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 70 49 Fax : +91 431 252 07 19 Email : csguna@bheltry.co.in Web : www.bhel.com

TWO PART BID Tender to be submitted in two parts.	**Enquiry Number:** **2620900204**	**Enquiry Date:** **23.09.2009**	**Due date for submission of quotation:** **02.11.2009**

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
10	**Long Seam Belt Seam Grinding Machine – Column and Boom Type Drum** as per the technical specification, general guidelines instructions & commercial conditions applicable (to be downloaded from web site www.bhel.com or http://tenders.gov.in)	**1 No**

Important points to be taken care during submission of offer

1. **Delivery required 12 months from the date of purchase order.**
2. **Grace period of 3 months beyond the above delivery period will be considered.**
3. **Checklist to be filled and enclosed along with the offer failing which, the offer will not be considered for evaluation.**

BHEL's General guidelines / instructions (refer MM/CE/GT/001) 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 "2620900204".

Tenders should reach us before 14:00 hours on the due date Tenders will be opened at 14:30 hours on the due date Tenders would be opened in presence of the tenderers who have submitted their offers and who may like to be present	Yours faithfully, For BHARAT HEAVY ELECTRICALS LIMITED Sr.Manager / MM / Capital Equipment

PART A.

QUALIFYING CRITERIA FOR THE SUPPLY OF COLUMN & BOOM TYPE LONG-SEAM WELD BUTT-JOINT BELT GRINDING MACHINE

SECTION – I : COMPANY PROFILE

The BIDDER has to provide the details pertaining to each clause in the table given below, to understand the profile of the BIDDER's COMPANY.

S.No.	PARTICULARS	VENDOR's RESPONSE
1.0	Number of Years of Experience of the BIDDER [OEM - Original Equipment Manufacturer] in the field of Design, Manufacture & Supply of Traveling Column & Boom Type Long-Seam Weld Butt-Joint Belt Grinding Machines with associated Dust Extraction Unit.	
2.0	Details on the Codes/Standards of Machine Design and Manufacture	
3.0	Details on Manufacturing Facilities available with the BIDDER for : a) Heavy Structural Fabrication b) Heat Treatment c) Machining & Grinding d) Machine Assembly & Testing	
4.0	Details of Quality System (with Stages of Internal Inspection) followed for the Machine Building and Testing of Capacity	

SECTION – II : QUALIFYING CRITERIA

The BIDDER [OEM] has to meet the following requirements to get qualified for submitting an offer for the Traveling Column & Boom Type Long-seam Weld Butt-Joint Belt Grinding Machine :
[Additional Sheets shall be attached with the OFFER, to provide requisite details]

S.No.	REQUIREMENTS	VENDOR's RESPONSE
5.0	The BIDDER shall have a minimum of TEN Years of Continuous Experience of in the Field of Design, Manufacture and Supply of Traveling Column & Boom Type Long-seam Weld Butt-Joint Belt Grinding Machines	

S.No.	REQUIREMENTS	VENDOR's RESPONSE
6.0	The BIDDER [OEM] might have supplied atleast FIVE numbers of Traveling Column & Boom Type Long-seam Weld Butt-Joint Belt Grinding Machine with minimum 6 M x 1.5 M configuration. [1.5 Mtr. tall Column and 6 Mtr. long Boom]. The power rating (@ 100% Duty Cycle) for the Electric Motor of the Grinding Head shall NOT be less than 15 HP.	
7.0	Performance Certificate in the enclosed FORMAT for a period, not less than one year, from Customers or Reference List of Customers with full contact details of CONTACT PERSON, who are the End Users of Traveling Column & Boom Type Long-seam Weld Butt-Joint Belt Grinding Machines supplied as per the above **Clause No.6.0**	
8.0	The Performance Certificate or Reference shall be only from customers who are Heavy Engg. Fabricators like Manufacturers of Pressure Vessels and Heat-Exchangers, Off-Shore Oil Rigs, Thermal Power Plant Equipment, etc.	
9.0	BHEL reserves the right to verify the information provided by vendor. In case, it is found to be false/ incorrect, the offer shall get rejected.	
10.0	Details on SERVICE-AFTER-SALES Set-Up in India including the Addresses of Agents / Service Centres in India, to be furnished .	

