Bharat Heavy Electricals Limited

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

ENQUIRY	Phone: +91 431 257 75 75 Fax : +91 431 252 07 19 Email : rrmanohar@bheltry.co.in Web : www.bhel.com

	Enquiry Number:	**Enquiry Date:**	**Due date for submission of quotation:**
	2620700011	**04.06.2007**	**13.08.2007**
Your 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 Schedule**
10	Pulsed SAW System as per the technical specification & commercial conditions applicable (to be downloaded from web site www.bhel.com)	1 No.	15.01.2008

Note:

(1) Confirmation of acceptance for BHEL commercial terms & conditions and Price Bid formats have been posted in BHEL Corporate web site www.bhel.com under Enquiry reference "2620700011". Your offer should be based on all the above documents.

(2) Also, you are requested to fill in the Supplier Registration formats available in www.bhel.com (under Advancement – Supplier Registration) and send it along with your offer.

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. Dy. Genl. Manager / Capital Purchase / MM / Manufacturing

PART A

QUALIFYING CRITERIA FOR THE SUPPLY OF PULSED SUBMERGED ARC WELDING MACHINE

SECTION – I

The BIDDER / VENDOR has to compulsorily meet the following requirements to get Qualified for submitting an offer for **Pulsed Submerged Arc Welding machine**.

S. No.	**REQUIREMENTS**	**Vendor's RESPONSE**
1	The BIDDER shall have a minimum of THREE Years of Continuous Experience in the field of Design, manufacture and supply of similar machines.	
2	Only those vendors, who have supplied, and commissioned at least one such machine for similar applications in the past five years (on the date of opening of Tender) and such machine is presently working satisfactorily for more than one year after commissioning (on the date of opening of Tender), should quote. However, if such machine (s) has/ had been supplied to BHEL, then such machine should be presently working satisfactorily for more than six months after its commissioning and acceptance (on the date of opening of Tender).	
2.1	The vendor should submit the following information where similar machines have been supplied, for qualification of their offer.	
2.2	Name and postal address of the customer / company where similar machine is installed.	
2.3	Name and designation of the contact person of the customer.	
2.4	Phone, FAX no. and email address of the contact person of the customer.	
2.5	Month and Year of commissioning	
2.6	Application for which the machine is supplied.	
2.7	One Performance certificate from the customers regarding satisfactory performance of machine supplied to them. The certificate should be current and on the letterhead of the Customer. It should contain information regarding model / Size of machine, year of commissioning and performance of M/c.	
3.0	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 is expected to give complete details against each clause in the table given below, with additional sheets those may be attached (giving clear reference number) to furnish and cover the requisite details / documents.

S. No	PARTICULARS	VENDOR's RESPONSE
4	Profile of the Company bringing-out the years of Experience of the BIDDER in the field of design, manufacture, integration and supply of **Pulsed Submerged Arc Welding machine.**	
5	Number of **Pulsed Submerged Arc Welding machines** supplied, installed and commissioned till date for similar applications (with details on machine type / model, configuration, customer and quantity)	
6	YEAR of supply of latest **Pulsed Submerged Arc Welding machine** for welding applications and the Technical Specifications of the Machine supplied [Details to be furnished]	
7	Details on the Firm's Registration and the FINANCIAL STRENGTH of the COMPANY (Balance Sheet for the last **3** years) shall be submitted with the TECHNICAL OFFER	
8	Details on International Standards / Design Process Codes followed in Design and Manufacture of the Equipment.	
9	Details on SERVICE-AFTER-SALES Set-Up in India including the Addresses of Agents / Service Centers in India. Competency & Experience of the Local Service Agency are to be provided	
10	Any Additional Data to supplement the manufacturing capability of the BIDDER for the subject equipment	

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

S. No.	REQUIREMENTS	VENDOR's RESPONSE
11	The BIDDER / VENDOR shall submit the offer in TWO PARTS-Technical [with PART A & PART B] & Commercial and Price Bid.	
12	The Technical Offer shall be supported by Product Catalogues and description.	
13	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 mere 'CONFIRMED' or 'COMPLIES' or 'YES' or 'NO-DEVIATION' or similar words in the technical comparative statement [without any supporting technical write-ups, photos and datasheets] may lead to disqualification of the Technical Offer.	
14	The BIDDER / VENDOR shall assure a continuous support for the supply of SPARES and SERVICE for TEN Years, from the date of commissioning of equipment at BHEL Works.	
15	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 the inclusion of all the accessories, tooling, attachments, auxiliary parts, spares, consumables, etc. with the main and basic equipment, to meet the technical specification requirements.	
16	Soft copy if any, giving the salient features of the proposed machine with all sub-systems and auxiliaries, and /or showing live-demo of an existing and working machine of similar configuration and capacity may be provided.	
17	BIDDER has to indicate the Country of Origin for the supply of equipment.	
18	The reference List of Customers shall be accompanied with (Phone Number and E-Mail ID) of the CONTACT PERSON for cross reference by BHEL	
19	In case of preliminary qualification of the offer, on technical grounds, the BIDDER may be called for a detailed technical discussion on the original technical offer at BHEL Works, with a sufficient notice period.	

