



An ISO 9001
Company

Bharat Heavy Electricals Limited

(High Pressure Boiler Plant)

Tiruchirappalli – 620014, TAMIL NADU, INDIA

CAPITAL EQUIPMENT / MATERIALS MANAGEMENT

ENQUIRY

NOTICE INVITING TENDER

Phone: +91 431 257 79 38

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Email : tvenkat@bheltry.co.in

Web : www.bhel.com

TWO PART BID

Enquiry
Number:

Enquiry
Date:

Due date for submission of
quotation:

Tender to be submitted in two Parts

2851300029

25.11.2013

03.01.2014

You are requested to quote the Enquiry number date and due date in all your correspondence. 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	Description	Quantity	Delivery Schedule
10	Heavy Duty CNC Flame Cutting Machine as per the technical specification & commercial conditions applicable (to be downloaded from web site www.bhel.com or http://tenders.gov.in)	2.00 Nos	6 months from date of PO

Important points to be taken care during submission of offer

1. Checklist No. BND/IMP/02 & BND/IND/02A and to be filled and enclosed along with the offer failing which, the Offer will not be considered for evaluation.
2. Material shall be delivered to FOR, BHEL Stores, POWER EQUIPMENT FABRICATION PLANT, BHARAT HEAVY ELECTRICALS LIMITED, Mundipar- 441804, Taluka: Sakoli, District: Bhandara, Maharashtra State.
3. Time period required for Erection & Commissioning shall be 1 Month from the date of intimation by BHEL requesting supplier to depute Service Engineers about site readiness.
4. EMD for this Tender will be (₹) : 1,50,000.00
5. Vendor should submit all Technical documents in duplicate.
6. All updates, amendments, corrigenda, etc., (if any), for each tender will be posted only on the above websites from time to time, as and when required, until each tender is opened. There will be no publication of such updates, amendments, corrigenda, etc., through newspapers or any other media.

BHEL's General guidelines / instructions (refer MM / CE / GENL / 001 - EMD) including bank guarantee formats and list of consortium banks, commercial terms check-list 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 "2851300029".

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 / Capital Equipment / MM

T. VENKATESWARAN

Senior Manager

Capital Equipment / MM

BHEL, Tiruchirappalli - 620 014.

HEAVY DUTY CNC FLAME CUTTING MACHINE**PART - A****SECTION- 1: Qualifying Criteria**

The BIDDER has to compulsorily meet the Qualifying Criteria indicated in **Section 1** to get qualified. Otherwise the technical offer will not be considered.

S No.	REQUIREMENTS	VENDOR'S RESPONSE
1.1	The BIDDER / VENDOR (OEM) shall have a minimum of TEN Years of Continuous Experience in the Design, Manufacture & Supply of "Heavy DutyCNC FLAME CUTTING MACHINE" . Vendor shall indicate the actual no. of years of experience in the field	
1.2	<p>Only those vendors (OEMs) should quote, who have commissioned in the past TEN years (on the original date of opening of Tender) at least ONE 'CNC FLAME CUTTING MACHINE' having all the following features:</p> <ol style="list-style-type: none"> 300mm thick plate cutting capability with minimum two torches cutting at a time. CNC system using latest software containing all flame cutting operations Working area of the machine shall not be less than 6500 x 15000mm <p>EITHER (i) in at least one country other than the country of origin to establish vendor's (OEM's) global business activity OR (ii) in India; and the referred machine is presently working satisfactorily for more than one year after commissioning (on the original date of opening of Tender). The name and contact addresses of the customers to whom the machine has been supplied has to be furnished with details.</p> <p>BHEL reserves the right to accept or reject the OEMs based on the assessment of their technical and financial capability.</p>	
1.3	<p>Vendor has to submit at least ONE PERFORMANCE CERTIFICATE from their customers in India or from the customers to whom the machine was supplied outside the country of origin, for satisfactory performance of the machine as given under Clause 1.2 above, for a minimum period of one year (on the original date of opening of Tender). (Original Certificate or through E-mail directly from the customer). The original performance certificate may be returned after verification by BHEL, if required.</p> <p>For obtaining the Performance certificate, a suggestive format is provided.</p>	

S No.	REQUIREMENTS	VENDOR'S RESPONSE
1.4	BHEL reserves the right to verify the information provided by the Vendor for the referred machine at their referred customer's works. It shall be the responsibility of the vendor to facilitate the visit of BHEL's team at their referred customer works .The Travel and Boarding expenses for BHEL Personnel shall be borne by BHEL. In case the information provided by vendor is found to be false/ incorrect, the offer shall be rejected.	

