



An ISO 9001  
Company

## Bharat Heavy Electricals Limited

(High Pressure Boiler Plant)

Tiruchirapalli – 620014, TAMIL NADU, INDIA

MATERIALS MANAGEMENT / CAPITAL EQUIPMENT

<b>ENQUIRY NOTICE INVITING TENDER</b>	Phone: +91 431 257 7653 Fax : +91 431 252 0719 Email : <a href="mailto:skaruna@bheltry.co.in">skaruna@bheltry.co.in</a> Web : <a href="http://www.bhel.com">www.bhel.com</a>
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<b>TWO PART BID</b>  Tender to be submitted in Two Parts	<b>Enquiry Number:</b>  2731200005	<b>Enquiry Date:</b>  dt.24.10.2012	<b>Due date for submission of quotation</b>  dt.23.11.2012
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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 No.	Item Description	Quantity
10	Supply , Installation and commissioning of 225 KV constant Potential X-ray equipment per the Technical Specification, & Commercial Conditions applicable (to be downloaded from web site <a href="http://www.bhel.com">www.bhel.com</a> or <a href="http://tenders.gov.in">http://tenders.gov.in</a> )	01 No.

### Important Points to be taken care during the submission of offer:-

1. Check list to be filled and enclosed along with the offer failing which, the offer will not be considered for evaluation.
2. Guarantee for the Items to be 18 months from the date of supply or 12 months from the date of commissioning.
3. The Price for AMC Portion as per the technical specification should be given in a separate sealed cover.

BHEL's General guidelines /instructions including bank guarantee formats and list of consortium banks, commercial terms checklist 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) Tender Enquiry reference "2731200005"

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  Engineer / MM / Capital Equipment
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## PART A

### **QUALIFYING CRITERIA FOR THE SUPPLY OF 225Kv X-Ray Equipment**

S. No.	PARTICULARS	VENDOR's RESPONSE
<b>1.0</b>	Number of Years of Experience of the BIDDER/ VENDOR in the field of design, manufacture and supply of 225Kv X-Ray Equipment	
<b>2.0</b>	YEAR of LAUNCH of the Model quoted against this ENQUIRY	
<b>3.0</b>	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	
<b>4.0</b>	Number of 225Kv X-Ray Equipments supplied, installed and commissioned till date, in the QUOTED MODEL	
<b>5.0</b>	Number of 225Kv X-Ray Equipments supplied, installed and commissioned till date for the following category of CUSTOMERS (within INDIA): a) Government Organisations b) Private Sector Companies [Large Scale Industries]	
<b>6.0</b>	Number of 225Kv X-Ray Equipments 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	
<b>7.0</b>	Details of Design Set-Up and Technology Back-Up assured for the PRINCIPAL Equipment Maker	
<b>8.0</b>	Details on International Standards followed in Design of the System	
<b>9.0</b>	Comprehensive Details on Performance Testing - of the Equipment quoted, to be ensured in presence of BHEL Executives, prior to dispatch from Supplier's Works	
<b>10.0</b>	Details of Quality System followed (Kindly furnish the salient aspects of the QA system followed)	
<b>11.0</b>	Details on SERVICE-after-SALES Set-Up in India including the addresses of Agents/Service Centres in India and Asia	
<b>12.0</b>	Any Additional Data to supplement the manufacturing capability of the BIDDER	

### SECTION – II

The BIDDER / VENDOR has to compulsorily meet the following requirements to get qualified for submitting an offer for the Optical Vacuum Spectrometer.

<b>S. No.</b>	<b>REQUIREMENTS</b>	<b>VENDOR's COMMENTS</b>
<b>13.0</b>	The BIDDER / VENDOR shall have a minimum of FIVE Years of Continuous Experience in the Design, Manufacture of 225Kv X-Ray Equipment SYSTEMs. Indicate the actual experience.	
<b>14.0</b>	The BIDDER / VENDOR shall have supplied at least one number of 225Kv X-Ray Equipment system within the last five years. Indicate the number of equipment (of QUOTED MODEL) sold in India & Other Countries.	
<b>15.0</b>	Reference List of Customers and Performance Certificate from CUSTOMERS (minimum 2 Customers) with full contact details of CONTACT PERSON.	

