



An ISO 9001 Company

## Bharat Heavy Electricals Limited

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Non Destructive Testing Laboratory  
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**ENQUIRY.NO: BHE: Q: NDT: ATP: ECT: 001 DATED: 30/07/2015**

**ENQUIRY FOR OUTSOURCING OF *EDDY CURRENT TESTING OF ASSEMBLED INCOLOY-800 'U' TUBES OF 700MW NUCLEAR STEAM GENERATORS AT BHEL, TRICHY***

**TENDER SUBMISSION: LAST DATE & TIME**

**05-09-2015 (SATURDAY) – 12:00 HRS (IST)**

**TENDER OPENING TIME**

**05-09-2015 (SATURDAY) - 14:00 HRS (IST)**

**ADDRESS FOR COMMUNICATION**

**ADDITIONAL GENERAL MANAGER**

**NON DESTRUCTIVE TESTING LABORATORY**

**BUILDING-01/ BHEL**

**TRICHY-620014**

# TENDER.ENQUIRY.NO-BHE: Q: NDT: ATP: ECT: 001

30-07-2015

## **TENDER ENQUIRY SPECIFICATION FOR EDDY CURRENT TESTING OF ASSEMBLED INCOLOY-800 'U' TUBES OF 700MW NUCLEAR STEAM GENERATORS AT BHEL, TRICHY AS A PART OF PRE-SERVICE EXAMINATION**

### **1.0 GENERAL:**

- 1.1 NDTL Department BHEL Tiruchirappalli is interested in utilizing services from one technically competent vendor for eddy current testing of assembled Incoloy-800 'U' tubes for 700MW Nuclear Steam Generators at BHEL, TRICHY as a part of pre-service examination. Experienced and reputed Inspection and testing companies in the field of eddy current testing meeting the conditions as stipulated in this enquiry are eligible to participate in this tender.
- 1.2 The Inspection companies may download the Enquiry Document and who fulfil the enquiry conditions may submit the offer as detailed below.
- 1.3 Earnest Money Deposit (EMD) amount of Rs. 1,50,000/- (Rupees One Lakh and fifty thousand only) in the form of crossed Demand Draft drawn in favour of Bharat Heavy Electricals Limited payable at Tiruchirappalli shall be sent along with your offer.
- 1.4 **Inspection Company shall quote a SINGLE RATE for eddy current testing based on per tube ECT basis which is valid uniformly for the entire contract period. No escalation of rate is admissible during the contract period.** Inspection Company shall quote the rate exclusive of service tax and education cess as applicable. No other taxes or duties will be paid by BHEL other than the above. However, additional financial implications on account of statutory changes and new levies subsequently introduced will be reimbursed by BHEL on production of documentary evidence.
- 1.5 BHEL units are ISO 9000 accredited companies and our system and procedures comply with ISO requirements. Hence all the Inspection companies shall preferably be an ISO 9000 accredited company and make sure that they fulfil all their obligations towards meeting the ISO 9000 requirements or equivalent Quality system requirements.

### **2. ELIGIBILITY CRITERIA:**

**2.1 Experience / Qualifying Criteria:** The Inspection Agency shall meet the mandatory Technical Qualifying Criteria mentioned in ANNEXURE-A. Necessary documentary evidences supporting individual points of ANNEXURE – A shall be submitted as part of offer besides giving statement explanations for individual points. Only bidders fully complying to ANNEXURE-A would be considered for this work technically. Also, the selected contractor shall comply to all the 12 points specified in the ANNEXURE-A in a full-fledged and complete manner while executing the contract.

**2.2 Legal Status:** The Tenderer should have a legal status such as that of a Proprietary concern, Partnership firm, Company etc. The Tenderer should have been registered under relevant Act for carrying out the nature of work for which this Tender is invited. Bid shall contain documents relating to constitution of the firm.

**2.3 Skill level:** The contractor should have minimum of 10 numbers of certified Level II persons (as per SNT-TC-1A or equivalent) in eddy current testing along with one certified ASNT / equivalent Level III in eddy current testing. Such certified NDE personnel shall have minimum qualification of Diploma in Engineering/Degree in Science or Engineering and work experience of 3 years' and above in eddy current testing. The offer shall contain details of education, experience and NDE certification of the persons.

### 3. SCOPE OF WORK - REQUIREMENTS :

**3.1 General:** Post manufacturing cum Pre-Service Eddy Current Testing (ECT) is to be done on 2489 Incoloy – 800 'U'- tubes in the first 700 MW Steam Generator (SG 1) which is being manufactured by BHEL, Trichy for NPCIL's Atomic Power Projects, viz. RAPP and KAPP. Following this, another 7 SGs will be offered for ECT, each in a gap of 2-3 months. **Total work on 8 SGs will be spanning over 2 years approximately.** Additionally, during the contract execution period, either in the beginning or at in between SGs, approximately 1000 numbers of bare Incoloy – 800 'U' tubes or in the assembled condition in SG before the full completion of its manufacturing activities may have to be planned for eddy current testing as part of raw material Quality Control check. Basically, deliverables from contractor shall consist of not only the execution of the test, but also other related activities such as level II, Level III involvement, preparation and obtaining approval from NPCIL for ECT procedure, preparation and obtaining NPCIL clearance for the ECT reports, etc. in order to meet the NPCIL specifications. BHEL, will only act as a mediator for coordination between the contractor and NPCIL, and will not be part of the technical activities.