Section - 2

The BIDDER / VENDOR are requested to provide the following information:-

S No.	REQUIREMENTS	VENDOR'S RESPONSE
2.1	The BIDDER / VENDOR to furnish Reference List of Customers, with complete address, details of contact person, where CNC FLAME CUTTING MACHINE have been supplied in the past.	
2.2	Specify details of CNC FLAME CUTTING MACHINE supplied to other units of BHEL, if any (Year of commissioning, parameters etc.)	
2.3	Details on SERVICE-AFTER-SALES Set-up in India including the Address of Agents / Service Centres in India.	
2.4	Any Additional data to supplement the manufacturing capability of the BIDDER for the subject equipment.	

SECTION – 3:

The BIDDER to note:

S No.	REQUIREMENTS	VENDOR'S RESPONSE
3.1	The BIDDER / VENDOR shall submit the offer in TWO parts. 1. Technical Offer [with PART A & PART B] 2. Commercial Offer and Price bid.	
3.2	The Technical Offer shall contain complete details against all clauses of Technical Specifications given by BHEL.	
3.3	The Technical Offer shall be supported by copies of product Catalogues, DataSheets and technical details of Bought- Out-Items.	
3.4	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.	

Suggestive Format of Performance Certificate:

The Performance certificate should be produced on **Customer's Letter Head** and submitted along with the offer.

PERFORMANCE CERTIFICATE

1.0	Machine Supplied by(Manufacturer's name)		
2.0	Make & Model number of the Machine		
3.0	Month & Year of Commissioning		
4.0	Application for which m/c is used		
5.0	Machine Details		
5.1	Working area		
5.2	Plate thickness cut by the machine		
5.3	CNC System		
5.4	Drives and motors, make		
5.5	Software for CNC and plate nesting		
5.6	Level of accuracy		
6.0	Performance of the Machine (Please tick the appropriate option)	Not Satisfactory	
		Average	
		Good	
		Satisfactory	
7.0	Service after sales (Please tick the appropriate option)	Not Satisfactory	
		Average	
		Good	
		Satisfactory	
8.0	Other remarks (if any)		
Date:		Signature & Seal of the Authority Issuing the Performance Certificate	

PART - B: Technical Specification**Revision No. 00 -- 01-09-2013****Note:-**

1. The Column "Vendor's offer with Technical details" in this specification shall be filled in by the Vendor and submitted along with the offer. Inadequate / incomplete, ambiguous or unsustainable information against any of the clauses of the specifications / requirements shall be treated as non-compliance.
2. The offer and all documents enclosed with offer should be in English language only.

3. Name & Address of the Supplier:

Name & Address of the Indian agent(if any)

Telephone no.:

Fax no.:

e-mail:

SCOPE: SUPPLY, ERECTION & COMMISSIONING OF HEAVY DUTY CNC FLAME CUTTING MACHINE

S. NO.	DESCRIPTION OF BHEL REQUIREMENT	Vendor to confirm/specify	OFFERED	DEVIATION	REMARKS
1	Purpose: CNC oxy-acetylene flame cutting of mild steel and alloy steel in straight and various shapes.	Vendor to Confirm			
2 SPECIFICATIONS:					
2.1	Basic Equipment:- Shall be capable to mark and cut on MS, alloy steel plates of thickness upto max. 300 mm and table size 6.5M x 15M using oxy acetylene gas. Machine shall be provided with flashback arrestors. Qty of machines - 2 nos.	Vendor to Confirm			
3. CUTTING TORCH:					
3.1	2 nos. cutting torch stations. Each shall be suitable for flame cutting and marking.	Vendor to (C&S)			
3.2	Operating Mode : Manual / Auto selectable	Vendor to (C&S)			
3.3	Torch suspension system for oxy-acetylene cutting	Vendor to (C&S)			
3.4	5 additional cutting torches to be quoted with each machine.	Vendor to (C&S)			
3.5	50 sets of each nozzle shall be quoted for the cutting torch to cover entire range of cutting & marking plates upto 300mm thickness. Complete list to be provided with the offer.	Vendor to (C&S)			
3.6	Piercing thickness min. 70mm	Vendor to (C&S)			
3.7	Cutting torch shall have Auto ignition system	Vendor to (C&S)			
3.8	Vertical height adjustment of the torch min. 325mm. Suitable adjusted to easily cut 300mm thick plates	Vendor to (C&S)			
4 TRACK /ENERGY FEEDING SYSTEM:					