### **SECTION – III**

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

<b>S.No.</b>	<b>REQUIREMENTS</b>	<b>VENDOR's COMPLIANCE</b>
<b>16.0</b>	The BIDDER / VENDOR shall submit the offer in TWO PARTS - Technical [ <b>with PART A &amp; PART B</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.	
<b>17.0</b>	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.	
<b>18.0</b>	The BIDDER / VENDOR shall assure a continuous support for SPARES and SERVICE for four Years, from the date of commissioning of the equipment at BHEL Works.	
<b>19.0</b>	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	
<b>20.0</b>	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.	
<b>21.0</b>	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-Technical Specification of 225kV Constant Potential X-Ray equipment

Sl. No.	PARTICULARS	BHEL SPECIFICATIONS	BIDDER's OFFER [with Complete Technical Details]
1.0	Area of Application	225 kV Constant potential X-Ray system is used as a Radiation source for inspection of weld joints in Boiler components and Advanced Technology Products. Thickness (in Steel or equivalent) of the weld joints to be tested ranges from 5mm to 40mm and the techniques used are Single Wall Single Image (SWSI), Double Wall Double Image (DWDI), Double Wall Single Image (DWSI) and Panoramic.	
2.0	Principle of Operation	225 kV constant potential X-Ray equipment is the Radiation source which generates continuous X- rays by bombardment of high speed electrons on high atomic number Target (Tungsten) and it will have 100% duty cycle.	
3.0	Design Base	Constant potential Bi polar metal ceramic X ray tube with capacity 225kV/10mA (by varying potential difference across the electrodes (30 kV to 225 kV) with varying tube current 0 to 10 mA High frequency: 40 kHz output for stability, low ripple and better sensitivity.	
4.0	Equipment Configuration	The minimum desired features are enlisted below	
5.1	Operating Parameters	<b>Tube voltage:</b> Minimum 30 kV to 225kV(Variable insteps of atleast 1 kV).Accuracy $\pm 2\%$ <b>Tube Current</b> Minimum 0.5 mA to 10mA (Variable in steps of 0.1mA). Accuracy $\pm 2\%$	
5.2	Focal Spot	Dual focal spot preferable (with large focus $\leq 1.8$ and mini focus $\leq 0.8$ ) as per IEC 336	
5.3	Tube current	To be specified by supplier for large focus and mini focus at 225kV.	
5.4	Exposure Timer	Digital display: preferably 1 Second, in steps up to 60minutes	
5.5	Pre warning	Preferably 1 to 30 seconds	
5.6	Programmed operation	Supplier to specify the details of programmed operations-No.of programs which can be stored.	
5.7	Inherent filter	Preferably Beryllium filters. Supplier to specify	