**3.2 References :** As the ultimate customers are NPCIL, the enclosed specification PP-P-1963 Revision 02, dated January 2013 and titled as 'Procedure for Eddy Current Testing of Steam Generators' issued by NPCIL shall be followed for this proposed work of eddy current testing of U tubes in the 700MW SG. The generation of working procedural document and technique sheets, if any in line with PP-P-1963 and further obtaining their due approval from NPCIL shall be undertaken by the contractor after obtaining the order and this activity shall be completed much ahead of the stage of commencement of physical work execution in the SG. If there are any periodic changes and revisions made to PP-P-1963 by NPCIL during the contract execution period, such changes shall be accommodated by the contractor without any price or time implication and all the relevant contractor made procedures and technique sheets shall undergo applicable revisions immediately. Contractor's ECT-Level III shall perform all the works related to generation of working procedures and technique sheets and obtaining approval from NPCIL.

**3.3 Dimensions:** Each tube has an OD  $19+0.12/-0.03$ mm, thickness  $1.1\text{mm}\pm 10\%$ , and approximate developed length of 25000 mm (on an average), including the straight as well as curved/ bend portions. The eddy current testing shall be carried out in the assembled condition of 'U' tubes inside the SG. Assembled condition means, both ends of the tubes are welded to tube sheet and then further mechanically expanded with the tube sheet. Because of this, minimum to maximum dimensions at ECT probe entry point would be Inner diameter: Minimum 16.50mm to maximum 17.20mm (at weld end), Minimum 16.50mm to maximum 17.20mm in straight portion and minimum 15.50mm to maximum 18.25mm in bend portion. There are 72 variants of bends starting from shortest radius of 91mm to longest radius of 1014mm. The radial difference between consecutive radii = 13mm. These dimensions shall be considered for deciding about the required ECT probes, their dimensions and the dimensions for the cables / connecting wire, etc in order to get reliable signal responses for real and simulated flaws on OD side, ID side and for the full thickness of the tube in its full length including bend portion.

**3.4 Testing conditions:** The SG will be in horizontal position during the test after completion of all manufacturing and testing activities, and the test personnel have to

operate from the dished end side in which the personnel entry is to be made through man-hole nozzles in order to access the tubes for carrying out eddy current testing. There is also a constraint to access due to a partition plate which separates the hemispherical space into two halves (which practically leaves one manhole for each side of the tubes). As per the option and convenience of the contractor, the partition plate inside the dished end separating hemisphere in to two halves may be kept in horizontal or vertical position for inserting (entering or pushing) and withdrawing or pulling of bobbin type probes and connectors.

**3.5 Engagement of Qualified personnel and Customer approval:** This work shall be done in accordance with the requirements of NPCIL's specification and approved procedure. This ECT test will be 100% witnessed by NPCIL and will be treated complete, only when NPCIL approves the test results and signs of all reports and the relevant stages of operations in the operation process sheet. The presence of ECT Level III of contractor is mandatory for customer dealing and work supervision of Level II persons engaged in physical testing along with obtaining stages and reports signed off by NPCIL customer. Vendor shall engage a well experienced ASNT ECT Level-III personnel (preferably with vast experience – a minimum of 2 years - in handling NPCIL projects), who will be responsible for preparation and customer approval of procedure, witnessing the test and convincing the customer inspector whenever necessary, preparation of the reports and customer clearance of the same. The test shall be done by ECT level II qualified personnel with work experience in NPCIL projects

**3.6 Caution against spurious signals:** It is emphasized that there is a possibility of spurious signals due to supporting grid plates and tube sheet which come in contact with the tubes at straight portions and due to tube supports at bend portions. Contractor has to take care of this suitably with the help of suitable signal filtering systems of the equipment.

**3.7 Calibration Specimens:** It is hereby informed that, NPCIL is likely to ask for a separate calibration for the bend regions and straight regions. In that case, the contractor shall do the same. However, required bend portion of the tubes and straight portion of the tubes will be issued by BHEL and contractor has to make his own arrangements and facilities for converting the BHEL supplied raw tubes into required calibration specimens with required notches / holes as per code / NPCIL specification. On this, if any clarification is to be sought by the contractor, the same has to be directly taken up with NPCIL customer.

**3.8 Scanning Speed:** As it is a major requirement of NPCIL specification that the scanning speed shall be ensured to be constant, the contractor shall employ a mechanical scanning system (eg: puller-pusher automatic type) for ECT probes. Alternately, if it is acceptable to NPCIL, manual scanning is also permitted subject to maintaining the scanning speed at reasonably uniform level by engaging well experienced crew for scanning.