4.1	Track length suitable to cut 15M plates, including double sides synchronized longitudinal hardened rack & pinion drive. Accurately machined heavy duty rail tracks shall be used. Both the rails shall be perfectly aligned and parallel.	Vendor to (C&S)				
4.2	Heavy duty gantry construction with completely fabricated structure to provide stable machine operation. But shall be suitable for high speed cutting of plates. The gantry shall remain at ambient temperature during cutting of 300mm thick plates.	Vendor to (C&S)				
4.3	Overhead Drag chain system for longitudinal energy feeding. It shall be strong & flexible and properly supported along total length with sufficient no. of supports so that it can carry total weight of cables & hoses for long time at continuous duty without any breakage or damage of drag chain. Make Igus/Kabelshrupp	Vendor to (C&S)				
4.4	Carriage for transverse energy system for gas cutting to cover full track width to meet job requirements as per clause 2.0 of specification. Heat resistant partition shall be provided to protect the transverse cabling and tubing from heat of cutting.	Vendor to (C&S)				
4.5	X-axis rapid traverse rate shall be equal or more than 24M/min.	Vendor to (C&S)				
4.6	X-axis feed rate (0-120%) of programmed speed	Vendor to (C&S)				
4.7	Y-axis rapid traverse rate shall be equal or more than 24M/min.	Vendor to (C&S)				
4.8	Y-axis feed rate (0-120%) of programmed speed	Vendor to (C&S)				
4.9	Traverse of X, Y and Z	Vendor to specify				
4.1	Gear box on drives shall be high precision zero backlash and suitable for thermal cutting machine. Gear boxes shall be of Neugart/SEW/Bonfiglioli/Alpha/Koike/ESAB make. Wipers for X & Y axes guide ways to be provided	Vendor to (C&S)				
4.11	Z axis construction for cutting torch assembly:-It be light weight designed and high in dynamics. Shall move in Z axis on of precision linear ways and driven by a ball screw and AC servo motor. Vertical Height adjustment of torch shall be min.325 mm	Vendor to (C&S)				
4.12	The CNC system and softwares shall support all parameters required for oxy-fuel cutting. The design of the machine shall be such that its structure like gantry, slides, guideways etc. shall remain at ambient temperature even during cutting of 300mm thick plates.	Vendor to (C&S)				
4.13	For predrilling 1 no. portable Eurobore/Unibore/BDS Maschinen make magnetic base automatic feed drilling machine shall be provided of capacity upto 20/24 mm dia and length min.160 mm with its all accessories with each machine.	Vendor to (C&S)				
5 FEED AND DRIVE SYSTEM:						
5.1	AC Servo Motors and Drives of suitable rating with necessary chokes and transformers including:	Vendor to (C&S)				
	i) Longitudinal double side drive, ii) Transverse drive & control	Vendor to (C&S)				
5.2	Make of all motors and drives : Siemens/ Fannuc/ Yaskawa / Bosch-Rexroth/ Panasonic/Baumuller. (Details of model, make, type etc. to be specified)	Vendor to (C&S)				
5.3	The longitudinal travel of bridge on a precision track should be through servo drives on both sides of bridge having electronic synchronization control to eliminate any skewing of the machine.	Vendor to (C&S)				
6	CONTROL SYSTEM: 3 axes latest model CNC control system with programming facility.	Vendor to (C&S)				
6.1	CNC Controller: Latest model, suitable for Oxy-flame cutting applications.	Vendor to (C&S)				

6.2	Single control unit on operator panel for controlling torch stations.	Vendor to (C&S)			
6.3	Make: Latest model Bunn/Fanuc/Siemens/ESAB/Messer/Koike/Soitab/Farley with service & spare backup in India atleast for a period of 10 years after supply of machine.	Vendor to (C&S)			
6.4	Details of Standard features. List to be specified.	Vendor to (C&S)			
6.5	All software changes in cutting software should be supported free of cost for 10 years if there is any operating platform changes.	Vendor to (C&S)			
6.6	RS 232, Ethernet, USB ports for communication.	Vendor to (C&S)			
6.7	MANUAL CONTROL : Complete manual control of machine with required switches / keys should be provided on operator's panel for selection of required axis, axis direction, cutting feed, on/off, display of torch position etc. for manual operation without using CNC program or MDI mode. Diagram/ Sketches for switches/ keys provided on operators pendant to be specified.	Vendor to (C&S)			
7	OPERATION AND CONTROL SYSTEM:				
7.1	OPERATOR'S PANEL:				
7.1.1	Fixed/Swivelling type operator's panel having latest model complete CNC and machine control system with large size TFT/LCD of required configuration shall be provided on the operators platform. All displays/indications shall also be conveniently placed accordingly. Layout showing complete details of the panel shall be provided.	Vendor to (C&S)			
7.1.2	Operator control panel should display all control features, other necessary features and shall have all push buttons, signal lamps, gauges, knobs etc. for easy & comfortable operation.	Vendor to (C&S)			
7.1.3	All details of operator panel to be provided.	Vendor to (C&S)			
8	Machine Accuracy				
8.1	Longitudinal Guiding Accuracies: ± 0.2 mm/10M length	Vendor to (C&S)			
8.2	X & Y positioning accuracy: ± 0.3 mm/10M length	Vendor to (C&S)			
8.3	Repeatability: ± 0.2 mm/10M length	Vendor to (C&S)			
8.4	Shape Accuracy/ Diagonal Accuracy: ± 0.5 mm in 10Mx6M cutting	Vendor to (C&S)			
8.5	All the above accuracies to be demonstrated to BHEL engineers during pre-acceptance at supplier's work and during erection & commissioning at BHEL Works	Vendor to (C&S)			
9	SOFTWARE PACKAGE:				
9.1	PC based Software package compatible to 64 bit for generation of nesting plans for Oxy-fuel cutting.	Vendor to confirm			
	The PC with software package will be located at remote place away from the machine	Vendor to note			
	• Adjustable technology database which takes care of all necessary parameters during nesting automatically based upon the material, plate thickness and cutting process	Vendor to confirm			
	• Definition and nesting of remnant plate geometries	Vendor to confirm			
	• Optimum plate usage	Vendor to confirm			
	• Compatibility to a wide range of cutting machines	Vendor to confirm			
	• Easy and intuitive operation as many of CAD drawing functions	Vendor to confirm			
	• Interfaces DXF, DWG, DWF, IGES	Vendor to confirm			
	• General Functions				
	Reading in and creation of part drawings	Vendor to confirm			
	Manual nesting	Vendor to confirm			

