to be submitted as per the Annexure-I.

b) The firm should be neither blacklisted / debarred by any Central / State Government / Public Undertaking / Institute nor is any criminal case registered / pending against the firm or its owner / partners anywhere in India. A duly completed certificate to this effect is to be submitted as per Annexure-II.

c) Experience and Past Performance:

   (i) The bidder/OEM should have regularly manufactured, supplied, erected and commissioned successfully the tendered item(s) with the same or higher specifications for at least last three financial years i.e. during 2017-18 to 2019-20.
(ii) The supplier should have supplied minimum 5 No’s similar systems to reputed R & D Labs & Premier Educational Institutes/organizations in India during last five years. Details (telephone number with address and contact person) pertaining to these organizations should be given to us. Customer satisfaction certificate in this regard is preferred.

The details of the same along with supporting document w.r.t. satisfactory execution of work from clients are to be submitted as per the Annexure-III.

(d) Authorized Representatives:

Bids of bidders quoting as authorised representative of a principal manufacturer would also be considered to be qualified, provided:

(i) Their principal manufacturer meets all the criteria above without exemption, and

(ii) The principal manufacturer furnishes a legally enforceable tender-specific authorisation assuring full guarantee and warranty obligations as per the general and special conditions of contract; and

(iii) The bidder himself should have been associated, as authorised representative of the Principal Manufacturer for same set of services as in present bid (supply, installation, satisfactorily commissioning, after sales service as the case may be) for same or similar item for past three years ending on bid opening date.

(e) Financial Standing – under all conditions

The average annual financial turnover of the bidder during the last three financial years, should be at least 80% of the tendered estimated cost (or equivalent in foreign currency at exchange rate prevalent on the date of opening of the bid as per the annual report (audited balance sheet and profit & loss account) of the relevant period, duly authenticated by a Chartered Accountant/Cost Accountant in India or equivalent in relevant countries.

Copies of duly signed trading and profit & loss accounts / CA Certificate are to be submitted as per the Annexure-IV.

f) The firm should be Profitable in each of the previous three financial years (2016-17 to 2018-19). Duly completed Annexure-V along with supporting documents is to be submitted.

g) The bidder should be OEM or OEM authorized Dealers / Channel partners / Distributors of reputed brand having authorization for sales and after sales support. Valid OEM authorization letter is required to participate in this tender.

4.2 Technical Criteria:

Bidders should comply the specification of the tendered item in all respect. The detailed format is attached at Annexure-VI. The bidder is to complete the same in all respect and submit accordingly.

5. FINANCIAL BID DETAILS

Financial bid i.e. BOQ given with tender (in Excel format) to be downloaded first and uploaded after filling all relevant information strictly as per the format failing which the offer is liable for rejection. Kindly quote your offer on FOR IIT Tirupati (inclusive of all taxes and charges) for indigenous bidders. CIF
Chennai airport for foreign bidders. **Vendor should quote prices in BOQ only, offers indicating rates anywhere else shall be liable for rejection.**

Foreign bidders are required to quote on CIF Chennai airport basis. Indian bidders are required to quote FOR Destination basis. However, only Concessional GST Certificate can be provided to Indian bidders by IIT Tirupati at the time of placement of PO. Please quote the concessional GST rates.

6. **TIME SCHEDULE:**

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Particulars</th>
<th>Date</th>
<th>Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>a.</td>
<td>Date of Online Publication of Tender</td>
<td>16.04.2020</td>
<td>18.00 hours</td>
</tr>
<tr>
<td>b.</td>
<td>Bid Submission Start Date</td>
<td>16.04.2020</td>
<td>18.00 hours</td>
</tr>
<tr>
<td>c.</td>
<td>Bid Submission Close Date</td>
<td>13.05.2020</td>
<td>15.00 hours</td>
</tr>
<tr>
<td>d.</td>
<td>Closing Date &amp; Time for Submission of EMD &amp; Tender Fee</td>
<td>13.05.2020</td>
<td>15.00 hours</td>
</tr>
<tr>
<td>e.</td>
<td>Opening of Technical Bids</td>
<td>14.05.2020</td>
<td>15.00 hours</td>
</tr>
</tbody>
</table>

7. **AVAILABILITY OF TENDER:**

The tender document can be downloaded from [http://eprocure.gov.in/eprocure/app](http://eprocure.gov.in/eprocure/app) and be submitted only through the same website.