**3.9 Working Time:** The contractor shall operate two shifts, so that the entire work, including the report clearance gets completed within a maximum time of 10-12 days per SG including clearance of the report. To meet this multiple crews shall be planned by the contractor. Based on the situational requirement of BHEL Trichy, vendor should be ready to work on Sundays, holidays etc.

#### **4 RATES :**

**4.1** The rates shall be quoted in terms of number of tubes (scanned to ultimate satisfaction of NPCIL customer). The contractor shall quote same rate for ECT for all 8 SGs and

loose tubes. The quotation shall be mandatorily per U tube basis. No price change is permitted during contract execution stage for 8 SGs plus additional 1000 tubes.

**4.2** The date of requirement of ECT on any SG or lot of loose tubes will be communicated to contractor in about 15 days in advance for making needed arrangements for mobilization. Delay of more than 5 days in starting / completion of each phase of ECT on account of contractor shall be liable for % reduction in rate. (@ 0.5 % test lot).

**4.3** The rates will be for the number of tubes tested at the rate of per tube rate. The full tube scanning coverage means covering of full developed length of tube which includes two straights and one U bend part in each of the tube. This shall be done by scanning from one end up to crossing the bend and scanning from other end for other straight portion.

## **5 ECT SYSTEM:**

**5.1** Vendor shall execute this work with their own ECT equipment, probes, cables and other accessories, and confirm that this complete system meets the requirements of NPCIL procedure. BHEL will provide the necessary electrical supply for operating these systems.

**5.2** It is anticipated that there could be spurious indications due to the ID / OD surface of the tubes, supporting grid plates, tube sheets, and curved portions of the tubes. The ECT system shall be able to correctly interpret these signals, to the satisfaction of NPCIL.

## **6 EXPECTED PART OF CONTRACTOR'S WORK ACTIVITIES AS A MINIMUM:**

**6.1** Preparation and approval from M/s NPCIL of the procedures. Level III of contractor has to involve in this. Technical specification of NPCIL was shared by BHEL for this.

**6.2** Arrangement of probes, cables, equipment, mechanical or manual scanning system etc. based on NPCIL requirement. Reference blocks / specimen's preparation and their validation / verification through third party reports. For this as per the needs of the contractor, straight or bent tube samples will be given by BHEL.

**6.3** Execution of the work using ECT Level II qualified personnel of contractor including report preparation and obtaining clearance from M/s NPCIL (after witnessing and supervision of testing due signing of reports by Level III of contractor). Boarding, lodging, mobilization from outside places and local conveyance for contract personnel have to be suitably planned.

**6.4** ECT carried out shall be capable to provide location of discontinuities, orientation of the discontinuities at each location, longitudinal length of the discontinuities from the tube end, depth of the discontinuities, severity of the discontinuities and characterizations of the discontinuities, etc as desired and stipulated by NPCIL. All the requirements spelt out in the NPCIL specification / procedure regarding discontinuities and their detection / characterization shall be finally binding on the part of the contractor. There are going to be 13 tube supports (called grids) and tube sheet for both straight portions of the tubes and tube bend supports at bent portion of the tubes (making contacts at few locations on OD side of the tubes) and signals in ECT because of such points shall have to be suitably taken care in order to scan the tubes' total thickness for defects. For each and every tube for their full developed length, detailed report on Eddy Current Testing data shall be provided.

**6.5** Testing shall be monitored by Level III of the contractor mandatorily.

- 6.6** Testing including closing of reports, clearance from customer for one SG shall be completed within 12-15 days.
- 6.7** Preparation of documents and obtaining NPCIL approval, Mobilization and demobilization of systems, Equipments, consumables, man power and all the resources required, ensuring availability of adequate man power and arranging for their boarding, lodging and local conveyance, execution of the work and final submission of data and reports after NPCIL's acceptance are in the scope of the contractor whereas cleaning of tubes before testing, arranging proper working condition for testing, provision of electricity, lighting, working tables and chairs and safe working space for preserving contractor goods are in the scope of BHEL. The readiness for commencing the work for any SG will be intimated to the contractor 10 days in advance.