<b>5.8</b>	High voltage connections	Two plugs socket with locking lever and safety features, to be specified by the bidder.	
<b>5.9</b>	High Voltage cables	High Voltage cables to have Anode and Cathode connections with 10 meters in length, both ends Rubber cone covered plugs.	
<b>5.10</b>	Dose out-put with inherent filter	Supplier to specify	
<b>5.11</b>	Dose-Rate	InSv/min (R/ min) (or Micro Sv/min) at 1 M with and without filter - Supplier to specify at Max KV	
<b>5.12</b>	Leakage level radiation (at full load)	Shall not exceed 1R / 1Hour /1metre from focal spot.	
<b>5.13</b>	Control Unit	Digital Control Unit containing Power Module, Control Module [with clear text in English], Control Cabinet [with table top], Standard Operating Programs, Inter- Connecting Cables [with length of approximately 20 meters], Control Unit Lock & Key, etc.	
<b>5.14</b>	Cooling Unit	a. Heat Exchanger Type Cooling Unit with suitable rating and efficient coolant pump, to meet the peak-load operational requirements. b. The unit shall have the in-built warning system for unit failure, low level of coolant, lack of flow, leakage, etc. and connected with the tripping mechanism of the main equipment. c. BIDDER to furnish complete details on the Cooling System with Accessories provided and to list down Essential Spares like Cooling Fans, pair of Coolant Circulation ,Hoses with end connectors, etc.	
<b>5.15</b>	Flash Lamp	A Warning Flash Lamp with fail-proof safety circuit shall be supplied with 20-meter long cable.	
<b>5.16</b>	Tripod stand	Tripod stand (Sturdy) for mounting X ray head, height adjustable arrangements with spirit level indicator.	
<b>6.0</b>	Weight	For X-Ray Tube(head) weight shall be $\leq 30$ kg preferably For X-Ray control panel weight shall be $\leq 15$ kg preferably. Supplier to specify the exact weight of the X-Ray tube(head) and Control panel	
<b>7.0</b>	Safety interlocks	Built in safety interlocks to switch off the system in case of emergency and safety with door interlocks.	

7.1	Input Electric Power Supply	<p>a. BHEL will provide Electric Input Power Supply at ONE POINT only, With 230 ± 10 % V, 50 Hz, Single Phase AC through a 3 wire system [Phase, Neutral &amp; Protective Earthing].</p> <p style="text-align: center;"><b>OR</b></p> <p>With 415 ± 10 % V, 50 Hz, Three Phase AC through a 3 wire system [No Neutral Conductor, 4<sup>th</sup> wire for Protective Earthing].</p> <p>b. BIDDER to take supply from this SINGLE Point to all the sub-systems of the equipment through proper step-up or step-down transformers. Supplier to Specify.</p>	
7.2	Ambient Condition	<p>a. The uncontrolled ambient room conditions are :</p> <p>1) Temp: 18 to 45° C 2) Relative Humidity : 45 to 85 %</p> <p>b. BIDDER to specify the atmospheric conditions, as the working environment for the OFFERED Equipment to deliver precise results and serve for a prescribed life of the Equipment.</p>	
7.3	Accessories	<p>BIDDER to list down (with UNIT RATE) the various ACCESSORIES to be procured with the EQUIPMENT to enhance the Operating Efficiency and Features of the OFFERED EQUIPMENT, over and above those mentioned in the SPECIFICATIONS.</p>	
7.4	Safety and Quality Standards	<p>a. Supplier to ensure Safety and Quality of X-Ray System, which shall conform to International Standards.</p> <p>b. Conformance certificate to be given along with the equipment</p>	
8.0	Scope of supply	<p>Total Number of X-Ray systems-1 Number.</p> <p>Following shall be supplied compulsorily with the each system :</p> <ol style="list-style-type: none"> <li>1. X ray head as per BHEL specifications-</li> <li>2. High voltage Generators</li> <li>3. High Voltage Cables: 1 pair.</li> <li>4. Power connection cables :</li> <li>5. Digital Control unit</li> <li>6. Cooling system: <ol style="list-style-type: none"> <li>7. Warning flash lamp</li> <li>8. Tripod stand (Sturdy) for mounting X ray head, height adjustable</li> </ol> </li> </ol>	