SECTION – III : BID / OFFER FORMATS

The BIDDER has to note the following :

S.No.	REQUIREMENTS	VENDOR's COMPLIANCE
11.0	The BIDDER shall submit the offer in TWO PARTS - Technical **[**with **PART A & PART B]** & Commercial and Price Bid.	
12.0	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 just 'YES' or 'CONFIRMED' or 'NO-DEVIATION' or 'COMPLIES' or 'ACCEPTED' or similar words in the technical comparative statement may lead to disqualification of the Technical Offer.	

S.No.	REQUIREMENTS	VENDOR's COMPLIANCE
13.0	The Technical Offer shall be supported by Product Catalogue and Data Sheets in ORIGINAL and complete technical details of 'Bought-Out-Items' with copies of Product Catalogue (if applicable)	
14.0	The Commercial 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, auxiliary parts, spares, consumables, etc. with the main and basic equipment, to meet the technical specification requirements.	
15.0	Earlier performance/field experience (including service support) if any, with BHEL for the VENDOR's Equipment / Service, will be a reckoning factor for the technical qualification of the OFFER.	
16.0	The expected delivery period (including the time for Pre-Dispatch Inspection clearance by BHEL) for the subject Belt Grinding Machine is not more than TWELVE Months (which includes time for General Arrangement Drawing approval by BHEL also) from the date of issue of BHEL Purchase Order. In case the quoted delivery period extends beyond TWELVE Months, an additional grace period of three months is permitted, but with a loading for arriving at the PRICE COMPETITIVENESS of the Commercial Offer (if the Offer is technically acceptable on all accounts). Details are given in the Commercial Terms of this Tender.	

PERFORMANCE CERTIFICATE – [SAMPLE FORMAT]

(On Customer's Letter Head with Additional Sheet – if necessary)

1. Supplier of the Equipment/Machine :

2. Make & Model of the Equipment :

3. Month & Year of Commissioning :

4. Application for which Machine is used :

5. a. Equipment Serial Number :
   b. Horse Power of Grinding Head Motor :
   c. Column & Boom Dimensions :
   d. Sizes of Grinding Belts/Wheels Used :
   e. Other Specifications [optional] :

6. Performance of the Machine : Satisfactory / Good / Average / Not Satisfactory

7. Feed- back on 'After Sales Service' by the Supplier :

8. Remarks / Reasons for Recommendations :

Date:

Signature & Seal of the Authority
Issuing the Performance Certificate

PART B

TECHNICAL SPECIFICATIONS FOR TRAVELING COLUMN & BOOM TYPE LONGITUDINAL WELD-SEAM BELT GRINDING MACHINE

1.0 APPLICATION :

1.1 External polishing (flush grinding) of the reinforcement due to weld-beads appearing on longitudinal weld-joints coming in cylindrical / conical shells. The flush grinding has to be done by emery belt.

1.2 Edge Preparation of cylindrical/conical shells of thin walls, to form Single "V" or Double "V" type weld-joint style for large diameter pipe-lines and pressure vessels. This face grinding has to be done by emery belt.

1.3 Back-Chipping/Back-Gouging of un-fused weld-material or lip (part of parent metal) to form the sound metal backing for further welding. This back-grinding or back-chipping operation has to be done by a grinding wheel.

1.4 Plunge – Grinding to form "U" Groove from outside, at the junction formed by butting of square ends of plates/half-shells/cylindrical shells for circumferential welding, by the use of grinding wheel.

1.5 Buffing of surface of cylindrical/conical jobs for cleaning with the use of metal brush.

2 OPERATION :

2.1 The above listed operations are carried out on cylindrical vessels or pipes placed on job-rotators, with facility for surface speed variation and also at uniform rate of rotation.

2.2 The machine shall be operational by a single operator and the machine is placed on steel rails mounted on shop floor, with respect to the job or work-piece.

3 JOB DETAILS :

A. DIMENSIONS :

Minimum Inner Diameter (I.D.)	:	Around 700 mm *
Maximum Inner Diameter (I.D.)	:	3000 mm *
Minimum Wall Thickness	:	30 mm
Maximum Wall Thickness	:	250 mm
Length of Single Shell (weld –seam)	:	1250 mm to 12500 mm

[*** Note:** In case single grinding head is not covering the range of I.D. given above, two different heads (one smaller head & one bigger head) may be proposed.]