Saving and loading of the nesting plans created	Vendor to confirm			
NC code generation	Vendor to confirm			
Printing of nested plans and parts	Vendor to confirm			
Technology database	Vendor to confirm			
Zoom, object snap and drawing functions	Vendor to confirm			
Preview of all parts in an optical parts list	Vendor to confirm			
Display and nesting of several nesting plans in one layer	Vendor to confirm			
Profiles to support a variety of individual configurations	Vendor to confirm			
• Nesting Functions				
Form and nest groups	Vendor to confirm			
Automatic check of gaps between parts	Vendor to confirm			
Nesting in rows	Vendor to confirm			
Part matrices	Vendor to confirm			
Move, Rotate, Copy, Mirror	Vendor to confirm			
Common cuts	Vendor to confirm			
Configurable process database	Vendor to confirm			
Gap between parts, lead length and position configurable according to process	Vendor to confirm			
Allocation of the process data for different machines	Vendor to confirm			
Pre-selection of the machine, thickness and type of material	Vendor to confirm			
Automatically placed lead-ins and run-outs	Vendor to confirm			
Lead length and type can be changed manually	Vendor to confirm			
Output format for the NC machine code configurable	Vendor to confirm			
Coordinate origin freely selectable	Vendor to confirm			
• Autonest Program for automatic nesting				
Selection of several strategies	Vendor to confirm			
Parts library with graphic representation.	Vendor to confirm			
Simple administration of the part	Vendor to confirm			
Saving of parts	Vendor to confirm			
Easy assembly of the parts for nesting using search criteria	Vendor to confirm			
Sorting parts lists by groups, for example by material and thickness	Vendor to confirm			
Creation of customer specific parts libraries	Vendor to confirm			
• Plan Library				
Administration of plans	Vendor to confirm			
Storage of plans	Vendor to confirm			
• Plate Library				
Administration of plates	Vendor to confirm			
Selection of plates for nesting	Vendor to confirm			
Saving of remnant plates created	Vendor to confirm			
Sorting of plates lists	Vendor to confirm			
Creation of customer specific plates libraries	Vendor to confirm			
Automatic generation of corner loops, leadin windows, lead-in & lead-outs	Vendor to confirm			