**7. SPECIFIC TECHNICAL POINTS TO BE TAKEN CARE BY CONTRACTORS:**

- 7.1** It is preferred to have few numbers of slightly lower diameter probes also in addition to normal probes in order to take care of 'probe stuck' if any observed with normal probes.
- 7.2** The probes shall be of rugged ones and their durability shall be very high without wear / tear / damage. Also, they shall be flexible enough to enter into minimum radius bend in a smooth manner without undergoing damage. As damage could be a possibility, the contractor is expected to keep sufficient number of spare probes as replacements.
- 7.3** Approximately 10% of the tubes are expected for re-scanning due to some dusting or presence of dirt within the tubes resulting in unwanted signals. In such occasions, cleaning (performed by BHEL and contractor) of tubes' inner volume would remove / eliminate such spurious signals and such cleaned tubes will be warranting testing again. This 10% rescanning is to be considered as part of normal testing and exclusive charging by contractor for this rescanning is not permitted.
- 7.4** As already mentioned elsewhere in this document, automatic scanning is preferred but it is not mandatory provided the scanning speed is maintained at a reasonably constant level (either by manual scanning or automatic scanning).
- 7.5** For data analysis and defect location and orientation identification along with its severity level fixing, the contractor shall use state of art software. This software should be compatible to NPCIL's system for later reading of the contractor's data through NPCIL's software / system without any data distortion as further in-service examinations will be planned periodically by NPCIL at shut downs using the NPCIL system.
- 7.6** After taking the order, out sourcing of part or full work to another vendor is not all permitted.
- 7.7** During the first time eddy current testing activity at BHEL, supplier shall make a thorough demonstration of ECT on a shortest radius bend tube by multiple entries and with drawl of probes and in this trial, there shall not be any deterioration in the signal response and signal quality and this demo shall be acceptable to NPCIL witnessing the activity. This has to demonstrate separately outside using a plain 'U' tube (given by BHEL).
- 7.8** Eddy Current Testing equipment, probes and system shall meet the requirements of ASME Section V, Article 8 and PP-P-1963 (NPCIL's specification).

**7.9** If the supplier's software is directly not compatible to NPCIL's software, it shall be the responsibility of contractor to arrange for a suitable intermediate facility to replay and analyze the bidder's system signals through the NPCIL's system / software (at a later date).

## **8 CONTRACT PERIOD:**

The period of contract will be **till the successful completion of work**. This is expected to be approximately 2 years from the commencement of contract. The contract can be extended for further period based on mutual agreement between BHEL and inspection agency.

## **9 GENERAL GUIDELINES & INSTRUCTIONS TO BIDDERS FOR SUBMITTING OFFER** is detailed in **ANNEXURE-I**.

## **10 INVOICE AND PAYMENT:**

**10.1** The Inspection Agency shall submit the detailed work completion report after every SG with supporting documents for verification of item wise Quantity as per BHEL PO No., PO Item No., Description, specification number and the number of tubes tested satisfactorily. In addition to invoice, the contractor shall have to submit ESI & PF documents as applicable.

**10.2** Invoices together with the work completion Report shall be submitted to BHEL once in SG Completion basis / loose tubes after completion of atleast 300 or more numbers as offered (the loose tubes offering will be atleast 300 numbers in one lot) and payment shall be made as per normal BHEL rules.

**10.3** The Invoices shall be submitted to BHEL within one month but not exceeding three months from the date of inspection of the item, to avoid missing of invoices and also for making payment in time.

## **11 PERSONNEL WELFARE:**

**11.1** All Labour regulation laws like Provident Fund, ESI etc., applicable either existing or enacted in future shall be strictly complied with.

**11.2** Safety, Provident fund, ESI, Insurance and all statutory requirements and BHEL safety rules and regulations shall be taken care by the Inspection Agency. BHEL shall not be held responsible for any injury or damage that is caused to the staff / property during the course of inspection or otherwise.

## **12 INCOME TAX:**

Income tax, as applicable, will be deducted at source at the rate applicable in accordance with statutory guidelines. PAN Number to be furnished along with the offer.

**Signature with Seal of  
Authorized signatory**

**GENERAL GUIDELINES & INSTRUCTIONS TO BIDDERS**  
**FOR SUBMITTING OFFER**

**Vendors are requested to read the following points / guidelines / instructions and ensure that the offer is prepared and submitted strictly as per the requirements. Offers with insufficient details would not be considered for evaluation. The following points / guidelines / instructions are part and parcel of the tender and non-compliance will result in rejection of offer.**

**1.0 QUOTATIONS for *Outsourcing of EDDY CURRENT TESTING OF ASSEMBLED INCOLOY-800 'U' TUBES OF 700MW NUCLEAR STEAM GENERATORS AT BHEL, TRICHY***

Considering the nature of contract which requires a good amount of technical details, etc., to be submitted along with the offer as well as the confidentiality required to be maintained during the offer evaluation process, bidders are requested to submit their offers only through sealed bids. As the part II (the price bid) would not be opened before the Part I technical bid evaluation is completed, bidders are requested not to submit their bids through email / fax etc.

Bidders shall submit the offer in **TWO INNER ENVELOPES** as indicated below which shall be sealed in one outer envelope.

