

BHARAT HEAVY ELECTRICALS LIMITED, RAMACHANDRAPURAM			Enquiry No. :		
UNIT'S ADDRESS:			Due Date :		
UNIT'S PHONE NOS.			Supplier Qtn. No.:		
CONTACT PERSON'S NAME/DESIGN./PHONE NO./E-MAIL (FROM PURCHASE DEP'T.)			Date :		
SPECIFICATION CUM COMPLIANCE CERTIFICATE FOR 300kV Industrial X-ray equipment with control unit, Accessories & Spares					
NOTE:					
1. Vendor must submit complete information against Clause Nos. 16. The offer meeting these clauses would only be processed.					
2. Inadequate / incomplete, ambiguous, or unsustainable information against any of the clauses of the specifications/requirements shall be treated as non-compliance					
3. The offer and all documents enclosed with offer should be in English language only					
ADDRESS OF THE SUPPLIER :			Address of the Indian Agents:		
TELEPHONE NOS.:			TELEPHONE NOS.:		
FAX NOS.:			FAX NOS.:		
E-MAIL ADDRESS :			E-MAIL ADDRESS :		
S.No.	Description for BHEL Requirement	REQUIRED	OFFERED	DEVIATIONS	REMARKS
1.0	Purpose:				
1.1	For Industrial X-Ray Radiography of materials and welded structures , with thickness ranging from 2 mm to 40 mm steel equivalent meeting the sensitivity and density requirement of ASME Sev V.	Vendor to confirm			
2.0	Principle of operation:				
2.1	300 kV constant potential X-Ray equipment is used as Radiation source for film radiography.It gennerates X-Rays by bombardment of high speed electrons on a high atomic number Target (Anode). ☐	Vendor to confirm			
3.0	Design base:				
3.1	Portable and directional X-Ray generator with a ceramic tubehead with capacity 300 kV/ 5mA [by varying potential difference across the electrodes (100 kV to 300 kV) with varying tube current 0.5 mA-5mA]	Vendor to confirm			
3.2	Weight of the Tube Head should be around 40Kg,to ensure portability.	Vendor to confirm			
4.0	Equipment Configuration				
4.1	Operating Parameters: Tube voltage range: Minimum 100 kV to 300 kV (minmum steps of 1 kV) Tube Current range: Minimum 0.5 mA to 5mA (minmum steps of 0.1 mA)	Vendor to confirm			
4.2	Focal spot shall not be more than 3X3 mm as per EN 12543/ ASTM E1165 or any equivalent standard.	Vendor to confirm			

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4.3	Emergent Beam angle should be at least 30°	Vendor to confirm			
4.4	(i) The equipment shall have the provision for giving a minimum exposure time from 1 sec to 10 sec. (ii) The equipment shall have the provision for giving a maximum exposure time up to 60 minutes or more. However the equipment shall have suitable arrangements to set the exposure time as per above requirements.	Vendor to confirm			
4.5	Automatic preheating mechanism to be indicated	Vendor to furnish details			
4.6	Memories (Storing Previous exposure data)	Vendor to furnish details			
4.7	Inherent filter [Beryllium (Be) or any other suitable metal]	Vendor to furnish details			
4.8	High voltage connections: Two plugs socket with locking lever and safety features, to be specified by the bidder.	Vendor to furnish details			
4.9	Cables: Main Cable((For power supply) should be of at least 10 m length and Connecting Cable (Between control panel and Tubehead) Should be at least 20 m length.	Vendor to confirm			
4.10	Control Unit: a. Digital Control Unit containing Power Module, Control Module [with clear text in English],Control Cabinet [with table top], Standard Operating Programs. b. Control Unit Lock Key, Emergency Stop Button. c. Display must be LCD/LED, with RS 232 / Ethernet / USB Interface. d. Provisions for adjusting kV, mA & time e. Provision for recording the exposure parameters and their recollection. Text messages of faults to be displayed for rectification. f. Built in automatic warm-up program. g. Auto-trip facility at higher target loadings & higher target temperatures.	Vendor to confirm			
4.11	Provision for rotation of tube head w.r.t. its axial direction.	Vendor to furnish details			
4.12	A suitably designed four legged Stand with wheels for movement and hieght adjustment of the X-Ray head shall be provided.	Vendor to confirm			

