Bharat Heavy Electricals Limited

(High Pressure Boiler Plant**)**
Tiruchirappalli – 620014, TAMIL NADU, INDIA
An ISO 9001 Company
CAPITAL EQUIPMENT / MATERIALS MANAGEMENT

ENQUIRY	Phone: +91 431 257 76 83 Fax : +91 431 252 07 19 Email : ramado@bheltry.co.in Web : www.bhel.com

	Enquiry Number:	**Enquiry Date:**	**Due date for submission of quotation:**
	2720800019	**01.11.2008**	**04.12.2008**

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

Item	**Description**	**Quantity**	**Delivery (Item required at BHEL on)**
10	Column & Boom Type Submerged Arc welding Machine with Manipulator as per the technical specification & commercial conditions applicable (to be downloaded from web site www.bhel.com or http://tenders.gov.in)	1 No.	30.09.2009

Note: Offer should be
Foreign Bidders: CFR Mumbai Port

Indigenous Vendors:
FOR, BHEL, Stores
Industrial Valves Plant
433, Industrial Complex
Goindwal – 143 423
District: Tarn Taran (Punjab), India

BHEL commercial terms & conditions with Price Bid and Bank Guarantee formats along with technical specifications can be downloaded from BHEL web site http://www.bhel.com or from the Government tender website http://tenders.gov.in (public sector units > Bharat Heavy Electricals Limited page) under Enquiry reference "2720800019".

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 Sr.Manager / MM / Capital Equipment

PART A

Column & Boom Type Sub-Merged Arc Welding Machine With Manipulator

SECTION – I : QUALIFYING CRITERIA

The BIDDER has to compulsorily meet the following requirements to get qualified for considering the technical offer for the Sub-Merged Arc Welding Machine.

S. No.	REQUIREMENTS	Vendor's Response
1	Only those vendors (**OEMs**), who have supplied and commissioned at least two Column and boom type Sub-Merged Arc Welding Machines with manipulators with **1. DC Thyristorised Power source of 500 amps or more and** **2. Tiltable Rotary Table of diameter not less than 750 mm** in the past ten years and such machine should be presently working satisfactorily for a minimum period of one year after commissioning, as on the date of opening of this Tender are eligible to quote. *(However, if such machine is already supplied to BHEL, then that machine should be working satisfactorily for a minimum period of six months after commissioning, as on the date of opening of this Tender.)*	
The vendor should submit the following information where similar machine has been supplied, for qualification of this offer.		
1.1	Name and postal address of the customer or company where similar machine is installed.	
1.2	Name and designation of the contact person of the customer.	
1.3	Phone, FAX no and email address of the contact person of the customer.	
1.4	Month and Year of commissioning of the machine.	
1.5	Parameters of machine supplied, viz. Power source rating, Table diameter and the application for which the machine is supplied.	

1.6	Along with the Technical offer, the Vendor should submit one Performance certificate from the customer for the satisfactory performance of the machine supplied to them. For obtaining the Performance certificate, a suggestive format is provided in **SECTION – IV.**	
2.0	BHEL reserves the right to verify the information provided by vendor. In case the information provided by vendor is found to be false/ incorrect, the offer shall be rejected.	

SECTION – I I

The BIDDER / VENDOR is requested to provide the following information:

S. No.	REQUIREMENTS	Vendor's Response
3.0	The BIDDER/VENDOR to furnish Reference List of Customers, with full address, details of contact person, where Sub-Merged Arc Welding Machines have been supplied in the past.	
4.0	Details of Sub-Merged Arc Welding Machines supplied to other BHEL units, if any. (Year of commissioning, Power source, Table diameter).	
5.0	Details on SERVICE-AFTER-SALES Set-Up in India including the Address of Agents / Service Centers in South India.	
6.0	Any Additional Data to supplement the manufacturing capability of the BIDDER for the subject equipment.	

SECTION – III

The BIDDER to note:

S. No.	PARTICULARS	Vendor's Response
7.0	The BIDDER / VENDOR shall submit the offer in TWO PARTS. 1. Technical Offer [with PART A & PART B] and Commercial offer. 2. Price Bid.	
8.0	The Technical Offer shall contain a comparative statement of Technical **Specifications demanded by BHEL** and **Offer Details submitted by the Bidder**, against each clause. A just 'CONFIRMED' or 'COMPLIED' or 'YES' or 'NO-DEVIATION' or similar words in the technical comparative statement may lead to disqualification of the Technical Offer.	
9.0	The Technical Offer shall be supported by product Catalogues & Data Sheets and also technical details of Bought-Out-Items with copies of Product Catalogue to the extent possible.	
10.0	The Commercial Offer (given with the Technical Offer) shall contain the Scope of Supply and the Un-Priced Part of the Price-Bid, for confirmation.	