**Envelope I.** This sealed envelope should contain Technical & Un-priced Commercial Bid with document evidences for 1) Organisation Chart, 2) Previous experience in NDE related activities. 3) Satisfactory acceptance to our tender specification as mentioned in pages 2-7 and ANNEXURE-I in pages 8-12 and sign off by authorised signatory for this in pages 7 and 12, 4) Compliance to Technical Bid Qualifying Criteria duly filled with bidder's responses & signed (on page 16) as given in the enclosed **ANNEXURE-A** along with relevant documentary evidences, 5) Annual Turnover, Balance Sheet for the last 3 years and 6) EMD of Rs. 1,50,000/- as detailed. This envelope should be clearly marked "**Part I - Technical and Un-priced commercial bid**", indicating Enquiry No., *Outsourcing of EDDY CURRENT TESTING OF ASSEMBLED INCOLOY-800 'U' TUBES OF 700MW NUCLEAR STEAM GENERATORS AT BHEL, TRICHY*, Due Date, Address and Reference of the Bidder.

**Envelope II.** This sealed envelope should contain **price details**, duly filled and signed as per **ANNEXURE-B** (page 17) in inspection agency's letter head. This envelope should be clearly marked "**Part II - Price bid**", indicating Enquiry No., *Outsourcing of EDDY CURRENT TESTING OF ASSEMBLED INCOLOY-800 'U' TUBES OF 700MW NUCLEAR STEAM GENERATORS AT BHEL, TRICHY*, Due Date, Address & Reference of the Bidder

Both the envelopes I & II shall be put in one cover, duly sealed, super scribing as Part I and Part II indicating Enquiry No., *Outsourcing of EDDY CURRENT TESTING OF ASSEMBLED INCOLOY-800 'U' TUBES OF 700MW NUCLEAR STEAM GENERATORS AT BHEL, TRICHY*, Due Date, Address & Reference of the Bidder.

The above tender (envelope containing Part I & II) should reach this office on or before the due date and time. Tenders received after due date and time will not be considered for evaluation. Tender should not be addressed to Individual's name but only by designation to:

**AGM / NDTL, Building No-1,  
BHARAT HEAVY ELECTRICALS LIMITED  
HIGH PRESSURE BOILER PLANT  
TIRUCHIRAPALLI – 620 014  
TAMIL NADU, INDIA**

Tenders should be free from **CORRECTION AND ERASURES**, Corrections if any, must be attested. All amounts shall be indicated both in words as well as in figures. Where there is difference between amount quoted in words and figures, amount quoted in words shall prevail.

Tenders should be in **ENGLISH** and accompanied by detailed technical literature, catalogue and detailed dimensional drawings in **ENGLISH** or otherwise, the tenders will not be considered for evaluation.

BHEL reserves the right to reject any offer without assigning any reason and also enter into contract with more than one Inspection Agency by sharing each work centre depending upon the quantum of work.

**If the past performance of a vendor in any of the previous Purchase orders/contracts/in any projects, of BHEL Units, and NON-BHEL, is not satisfactory BHEL then reserves the full right to reject such offers of those vendors straightaway irrespective of their suitability and will not be considered for further processing of the tender.**

## **2.0 Guidelines for PART I (TECHNICAL & UN-PRICED COMMERCIAL BID)**

### **2.1 Technical**

This part shall include / indicate the following:

2.1.1	Tenders should contain complete scope of supply with all technical details, specifications and other commercial terms and conditions. Point by point confirmation for the Technical Specification and Qualifying Criteria shall be provided.
2.1.2	If there are any deviations, the same should be clearly specified. Tenders received without confirmation to our specification will be rejected.
2.1.3	The contract is for a period till successful completion of work. Approximate quantum of ECT will be as per " <b>ANNEXURE-B</b> ". There may be a variation in the estimated value of contract depending upon the production plan variation that may arise then and there. BHEL does not guarantee for the quantum of work
2.1.4	Inspection Agency have to ensure that his workmen are covered under PF, ESI and miscellaneous provisions act of <b>1952</b> and accordingly produce documents to BHEL management, the registration/ Enrolment number before awarding of contract work. As per the provisions, every employee employed in or in connection with the work of Factory or other establishment who has not become a member already shall also be entitled and required to become a member of the fund from the date he is employed by the contractor. The employee's contribution is as notified by the PF Authority from time-to-time. The employee's contribution will be recovered by the contractor from the wages of his workmen and the contractor should make equal contribution.

## 2.2 Un-Priced Commercial BID

This part shall include / indicate the following:

2.2.1	The testing rates should be quoted as detailed in Scope of work.
2.2.2	<b>Fixed price:</b> Prices quoted by the bidder shall be fixed and not subject to any escalation whatsoever during the period of bid validity and execution of the Purchase Order. A bid submitted with an adjustable price will be treated as non-responsive and rejected. Prices shall be written in words and figures. In the event of difference, the price written in words shall be valid and binding
2.2.3	The contractors are requested to offer 'QUOTATION' enclosing a crossed demand draft in favour of BHARAT HEAVY ELECTRICALS LIMITED for <b>Rs.1,50,000/-</b> (Rupees One Lakh AND Fifty only) towards <b>Earnest Money deposit.</b>

## 3.0 OPENING OF TENDERS

The Part I - Technical & Un-priced commercial bid alone would be opened on the Tender opening date.

