

	<u>BHARAT HEAVY ELECTRICAL LIMITED</u>			Enquiry No.:	
	<u>UNIT'S ADDRESS:</u>			Enquiry No.:	
	<u>UNIT'S PHONE NOS.</u>			Enquiry No.:	
	<u>CONTACT PERSON'S NAME/DESIGN./PHONE NO./E-MAIL (FROM PURCHASE DEPTT.)</u>			Enquiry No.:	
	<u>SPECIFICATION CUM COMPLIANCE CERTIFICATE OF CNC PLASMA CUTTING MACHINE</u>				
	<u>NOTE:-</u>				
	1. Vendor must specify complete specification against clause no. 41.0 The offer meeting this clause would only be processed				
	2. The "Offered" Column and where applicable, the "Deviations" & "Remarks" Column of this format shall be filled in by the Vendor and specified along with the offer. Inadequate / incomplete, ambiguous, or unsustainable specification 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.				
	4. The specification provided by vendor in specification cum compliance certificate will supersede any other specification provided by vendor.				
	<u>ADDRESS OF THE SUPPLIER :</u>		<u>ADDRESS OF THE INDIAN AGENTS :</u>		
	<u>TELEPHONE NOS.:</u>		<u>TELEPHONE NOS.:</u>		
	<u>FAX NOS.:</u>		<u>FAX NOS.:</u>		
	<u>E-MAIL ADDRESS :</u>		<u>E-MAIL ADDRESS :</u>		
	<u>SCOPE: SUPPLY, ERECTION & COMMISSIONING OF CNC PLASMA CUTTING MACHINE</u>				

S. NO.	DESCRIPTION OF BHEL REQUIREMENT	Vendor to confirm/specify	OFFERED	DEVIATION	REMARKS
1	Purpose: High current density CNC Plasma Cutting of stainless steels, mild steel and alloy steel in various shapes with auto bevelling (contour).	Vendor to confirm			
2	SPECIFICATIONS:				
2.1	Basic Equipment:- Should be capable to cut plates of size 3000 mm (width) x 12000 (length) mm without moving the plate.	Vendor to confirm			
2.2	Thickness cutting capacity -up to 70 mm stainless steel quality cut and 100 mm with dress as per DIN 2310 part -4 for dry gas plasma cutting.	Vendor to confirm			
2.3	Cutting and chamfering (Straight , circular and contour) as per CNC programmes with rotary bevelling facility.	Vendor to confirm			
2.4	Hole Piercing capacity: 50 mm or more	Vendor to confirm			
2.6	Bevel angle after cutting: : < 3° up to 100 mm thick plate	Vendor to confirm			
2.7	Plasma gas -Argon/Hydrogen/Air/Oxygen/Nitrogen	Vendor to confirm			
2.8	Swirl gas: Oxygen / Nitrogen	Vendor to confirm			
3	Power Source				
3.1	Power source thyristor / Inverter type with high plasma cutting performance for CNC controlled cutting to meet job requirements as per clause 2.0 of specification .	Vendor to confirm			
3.2	Power Source Make: ESAB / Kjellburg / Kaliburn / Hypertherm / Koike	Vendor to confirm			
4	CUTTING TORCH:				
4.1	2 separate torch station with two torches one for bevel cutting and one for straight cutting to be provided as specified in clause 4.2 and 4.4.	Vendor to confirm			