PART-B
TECHNICAL SPECIFICATIONS OF PULSED SUBMERGED ARC WELDING

S.No.	PARTICULARS	BHEL SPECIFICATION / DESCRIPTION	BIDDER's OFFER WITH COMPLETE TECHNICAL DETAILS
0.0	**Purpose:** The pulsed submerged arc tandem welding head, with two power sources with necessary controls and motorized cross slides, swiveling system to be integrated, demonstrated with a column and boom system available at WRI. This machine is to be used as a research facility for demonstration of pulsed submerged arc welding technology for different types of steels and products.		
1.0	**Welding machine**	Tandem pulsed submerged arc welding head with two inverter based pulsed SAW power sources	
1.1	**Weld Process**	Pulsed submerged arc welding	
1.2	**Application**	Different types of steels and products.	
1.3	**Job to welded**	Plates, pipes	
1.4	**Machine requirements**		
1.4.1	**Construction**	Tandem Pulsed SAW heads with two inverter based pulsed power sources and other accessories to be integrated with column and boom available at WRI	
1.4.2	**Welding head**	Comprising of 1. Two separate wire feeders 2. Two torches 3. Wire straightening devices 4. Two separate wire spool holders with provision for mounting two wire spools for twin wire welding in each nozzle 5. Flux feeder with flux level indicator 6. One flux recovery system 7. Necessary controls 8. Motorised XY cross slides for movement in vertical axis and horizontal axis perpendicular to boom movement	

		9. Manual alignment system to align two torches 10. Twin wire kits for both wire feeders	
1.4.3	**Welding power source**	Quantity – 2 Nos Current range : 100 to 1000A Duty cycle : 100% Welding voltage : 20 to 45 volts Frequency adjustment: 10 – 100 Hz Input Power Supply : 415 ±10% V, 50 Hz, 3-phase AC. Design Feature: Inverter with separate AC and DC modules With arc link/ RS232/ Ethernet/ device net connector for communication Digital Wave form control: Arc current, voltage or power to be controlled. Different parts of the waveform and wire feed speed may be modulated at varying rates to accomplish a constant average condition. (Constant voltage, constant current etc.) Insulation class H Protection IP23 Model no and weight of the power source to be specified.	
1.4.4	**Variable balance Control.**	Setting of wave balance (that is the ratio between positive and negative waveforms) range: -25% to +25%	
1.4.5	**DC offset (Variable Amplitude) Control**	Wave form amplitude to be controlled from 10% to 90% range.	

1.4.6	**Phase shift control**	Provision to be made for phase shifting of the wave form to avoid arc blow.	
1.4.7	**Wire reel**	Wire reel and mounting -4 nos	
1.4.8	**Wire feeder**	Quantity : 2 Nos Each suitable for feeding wires of diameter 2.0 mm to 5.0 mm	
1.4.9	**Torches**	Quantity : 2 Nos SAW welding torches rated for 1000 Amperes AC/DC current. Tandem arc frame work: To be provided	
1.4.10	**Wire straightening devices**	Necessary wire straightening devices to be provided for each wire feeder	
1.4.11	**Wire spool holders**	Quantity: 4 Nos To hold 25 kg SAW wire spools	
1.4.12	**Flux feeder**	One flux feeder to feed flux for welding torch One Flux Hopper: Capacity 5.0 kg (min). Open / Shut-Off auto Control Valve and Flux Feed Tube Transparent window for checking the flux level in the hopper.	
1.4.13	**Necessary controls and cables**	Controls for remote on/off for each power source. Provision for single knob control of each machine on the remote control panel **Cables:** Suitable Power input cables of length 10 meters to be supplied. Suitable output welding cables 15 meters for each welding head to be supplied. Suitable Earth cable of 15 meters length to be supplied along with earth clamp.	
1.4.14	**Motorised XY cross slide**	Provision to vary the torch position in X and Y direction smoothly using a motorised control system. 500mm stroke motorised vertical slide assembly suitable to carry tandem head	