The Part II – The Part I would be evaluated and bidders qualifying alone will be considered for further processing. During this process, either direct meeting with contractors at BHEL, Trichy or at contractor works (which include a comprehensive technical audit on contractor's capability) may be performed at the discretion of BHEL and for which contractor is expected to give his acceptance. After selection of technically accepted bidders, BHEL would proceed with Reverse Auction route or Price Bid opening route for finalizing the party, which would be intimated to the qualified bidders after completion of the techno-commercial evaluation.

**BHEL reserves the right to go for a Reverse Auction (RA)** instead of Opening the Price Bid submitted, which will be decided after the techno-commercial evaluation. Information and general terms and conditions governing RA are given below.

### GENERAL TERMS AND CONDITIONS OF RA

- Against this enquiry for the subject item/system with detailed scope of supply as per enquiry specifications, BHEL may resort to "REVERSE AUCTION PROCEDURE" i.e., ON LINE BIDDING ON INTERNET.
- For the proposed RA, technically and commercially acceptable bidders only shall be eligible to participate.
- In case of RA, BHEL will engage the services of a service provider for conduct of the RA who will provide all necessary training and assistance to the bidders before commencement of on line bidding on internet.
- Business rules governing the RA will be communicated to the bidders through service provider for compliance.
- Vendors have to fax the Compliance form in the prescribed format (provided by Service provider) before start of RA. Without the compliance, the vendor will not be eligible to participate in the event.

- BHEL will provide a sample calculation sheet (in EXCEL format) which would help the bidders to arrive at “Net Cash outflow to BHEL” considering various price / cost elements like Packing & forwarding charges, Taxes and Duties, Freight charges, Insurance, Service Tax for Services and loading factors (for non-compliance to BHEL standard Commercial terms & conditions) etc. for each of the bidders to enable them to arrive at “Net Cash outflow to BHEL” which is the amount the bidder would be bidding during the RA.
- RA will be conducted on scheduled date & time and at the end of event, the lowest bidder value will be known on the network.
- The lowest bidder has to Fax the duly signed “Price Break-up” in prescribed format as provided on case-to-case basis to BHEL through Service provider within 24 hours of Auction without fail.
- Any variation between the on-line bid value and the signed document will be considered as sabotaging the tender process and will invite disqualification of vendor to conduct further business with BHEL, as per the prevailing procedure.
- BHEL reserves the right to negotiate if needed with the “L1” vendor of the Reverse Auction

<b>4.0</b>	<b>GENERAL</b>
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BHEL reserves its right to reject a vendor due to unsatisfactory past performance in the execution of a contract at any of BHEL projects / Units.

BHEL shall be at liberty to reject or accept any tender, part or in full, at their own discretion and any such action is not liable for any question or claim against BHEL.

The correspondence exchanged against the tender between the bidder and BHEL through email are considered as valid document legally though it is not signed. It is treated as valid confirmations made on behalf of the respective company and very much comes under the legal ambit of the business transaction and hence it is binding on both the parties to the business.

Any transaction / communication pertaining to the tender carried out by the bidder and BHEL round the clock irrespective of the office or business hours of the companies, are valid legally and binding on both the parties. This applies to the extent only in such cases where deadline time for transaction is not specifically declared by either or both the parties to the business.

In case Letter of Intent (LoI) is issued through email, the computer generated time and date of mail shall be construed as the official time and date of release of LoI. In as much as this date is within the last date of validity given by the bidder the LoI is said to have been issued within the validity period and shall be binding on both the parties to the business.

**Bidders participating in the tender should declare in their technical bid that whether they have been black-listed / kept on hold for a specified period / given Business holiday for a specified period by any Public sector undertaking or Government departments. The reasons for such action with details and the current status of such hold shall be clearly furnished to BHEL. If no such details are mentioned in the offer then it will be construed that the subject bidder is not under any such hold. But at a later date if it comes to the notice of BHEL about any such hold under enforcement on the subject bidder, BHEL will have every right to reject the offer of such vendors at**

any point of time and also under any stage of the finalisation of the subject tender irrespective of the status of the subject bidder in that tender. Such bidders will not be permitted to participate in the further tender proceedings and will be communicated suitably. They will not be also considered for any ongoing enquiries even if participated till the hold is officially lifted and confirmed in writing.