S. NO.	DESCRIPTION OF BHEL REQUIREMENT	Vendor to confirm/specify	OFFERED	DEVIATION	REMARKS
4.2	Plasma cutting Torch- 1 no. with 3-axis automatic plasma bevel cutting and chamfering for circular jobs and contour cutting: Capacity -up to 100 mm stainless steel for dry gas plasma cutting	Vendor to confirm			
4.3	Bevel angle cutting variable between -45° to +45 °	Vendor to confirm			
4.4	Plasma cutting Torch- 1 no. for straight cutting: Capacity -up to 120 mm stainless steel for dry gas plasma cutting	Vendor to confirm			
4.5	Operating Mode : Manual / Auto selectable	Vendor to confirm			
4.6	Torch suspension system for dry gas plasma cutting including arc height sensing control device to meet cutting at thickness up to 100 mm	Vendor to confirm			
4.7	Arc height sensing & control system (for out of flatness plates).	Vendor to confirm			
4.8	Torch anti - collision device.	Vendor to confirm			
4.9	Two additional cutting torch one as specified in clause no 4.2 and one as specified in clause no 4.4 to be quoted.	Vendor to confirm			
4.10	10 no electrodes and 10 no nozzles to be quoted for each torch				
	5 TRACK /ENERGY FEEDING SYSTEM:				
5.1	Track length suitable to cut 12000 mm plate, including Double sides synchronized longitudinal hardened rack & pinion drive. Track should be accurately machined & aligned.	Vendor to confirm			
5.2	Heavy duty gantry construction.	Vendor to confirm			
5.3	Overhead Drag chain system for longitudinal energy feeding. It should 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. Capacity of chain to be mentioned.	Vendor to confirm			

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5.4	Carriage for transverse energy system for plasma cutting to cover full track width to meet job requirements as per clause 2.0 of specification.	Vendor to confirm			
5.5	X-axis feed rate (0-120%)	Vendor to confirm			
5.6	X-axis rapid traverse rate 6000mm/min or more	Vendor to confirm			
5.7	Y-axis feed rate (0-120%)	Vendor to confirm			
5.8	Y-axis rapid traverse rate 6000mm/min or more	Vendor to confirm			
5.9	Wipers for X & Y axes guide ways to be provided	Vendor to confirm			
5.10	Clutch should be incorporated in driving system to permit free moving of cutting heads and machine bridge.	Vendor to confirm			
	6 FEED AND DRIVE SYSTEM:				
6.1	AC Servo Motors and Drives of suitable rating with necessary chokes and transformers including	Vendor to confirm			
6.2	i) Longitudinal double side drive ii) Transverse drive & control	Vendor to confirm			
6.3	Make of all motors and drives : Siemens / Fanuc / Rexroth / Yasakawa / Baumuller / Panasonic. (Details of model, make, type etc. to be specified)	Vendor to confirm			
6.4	The longitudinal travel of bridge on a precision track should be through servo drives on both sides of bridge having electronic synchronization control to avoid skewing of the machine.	Vendor to confirm			
7	CONTROL SYSTEM: Five axes CNC control system with programming facility. The model, make and complete details with features to be mentioned along with the offer.	Vendor to confirm			
7.1	CNC Controller: It should be Industrial PC Based, 30 GB Hard Disk min, 3 USB port, 12 inch min. LCD colour display, Mouse etc.	Vendor to confirm			
7.2	Separate controls on operator panel for each torch station one for straight and one for bevel cutting.	Vendor to confirm			

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7.3	Make: Burny / Messer / Esab	Vendor to confirm			
7.4	PLC for controlling the logic operation. Make : Siemens / Fanuc / Messer / Burny / ESAB.	Vendor to confirm			
7.5	Details of Standard features. List to be specified.	Vendor to confirm			
7.6	All software changes in cutting software should be supported free of cost for 10 years if there is any operating platform changes.	Vendor to confirm			
7.7	RS 232 port for communication.	Vendor to confirm			
7.8	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 confirm			
	8 OPERATION AND CONTROL SYSTEM:				
	8.1 OPERATOR'S PANEL:				
8.1.1	Swivelling type operator's panel having complete CNC and machine control system with TFT/LCD of required configuration shall be provided on the operators platform. All displays/indications should also be conveniently placed accordingly. Layout showing complete details of the panel should be provided.	Vendor to confirm			
8.1.2	Operator control panel should display all control features (Refer clause 3.3.1 of specification) & other features & should have all push buttons ,signal lamps, gauges, Knobs etc. for easy & comfortable operation.	Vendor to specify /confirm			
8.1.3	All details of operator Panel to be provided.	Vendor to confirm			