		300mm stroke motorised horizontal slide assembly suitable to carry tandem head. Joy stick control unit for slide adjustment Tandem head mounting assembly	
1.4.15	**Alignment of torches**	Provision to be made for aligning the two torches in both vertical and horizontal axis with respect to each other.	
1.4.16	**Twin wire kit for both wire feeders**	Provision for feeding Twin wires in both wire feeders. Twin wire welding assembly: Including torch, wire straighteners, spool holders, contact tips, etc	
1.5.0	**Electrical & service data** **Electrical** **Compressed air**	440 volts, three phase, 50Hz Available compressor air line pressure: 5.5 bar Requirement of air volume and cooling water quantity and temperature	
1.6.0	**Control panel**	The control panel shall have the following Controls / Display: a. Meters for reading welding current, voltage and carriage speed. b. Arrangement for wire feed and carriage speed adjustment. c. Push buttons for upward and downward inching of the electrode wire. d. Switches for Start and Stop of welding. e. Forward, off and reverse, up, down movement of the boom. f. Spot Light ON/OFF Switch g. Indication Lamp for Welding 'ON' h. Wire burn back control setting i. Suitable interfacing cables & controls such as arc link, etc.	
1.7.0	**Optional** **Welding parameter measurement**	Welding parameter recording systems consisting of the following 1. Sensors for measurement of	

	and recording system	a. welding current up to 1000 amperes (variable polarity) b. welding voltage up to 100V c. Carriage speed 3000 mm per minute d. Wire feed speed 0 to 50 Mtrs per minute e. Temperature 0 to 400^{o}C (non contact and contact type) 2. 8 channel signal converter 3. PLC for recording the above parameters 4. Power supply for the above system 5. Suitable software (SCADA) for recording and processing of above parameters in a PC at a distance of 100 metres through RS232 / RS485 interface. These parameters are to be recorded for 24 hours non-stop automatically in file.	
1.7.1	**Flux recovery unit**	One suitable flux recovery / storage unit.	
1.7.2	**Laser light**	Laser light (with flexible support) to view the Weldment and for assisting alignment of filler wire with job.	
1.7.3	**Mounting bracket**	Suitable mounting bracket for mounting the tandem welding head and the control systems on the Column and boom to be provided.	
1.7.4	**Torch Tip Positioning**	The welding head has to be adjusted transversely and also vertically to bring the welding tip in correct position and swivel up to 45° for fillet seams in fillet position.	
2.0	**Acceptance criteria of the machine**	The machine to be proven for all parameters	
3.0	**Installation & commissioning of the equipment**	The tandem welding head, controls to be interfaced with the column and boom available at WRI. To be carried out at WRI, BHEL, Trichy, India	

3.1	**Commissioning**	Commissioning of the Equipment shall be the responsibility of the Supplier.	
3.2	**Performance Prove-Out**	After the successful commissioning of the machine, the COMMISSIONING ENGINEER of the Supplier have to establish the Performance Prove –Out for the Machine's Capability, as given under the Clause Sl.No. 2.0.	
4.0	**Documentation**		
4.1	**Operation manual**	Detailed operating instructions	
4.2	**Maintenance and trouble shooting manual**	a. Electrical Wiring Drawings – Power & Control Circuits b. Complete Printed Circuit Board Schematics indicating check points (Test Points) for Electronic Controls c. On-Line Fault Diagnostics to be provided.	
5.0	**PERFORMANCE GUARANTEE**	The Performance of the Total Equipment shall be guaranteed for a minimum period of twelve months from the date of commissioning at BHEL Works.	
6.0	**Spares**	Spares for 2 years trouble free operation to be quoted along with the offer. Spares to include spares for the power sources, torches, cross slides, control panel etc.	
7.0	**GENERAL POINTS**		
7.1	Make and Model of the machine to be mentioned. Detailed catalogs of the machine to be sent with the offer.		
7.2	Complete description of all systems & sub-systems shall form part of the technical bid		
7.3	A schematic diagram showing the layout of the		

	machine & associated systems with salient dimensions shall be submitted along with the offer.		
7.4	The operating sequence of the machine with broad outline of various operations involved should be furnished with the offer.		
7.5	Standards for Design, Manufacture and testing of the machine shall be in accordance with internationally accepted standards.		
7.6	Total weight of the Machine & Sub-Systems. Weight of the heaviest part of the machine		
7.7	Total connected load KVA		
7.8	Painting of machine and Electrical panel	RAL6011 Apple green (Polyurethane paint)	
7.9	Floor area required (Length x width x height) for complete machine and accessories		
7.10	Spares required for 2 years trouble free operation		