8. **BID VALIDITY PERIOD:**

The bid will remain valid for 90 days from the date of opening as prescribed by IIT Tirupati. A bid valid for a shorter period shall be rejected, being non-responsive.

9. **BID SUBMISSION:**

9.1 **Instruction to Bidder**

a) Bidders are required to enrol on the e-Procurement module of the Central Public Procurement Portal (URL: [https://eprocure.gov.in/eprocure/app](https://eprocure.gov.in/eprocure/app)) by clicking on the link "Online Bidder Enrolment" on the CPP Portal. **The registration is completely free of charge.**

b) Possession of a valid Class II/III DSC in the form of smart card / e-token is a prerequisite for registration and participating in the bid submission activities. DSCs can be obtained from the authorised certifying agencies recognized by CCA India (e.g. Sify/TCS/nCode/eMudhra etc).

c) Bidders are advised to register their valid email address and mobile numbers as part of the registration process. These would be used for any communication from the CPP Portal.

d) Only one valid DSC should be registered by a bidder. Please note that the bidders are responsible to ensure that they do not lend their DSCs to others which may lead to misuse.

e) The Bidders are required to log in to the site through the secured log-in by entering their respective user ID / password and the password of the DSC.

f) The CPP portal also has user manuals with detailed guidelines on enrolment and participation in the online bidding process. The user manuals can be downloaded for reference.

9.2 **Tender Clarification**

a) In case the bidders require any clarification regarding the tender documents, they are
requested to contact our office Ph. no: 0877-2503572, Email ID: purchase@iittp.ac.in on or before due date.

b) Technical and Specifications related Clarifications contact our office No : 8008890497, Email ID: subbareddy.daggumati@iittp.ac.in on or before due date.

c) Any queries relating to the process of online bid submission or queries relating to CPP Portal in general may be directed to the 24x7 CPP Portal Helpdesk.

9.3 Online Bid Submission Procedure

Cover-1:
The file should be saved in a PDF version numbered sequentially and should comprise of the following items:

**Packet-1**: Duly Completed Scanned PDF copy of, PAN, GST, Firm Registration certificate and Annexure-I to VII with relevant supporting documents

*Only the relevant documents as per the tender clauses are to be uploaded along with duly completed checklist as per the annexure-VII. Uploading of other than the required documents may liable for rejection of the bid.*

Cover-2:
A standard BOQ format has been provided in excel format. Bidders are required to download the BOQ excel file and fill their financial offer on the same BOQ format. After filling the same, submit it online in excel format, without changing the financial template format.

Note:
If the bid is incomplete and / or non-responsive it will be rejected during technical evaluation. The bidder may not be approached for clarifications during the technical evaluation. So, the bidders are requested to ensure that they provide all necessary details in the submitted bids.

10. BID OPENING:

a) Technical Bids will be opened on 14.05.2020 @ 15.00 Hrs.

b) Financial Bids of the eligible bidders will be opened on a later date. The date and time for opening of Financial Bids will be announced later.

c) Bids should be summarily rejected, if tender is submitted other than through online or original EMD & tender fee are not submitted within stipulated date / time.

11. BID EVALUATION:

Based on results of the Technical evaluation IIT Tirupati evaluates the Commercial Bid of those Bidders who qualify in the Technical evaluation. The Commercial Bid with the lowest price will be the highest evaluated bid.

12. PAYMENT TERMS:

*No advance payment will be made in any case.* Bills in Duplicate should be sent and the payment shall be released generally within 30 days, only after it is ensured that the items / quality of the items supplied are to the entire satisfaction of IIT Tirupati and completed the entire work within the stipulated delivery schedule. If any item is found defective, or not of the desired quality etc., the same should be replaced by the firm(s) immediately for which no extra payment shall be made.

For Foreign bidders:
For imported items payment will be made through wire transfer/TT. 90% payment will be made on CIF Chennai Airport value against the proof of despatch documents and balance 10% will be released after the successful installation, commissioning and demonstration, training of the equipment at IIT Tirupati site.

Bank charges within India to applicant account and outside India to beneficiary account.