B. ***MATERIAL SPECIFICATIONS*** :

Carbon Steel - SA 106 Gr. B/C, SA 299, SA 515/516 Gr.60/70 as per ASTM Standards

Quenched & Tempered Steel - 20MnMoNi55 as per DIN Standards

Alloy Steel - SA 335 Gr.P11/P12/P22/P91- ASTM
Std.Stainless Steel - SA 240 TP304 L & TP 321 as per ASTM

Surface Cladding with INCONEL or Stainless Steel

C. ***WELDING PROCESSES (adopted for metal deposition)*** :

Submerged Arc Welding (SAW), Manual Metal Arc Welding (MMAW), MIG/MAG Welding with Argon+CO2 Gas Shielding, etc.

Weld Reinforcement normally Built-Up : 4 to 7 mm (average)

4.0 MACHINE CONFIGURATION :

S. No.	PARAMETERS	SPECIFICATIONS	VENDOR's OFFER [with Technical Details]
4.1.0	**COLUMN & BOOM DESIGN**		
4.1.1	Mode of Longitudinal Travel of Carriage.	Column & Boom on Carriage/Saddle travelling on machined floor mounted rails.	
4.1.2	Effective Traversing Length of Carriage	15000 mm	
4.1.3	Carriage Travel Speed.	Two speed operation – One for fine positioning and another for rapid positioning including inching mode)	Bidder to specify.
4.1.4	Vertical traversing stroke for the Boom	Minimum 1850 mm	Bidder to specify.
4.1.5	Minimum Height under Boom [lowest point of contact of grinding belt, from the ground level].	Preferred is 800 mm	Bidder to specify.

S. No.	PARAMETERS	SPECIFICATIONS	VENDOR's OFFER [with Technical Details]
4.1.6	Boom Effective Stroke in Horizontal Direction	Minimum 8000 mm	Bidder to specify.
4.1.7	Presetting facility for various Boom Traversing Strokes in Horizontal Direction.	Bidder to provide details.	
4.1.8	Maximum sag at the end of boom	3 mm only. *(when measured for the full stroke in the horizontal direction)*	Bidder to specify.
4.1.9	Boom Vertical Travel Speed – fixed speed.	Around 800 to 1200 mm /min .	Bidder to specify.
4.1.10	Boom Horizontal Travel Speed	100 - 2000 mm/min. (infinitely variable)	Bidder to specify.
4.1.11	Maximum Boom extension (from centre of column)	Bidder to Specify (to suit the stroke length of 8000 mm)	
4.1.12	Minimum Boom extension (from center of column)		
4.1.14	Speed holding accuracy : for Boom	Bidder to Specify	
4.1.15	Vibration Level of Grinding head.	Maximum 1.0 mm during the traverses	
4.1.16	Rotation of Column (about the vertical axis)	0 to 180º (mechanized rotation is preferred)	Bidder to give details
4.1.17	Clamps for Column Rotation	Details of clamping mechanism to be furnished with offer (Auto clamping mechanism is preferred)	
4.1.18	Clamps for Boom (for vertical movement)	Details of clamping mechanism is to be furnished with offer.	
4.1.19	Clamps for Carriage movement	Details of clamping mechanism is to be furnished with offer.	
4.1.20	Self locking mechanism in case of power failure for above clamps	Bidder to give details	
4.2.0	**UNIVERSAL GRINDING HEAD**		
4.2.1	Turning Device	To enable the turning of Grinding Head about boom axis – motorized.	
4.2.2	Angular Displacement	30 ° from the Neutral Axis of Machine (through angle plate)	Vendor to provide details.

S. No.	PARAMETERS	SPECIFICATIONS	VENDOR's OFFER [with Technical Details]
4.2.3	Swiveling of Grinding Head	Swiveling of Head from vertical plane to horizontal plane by 90°.	Vendor to provide details.
4.2.4	Free play of the grinding head for automatic compen-sation of out–of-roundness of job surface / profile	± 50 mm (minimum)	Vendor to provide details.
4.2.5	Adjustable Grinding Pressure Range	0 to 1000 Newtons	
4.2.6	Mechanism for grinding pressure adjustment. [BHEL prefers infinitely variable adjustment through operator pendent.]	Vendor to specify and give details.	
4.2.7	Power of Driving Motor	15 HP (minimum)	Bidder to specify.
4.2.8	Cross Slide Stroke	Around 250 mm	
4.2.9	Traverse in Cross Slide	By Geared Motor	
4.2.10	Contact Wheel Size	Bidder to specify	
4.2.11	Grinding Belt Size	Bidder to specify	
4.2.12	Grinding Wheel Size	Bidder to specify	
4.2.13	Surface Cleaning Brush Size	Bidder to specify	
4.2.14	Depth of Back-Grinding / Plunge-Grinding with Dia. 650 mm wheel, achievable.	Around 180 mm	
4.2.15	Metal Removal Rate from weld-seams with Emery Grinding Belt (belt width 100 mm) – minimum expected values :	40 kg/hr *(mild steel)* 30 kg/hr *(low alloy steel)* 12 kg/hr *(stainless steel / cladding)*	
4.2.16	Metal Removal Rate with Grinding Wheel (wheel width 12 mm)	30 kg/hr *(mild steel)* 20 kg/hr *(low alloy steel)*	
4.2.17	Constant belt tension by electronic/pneumatic control	Supplier to specify	
4.2.18	Quick lift-off of grinding head	Supplier to specify	
4.2.19	Belt oscillation system	Supplier to specify	
4.2.20	Belt Oscillation range adjustable to suit seam width	Supplier to specify	
4.2.21	Accurate rotation of grinding wheel to obtain continuous and smooth profile for the weld-grooves generated	Supplier to specify	
4.2.22	Sound / Noise Level generated during the belt / wheel grinding operations	Not to exceed 85 dB at a distance of 1 metre from the grinding head.	