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**Signature with Seal of  
Authorized signatory**

TECHNICAL BID QUALIFYING CRITERIA

ENQUIRY.NO: BHE: Q: NDT: ATP: ECT: 001 DATED: 30/07/2015

S.NO	TECHNICAL CRITERIA	BIDDERS RESPONSE
1	<p>The bidder shall have minimum 5 years of work experience in the field of eddy current testing of straight tubes / 'U' tubes / coiled tubes or tubular parts of any engineering configuration of various tube size ranges (OD, ID and thickness) covering tube materials like monel, stainless steel, carbon steel, alloy steel, Inconel / incoloy, titanium, or any other tube materials accepted by International codes used in heat exchangers or steam generators or similar equipment. The experience shall be in the eddy current testing with tube manufactures (for their tubes manufacturing stages) or with equipment (heat exchanger / steam generator / condenser / etc) manufactures as a part of post manufacturing / pre-service examination of assembled tubes or with ultimate users of the equipment at sites during shut downs as a part of in-service examination of tubes. The complete work shall have been handled in this aspect which includes, preparation of procedures as per code or specification given by the customer, performance of equipment and method of calibration after making necessary reference specimens, performance of tests and generation of reports and due acceptance of such reports by the customers. As a minimum, the bidder shall establish documentary evidences for having performed eddy current testing as per ASME Section V Article 8 or equivalent international Codes or superior level requirements using trained, Qualified and Certified personnel (NDE Level II/ Level III in eddy current testing as per ASNT's SNT-TC-1A or any other equivalent training and certification programmes). Complete set of evidences to support this shall be included as part of offer to get clear details on experience of bidders in eddy current testing expressed in terms of time periods, their capability on procedures preparation and handling the same for approval by customers, their capability on calibration, test performance and report generation. Also, evidences in the form of purchase orders placed by the customers, completion certificates issued by customers, etc shall be enclosed.</p>	
2	<p>Out of this 5 years of experience, as a minimum, the bidder shall have performed complete eddy current testing - starting from procedure preparation, references augmentation for calibration, calibration, test performance and up to test report generation - for 1000 numbers of Incoloy-800 'U' tubes for 235MW or 500MW or 700MW Nuclear Steam Generators of NPCIL (Pressurised Heavy Water Type SGs) in assembled condition either at steam generator manufacturer's works as part of pre-service examination or at NPCIL sites during shut downs as part of in-service examination. In case, if this specific experience with Nuclear Steam generator testing is not fulfilled, alternately, the bidder shall have handled eddy current testing of minimum 1000 numbers of U tubes in the assembled condition in any one of the heat exchangers / condensers / similar equipments made for NPCIL where the tubes are of : Inner diameter range 20mm and lower, thickness range 0.6mm to 2 mm, with developed length of 'U' tubes 15 metres and above covering a shortest bend radii of as low as 100 mm, with tube materials like monel, stainless steel, carbon steel, alloy steel, Inconel / incoloy, titanium, or any other tube materials accepted by</p>	

	<p>International codes. In this 1000 tubes experience part, the bidders are requested to mention about the names of equipments / probes and facilities handled for tubes testing which shall also mandatorily include whether the equipments / probes / facilities are of bidder's own property or NPCIL's property but given to bidder. If any technical dissatisfaction is surfaced on this as doubts, the bidder is likely to get disqualified. Also, solid supporting documentary evidences in this regard mentioning the tubes quantity handled, procedures followed along with its code back up, reports generated, customer's endorsement shall be attached.</p>	
<b>3</b>	<p>The bidder shall have the capability to perform specific test calibration exclusively for straight and bend portion of the 'U' tubes separately to the satisfaction of NPCIL. Tests shall have been performed for straight and bend portions of the tubes by inserting the probes into the tubes from one end either by manual pushing or automatic pushing but maintaining the scanning speed at a reasonably constant level. (for example pusher-puller system: constant pulling speed shall be approx. 300mm/sec). Higher pulling speeds may be used provided the Eddy Current Tester is proven to be capable of faithful data acquisition – probe excitation and data recording at the higher speed employed. Vendor shall be competent to precisely inspect the curved region of the U- tubes, to the satisfaction of NPCIL. Repeatability of signals from real and simulated flaws of references from straight and bend portions shall have been established multiple times by inserting and with drawing of the probes in the shortest radius bend and also on longest developed length tube. Detailed reports supporting this shall be included in the offer. If needed, as a part of technical evaluation, this may have to be demonstrated to the NDE-Level III in eddy current testing of BHEL and / or authorized ultimate customer officials who are having expertise in the field</p>	
<b>4</b>	<p>The probes shall be durable and the insertion shall be smooth following the track of the shortest radius bend without affecting relevant signals. The probes and equipment shall have been purchased from reputed original equipment suppliers and are of state of the art ones. The bidders are requested to provide the complete details of the probes, cables and equipment envisaged for BHEL's work which include the names of the probe / equipment suppliers. If any doubts are sought by BHEL on this, it shall be furnished by the bidder and if BHEL is not getting satisfied on the capability with regard to this point, then the bidder will get disqualified. As calibration references are to be made by the bidder from the bend and straight tubes given by BHEL, bidder shall mention the cycle time required for making such reference specimens, sub-vendor sources and their capability / facility for making the references, type and numbers of calibration references to cover both straight and bent parts separately (covering minimum to maximum radii bends and the full developed length of straight and bend portions). Bidder shall give complete documentary evidences based on earlier works handled</p>	
<b>5</b>	<p>Evidence for at least one repeat order from the same customer group shall be furnished in order to gain confidence on capability. Evidence in the form of purchase order or completion certificate of customer or invoice for a similar assignment will serve this purpose. In case repeat order could not be established, the bidder shall have to furnish the complete contact details of customer authorities (Name, designation, address, e-mail and phone) so that BHEL would directly contact them and seek the needed clarifications about the bidders' capability.</p>	