SECTION – IV

The performance certificate should be produced **on Customer's Letter Head.**

PERFORMANCE CERTIFICATE

1. Supplier of the machine			
2. Make & Model of the M/C			
3. Month & Year of Commissioning			
4. Application for which M/C is used			
5	a) Power Source rating b) Table diameter c) Column and boom dimensions		
6. Performance of the Equipment (**Tick** whichever is **applicable**)		**Best** in the market	
		Satisfactory	
		Good	
		Average	
		Not Satisfactory	
7. Any Other remarks			
Date:		Signature & Seal of the Authority Issuing the Performance Certificate	

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PART- B

Technical Specification Of Column & Boom Type Sub-Merged Arc Welding Machine With Manipulator

1.0	**Application:** The system is meant for hard facing of valve seat and related components by Submerged ARC Welding process, with SS 410 / 430 material in wire form. The weld deposit shall be made on the machined surface on these components. .	
2.0	**Job Details**	
	Max Dia	750 mm
	Min Dia	100 mm
	Min Height	20 mm
	Max Height	250 mm
	Maximum weight of job	300 Kg
	Maximum weight of job+ flux	About 500 Kg
2.1	Type of material	Casting / Forging
2.2	Type of welding	SAW process
2.3	Type of filler wire to be used	SS 410 / SS 430
3.0	**Work-Centre Configuration** The welding equipment will have one column & boom type sub-merged arc-welding machine with power source. The job will be positioned on a tilting type rotary table. Wedges and seat rings will be fully immersed in a mass of granular flux. An independent portable flux recovery unit shall also be supplied with the equipment.	
3.1	A schematic diagram showing layout of the machine & associated systems with salient dimensions shall be submitted along with the offer.	Vendor to submit
3.2	Explanation of the machine and its system with Drawings, Photographs / Video images should be submitted with the offer.	Vendor to submit
4	**Scope of supply**	
4.1	Welding positioner - Dia 1000 mm	1 No.
4.2	SAW welding power source	1 No.
4.3	SAW welding head and wire feed system	1 No.
4.4	Control Panel	1 No.
4.5	SAW welding head mounting system	1 Set
4.6	Flux recovery unit	1 Set
4.7	Control cables	1 Set
4.8	Tools	1 Set
4.9	Operation & Maintenance manual and other documents	3 Sets

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5	**Specification of the machine**	
5.1	**Welding Positioner**	
5.1.1	Welding positioner shall be fabricated by using MS plates, angles and channels. The positioner will have rigid frame with 1 Meter diameter rotary table with T slots and spigot hole (Dia 50 H7) for mounting of fixtures.	Vendor to specify
5.1.2	The positioner will have AC drive for the table rotation and tilt. The Speed of rotation of table shall be 0 – 2 RPM (Steplessly variable). The table shall be tiltable by min 30^{0} with respect to horizontal plane. This drive will be AC motor with a fixed speed.	Vendor to specify
5.1.3	The rotary table should be supported with spindle, which shall be housed in a box with bearings to take the static, thrust and rotational loads.	Vendor to confirm
5.1.4	All the fabricated components have to be stress relieved before taking for machining and assembly work.	Vendor to confirm
5.1.5	Table weight carrying capacity	Vendor to specify
5.1.6	Height of table from floor level	Approx 1000 mm
5.2	**Submerged Arc Welding Power Source**	
5.2.1	The SAW welding power source confirming to the following specification has to be interfaced with welding positioner. The make of the Power Source shall be **Esab** or **Lincoln**	Vendor to confirm
5.2.2	**A**. Type of Power Source :	Fully Thyristorised
	B. Welding Current (100 % duty cycle rating):	500 amps
	C. Welding Current range :	50 amps to 500 amps
	D. Voltage :	0 – 60 V
	E. Class of insulation :	H
	F. Analog / Digital Ammeter & Voltmeter are to be provided on the power source.	Vendor to confirm
5.3	**SAW welding head and Wire feed system**	
5.3.1	The SAW welding head should be capable of feeding wire dia of 2.5mm, 3.15mm and 4.0 mm. The offered head should be supplied with wire drive roller suitable for all the wire dia as per our requirement.	Vendor to confirm
5.3.2	The details of the make and type of welding head being used should be clearly specified.	Vendor to specify
5.3.3	Wire feeder shall be capable to handle 25 Kg wire in spools. The diameter of spool will be around 300 mm.	Vendor to confirm
5.3.4	The wire spool shall have the facility for adjustable brake on wire coil.	Vendor to specify
5.4	**Control Panel**	
5.4.1	All the controls for the welding positioner and interfacing controls for the welding power source shall be housed in a fabricated sheet metal enclosure and protected against dust and	Vendor to specify