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4.13	Power Supply: Input Power Supply With $230 \pm 10\%$ V, 50 Hz, Single Phase AC through a 3 wire system [Phase, Neutral & Protective Earthing].	Vendor to confirm			
4.14	Ambient Condition: The environment will be a fabrication shop with operating temperature in the range of 0°C to 50°C .	Vendor to confirm			
5.0	Safety Requirements:				
5.1	AERB type approval for the X-ray equipment	Vendor to confirm			
5.2	Leakage radiation levels measured at a distance of 1m at max voltage of 300 kV and max current at that voltage be given. These should be within limits prescribed by Atomic Energy Regulatory Board(AERB).During installation this must be demonstrated.	Vendor to confirm			
5.3	Dose out put with inherent filter for 100 kV,150 kV,200 kV,250 kV & 300kV at 1 m distance from the focal spot	Vendor to furnish details			
5.4	Dose out put without inherent filter for 100 kV,150 kV,200 kV,250 kV & 300kV at 1 m distance from the focal spot	Vendor to furnish details			
5.5	Flash Lamp: A Warning Flash Lamp with fail-proof safety circuit shall be supplied with 20 meter long cable.	Vendor to confirm			
5.6	Safety and Quality Standards: a. Supplier to ensure Safety and Quality of X-Ray System, which shall conform to International Standards. b. Conformance certificate to be given along with the equipment	Vendor to furnish details			
6.0	ACCESSORIES				
6.1	List of accessories to be specified and quoted seperately item wise with break up.	Vendor to furnish details			
7.0	SPARES :				
7.1	One set of Main Cable(Power Supply to Control Pannel) of 10m length and Connecting cable (Control Pannel to Tube Head/Ground cable) of 20 m Length.(To be quoted Separately)	Vendor to furnish details			
7.2	Other standard spares for trouble free operation after guarantee period to be quoted separately giving itemised break up.	Vendor to furnish details			
8.0	INSPECTION : Pre-dispatch inspection at supplier's works by BHEL Engineers.It includes the performance demonstration as per clause no 1.1 and demonstration of safety features.	Vendor to confirm			

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9.0	Erection and commissioning : At BHEL works by qualified Engineers of supplier.	Vendor to confirm			
10.0	PROVE-OUT : The equipment to be proved for its full capacity at BHEL works.It includes the performance demonstration as per clause no 1.1 . The necessary job and films will be supplied by BHEL.	Vendor to confirm			
11.0	TRAINING : Training shall be given for BHEL personnel at BHEL works after commissioning.	Vendor to confirm			
12.0	Gaurantee : 24 months from date of commissioning	Vendor to confirm			
13.0	Service after sales : During and after guarantee period.	Vendor to furnish details			
14.0	DELIVERY in months	Vendor to furnish details			
15.0	DOCUMENTS : 5 Sets of operating and maintenance manuals in English for complete system and general arrangement drawings shall be furnished along with the equipment. Trouble shooting charts to be provided by the supplier. All necessary certificates required by regulatory authorities shall be supplied.	Vendor to furnish details			
16.0	REFERENCE LIST / QUALIFYING CONDITIONS:				
16.1	Only those vendors, who have supplied and commissioned atleast one of same or higher capacity equipment for same application preferably to any Govt. of India organisations/PUS's/Big Engineering enterprises like Larsen & Toubro Ltd,Godrej & Boyce Mfg. Co. Ltd. etc in the past ten years and the same is working satisfactorily for more than one year,as on the date of opening of the tender should quote. However if such equipment(s) has/had been supplied to BHEL ,then such equipment should be presently working satisfactorily for more than one year after its commissioning and acceptance in BHEL,should quote. ☐	Vendor to furnish details			
17.0	The following information should be submitted by the vendor about the companies where similar equipment(s) have been supplied. This is required from all the vendors for qualification of their offer.				
17.1	Name of the customer / company where similar machine is supplied.	Vendor to furnish details			
17.2	Complete postal address of the customer	Vendor to furnish details			
17.3	Date of commissioning.	Vendor to furnish details			
17.4	Performance certificate from the customer	Vendor to furnish details			
17.5	Phone, FAX no. and email address of the contact person of the customer.	Vendor to furnish details			