13. WARRANTY OF QUALITY AND QUANTITY:

a) The awardee shall give minimum 3 years onsite warranty on successful completion of supply, installation, training and commissioning of supplied items.

b) The awardee shall give warranty that all items are as per specification(s), conforming to the specified design and there are no defects in the process of manufacturing, packaging, transportation and delivery.

c) Upon receipt of notice from IIT Tirupati for defective material, the firm shall within 15 days of receipt of the notice, replace the defective material, free of cost at the destination. The firm shall take over the defective material at the time of their replacement. No claim whatsoever shall lie on IIT Tirupati for the replaced goods thereafter. If the firm fails to replace the defective goods within a reasonable period, IIT Tirupati may proceed to take such remedial actions as may be necessary, at the company’s risk and expense.

14. LIQUIDATED DAMAGES:

In case of delay in Supply and installation /replacement by the stipulated date, IIT Tirupati reserves the right of imposing penalty @0.5% per week on the value of the undelivered items subject to maximum 10% of the cost of undelivered items.

15. PERFORMANCE SECURITY DETAILS:

a) The successful tenderer will have to deposit the performance security valid for 39 Months in the form of DD / TDR / FDR / Bank Guarantee @ 10% of the total value of order at the earliest from the date of issue of the award letter. No interest will be paid by IIT Tirupati on the deposit.

b) Performance Security will be refunded to the supplier, after it duly performs and completes the contract/warranty period in all respects.

c) Performance Security will be forfeited if the firm fails to perform/abide by any of the terms or conditions of the contract.

d) In case, the firm fails to execute the order successfully, within specified delivery period, the same goods/items will be procured from open market and the difference of cost, if any, will be recovered from Performance Security or from pending bill(s) of the defaulting firm or from both in case the recoverable amount exceeds the amount of Performance Security.

e) In case of non-receipt of Security Deposit within the stipulated time, EMD will be converted into Security Deposit and the balance amount will be recovered from the bill submitted for the payment.

16. DELIVERY SCHEDULE:

The successful bidder should execute the order successfully i.e. Supply, Installation of ordered item within 90 days and any extension in the delivery period will be at the discretion of IIT Tirupati from the date of issue of the purchase order or date of acceptance of sample piece whichever is later. In case of any damage found, the item(s) should be replaced within 15 days at IIT Tirupati. The bidder has to make own arrangement for unloading and positioning of items at the desired location of IIT Tirupati.

17. TERMS AND CONDITIONS:
a) **Termination for Insolvency**

i) The IIT Tirupati may at any time terminate the Contract by giving a written notice to the awarding firm, without compensation to the firm, if the firm becomes bankrupt or otherwise insolvent as declared by the competent Court, provided that such termination will not prejudice or affect any right of action or remedy, which has accrued or will accrue thereafter to the department.

ii) The courts of Tirupati alone will have the jurisdiction to try any matter, dispute or reference between the parties arising out of this purchase. It is specifically agreed that no court outside and other than Tirupati Court shall have jurisdiction in the matter.

b) **Force Majeure**

i) Should any force majeure circumstances arise, each of the contracting parties be excused for the non-fulfilment or for the delayed fulfilment of any of its contractual obligations, if the affected party within 15 days of its occurrence informs in a written form the other party.

ii) Force Majeure shall mean fire, flood, natural disaster or other acts such as war, turmoil, sabotage, explosions, epidemics, quarantine restriction, strikes, and lockouts i.e. beyond the control of either party.

iii) **Patent rights:** The supplier shall indemnify the purchase against all third party claims of infringement of patent, trademark or industrial design rights arising from use of the goods or any part thereof in India.

c) **Arbitration**

In the event of any dispute or difference arising under this contract, the Director, IIT Tirupati or his nominee is the arbitrator and the decision of the arbitration will be binding on both parties.

d) **Other Conditions**

i) The bidder has to upload the relevant & readable files only as indicated in the tender documents. In case of any irrelevant or non-readable files, the bid may be rejected.

ii) IIT Tirupati reserves the right to accept or reject any or all the tenders in part or in full or may cancel the tender, without assigning any reason thereof.

iii) IIT Tirupati reserves the right to relax / amend / withdraw any of the terms and conditions contained in the Tender Document without assigning any reason thereof. Any inquiry after submission of the quotation will not be entertained.

iv) IIT Tirupati reserves the right to modify/change/delete/add any further terms and conditions prior to issue of purchase order.

v) Repeat Order: IIT Tirupati reserves the right to place repeat order up to 100% of the quantities within a period of 12 months from the date of successful completion of purchase order at the same rates and terms subject to the condition that there is no downward trend in prices.

vi) In case the bidders/successful bidder(s) are found in breach of any condition(s) at any stage of the tender, Earnest Money/Performance Security shall be forfeited.