	harsh environment.	
5.4.2	All hardware items are to be mounted on DIN RAILS inside the control panel. The entire wiring has to be properly done and routing has to be done. The cables should be bundled.	Vendor to specify
5.5	**SAW Head mounting**	
5.5.1	The SAW Head shall be mounted on a suitable column and boom. The column shall be close to the welding positioner and grouted to the floor.	Vendor to specify
5.5.2	The welding head should have X, Y and Z axes for moving and the movement shall be manual with hand wheels.	Vendor to specify
5.5.3	The torch holder horizontal movement should be such that it can reach the table centre.	Vendor to confirm
5.5.4	Max height of torch holder from Rotary Table (adjustable)	750 mm
5.5.5	The torch adjustment on the head	Min 300 mm
5.6	**Flux recovery unit**	
5.6.1	Flux will be manually loaded on the table such that the entire job is covered with the flux completely. To recover the unused flux an independent portable flux recovery unit shall be supplied with the machine. Capacity of this Unit shall be around 40 Kg. This flux recovery unit shall have a mounting arrangement on the welding unit itself.	Vendor to specify
5.7	**Tools for maintenance**	
5.7.1	One set of necessary hand tools for maintenance of the above system to be provided. List shall be submitted.	Vendor to submit
5.8	**Compressed air**	
5.8.1	Compressed air is available at a pressure of 60 to 70 PSI at BHEL. This shall be made use of for the pneumatic systems on the machine if required.	Vendor to specify
6.0	**Machine Lighting**	
6.1	A fluorescent lamp shall be provided on the machine for the welding area visibility.	Vendor to confirm
7.0	**Electrical**	
7.1	415V ±10%, 50HZ ±3 HZ, 3 Phase AC (3 wire system with out neutral) Power Supply Source will be provided by BHEL at a single point near the machine, as per layout recommended by Vendor. All types of cables, connections, circuit breakers etc. required for connecting BHEL's power supply point to different parts of the machine/control cabinets, shall be the responsibility of vendor.	Vendor to confirm
7.2	All electrical equipment shall be Tropicalized and shall have IP 54 protection	Vendor to confirm

7.3	All electrical control cabinets & panels should be dust and vermin proof	Vendor to confirm
7.4	All electrical panels should be provided with CFL lamps for sufficient illumination and electric power receptacles of 220 Volts, 5/15 Amp. AC. All adapters/receptacles should have compatibility with Indian equivalents.	Vendor to confirm
7.5	Motors shall be of reputed make conforming to IEC Standards and acceptable to BHEL	Vendor to confirm
7.6	All components / devices / terminals are to be incorporated with ferrules.	Vendor to confirm
7.7	Vendor should ensure the proper earthing for the machine and its accessories.	Vendor to confirm
7.8	All electrical motors, limit switches etc, on the machine shall be wired using PVC sheathed cable running in conduits to common terminal block	Vendor to confirm
7.9	External wiring from / to control panel, control desk, external motors etc shall be by means of armoured multi-core cables	Vendor to confirm
7.10	The control voltage for all applications shall be less than 110 V	Vendor to confirm
8.0	**Environmental**	
8.1	Noise level shall not exceed 85 dB (A) at normal load condition, 1 M away from the machine.	Vendor to confirm
8.2	The machine shall be suitable for an ambient temperature of +50 ° C and relative humidity of 95 % respectively, but both do not occur simultaneously.	Vendor to confirm
8.3	If any safety / environmental protection enclosure is required it shall be built in the machine by the vendor.	Vendor to specify
8.4	The total machine and accessories shall be suitable for continuous operation of 24 hours a day and 7 days a week.	Vendor to confirm
9.0	**Safety**	
9.1	All the pipes, cables etc. on the machine should be well supported and protected.	Vendor to confirm
9.2	Emergency Switches at suitable locations as per Norms should be provided.	Vendor to specify
10.0	**Spares**	
10.1	The Vendor shall recommend and submit list of spares required for the machine for two years of trouble free operation on three shifts /day basis under two headings as **a) Mechanical spares**: **b) Electrical & electronic spares:** **c) Un-priced list** of spares with quantities, specified in **a & b** above, should be submitted with this technical offer. **d) Unit Price** of each item figuring in **c** shall be submitted in a sealed cover with the price bid.	Vendor to Submit
10.2	All types of spares for the total machine and its accessories	Vendor to Confirm