9.2	Suitable post-processor for CNC controller supplied	Vendor to confirm			
9.3	Work order management, i.e. status of job cut w/rt plate loaded, already produced, qty. left, may be automatically loading in the new nesting etc.	Vendor to confirm			
9.4	Desktop PC to be provided by Vendor	Vendor to confirm			
	Make: HP latest versions	Vendor to (C&S)			
	Latest operating version of Windows 64 Bit	Vendor to (C&S)			
	• Microsoft Internet Explorer latest version	Vendor to (C&S)			
	• Microsoft .NET Framework, latest Version	Vendor to (C&S)			
	• TFT 21", Hi resolution screen; min. 2 GHz Intel Processor, USB-Ports, 4 GB RAM, min.320GB HD with keyboard and mouse. A3 size high performance B/W HP Laser printer.	Vendor to (C&S)			
9.5	DNC NETWORKING: Make Cisco / Cimco Software for transfer of CNC part programmes from programming station computer to the machine via wireless communication. Suitable Hardware like Transmitter, Receiver, connecting cable , adapters should also be provided by the vendor. May be quoted as optional	Vendor to (Confirm & Specify)			
9.6	Vendor to take full responsibility of commissioning the DNC Networking system between machine & PC supplied.	Vendor to confirm			
10	Gas Control	Vendor to (C&S)			
10.1	Automatic and manual gas control system to control flow & pressure of cutting gas system.	Vendor to (C&S)			
10.2	Flash back arrestor for the gases				
11	Hoses and Cables: All hoses & cable assemblies required for oxy-fuel cutting system should be of high quality, robust & resistant to heat, oil and suitable for tropical environment. Hoses shall be of OEM make or of manufacturers of repute like Parker/Gates. All fittings for the flow of all required gases from gas cylinders/gas lines to gas console shall be supplied by vendor.	Vendor to confirm			
12	Table: Dry cutting tables for cutting with provision of slag collection and movable trays. Ample no. of heavy duty slats shall be fitted on the table to support thick plates. The computer software shall have in built program to cut the slats.	Vendor to (C&S)			
13	Lubrication system if any shall be provided.	Vendor to confirm			
14	AIR CONDITIONERS:				
14.1	Independent air conditioners with dehumidifiers of suitable & sufficient capacity to be provided for each Electrical / Electronic Panels / Cabinets including Operator's Panel considering specified ambient conditions. Detailed specifications of the same to be provided.	Vendor to (C&S)			
14.2	Air conditioner must be of refrigerant type.	Vendor to (C&S)			
15	UPS FOR CNC SYSTEM:				
15.1	UPS unit for CNC System with 15 minute minimum backup time, automatic shutdown feature for Windows operating system.	Vendor to (C&S)			
16	MACHINE LIGHTS:				
16.1	Machine Lights for sufficient illumination at operator's panel should be provided for clear visibility.	Vendor to (C&S)			

16.2	All light fittings, consumables, adapters/receptacles should have compatibility with Indian equivalents	Vendor to (C&S)			
17 ULTRA ISOLATION TRANSFORMER					
17.1	Ultra Isolation Transformer (NEEL or reputed Indian make) suitable for complete machine including, for unbalanced load & supply conditions considering specified power supply & ambient conditions.	Vendor to (C&S)			
17.2	Make, Model, Rating & Input/output Voltage etc.	Vendor to (C&S)			
17.3	Monitoring device with cut-off facility for under/over output voltage. Devices for load current measurement, MCCB at input for overload/short circuit protection. (Details to be specified)	Vendor to (C&S)			
18 CONSTRUCTION:					
18.1	Vendor to furnish details of material, hardness & constructional details, including explanatory drawings, of various components/assemblies like Column, end carriage, cross arm, cutting head etc. of the machine.	Vendor to confirm			
18.2	Video images on CD including hard copy explaining the technical features / Literature with photographs, drawings explaining the technical features should be enclosed with the offer	Vendor to confirm			
19 ELECTRICAL SYSTEM :					
19.1	415V \pm 10%, 50HZ \pm 3%, 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. Requirement of grounding/earthing with required material details is to be specified by vendor well in advance so that same could be incorporated during construction of foundation.	Vendor to (C&S)			
19.2	Tropicalisation: All electrical / electronic equipment shall be tropicalized	Vendor to (C&S)			
19.3	All electrical & electronic control cabinets & panels should be dust and vermin proof	Vendor to (C&S)			
19.4	All electrical components in the cabinets should be mounted on DIN Rail	Vendor to (C&S)			
19.5	All electrical / electronic panels to be provided with adequate door locks. All electrical and electronic panels including operator's panel should be provided with fluorescent lamps for sufficient illumination and power receptacles of 220VVolts, 5/15 Amp AC. All adapters/receptacles should have compatibility with Indian equivalents.	Vendor to (C&S)			
19.6	Motors shall conform to IEC or Indian Standards	Vendor to (C&S)			
19.7	All cables moving with traversing axes should be installed in Caterpillar/ Drag chain. Additionally, all the cable trays required for laying of cables should be included in the offer.	Vendor to (C&S)			
19.8	Vendor should ensure the proper earthing for the machine and its peripherals.	Vendor to (C&S)			
20 SAFETY ARRANGEMENTS					
	Following safety features in addition to other standard safety features should be provided on the machine:				