vii) False declaration/documents will be in breach of the Code of Integrity under Rule 175(1) (h) of the General Financial Rules for which a bidder or its successors can be debarred for up to two years as per Rule 151 (iii) of the General Financial Rules along with such other actions as may be permissible under law.
viii) Conditional tenders will not be considered in any case.

ix) In case of doubt in material, the expenditure on testing of equipment will be borne by the tenderer.

x) Institute reserve the right to increase/decrease the order quantity at any period of times during the validity of the contract.

xi) IIT Tirupati may issue amendment/corrigendum to tender documents before due date of submission of bid. Any amendment/corrigendum to the tender document if any, issued by IIT Tirupati will be posted on CPP Portal. For the bidders, submitting bids on downloaded tender document, it is ‘bidders’ responsibility to check for any amendment/corrigendum on the website of IIT Tirupati or check for the same CPP Portal before submitting their duly completed bids.
ANNEXURE – I

Undertaking

To
The Registrar,
Indian Institute of Technology
Tirupati-Renigunta Road, Settipalli post,
Tirupati 517506.

Tender No. IITT/MECH/08/2019-20/51
(Notice Inviting Tender for supply and installation, testing and Commissioning of Ultrasonic Phased Array for Flaw Detection with Accessories)

Sir,
I/we hereby submit our tender for supply and installation, testing and Commissioning of Ultrasonic Phased Array for Flaw Detection with Accessories.

1. I/we enclosed here with the following in favors of Indian Institute of Technology Tirupati towards EMD & Tender Fee.

<table>
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<tr>
<th>Particular</th>
<th>Amount</th>
<th>Payment Reference Details</th>
<th>Payment Date</th>
</tr>
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<tbody>
<tr>
<td>Tender Fee (Including Tax)</td>
<td>1,500/-</td>
<td></td>
<td></td>
</tr>
<tr>
<td>EMD</td>
<td>3,15,000/-</td>
<td></td>
<td></td>
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</tbody>
</table>

2. I/we hereby reconfirm and declare that I/we have carefully read, understood & complying the above referred tender document including instructions, terms & conditions, scope of work, schedule of quantities and all the contents stated therein. I/we also confirm that the rates quoted by me/us are inclusive of all taxes, duties etc., applicable as on date.

3. I/we have gone through all terms and conditions of the tender document before submitting the same.

Date: ____________________________

Authorized Signatory

Name: ____________________________
Place: ____________________________
Designation: ______________________
Contact No: _______________________
CERTIFICATE
(To be provided on letter head of the firm)

I hereby certify that the above firm neither blacklisted / debarred by any Central/State Government/Public Undertaking/Institute nor is any criminal case registered / pending against the firm or its owner / partners anywhere in India.

I also certify that the above information is true and correct in any every respect and in any case at a later date it is found that any details provided above are incorrect, any contract given to the above firm may be summarily terminated and the firm blacklisted.

Date: 

Authorized Signatory

Name:

Designation:

Contact No.: 

Place:
a) Experience: (As per tender Clause No.4(c)(i))

<table>
<thead>
<tr>
<th>Year</th>
<th>Name of the Item with Specification (Technical specification brochure to be attached)</th>
<th>Purchase Order No. &amp; Date (Copy of the Orders to be attached)</th>
<th>Date of successfully completion of SITC of ordered Item (copy of SITC report from client to be attached)</th>
<th>Contact Details of Client</th>
</tr>
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<tbody>
<tr>
<td>2017-18</td>
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<td>2018-19</td>
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<td>2019-20</td>
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b) Past Performance: (As per tender Clause No.4(c)(ii))

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<tr>
<th>Year</th>
<th>Purchase Order No. &amp; Date (Copy of the Orders to be attached)</th>
<th>Quantity</th>
<th>Date of successfully completion of SITC of ordered Item (copy of SITC report from client to be attached)</th>
<th>Whether supplied item(s) is in successful operation for at least three years (Certificate from client to be attached)</th>
<th>Contact Details of Client</th>
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<tbody>
<tr>
<td>2016</td>
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Date: Authorized Signatory
Name:
Designation:
Contact No.:
# ANNUAL TURNOVER DETAILS

<table>
<thead>
<tr>
<th>Evaluation Criteria</th>
<th>Remark</th>
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<tbody>
<tr>
<td>Bidder’s Annual Turnover for last three financial years</td>
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<tr>
<td>Financial Year</td>
<td>Turnover in Rs.</td>
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<td>Supporting Documents are to be attached along with the Annexure-V</td>
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Date:  
Authorized Signatory:  