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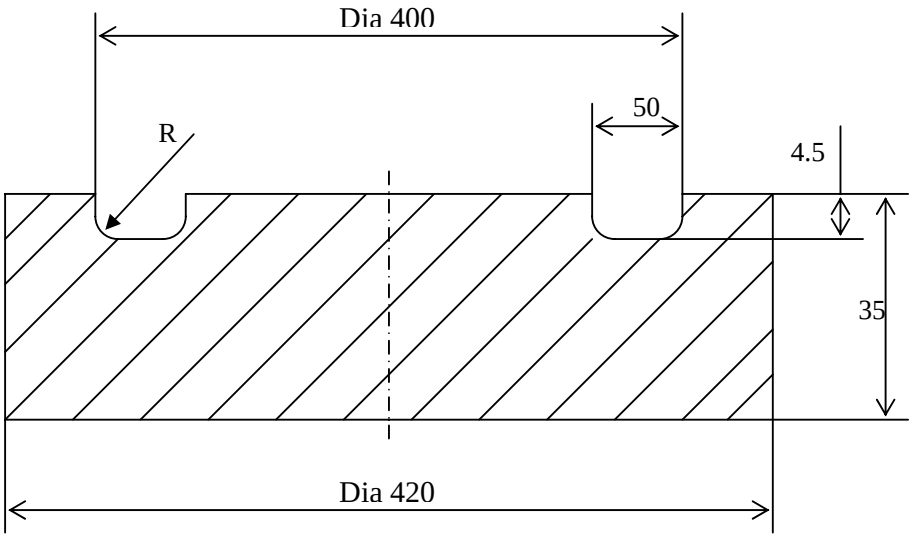
	should be available for minimum ten years, after supply of the machine. If any spares or controls are likely to become obsolete within this period, the vendor should inform BHEL and provide details of it's suppliers to enable BHEL to procure them in advance.	
10.3	In case of ordering, a complete list of spares for the machine and its accessories along with spares specification / type / model, and name & address of the spare supplier shall be submitted along with documentation while supplying the machine.	Vendor to Confirm
11.0	**Documentation**	
11.1	THREE sets of following documents (Hard Copies) in English language shall be supplied along with machine	Vendor to confirm
11.2	Operating Manuals of Machine, and Other Accessories	Vendor to submit
11.3	Detailed Maintenance Manual of machine with all drawings of machine assemblies/sub-assemblies/parts including Electrical circuit diagrams.	Vendor to confirm
11.4	Complete Printed Circuit Board Schematics indicating check points (Test Points) for Electronic Controls	Vendor to confirm
11.5	Drawings of wear components like bushes, worm-wheel, racks & pinions, nozzle-tips, wire-feed rolls, etc.	Vendor to confirm
11.6	Catalogues, O&M Manuals of all bought-out-items including drawings, wherever applicable.	Vendor to confirm
11.7	Specifications of all standard items like Bearings, etc. available in the machine should be specified.	Vendor to specify
11.8	The vendor shall submit complete Master List of parts used in the machine.	Vendor to submit
11.9	One additional set of all the above documentation on CD ROM, wherever possible.	Vendor to confirm
12.0	**Training**	
12.1	The Vendor shall train Three BHEL Engineers in Operation and Maintenance (Mechanical, Electrical/ Electronics) of the Machine at Vendor's works for a period not exceeding 5 working days.	Vendor to confirm
12.2	Airfare, boarding & lodging for the BHEL Engineers shall be borne by BHEL.	Vendor to confirm
12.3	The Vendor shall impart training to BHEL's Machine Operators and Maintenance crew in Operation and Maintenance after the commissioning of the Machine at BHEL works for not less than 6 working days	Vendor to confirm
12.4	Competent, English speaking experts shall be arranged by the vendor during training for satisfactory & effective training of BHEL personnel	Vendor to confirm
12.5	Vendor to quote on the basis of per man per Day for training at vendor's work	Vendor to confirm