20.1	Machine shall have adequate and reliable safety interlocks / devices to avoid damage to the machine, work piece and the operator due to the malfunctioning or mistakes. Machine functions should be continuously monitored and alarm / warning indications should be generated.	Vendor to Confirm			
20.2	3 stage Limit safety available on X and Y axis Geometric Soft Limits, Electrical Limit & Mechanical Limits via suitable methods. Andon light with alarm which will give beep signal when the machine is moving in rapid	Vendor to (C&S)			
20.3	All the pipes, cables etc. on the machine should be well supported and protected. These should not create any hindrance to machine operator's movement for effective use of machine and for maintenance personnel.	Vendor to Confirm			
20.4	Emergency Switches at suitable locations as per International Norms should be provided.	Vendor to Confirm			
21	ENVIRONMENTAL PERFORMANCE				
	The machine should conform to following factors related to environment :				
21.1	Supplier to specify the sound level during cutting of various thicknesses.	Vendor to specify			
21.2	No hazardous chemicals shall be required to be used in the machine.	Vendor to Confirm			
21.3	If any safety / environmental protection enclosure is required, it shall be built-in by the vendor. Shall be quoted as optional.	Vendor to (C&S)			
21.4	Paint of the machine should be oil resistant & should not get peeled off.	Vendor to Confirm			
22	LEVELLING & ANCHORING SYSTEM				
22.1	Complete set of anchoring materials including foundation bolts, nuts, washers, fixators, levelling shoes etc for alignment of tracks, levelling of tracks & transverse carriage, torch suspension system shall be arranged by the vendor to for machine erection.	Vendor to Confirm			
23	TOOLS FOR ERECTION, OPERATION & MAINTENANCE				
23.1	Tools and Equipments required for erection of the machine shall be brought by the vendor. Necessary tools like Torque Wrench, Spanners, Keys, grease guns etc. for operation and maintenance of the machine shall be supplied by the vendor. List of such tools & machine equipments to be specified.	Vendor to Confirm			
23.2	Set of Test instruments for alignment of track, carriage , checking levelling of cutting table to be brought by vendor . List of instruments to be specified.	Vendor to Confirm			
24	SPARES; Optional -To be quoted separately. Itemised breakup of following mechanical, electrical, electronic and plasma source/torch spares used on the machine Unit Price of each item should be offered.	Vendor to Confirm			
24.1	Mechanical Spares :	Vendor to specify			
24.1.1	All types of Valves, all types of pressure switches / transducers, all types of filters, all types of seals	Vendor to specify			
24.1.2	Gears & Pinions.	Vendor to specify			
24.1.3	Solenoid valves	Vendor to specify			
24.1.4	Bearings used.	Vendor to specify			
24.1.5	Gas regulators and hoses	Vendor to specify			
24.2	Electrical/Electronic/Spares	Vendor to specify			

24.2.1	Relays (each type)	Vendor to specify			
24.2.2	Contactors (each type)	Vendor to specify			
24.2.3	Proximity Switches (each type).	Vendor to specify			
24.2.4	Push Buttons (each type)	Vendor to specify			
24.2.5	Indicating Lamps (each type)	Vendor to specify			
24.2.6	Semiconductor Fuses (each type)	Vendor to specify			
24.2.7	Special Fuses (each type)	Vendor to specify			
24.2.8	Circuit Breakers (each type)	Vendor to specify			
24.2.9	Main Power Switch (each type)	Vendor to specify			
24.2.10	Encoders (each type) if used.	Vendor to specify			
24.2.11	Scanning Heads for Linear Scales (each type)if used	Vendor to specify			
24.2.12	Software 's back up on CD/hard disc (if used).	Vendor to specify			
24.2.13	Main CPU Board .	Vendor to specify			
24.2.14	Complete drive unit.	Vendor to specify			
24.2.15	Ext. PLC CPU, Power supply & I/O unit 1 no. (If used)	Vendor to specify			
24.2.16	Operator's panel with Display Unit(if used)	Vendor to specify			
24.2.17	I/O Cards for PLC (each type)	Vendor to specify			
24.2.18	One each of the following items : CNC /PLC Power Supply, Control Panel, Any other auxiliary drive , if used, Complete Proportional Valve Controller, if used.	Vendor to specify			
24.2.19	Complete CNC system - 1 no.	Vendor to specify			
24.2.20	Axis Servo motor-1 no. of each type.	Vendor to specify			
24.2.21	Spare hard disc of same capacity as used in the machine, loaded with system and OEM software.	Vendor to specify			
24.3	All types of spares for total machine and accessories should be available for at least ten years after supply of the machine. If machine or control is likely to become obsolete in this period, the vendor should specify BHEL sufficiently in advance and provide spares.	Vendor to confirm			
24.4	Complete spare parts manual. Complete list of spares for machine and accessories, with proper identification No./Code. Complete list of all Bought out items along with specification /Type, rating, model, make & address of supplier. Details technical leaflets, literature for all bought out item, accessories etc. of the supplier. All the details given on the drawing and manual should be in English Addressses of the spare supplier shall be furnished along with documentation to be supplied with the machine	Vendor to note			
25	DOCUMENTATION : Four sets of following documents (Hard copies) in English language should be supplied along with the machine:-	Vendor to confirm			
25.1	O & M manuals of Machine & CNC system	Vendor to confirm			
25.2	Programming Manuals of Machine & CNC system	Vendor to confirm			
25.3	Detailed Maintenance manual of machine with all drawings of machine assemblies/sub-assemblies/parts including Electrical /circuit diagrams. All mechanical assembly/ Sub Assembly Drawings shall be supplied with the part list also in English.	Vendor to confirm			
25.4	CNC system manual.	Vendor to confirm			