S. No.	PARAMETERS	SPECIFICATIONS	VENDOR's OFFER [with Technical Details]
4.3.0	**OPERATOR CONTROLLER**		
4.3.1	Controller Operations in Handheld Control Unit	a. To & Fro Carriage Movement b. Column Rotation with limit switches c. Boom Up & Down Movement d. Boom Forward & Reverse Movements e. Movement of b, c, d in inching modes" f. Pre-setting of all grinding parameters g. Switches for Start & Stop of Grinding. h. Indication Lamp for Grinding 'ON' i. Emergency "OFF" Switch. j. Dust Extraction Unit Operation – ON / OFF k. Grinding Head Slide Traverse (to & fro) l. Machine Illumination ON/OFF	
4.3.2	Machine Operations in Main Panel mounted on Machine Base / Carriage	a. To & fro Carriage Movement b. Column Rotation with limit switches c. Boom Up & Down Movement d. Boom forward & reverse movements	
4.3.3	Type of Controller	Bidder to provide latest control units & furnish technical details.	
4.3.4	Additional Features for Enhanced Productivity	Bidder to give the details (if available)	

S.No.	DESCRIPTION / PARTICULARS	VENDOR's OFFER [with Technical Details]
4.5.0	**CONTROL CABINET & REMOTE CONTROL PANEL**	
4.5.1	Control Cabinet to house all relays, contactors, time relays, control, etc. Emergency Stop on Cabinet Panel	Supplier to specify
4.5.2	Valve box with all necessary solenoid operated pneumatic valves.	Supplier to specify
4.5.3	Complete internal electric wiring and pneumatic installation, including connection for compressed air, with moisture separator, filter, controller and line oiler unit.	Supplier to specify
4.5.4	Remote control case with controls for grinding motor, carriage, cross slide, grinding pressure, quick lift-off, ammeter and emergency stop. [Provided with FIFTEEN metre long cable with plug-in-connector to the switch cabinet.]	Supplier to specify
4.5.5	Operator pendent control panel shall be provided with hard keys/ switches instead of feather touch type.	Supplier to confirm.
4.6.0	**GRINDING DUST EXHAUSTER UNIT [OPTIONAL ITEM – Bidder to give separate price for this unit with suitable attachment / accessories / spares / consumables, required for an effective working]**	
4.6.1	Dust extraction system complete with lower part with funnel, dust container, filters, sound proofing, flexible connection pipes and support for dust extractor on Base Plate / Machine Carriage.	Supplier to specify with complete Technical Details for the Vacuum Generating Unit, Motor Power, etc.
4.7.0	**LIFTING DEVICE**	
4.7.1	Lifting Device is to be provided for an easy movement of the complete installation (Grinding Machine) by an EOT Crane (by suspension at one point) and hence proper balancing has to be taken note of.	Supplier to confirm

05. BASIC CONSTRUCTIONAL FEATURES

S.No.	DESCRIPTION / PARTICULARS	VENDOR's OFFER [with Technical Details]
5.1	The column, boom and carriage shall be of fully welded construction and amply ribbed, and built in closed construction.	
5.2	If heat-treatment is required for the fabricated structure, proper heat-treatment shall be carried out prior to taking up machining or grinding works. Bidder to mention/give heat-treatment details.	