S. NO.	DESCRIPTION OF BHEL REQUIREMENT	Vendor to confirm/specify	OFFERED	DEVIATION	REMARKS
9	Accuracy				
9.1	Longitudinal Guiding Accuracies: 0.02mm	Vendor to confirm			
9.2	Positioning Accuracy: 0.5mm	Vendor to confirm			
9.3	Repeatability: 0.5mm	Vendor to confirm			
9.4	Shape Accuracy / Diagonal Accuracy: 1 mm in 3000 mm x 12000 mm cutting	Vendor to confirm			
9.5	All the above accuracies to be demonstrated to BHEL engineers during pre-acceptance at Suppliers works and during Erection & Commissioning at BHEL Works	Vendor to confirm			
10	SOFTWARE PACKAGE:				
10.1	Required for generation of nesting plans for plasma cutting on CNC plasma cutting machine.	Vendor to specify /confirm			
10.2	Powerful CAD system for design of parts for thermal cutting .	Vendor to confirm			
10.3	Auto CAD system for import of components from Engineering /design departments.	Vendor to confirm			
10.4	Auto nesting of components w.r.t thickness & materials grades of components with best utilization of plate .	Vendor to confirm			
10.5	Make of software package for auto nesting: NC Polarized / Sigma Nest / Jet Cam				
10.6	Programme for the manual on-screen nesting of parts on a plate.	Vendor to confirm			
10.7	Acceptance of ESSi format to read the CNC programme.	Vendor to confirm			
10.9	CAD/CAM programming software package to meet job requirements as mentioned at clause 2.0 of specification. It should be suitable for automatic contour bevelling. Vendor to provide details of CAD/CAM programming software including :-	Vendor to confirm			
10.10	CAD-Module giving details of geometry function ,Auxiliary function, Manipulations , Dimensions, standard programs, Text input etc.	Vendor to confirm			

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10.11	Special functions giving details of marking functions, print output , Data converter, NC link, Simulation, Post processor etc.	Vendor to confirm			
10.12	Path automatic nesting module giving details of lead in/ lead out , nesting etc.	Vendor to confirm			
10.13	Parts library with graphic representation.	Vendor to confirm			
10.14	Work order management.	Vendor to confirm			
10.15	Wi-Fi Communication system: Suitable wireless device/server for wireless communication from centralized computer.	Vendor to confirm			
10.16	NETWORKING: Software for transfer of CNC part programmes from centralized computer to the M/C via wireless communication.	Vendor to confirm			
10.17	All software packages should be provided with lifetime license validity and compatible with Microsoft windows operating system	Vendor to confirm			
11	FAULT DIAGNOSTIC SYSTEM : Supplier's own diagnostic system with required Software and Hardware installed on the CNC system, which shows detailed cause and remedy for the fault on the CNC system display with full diagnostics indicating the element /device causing the fault.	Vendor to confirm			
12.1	Automatic Gas control and manifold system for plasma cutting .	Vendor to confirm			
12.2	Plasma gas pressure, quality of gas at the cutting end to be mentioned.	Vendor to specify			
13	Hoses and Cables: All hoses & cable assemblies required for Plasma cutting system . All power cables & hoses should be of high quality , robust & resistant to heat,oil and suitable for tropical environment.	Vendor to confirm			
14	Cooling System, Chiller unit etc. for Gas Plasma Cutting.	Vendor to confirm			