25.5	Maintenance, interface & commissioning manuals for CNC system, feed drives.	Vendor to confirm			
25.6	Interface description with main machine.	Vendor to confirm			
25.7	Alarm list & diagnostic manual.	Vendor to confirm			
25.8	Operating Manuals, Maintenance Manuals & Catalogues for all items and supplied Accessories.	Vendor to confirm			
25.9	Manual of all bought- out items , Spare parts list and complete addresses of bought- out items supplier.	Vendor to confirm			
25.10	Catalogues, Operation & Maintenance Manuals of all bought out items including drawings, wherever applicable.	Vendor to confirm			
25.11	Details of operator's Panels.	Vendor to confirm			
25.12	PLC program print-outs (hard copy) with comments in English including PLC program for any other auxiliary system if used.	Vendor to confirm			
25.13	PLC program, NC data & PLC data in soft copy.	Vendor to specify			
25.14	Operating system & PLC back up in soft copy.	Vendor to specify			
25.15	Complete back-up on a hard disk to be provided.				
25.16	Complete list of parts/items(Bill of materials) used in the machine in English language.	Vendor to specify			
25.17	One additional set of all the above documentation in soft copy, wherever possible.	Vendor to specify			
26	FOUNDATION: Vendor shall specify the preliminary layout drawing for getting BHEL's approval within one month from the date of Letter of Intent (LOI)/ P.O. , whichever is earlier. Soil condition data will be furnished by BHEL along with the approval. Complete Foundation Design including details of reinforcement and Final Layout drawings shall be specified by the supplier within 2 months after getting BHEL's approval. The layout should consist of all requirements pertaining to complete machine including space requirement for Voltage Stabilizer, Isolation Transformer (if any), Air compressor (if any), & any other accessories. BHEL shall construct complete foundation for the machine under supervision of supplier and at supplier's responsibility. Vendor should arrange equipments required for the testing of foundation, if required by the vendor. The vendor shall also indicate detailed specifications of grouting compound and Grouting procedure etc. for foundation bolts of the machine	Vendor to confirm			
27	ERECTION & COMMISSIONING				
27.1	Supplier to take full responsibility for carrying out the erection, start up, testing of machine, it's control system & all types of other supplied equipments/accessories etc. Service requirement like power, air & water shall be provided by BHEL at only one point to be indicated by supplier in their foundation/layout drawings. Entire material handling, erection and commissioning shall be done by the vendor. Details of these requirements shall be specified by vendor in advance.	Vendor to confirm			
27.2	Erection & Commissioning of track ,Gantry, Drag chain , carriage , Power source, cable /hose assemblies, gas manifolds, UPS / Voltage stabilizer, Isolation Transformer with all mechanical /electrical connections shall be responsibility of vendor.	Vendor to confirm			