Place:  
Seal  
Designation:  
Contact No.:  

15
## ANNEXURE – V

### ANNUAL PROFIT DETAILS

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<tr>
<td>Financial Year</td>
<td>Profit as per Books of Accounts</td>
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<td>2016-17</td>
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Date: 
Authorized Signatory: 
Name: 
Designation: 
Place: 
Contact No.:
## TECHNICAL COMPLIANCE STATEMENT

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<th>S. No</th>
<th>Specifications</th>
<th>Complied</th>
<th>Remarks if any</th>
<th>Offered make &amp; Model</th>
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<tbody>
<tr>
<td>01</td>
<td>Ultrasound Phased Array for Flaw Detection with Accessories:</td>
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</tbody>
</table>

### I. Preamble:

IIT Tirupati – Department of Mechanical Engineering intends to establish an NDT (Non-Destructive Testing) Ultrasound phased array flaw detector facility to carry-out research on Fibre Reinforced Composite materials and metal structures. The system will be used for both laboratory research work and studies in the field on FRP structures viz: - Wind turbines, gas turbines...etc. Since the system may be needed for field applications, the system must be portable and with minimum electronic connections. Given the multiple applications, extensive technical support from the vendor is required. Vendors (with local technical support in India) who have sufficient experience and expertise in flaw detection using phased array ultrasonic equipment may only submit their bids. It is mandatory that the bidder must have supplied the ultrasonic flaw detector system to IIT’s and/ or any research laboratory/institutes in India involved with research studies on fiber reinforced composite structures, metallic and other civil structures. Performance certificates from the user institute/laboratory may be attached to the bid.

### II. System Configuration

27. The system should have the facility to perform standard conventional dual-channel pulse-echo and through-transmission ultrasonic testing with normal beam, angle & dual transducers. The system should consist of a phased array module to handle 16 – 128 element phased array probes.

28. The system should have fully-featured A-scan / B-Scan / C-Scan Display Support with a user-defined color scheme with a recording facility.

29. System should have the Mini-lemo connector for the conventional UT probe or should provide adopter (3 no’s) for Mini to Micro-lemo connection.

30. Signal Rectification: Full-wave, Positive Half-wave, Negative Half-wave, RF.

31. System should have the ability to use both conventional and phased array mode simultaneously and should have touch screen display to facilitate quick operation.

32. System should have TOFD capability for accurate amplitude-independent defect sizing.

33. System should have capability to do channel group inspections and display (at least up to 8 groups inspections simultaneously).

34. System should have software / hardware support to programmable array probes to perform linear scan with electronic movement of the ultrasonic beam along with...
the probes.
35. System should have the facility for automatic probe recognition & set-up
36. The system should have pulser / receiver with minimum 16 element apertures and number of elements to be 128 with 256 focal laws
37. Pulser Voltage: maximum of 110 V per element for phased array mode and at least 320 V for conventional UT mode.
38. Pulse width : Resolution of ~2.5 ns, adjustable from 25 ns to 600 ns
39. Receiver gain : at least 0 to 70 dB in PA and at least 120 dB in conventional UT
40. Probe frequency range to be supported: minimum of 0.6 to 15 MHz in PA and 0.25 to 25 MHz or higher in conventional UT at -3 dB
41. System digitising frequency : At least 400 MHz
42. Pulse Repetition Frequency : max of 10 kHz or better and adjustable.
43. Display resolution : 750 x 500 pixels or better
44. Display Size : minimum of 25 cm (diagonal size) or higher
45. Power Requirement : Should work with regular 240 V supply or should provide adapter for 240 V power supply connection. Also should have the battery backup facility for remote field usage.
46. Communication port : USB-3, Ethernet 10/100, audio alarm, other ports supplier to specify.
47. Simplified phased array interpretation embedded software should be available for manual weld inspection for the spontaneous ultrasonic wave ray tracking display on screen & also to locate the position of the defects during analysis. Weld overlay image feature to be provided.
48. Real-time averaging - of the 2, 4, 8, 16 for PA Channels 2, 4, 8, 16, 32, 64 for UT Channels
49. Filtering - low-pass, band pass, and high-pass filters for PA & UT Channels
50. Number of alarms : at least -3.
51. Data, reference, and measurement cursors for defect sizing
52. Storage devices - Flash card / SDHC of 2 GB or higher, standard USB storage devices