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15	Compressor system with dryer for Air plasma	Vendor to confirm			
16	Table: Cutting tables for gas plasma cutting .	Vendor to confirm			
17	Removable trays for disposal of slag for entire cutting table of the machine.	Vendor to confirm			
18	Fume extraction system for plasma cutting to cover complete bed of size 3000 mm x 12000 mm.	Vendor to confirm			
19	Sets of tools required for operation & maintenance. List of tools to be specified with offer.	Vendor to confirm			
20	AIR CONDITINERS:				
20.1	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 confirm			
20.2	Air conditioner must be of refrigerant type.(Refer ambient conditions as per clause no. 36 of specification)	Vendor to confirm			
21	UPS FOR CNC SYSTEM:	Vendor to specify			
21.1	UPS unit for CNC System with 15 minute minimum backup time, automatic shutdown feature for Windows operating system.	Vendor to specify			

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22	MACHINE LIGHTS:				
22.1	Machine Lights for sufficient illumination at operator's panel should be provided for clear visibility.	Vendor to confirm			
22.2	All light fittings, consumables, adapters/receptacles should have compatibility with Indian equivalents	Vendor to confirm			
23	ULTRA ISOLATION TRANSFORMER				
23.1	Ultra Isolation Transformer (NEEL or reputed Indian make) suitable for complete machine , its drives, controls, PLC etc. for unbalanced load & supply conditions considering specified power supply & ambient conditions.	Vendor to confirm			
23.2	Make, Model, Rating & Input/output Voltage etc.	Vendor to specify			
23.3	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 specify			
24	CONSTRUCTION:				
24.1	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			
24.2	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			

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25	ELECTRICAL SYSTEM :				
25.1	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 confirm			
25.2	Tropicalisation: All electrical / electronic equipment shall be tropicalized	Vendor to confirm			
25.3	All electrical & electronic control cabinets & panels should be dust and vermin proof	Vendor to confirm			
25.4	All electrical components in the cabinets should be mounted on DIN Rail	Vendor to confirm			
25.5	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 220V volts, 5/15 Amp AC. All adapters/receptacles should have compatibility with Indian equivalents.	Vendor to confirm			
25.6	Motors shall conform to IEC or Indian Standards	Vendor to confirm			
25.7	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 confirm			
25.8	Vendor should ensure the proper earthing for the machine and its peripherals.	Vendor to confirm			

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26	SAFETY ARRANGEMENTS Following safety features in addition to other standard safety features should be provided on the machine:	Vendor to confirm			
26.1	Machine should 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		,	
26.3	A detailed list of all alarms / indications provided on machine should be specified by the supplier.	Vendor to specify			
26.4	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's .	Vendor to confirm			
26.5	Emergency Switches at suitable locations as per International Norms should be provided.	Vendor to confirm and specify			
26.6	Oil pipe lines should not run with electrical cable in the same trench.	Vendor to confirm			
27	ENVIRONMENTAL PERFORMANCE The machine should conform to following factors related to environment :	Vendor to confirm			
27.1	Maximum noise level shall be 85 dB(A) at normal load condition, 1 meter away from the machine with correction factor for back ground noise, if necessary. This will be measured as per international standards like DIN 45635-16, if required.	Vendor to confirm			
27.2	No hazardous chemicals shall be required to be used in the machine.	Vendor to confirm			

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27.3	If any safety / environmental protection enclosure is required it should be built in by the vendor.	Vendor to confirm			
27.4	Paint of the machine should be oil resistant & should not get peeled off.	Vendor to confirm			
28	LEVELING & ANCHORING SYSTEM				
28.1	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 & fix the machine to the foundation . Details to be specified.	Vendor to specify /confirm			
29	TOOLS FOR ERECTION, OPERATION & MAINTENANCE				
29.1	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 should be supplied by the vendor. List of such tools & machine equipments to be specified .	Vendor to specify /confirm			
29.2	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 specify /confirm			