6	<p>BHEL would like to have a professional handling of the work by the bidder. So, a team of qualified people in the level of NDE-Level II / III in eddy current testing shall be required for executing the work from the bidder's side. The bidder shall be in a position to arrange for a minimum of 2 crews for simultaneous handling of the execution work. Also, permanent availability of a senior person as NDE-Level III in eddy current testing shall be planned for interpretation of results, dealing with the customer, monitoring of progress so that timely completion would be achieved, etc during the work execution. In addition, the requirement of an experienced Level III shall be planned for writing the procedure, planning the sequence of work, finalizing references for calibration, finalizing the report format, finalization of NPCIL compatible signal replay system for future needs, etc. As an evidence for this point, the bidder shall provide complete details of qualified crew planned for this work</p>	
7	<p>BHEL has the right to interview the candidates planned for this work either through a Level III in Eddy current testing and / or through NPCIL's authorized expert in the field. Also, if required, to assess the technical capability of the bidder, meeting would be called up by BHEL and it may take place either at BHEL or at supplier's works. The supplier shall agree for this within a short notice period. BHEL reserves the right to disqualify the vendor during this event, in case of dissatisfaction</p>	
8	<p>Bidder shall submit an undertaking that the team of ECT allotted (based on acceptance by BHEL) for this proposed work at BHEL will be made available throughout the contact period (for all the eight SGs which may span over a period of two years from the start of ECT for the first SG). In the event of any personnel getting changed by the bidder during the contract period due to transfer, resignation or retirement, contractor shall furnish advance intimation to BHEL and shall confirm that a suitable substitute personnel is deployed in his / her place and this substituted person meets all the qualification/experience/knowledge criteria to the satisfaction of BHEL. This will be assessed as per clause 7. Any delay in work due to non-availability of approved personnel from vendor side attract a penalty of 1 % of contract value per week delayed.</p>	
9	<p>The bidder's experience shall clearly demonstrate the capability for performing a minimum of 150 tubes' eddy current testing in a single shift operation and this shall be proved based on a documentary evidence of earlier similar work completed. Also, the bidder shall agree for 2 shift or round the clock operation using multiple crew in order to complete ECT of one SG in a reasonable time period of 10-12 days (which includes report generation and obtaining reports sign off by NPCIL).</p>	
10	<p>Also, the bidder shall provide documentary evidence or customer's certificate for their capability to submit the test results in such a suitable form which will be further analysed and processed by the NPCIL's data processing systems / soft wares during the subsequent in-service examinations handled by NPCIL at sites during periodic shut downs</p>	
11	<p>The ECT raw Data recordings of all the tubes along with the calibration Tube data recordings, in the same sequence as recorded during the actual job, shall have to be provided to BHEL / NPCIL in suitable permanent / Non-volatile storage media (eg. CD/DVD) - 3 copies (1-BHEL, 2-NPCIL HQ, 3-NPCIL Station) for future reference / playback</p>	

	during the routine In Service Inspection campaigns of NPCIL. - this is in addition to the hardcopy paper report as submitted for the ECT job undertaken (any loss of data needs to be re-recorded hence it is advisable that a daily data backup of ECT Raw data recorded, from ECT Machine may be followed as a good practice). The supplier shall enclose suitable evidence complying to this requirement furnished to the earlier customer	
<b>12</b>	In this case of New 'U' tubes being inspected by Eddy Current Testing (after hydraulic testing) before putting the SG into operation, we do not anticipate any degradation type of indications from the ECT being performed from ID. However the ECT being performed is as per ASME Section V which primarily aims towards OD defects observed in the tubes. In case ID type of indications are observed, a separate Calibration Standard incorporating the variety of Tube thinning from ID (say 10%, 20%, 40%, 60%, 80% notches from Tue ID ) may need to be developed to satisfy NPCIL. Hence readiness for the same may have to be planned by the contractor. The contractor's experience in this regard in earlier completed works shall be attached in the form of sample reports along with offer	

**Signature with Seal of  
Authorized signatory**

PART – II: PRICE BID

ENQUIRY.NO: BHE: Q: NDT: ATP: ECT: 001 DATED: 30/07/2015

S.NO	ITEM DESCRIPTION	APPROXIMATE WORK LOAD	RATE /U-TUBE
1	EDDY CURRENT TESTING OF ABOUT 21000 TUBES IN 8 STEAM GENERATORS(BOTH STRAIGHT AND BEND PORTION)	21,000 U TUBES	

The Quoted rates are exclusive of service taxes and duties. For Service Tax, Service Tax Registration Number is required.

**Signature with Seal of  
Authorized signatory**

- **Note:** The above details shall be submitted in Letter Head by Quoting the Rate