III. Probes & other Accessories

10. Phased Array Probe-1
11. Phased array probe, 0.5 MHz, Linear Array, with suitable wedge, to inspect up to 50mm thick FRP materials
12. Two axis X-Y encoded scanner with vacuum cup for flat or slightly curved surfaces with facility to mount probe mentioned in 1.a. with minimum stroke of 36 inches on both axis, 5 meters’ encoder cable.
13. Phased Array Probe 2.25MHz of 64 elements and compatible 0 degree wedge to inspect composites. Probe should have at least 2 metre cable length and should come with holder for above scanner
14. Phased array Roller wheel type probe 5 MHz frequency
15. Conventional ultrasonic probe of 2.25MHz, to be screwed in 45deg, 60deg and 70deg shear wave wedges and corresponding cable for machine
16. Conventional ultrasonic probe of 1MHz, to be screwed in 45deg, 60deg and 70deg shear wave wedges and corresponding cable for machine
17. Conventional ultrasonic probe of 2MHz wideband sensor, to be used for 0 degree applications and corresponding cable for machine
18. Dual 4 MHz probe for normal beam inspection and corresponding cable for machine

IV. General Requirements

6. Ultrasonic system quoted should support to raw ultrasonic data storage for the research applications and necessary software needed for raw data processing, FFT analysis etc to be quoted as an optional.
7. A calibration block to be quoted for acceptable performance demonstration of supplied items
8. Two hard copies of detailed technical, maintenance and operating manuals along with circuit diagrams addition to one soft copy, in English should be provided.
9. Installation and specific application training should be duly arranged by the supplier for a period of minimum 5 days. The integration, installation and commissioning of the system at IIT Tirupati is sole responsibility of supplier.
10. Warranty for a period of at least 12 months. Spares and service to be made available at least for a period of five years. Software/ hardware updates if any within the warranty period have to be supplied free of cost.

The supplier should have supplied minimum 5 No’s similar systems to reputed R & D Labs & Premier Educational Institutes/organizations in India. Details (telephone number with address and contact person) pertaining to these organizations should be given to us. Customer satisfaction certificate in this regard is preferred.
# COMPANY DETAILS

<table>
<thead>
<tr>
<th>Name of the Party</th>
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<tbody>
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<td>PAN Number</td>
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<td>GST Registration Number</td>
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<td>Branch Name</td>
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<td>Registered Office Address</td>
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<tr>
<td>Authorized Signatory Details (Company/Firm Authorization by the competent authority, to be attached)</td>
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<td>Phone</td>
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<tr>
<td>Details of Contact other than Authorized Signatory</td>
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**Signature and Seal of the Tenderer:**
Name in Block Letter:  
Designation:  
Contact no.  
Date:
**CHECKLIST FOR BIDDERS TO BE SUBMITTED IN DULY FILLED AND SIGNED CONDITION**

<table>
<thead>
<tr>
<th>S No</th>
<th>Name of the documents</th>
<th>Submitted Yes/No</th>
<th>Page no. of the attached document</th>
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<tbody>
<tr>
<td>1</td>
<td>PAN Card</td>
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<td>2</td>
<td>Incorporation/Registration certificate of company</td>
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<td>3</td>
<td>GST Registration copy</td>
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<tr>
<td>4</td>
<td>Tender fee details/MSME/NSIC Certificates</td>
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<tr>
<td>5</td>
<td>EMD details/MSME/NSIC Certificates</td>
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<tr>
<td>6</td>
<td>Tender acceptance letter (Annexure I)</td>
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<tr>
<td>7</td>
<td>Blacklisting undertaking (Annexure II)</td>
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<tr>
<td>8</td>
<td>List of required purchase orders/Work orders for the last 5 years with Annexure III as per tender clause no. 4.1.c</td>
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<td>Annual turnover details (Annexure IV)</td>
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<tr>
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<td>Technical compliance statement duly filled and signed (Annexure VI)</td>
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<td>Company details duly filled and signed (Annexure VII)</td>
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<tr>
<td>12</td>
<td>Authorization letter duly signed regarding OEM/Authorized dealer/Authorized distributor of a firm</td>
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<tr>
<td>13</td>
<td>Technical brochures</td>
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**Note:** Submission of tender without the above mentioned documents will leads rejection/disqualification of the tender.

Signature of the bidder with stamp