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30	SPARES: Itemised breakup of mechanical, hydraulic, electrical, electronic and CNC spares used on the machine in sufficient quantity as per recommendation of Vendor for 2 years of trouble free operation on three shifts continuous running basis should be offered by vendor. The list to include following, in addition to other recommended spares: (Unit Price of each item of spare should be offered). Unpriced bid to be specified along with technical offer.	Vendor to specify			
30.1	Mechanical Spares : Following Spares are to be specified.	Vendor to specify			
30.1.1	All types of Valves, All types of pressure switches / transducers, All types of filters, All types of seals				
30.1.2	Gears & Pinions.	Vendor to specify			
30.1.3	Solenoid valves	Vendor to specify			
30.1.4	Bearings used.	Vendor to specify			
30.1.5	Gas regulators and hoses	Vendor to specify			
30.1.6	Electrical /Electronic / CNC Spares : Following Spares are to be specified.	Vendor to specify			
30.1.7	Front Panel Display	Vendor to specify			
30.1.8	Feed Drives	Vendor to specify			
30.2	Electrical/Electronic Spares	Vendor to specify			
30.2.1	Relays (5 Nos each type)	Vendor to specify			
30.2.2	Contactors (5 Nos each type)	Vendor to specify			
30.2.3	Proximity Switches (5 Nos each type).	Vendor to specify			
30.2.4	Push Buttons (5 Nos each type)	Vendor to specify			
30.2.5	Indicating Lamps (20 Nos each type)	Vendor to specify			
30.2.6	Semiconductor Fuses (5 Nos each type)	Vendor to specify			
30.2.7	Special Fuses (5 Nos each type)	Vendor to specify			
30.2.8	Circuit Breakers (1 No each type)	Vendor to specify			

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30.2.9	Main Power Switch (1 No each type)	Vendor to specify			
30.2.10	Encoders (1 No each type) if used.	Vendor to specify			
30.2.11	Scanning Heads for Linear Scales (1 No each type)if used	Vendor to specify			
30.2.12	Software 's back up on CD/hard disc (if used).	Vendor to specify			
30.2.13	Main CPU Board .	Vendor to specify			
30.2.14	Complete drive unit.	Vendor to specify			
30.2.15	Ext. PLC CPU, Power supply & I/O unit 1 no. (If used)	Vendor to specify			
30.2.16	Complete plasma arc height sensing system .	Vendor to specify			
30.2.17	Anti collision device.	Vendor to specify			
30.2.18	All PCB's of Plasma Power source unit .	Vendor to specify			
30.2.19	Power elements of plasma power source .	Vendor to specify			
30.2.20	Power lead of plasma torch.	Vendor to specify			
30.2.21	Operator's panel with Display Unit(If used)	Vendor to specify			
30.2.22	I/O Cards for PLC (1 No each type)	Vendor to specify			
30.2.23	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			
30.2.24	Complete CNC system -1 no.	Vendor to specify			
30.2.25	Axis Servo motor-1 no. of each type.	Vendor to specify			
30.2.26	Spare hard disc of same capacity as used in the machine , loaded with system and OEM software .	Vendor to specify			
30.3	Recommended set of spares for all attachments are to be offered with details.	Vendor to specify			

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30.5	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			
30.6	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, accssories etc. of the supplier. All the details given on the drawing and manual should be in English .Address of the spare supplier shall be furnished along with documentation to be supplied with the machine	Vendor to confirm/ specify			
31	DOCUMENTATION : Four sets of following documents (Hard copies) in English language should be supplied along with the machine:-	Vendor to specify/ confirm			
31.1	O & M manuals of Machine & CNC system	Vendor to specify			
31.2	Programming Manuals of Machine & CNC system	Vendor to specify			
31.3	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/ specify			
31.4	Hardware manual of CNC system.	Vendor to specify			
31.5	Maintenance, interface & commissioning manuals for CNC system, feed drives.	Vendor to specify			
31.6	Electrical schematic wiring diagram junction Box details , connector pin details cable layout.	Vendor to specify			
31.7	O &M manual of plasma power source .	Vendor to specify			
31.8	Wiring diagram, Circuit diagram , Component layout of plasma Source.	Vendor to specify			

