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:**
	2620700012	**04.06.2007**	**14.08.2007**
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	Welding Simulation Software 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 "2620700012". 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 WELD SIMULATION SOFTWARE AND HARDWARE

SECTION – I

The BIDDER / VENDOR has to compulsorily meet the following requirements to get Qualified for submitting an offer for Weld simulation software and hardware.

S. No.	**REQUIREMENTS**	**VENDOR's RESPONSE**
1	The BIDDER shall have a minimum of THREE Years of Continuous Experience in the field of supply and technical support for weld simulation software and hardware.	
2	Only those vendors, who have supplied, and installed at least one such a weld simulation software and hardware for similar applications in the past three years (on the date of opening of Tender) and such system is presently working satisfactorily for more than one year after commissioning (on the date of opening of Tender), should quote. However, if such system has/ had been supplied to BHEL, then such system should be presently working satisfactorily for more than six months after its installation and acceptance (on the date of opening of Tender) in BHEL.	
2.1	The vendor should submit the following information where similar systems have been supplied, for qualification of their offer.	
2.2	Name and postal address of the customer / company where similar system 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 installation	
2.6	Application for which the system is supplied.	
2.7	One Performance certificate from the customers regarding satisfactory performance of system supplied to them. The certificate should be current and on the letterhead of the Customer. It should contain information regarding version of the software, year of commissioning and performance of system.	
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 supply of weld simulation software and hardware	
5	Number of software installed till date for weld simulation analysis along with details of the version of software and customer details	
6	YEAR of supply of latest version of software and matching hardware and the Technical Specifications of the system 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 references highlighting the application of the software.	
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 for technical support are to be provided	
10	Any Additional Data to supplement the manufacturing capability of the BIDDER for the subject equipment	

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SECTION – III

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	Detailed Product Catalogues and description shall support the Technical Offer.	
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 update of software for FIVE Years, from the date of installation of the software and hardware 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 peripherals etc. with the main and basic system, to meet the technical specification requirements.	
16	Soft copy if any, giving the salient features of the proposed software with all modules and /or showing live-demo of an existing and working software of similar version and hardware configuration.	
17	BIDDER has to indicate the Country of Origin for the supply of system.	
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 SPECIFICATION FOR WELDING SIMULATION SOFTWARE

1.0	**Purpose**	
	Simulation, Modeling and analysis of the mechanical and metallurgical effects of fusion and resistance welding processes in engineering components and assemblies based on finite element method in materials with different metallurgical characteristics.	
2.0	**Scope of supply**	
	Dedicated finite element method based software to analyze thermal effects associated with various conventional and advanced welding processes with supporting material/metallurgical data base. Detailed documentation Training.	
	Parameters & BHEL specifications	**Bidder's offer (With Complete Technical Details**
3.0	Dedicated finite element software for welding	
	Types of welding simulation to be performed Transient and steady state thermal analysis Elastic, elastic-plastic stress analysis Large deformation analysis Microstructure modeling Coupled analysis of thermal-structural and thermal-metallurgical type	
3.2	**Finite element method capability** Generation of the part geometry of the component to be analyzed. Generation of area and volume mesh. Interfacing with CAD system for easy geometry generation. Generation of material property data as a function of temperature. Availability of a database for standard materials including their phases giving the thermal, mechanical and	

	metallurgical properties as a function of temperature. Capability for performing two-dimensional thermal and structural problems. Capability for performing three-dimensional multipass welding model. Capability for steady state and transient analyses. Capability for different types of elements viz. plane stress, plane strain, axisymmetric, three-dimensional brick and shell elements. Capability for combining solid and shell elements Capability for performing thermal and structural analysis with a total nodes up to 5,00,000. Capability for adaptive meshing. Capability for local / global approach for the analysis of large welded assemblies Engineering software tools / wizard for complete analysis Fully automatic treatment for element birth and removal facility	
3.3	**Thermal analysis** Capability for the prediction of transient thermal cycles associated with single pass and multipass arc welding processes like shielded metal arc welding, gas tungsten arc welding, gas metal arc welding and submerged arc welding based on the welding parameters like current, voltage, welding speed etc. Analysis of thermal cycles in advanced processes such as friction welding, friction stir welding, resistance spot welding, laser welding, electron beam welding, cladding, TIG dressing etc.	

	Analysis of a moving distributed heat source along any defined orientation. Analysis using predefined heat sources like double ellipsoid heat source, distributed heat source as per Gaussian distribution.	
3.4	**Structural analysis** Capability for performing structural analysis using linear elastic, non linear plastic (isotropic hardening rule, kinematic hardening rule, mixed isotropic and kinematic hardening rule), rate independent and rate dependent non-linear material models. Prediction of the build up of the residual stresses and distortion in a weldment. Prediction of small and large displacements / rotations in weldments caused by the welding heat input using a coupled thermal-structural model.	
3.5	**Micro structural modeling** Prediction of the microstructures of the weld metal, heat affected zones caused by the welding heat input including of phase transformation phenomena and CCT / TTT diagrams for standard materials. Prediction of the mechanical properties of the weld metal and the heat affected zones including hardness using a coupled thermal-metallurgical model. Material data base for mechanical and thermal properties of various materials.	
3.6	**Heat treatment** Analysis of heat treatment effects in weldments.	

3.7	**Input / output options**	
	Provision for generation / transfer of input data from CAD / Pro E model and data base Presentation of thermal, stress and displacement results in graphical and tabular forms portable in notepad, excel and other formats	
4.0	**Software license**	
4.1	Basic License for single user. Option for 4 more users	
5.0	**Documentation**	
5.1	Hard copy and soft copy of 3 full sets of operating manuals & instruction manuals, reference manuals, users guide, wizards. 3 Full sets of tutorials with step by step examples, case studies and technical literature for understanding and operation of the software. A set of technical literatures that have been published using the software for the analysis of welding and heat treatment problems. 3 sets of documentation for the hardware.	
6.0	**Training**	
	Training at Welding Research Institute for 15 days on the use of the various modules of the software and applications.	