S.No.	DESCRIPTION / PARTICULARS	VENDOR's OFFER [with Technical Details]
5.3	The carriage has to be filled with heavy material like concrete or cast-iron blocks to give self-weight for the column & boom structure.	
5.4	The guide-ways (sliding surfaces) shall be hardened and ground to give a smooth traversing.	
5.5	Suitable bellow covers with metallic / anti-tear materials are to be provided to protect the rotating / sliding parts from the grinding dust, wastes , etc.	
5.6	Since the jobs are welded with preheating to a temperature of 250 deg. Celsius, in certain cases the jobs will have body temperature of 100 deg. Celsius or above. Hence, all the machine parts shall be suitable for this working environment, by providing suitable covering or coatings.	
5.7	Wipers are to be fitted to machine parts to clean / remove the dust collected on guide-ways.	
5.8	All gears used in the machine are to be hardened and ground.	
5.9	BHEL prefers carriage travel with two double flanged & two plain wheels to suit machined floor rails and provided with guide rollers.	*[Bidder to give details of drive mechanism and the size of the machined & hardened rails with the pitch distance between the rails (rail centre to centre)]*
5.10	Vendor to furnish details of material, hardness & constructional details including explanatory drawings of various components/assemblies like Machine Frame, Drive /Transmission System, Electric Motors, PLC, etc. employed in the machine.	
5.11	Interlock to be suitably provided to make the Carriage / Boom movement Start / Stop in response to switching ON / OFF of Grinding during Long-seam Grinding (as there is no carriage travel in Circumferential-seam Grinding).	
5.12	Air Dryer Unit : The system shall include a refrigerant type air dryer, for removing moisture from the compressed air supplied by BHEL.	

06. MACHINE LIGHTING SYSTEM

S.No.	DESCRIPTION / PARTICULARS	VENDOR's OFFER [with Technical Details]
6.1	A fluorescent machine lamp with drip proof protective cover to be provided for the grinding area visibility.	
6.2	A spot light with sufficiently long cable (around 10 to 12 metres) should also be provided with 24V AC supply, for the visual spot inspection of ground seams.	
6.3	Flashing / Rotary type Machine Lamp to denote Machine ON, Working, Alarm / Tripping Condition, etc. as per Industry Standards, to be provided.	

07. IMPORTANT POINTS

S.No.	DESCRIPTION / PARTICULARS	VENDOR's OFFER [with Technical Details]
7.1	415V + 10% / -10%, 50HZ +/-1.5 HZ, 3 Phase AC (3 wire system with out neutral) Power Supply Source will be provided by BHEL at a single point near the machine, as per layout recommended by Vendor. All types of cables, connections, circuit breakers etc. required for connecting BHEL's power supply point to different parts of the machine/control cabinets, shall be the responsibility of vendor.	
7.2	All electrical equipment shall be Tropicalized and shall have IP 54 degree of protection	
7.3	All electrical control cabinets & panels should be dust and vermin proof	
7.4	All electrical components in the cabinets should be mounted on DIN Rail	
7.5	All electrical panels should be provided with CFL lamps for sufficient illumination and electric power receptacles of 220 Volts, 5/15 Amp. AC. All adapters/receptacles should have compatibility with Indian equivalents.	
7.6	Electric Motors shall be from Siemens / ABB or other reputed make conforming to IEC Standards and acceptable to BHEL. The grinding motor shall be of energy efficient one.	
7.7	All electrics shall be of reputed make like Siemens, L&T, BCH, Tele-mechanique.	

S.No.	DESCRIPTION / PARTICULARS	VENDOR's OFFER [with Technical Details]
7.8	Electrical drives (if used) shall be of Siemens / ABB / L&T / Eurotherm and PLC of SEW / Allen Bradley / Siemens / Messung / Fanuc	
7.9	BHEL prefer to have standard gear boxes used in the machine. Gear boxes shall be of Radicon / Greaves / Bonfiglioly or any other reputed make acceptable to BHEL.	
7.10	All pneumatics shall be of FESTO make only.	
7.11	All components / devices / terminals are to be incorporated with ferrules.	
7.12	Vendor should ensure the proper earthing for the machine and its accessories.	
7.13	Wiring: All electrical motors, limit switches etc, on the machine shall be wired using PVC sheathed cable running in conduits to common terminal block	
7.14	All cables/ hoses moving with traversing axes should be installed in cable drag chain. Additionally, all the cable trays required for laying of cables should be included in the offer.	
7.15	Pneumatics on machine and associated equipment shall be connected by nylon and/or steel tube from the common supply point fitted on the machine. The circuit to have the lubricator, regulator, filter and hand wheel valve.	
7.16	BHEL supplied compressed air will be at a pressure of 60 psi to 70 psi only. All pneumatic systems on the machine shall be designed to operate efficiently at this air pressure. A suitable refrigerant type air drier shall be included in the system by the vendor.	
7.17	The control voltage for all applications shall be less than 110 V.	
7.18	All non-working surfaces and control panels shall be given a primer coat & two coats of paint as specified in Vendor's Painting scheme. All unpainted surfaces shall be protected from rust during transit	
7.19	GUARANTEE: The equipment has to be guaranteed for its performance and also of the sub-assemblies / bought-out items, for a minimum period of TWELVE months from the date of commissioning and acceptance at BHEL Works, after machine performance prove-out..	