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31.9	Interface description of Plasma Source with main machine.	Vendor to specify			
31.10	Alarm list & diagnostic manual of plasma unit.	Vendor to specify			
31.11	Manufacturing drawings for all supplied tool holders, coolant connections, tailstock centre, adapters, sleeves, fixtures etc.	Vendor to specify			
31.12	Detailed specification of all rubber items and hydraulic/lube fittings	Vendor to specify			
31.13	Operating Manuals, Maintenance Manuals & Catalogues for supplied Isolation Transformer and all supplied Accessories.	Vendor to specify			
31.14	Manual of all bought- out items , Spare parts list and complete addresses of bought- out items supplier.	Vendor to specify			
31.15	Catalogues, Operation & Maintenance Manuals of all bought out items including drawings, wherever applicable.	Vendor to specify			
31.16	Details of operator's Panels.	Vendor to specify			
31.17	Operating Manuals, Maintenance Manuals & Catalogues for supplied accessories.	Vendor to specify			
31.18	PLC program print-outs (hard copy) with comments in English including PLC program for any other auxiliary system if used.	Vendor to specify			
31.19	PLC program, NC data & PLC data in soft copy.	Vendor to specify			
31.20	Operating system & PLC back up in soft copy.	Vendor to specify			
31.21	Complete back-up on a hard disk to be provided.				
31.22	Details of drives controlling the valves.	Vendor to specify			
31.23	Complete list of parts/items(Bill of materials) used in the machine in English language.	Vendor to specify			
31.24	One additional set of all the above documentation in soft copy, wherever possible.	Vendor to specify			

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32	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 three 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			
33	ERECTION & COMMISSIONING				
33.1	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. Crane shall also be provided by BHEL. Details of these requirements should be specified by vendor in advance.	Vendor to confirm			
33.2	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			

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33.3	Successful proving of BHEL components by the supplier shall be considered as part of commissioning for the machine . All tests, as mentioned at Sl. No. 19.0 (Machine Acceptance) and testing/demonstration of tele-diagnostic service etc. shall also be part of erection /commissioning .	Vendor to confirm			
33.4	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			
33.5	Commissioning spares, required for commissioning of the machine within stipulated time, shall be brought by the supplier on returnable basis.	Vendor to confirm			
33.6	Schedule of Erection and Commissioning shall be specified with the specify.	Vendor to specify			
33.7	Terms & conditions for Erection & Commissioning should be furnished in detail separately by vendor along with specify.	Vendor to specify			
33.8	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			
34	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 vide clause no. 2.0 of specification) at BHEL works, using software Package / Tools etc.supplied by Vendor. Wire less communication system will also to checked.	Vendor to confirm & specify			
35	TRAINING				

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35.1	Four BHEL Persons should 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 & Hydraulic 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	Vendor to confirm			
35.2	Air-fare, boarding & lodging for the trainees shall be borne by BHEL.	For vendor's			
35.3	Competent, English speaking experts shall be arranged by the vendor for satisfactory & effective training of BHEL personnel.	Vendor to confirm			
36	AMBIENT CONDITIONS & THERMAL STABILITY				
36.1	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			
36.2	Power Supply (AC): Voltage = 415V +10% / -10% of fluctuations , Frequency= 50Hz ±3%, No. of phases = 3 phase with neutral.	Vendor to confirm			
36.3	Ambient Operating Conditions: Temperature = 5 to 50 degree Celsius with maximum temperature variation of 25 °c , Relative Humidity = 95% max.	Vendor to confirm			
36.4	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			