		<p>arrangements with spirit level indicator.</p> <p>9. Service tool kit</p> <p>10. Necessary Standard/Certificate traceable to National/International Standard.</p> <p>11. Optional/Compulsory Accessories</p> <p>12.Spares 1)High Voltage Cables for 225kV - 1 Pair  2) All types of PCBs for X-Ray Control System-1Set  3) Critical Spares for X-Ray Head and HT transformers-1 set  4) HT Generator-1Set  5) All Signal Cables - 1 No. each  6)All Fuses – 3 Sets  7)If the system is through programmable microprocessor/Microcontroller based, pre-programmed IC should be given as spare  8) 500 grams of HT grease(consumable item)</p> <p>13. Inspection at Supplier’s Works &amp; Training</p> <p>14.Installation, Commissioning &amp; Performance Prove-Out and Training on Operation, Trouble Shooting &amp; Maintenance</p> <p>15. Documentation: Testing &amp; Calibration Certificates, O &amp;M manuals. Service manuals -It should contain complete technical specification of each component, part number, complete electrical drawing and control modules circuitry drawing and PCB circuit diagrams). Exploded view of the generators, X-ray head and other modules should be provided.</p> <p>16. Three nos. hard copies and 1 no. soft copy(in CD) of both O&amp;M and service manuals should be handed over to BHEL.</p> <p>17. Radiation Zone monitor (Wall mountable) 1No.</p> <p>18. Survey meters Ionisation chamber type with range 0-50 R/hr or 0-10 R/Hr -2 No.s</p> <p>19.Exposure chart for Radiography for Steel material</p>	
<b>9.0</b>	Consumables for Main Equipment & Accessories	BIDDER has to list down the CONSUMABLES to be used in the Operation of the Equipment and QUOTE with UNIT RATE for all the listed consumables, to be procured with the equipment.	

<b>10.0</b>	Spares for Main Equipment & Accessories	<p>a. BIDDER has to list down the SPARES under Mechanical, Electrical &amp; Electronic Category for the Main Equipment &amp; Accessories for Equipment Operation in 3 shifts a day and for 365 days in a year.ie, the Spares required for normal running of the system for a period of at least 2 years.</p> <p>b. BIDDER has to compulsorily quote for the following Spares with the TECHNICAL OFFER:</p> <ol style="list-style-type: none"> <li>1) High Voltage Cables for 225kV - 1 Pair</li> <li>2) All types of PCBs for X-Ray Control System-1Set</li> <li>3) Critical Spares for X-Ray Head and HT Transformer-1Set</li> <li>4)HT Generator-1Set</li> <li>5) All Signal Cables - 1 No. each</li> <li>6) All Fuses – 3 Sets.</li> <li>7) If the system is through programmable microprocessor/Microcontroller based, pre-programmed IC should be given as spare</li> <li>8) 500 grams of HT grease(consumable item)</li> <li>9) Equipment Control panel key pad-1 No.</li> </ol> <p>c) Other than the mentioned spares, suppliers shall specify and supply the recommended spares for the maintenance of the X-ray machine for atleast 2 years.</p>	
<b>11.0</b>	Type Approval	Supplier needs to furnish the type approval copy as approved by AERB/ Mumbai (Atomic Energy Regulatory Board).	

12.0	Other conditions	<ul style="list-style-type: none"> <li>a) Supplier should give spares support for minimum 10 years from the PO placing. If the Bidder is not an OEM, bidder shall have back-to-back agreement with the OEM to provide service and spare support for at least 10 years for the offered solution. Bidder shall give an undertaking to provide the agreement on award of contract.</li> <li>b) The OEM should have support infrastructure in spares for the OEM components stocking, Technical support and logistics in India to provide quick after sales support. Specify the OEM Spares logistics locations in India with address.</li> <li>c) For the bought out items, supplier shall specify the part numbers, complete specification, contact address details with e-mail id and contact numbers.</li> <li>d) Supplier shall quote the AMC rate for 4 years preventive and breakdown maintenance after the warranty period.</li> <li>e) Supplier shall supply the test kit and special tools for troubleshooting of the total system</li> <li>f) Online trouble shooting techniques and fault diagnosis provision should be provided and error code should be provided online. Detailed explanation for the error codes should be given.</li> <li>g) Special trolley for handling the x-ray head and generators for maintenance purpose should be provided.</li> </ul>	
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