13.0	**MACHINE ACCEPTANCE:**	
13.1.0	**(Tests/Activities to be performed by Vendor at Vendor's works, on the machine, before dispatch:)**	
13.1.1	Physical Verification of Assembly / Sub assemblies and Materials of Construction, Bought-out Items etc.	Vendor to confirm
13.1.2	Demonstration of all features of the machine & accessories	Vendor to confirm
13.1.3	A test piece shall be supplied by vendor for proving the machine's performance as shown in annexure- 1.Welding of test piece with vendor's consumables, and sub-sequent testing for establishing the quality of weld will be in vendor's scope.	Vendor to confirm
13.1.4	BHEL Engineers will witness the welding and inspect the test piece. The weld after machining will be subject to Liquid Penetrant Inspection (LPI) and Hardness test. In LPI, no linear indication of pinholes is allowed. The pinhole indication size on the surface shall not exceed 1 mm. Hardness of weld surface shall be around 350 BHN for SS 410 and 250 BHN for SS 430 wires.	Vendor to confirm
13.2.0	**Tests / Activities to be carried out at BHEL works while commissioning the machine:**	
13.2.1	Demonstration of all features of the machine, control system & accessories to the satisfaction of BHEL for efficient and effective use of the machine	Vendor to confirm
13.2.2	Demonstration by actual use of all supplied attachments and accessories to their full capacity.	Vendor to confirm
13.2.3	A test piece shall be supplied by vendor for proving the machine's performance as shown in annexure- 1.BHEL will provide consumables for Welding of test piece. Testing for establishing the quality of weld at BHEL works will be in vendor's scope.	Vendor to confirm
13.2.4	BHEL Engineers will witness the welding and inspect the test piece. The weld after machining will be subject to Liquid Penetrant Inspection (LPI) and Hardness test. In LPI no linear indication of pinholes is allowed. The pinhole indication size on the surface shall not exceed 1 mm. Hardness of weld surface shall be around 350 BHN for SS 410 and 250 BHN for SS 430 wires.	Vendor to confirm
14.0	**Machine Foundation**	

14.1	Vendor shall submit the preliminary layout drawing for getting BHEL's approval within one month from the date of Letter of Intent (LOI). Vendor shall submit complete foundation details including static and dynamic loads within three months after getting BHEL's approval. The layout should consist of all requirements pertaining to complete machine including accessories. BHEL will construct complete foundation.	Vendor to confirm
14.2	The Vendor shall indicate detailed specifications of grouting compound, Grouting procedure etc. for foundation bolts of the machine.	Vendor to confirm
15.0	**Erection and Commissioning**	
15.1	**1.** Complete erection and commissioning of the machine (including labour and material handling), its control system, all attachments and equipments supplied along with the machine are in the scope of the vendor. Also start up, testing of the machine and machining of test pieces are in the scope of the vendor. **2.** Service requirement like power, air & water will be provided by BHEL at only one point to be indicated by supplier in their foundation/layout drawing.	Vendor to confirm
15.2	Proving the capacity and good performance of the machine shall be considered as part of commissioning. All tests, mentioned under the clause "**Machine Acceptance**" should form part of the commissioning activity.	Vendor to confirm
15.3	The supplier should bring tools, Tackles, instruments and other necessary equipments required to carry out all above activities.	Vendor to confirm
15.4	The supplier shall arrange commissioning spares required for commissioning of the machine.	Vendor to confirm
15.5	Portion, if any, of the machine, accessories and other supplied items where paint has rubbed off or peeled during transit or erection should be repainted and merged with the original surrounding paint by the vendor. For this purpose, the vendor should supply sufficient quantity of touch-up paint of various colors of paint used.	Vendor to confirm
15.6	Schedule of Erection and Commissioning shall be submitted with the offer.	Vendor to confirm
15.7	Duration, terms & conditions for E&C should be furnished with the technical offer in detail. Charges for Erection & Commissioning shall be submitted with the price bid.	Vendor to confirm
16.0	**Packaging**	
16.1	Sea worthy, rigid packing for all items of machine and all Accessories to avoid any damage/loss in transit. When machine is dispatched in containers, all small loose items shall be suitably packed in boxes.	Vendor to confirm

17.0	**Guarantee**	
17.1	12 months guarantee from the date of acceptance of the machine.	Vendor to confirm
18.0	**General**	
18.1	The vendor should submit the following information:	Vendor to confirm
18.2	Machine Model	Vendor to specify
18.3	Total connected load (KVA):	Vendor to specify
18.4	Floor area required (Length, Width, Height) for complete machine & accessories.	Vendor to specify
18.5	Painting of Machine/ Electrical Panels: RAL 6011 Apple Green (Polyurethane Paint)	Vendor to Confirm
18.6	Total weight of the machine	Vendor to specify
18.7	Weight of heaviest part of machine	Vendor to specify
18.8	Weight of the heaviest assembly/ subassembly of the Machine	Vendor to specify
18.9	Dimensions of largest part/ subassembly of the machine	Vendor to specify

Annexure – 1 Sketch of Test Piece (Qty: 2 Nos)



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