S. NO.	DESCRIPTION OF BHEL REQUIREMENT	Vendor to confirm/specify	OFFERED	DEVIATION	REMARKS
37	MACHINE ACCEPTANCE (Tests/Activities to be performed & demonstrated by Vendor)	Vendor to confirm			
37.1	Tests/Activities to be carried out at vendor's works on the machine before dispatch :	Vendor to confirm			
37.1.1	Demonstration of specified Geometrical accuracies as specified in clause 9 and as per test chart/standard and specified values.	Vendor to confirm			
37.1.2	Demonstration of all features of the machine, control system & accessories	Vendor to confirm			
37.1.3	70 mm stainless steel quality with chamfering (Straight , circular and contour) as per CNC programmes with rotary bevelling facility cut to demonstrate cutting capacity of machine.	Vendor to confirm			
37.2	Tests/Activities to be carried out at BHEL works while commissioning the machine :	Vendor to confirm			
37.2.1	Demonstration of specified/specified Geometrical accuracies as per test chart/standard and specified values.	Vendor to confirm			
37.2.2	Full thickness test at largest width to demonstrate the maximum cutting capacity of the machine. Acceptance standard as per DIN 2310 part 4	Vendor to confirm			
37.2.3	The machine should 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			
37.2.4	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			
37.2.5	Demonstration by actual use of all supplied accessories to their full capacity for required applications.	Vendor to confirm			
37.2.6	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			
37.2.7	Job prove out.	Vendor to confirm			

S. NO.	DESCRIPTION OF BHEL REQUIREMENT	Vendor to confirm/specify	OFFERED	DEVIATION	REMARKS
37.2.8	Two weeks supervision of independent operation of machine by BHEL after job prove out.	Vendor to confirm			
38	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 specify & confirm			
39	GUARANTEE: Guarantee for complete machine and all supplied accessories/attachments/equipments/items for 24 months from the date of acceptance of the machine.	Vendor to specify			
40	GENERAL				
40.1	Machine Model No.	Vendor to specify			
40.2	Total connected load (KVA)	Vendor to specify			
40.3	Total Space required (Length, Width, Height) for complete machine, accessories/attachments and other supplied items like Voltage Stabilizer, Isolation Transformer.	Vendor to specify			
40.4	Painting of Machine / Electrical Panels : RAL 6011 Apple Green (Polyurethane Paint)	Vendor to specify			
40.5	Total weight of the machine	Vendor to specify			
40.6	Weight of heaviest part of machine	Vendor to specify			
40.7	Weight of the heaviest assembly of the Machine	Vendor to specify			
40.8	Dimensions of largest part of the machine	Vendor to specify			
40.9	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			

S. NO.	DESCRIPTION OF BHEL REQUIREMENT	Vendor to confirm/specify	OFFERED	DEVIATION	REMARKS
40.10	Detailed catalogues, sketches/drawings/photographs pertaining to the specified machines and accessories/attachments/items should be specified with the specify.	Vendor to specify			
40.11	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			

S. NO.	DESCRIPTION OF BHEL REQUIREMENT	Vendor to confirm/specify	OFFERED	DEVIATION	REMARKS
41	QUALIFYING CONDITIONS :				
41.1	Only those vendors who have supplied and commissioned at least one CNC Plasma Cutting machine with cutting capacity -up to 70 mm stainless steel quality cut and 100 mm with dross as per DIN 2310 part -4 for dry gas plasma cutting with chamfering (Straight , circular and contour) as per CNC programmes with rotary bevelling facility in the past ten years and such machines are presently working satisfactorily for more than one years after commissioning shall quote. The following specification is to be specified by the vendor about the companies where similar machines have been supplied.	Vendor to Confirm			
41.2	Name of the customer / company where similar machine is installed.	Vendor to Confirm			
41.3	Complete postal address of the customer.	Vendor to Confirm			
41.4	Year of commissioning.	Vendor to Confirm			
41.5	Application for which the machine is supplied.	Vendor to Confirm			
41.6	5. Name and designation of the contact person of the customer.	Vendor to Confirm			
41.7	Phone, FAX no. and email address of the contact person of the customer.	Vendor to Confirm			
41.8	Performance certificate from any one customer regarding satisfactory performance of machine supplied to them. The certificate to be issued within one year of issue of tender	Vendor to Confirm			
41.9	BHEL reserves the right to verify information provided by vendor. In case the information provided by vendor is found to be false/incorrect, the offer shall be rejected.	Vendor to Confirm			