27.3	Successful proving of BHEL components by the supplier shall be considered as part of commissioning for the machine. All testing/demonstration shall also be part of erection	Vendor to confirm			
27.4	Tools, Tackles, instruments and other necessary equipment/ tools required to carry out all erection & commissioning activities should be arranged and brought by the supplier.	Vendor to confirm			
27.5	Commissioning spares, required for commissioning of the machine within stipulated time, shall be brought by the supplier on returnable basis.	Vendor to confirm			
27.6	Schedule of Erection and Commissioning shall be specified.	Vendor to specify			
27.7	Terms & conditions for Erection & Commissioning should be furnished in detail separately by vendor along with specify.	Vendor to specify			
27.8	Portion, if any, of the machine, accessories/attachments and other supplied items where paint got rubbed or peeled off during transit or erection should be repainted and matched with the original adjoining paint by the vendor.	Vendor to confirm			
28	TRAINING				
29.1	Four BHEL Persons shall be trained at supplier's works for mutually agreed period in the area of (a) CNC Part Programming/ Technology, Use of all CNC Features, Programming for Measuring Systems & supplied accessories etc. (b) Electrical, Electronic & CNC maintenance for machine & other supplied equipments (c) Mechanical maintenance of the machine & other supplied equipments (d) Operation of the machine & other supplied equipments (e) for advanced features and specialised training if so required by BHEL Supplier to inform about the time required for training and quote for man/week basis.	Vendor to confirm			
29.2	Training of BHEL machine operators in operation of complete machine & accessories etc by the supplier's experts / engineers during their stay at BHEL works.	Vendor to confirm			
29.3	Two weeks supervision of independent operation of machine by BHEL after job prove out.	Vendor to confirm			
29.4	Air-fare, boarding & lodging for the trainees shall be borne by BHEL.	Vendor to note			
29.5	Competent, English speaking experts shall be arranged by the vendor for satisfactory & effective training of BHEL personnel.	Vendor to confirm			
30	AMBIENT CONDITIONS & THERMAL STABILITY				
30.1	Total machine including all supplied items should work trouble free and should give specified accuracies under existing power supply and ambient operating conditions, as mentioned below.	Vendor to confirm			
30.2	Power Supply (AC): Voltage = 415V +10% / -10% of fluctuations, Frequency= 50Hz ±3%, No. of phases = 3 phase with without neutral.	Vendor to confirm			
30.3	Ambient Operating Conditions: Temperature = 5 to 50 degree Celsius with maximum temperature variation of 25 °c, Relative Humidity = 95% max.	Vendor to confirm			
30.4	The machine should be suitable for continuous operation to its full capacity for 24 hours a day and 7 days a week throughout year. Vendor to ensure and confirm the same.	Vendor to confirm			
31	MACHINE ACCEPTANCE (Tests/Activities to be performed & demonstrated by Vendor)	Vendor to confirm			
31.1	Tests/Activities to be carried out at vendor's works on the machine before dispatch :	Vendor to Note			

31.1.1	Demonstration of specified Geometrical accuracies as specified in clause 8 and as per test chart/standard and specified values.	Vendor to confirm			
31.1.2	Demonstration of all features of the machine, control system & accessories	Vendor to confirm			
32.2	Tests/Activities to be carried out at BHEL works while commissioning the machine :	Vendor to Note			
32.2.1	Demonstration of specified Geometrical accuracies in clause 8 and as per test charts/standards and specified values. Vendor to submit the test charts/standards.	Vendor to confirm			
32.2.2	Demonstration of cutting of 300mm thick plates at largest width to demonstrate the maximum cutting capacity of the machine.	Vendor to confirm			
32.2.3	The machine shall be tested for continuous running of 24 hrs. If any break down occurs during this test, the test should be repeated for 24 hrs from that time.	Vendor to confirm			
32.2.4	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			
32.2.5	Demonstration by actual use of all supplied accessories to their full capacity for required applications.	Vendor to confirm			
32.2.6	PROVEOUT: Successful cutting of components by vendor as per BHEL requirements through AUTO CAD/ AUTO NESTING/Programming to the specified cutting capability & quality of cut (as per job requirement) at BHEL works, using software Package / Tools etc. supplied by Vendor. Proving of rotor end plate to drw. no. FAB/SK/001, will be provided during proving	Vendor to confirm			
33	PACKING: Sea worthy & rigid packing for all items of complete machine, CNC System, all Accessories and other supplied items 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			
34	GUARANTEE: Guarantee for complete machine and all supplied accessories/attachments/equipments/items for 24 months from the date of acceptance of the machine after commissioning. Including free replacement of defective items and services with additional guarantee of 1 year on replaced parts..	Vendor to confirm			
35	GENERAL				
35.1	Machine Model No.	Vendor to specify			
35.2	Total connected load (KVA)	Vendor to specify			
35.3	Total Space required (Length, Width, Height) for complete machine, accessories/ attachments and other supplied items like Voltage Stabilizer, Isolation Transformer.	Vendor to specify			
35.4	Painting of Machine / Electrical Panels : RAL 6011 Apple Green (Polyurethane Paint)	Vendor to specify			
35.5	Total weight of the machine	Vendor to specify			
35.6	Weight of heaviest part of machine	Vendor to specify			
35.7	Weight of the heaviest assembly of the Machine	Vendor to specify			
35.8	Dimensions of largest part of the machine	Vendor to specify			
35.9	Vendor to specify reference list of customers where similar machines have been supplied mentioning broad specifications of the supplied machine i.e. Model, CNC System, capacity etc.	Vendor to specify			
35.10	Detailed catalogues, sketches/drawings/photographs pertaining to the specified machines and accessories/attachments/items should be specified with the specify.	Vendor to specify			

35.11	All Cables and Hoses etc. should be well supported & protected in trays/brackets/drag chains etc. All designed & operating parameters for plasma power source, compressor, chiller unit etc. should be provided.	Vendor to specify			
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