08. ENVIRONMENTAL PERFORMANCE OF THE MACHINE

S.No.	DESCRIPTION / PARTICULARS	VENDOR's COMPLIANCE
8.1	Maximum noise level shall be 85 dB (A) at normal load condition, 1 M 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. Vendor to demonstrate compliance to noise level, if so required.	
8.2	The machine shall be suitable for an ambient temperature of + 50° C and relative humidity of 85 % respectively, but both do not occur simultaneously.	
8.3	If any safety / environmental protection enclosure is required it shall be built in the machine by the vendor.	

09. SAFETY ARRANGEMENTS

S.No.	DESCRIPTION / PARTICULARS	VENDOR's OFFER [with Technical Details]
9.1	Machine shall have adequate and reliable safety interlocks / devices to avoid damage to the machine, work piece and the operator due to mistakes or the malfunctioning.	
9.2	A detailed list of all alarms / indications provided on machine should be submitted by the Vendor.	
9.3	All the pipes, cables etc. on the machine should be well supported and protected. These should not create any hindrance to machine operator, for effective use of machine.	
9.4	Emergency Switches at suitable locations as per International Norms should be provided.	
9.5	Enclosures or protective covers shall be provided for the moving parts (either linear or rotary), as a safety measure, as per industry standards.	
9.6	Steel railings shall be provided in the carriage to support the sub-systems or maintenance staff during trouble shooting.	
9.7	Counter-balance & Safety device for holding the boom and the grinding head against rope breakage. Offer details to be elaborated.	
9.8	Anti-tipping or anti-toppling device (mechanism) has to be provided for safe guarding the fall of the entire column & boom (with carriage) structure from elevated platform due to imbalance, on any account. Offer details to be elaborated.	

S.No.	DESCRIPTION / PARTICULARS	VENDOR's OFFER [with Technical Details]
9.9	Safety mechanisms / interlocks for belt rupture, auto stop of grinding in case of safety cover / guard opening of grinding head.	
9.10	An access ladder and platform with hand rail shall be provided for the maintenance staff to attend to fault in the boom vertical travel mechanism.	
9.11	All the rotating parts used on machine should be statically & dynamically balanced to avoid undue vibrations, Noise and suitably guarded.	

10. MACHINE SPARES & CONSUMABLES

S.No.	DESCRIPTION / PARTICULARS	VENDOR's OFFER [with Technical Details]
10.1	Itemised break-up of Mechanical, Electrical , Electronic and Pneumatic /Hydraulic Spares used on the machine in sufficient quantity as per recommendation of BIDDER for 2 years of trouble free operation on three shifts continuous running basis should be offered by BIDDER. (Unit Price of each item of spare shall be offered)	
10.2	Mechanical & Pneumatic Spares: Bearings, Clutches, gears and all types of Cylinders, Valves, Pressure Switches / Transducers, Filters, Seals, 'O' Rings, Pneumatic Hoses, etc.	
10.3	Electrical: All types of Relays, Contactors, Proximity Switches, Printed Circuit Boards, Push Buttons, Indicating Lamps, Semiconductor Fuses, Special Fuses, Circuit Breakers, Main Power Switch, etc.	
10.4	All types of spares for total machine and accessories shall 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 inform BHEL sufficiently in advance and provide drawings of parts / details of spares & Vendors to enable BHEL to procure these in advance, if required.	
10.5	Vendor to confirm that complete list of spares for machine and accessories, along with specification / type / model, and name & address of the spare Vendor shall be furnished along with documentation to be supplied with the machine.	

S.No.	DESCRIPTION / PARTICULARS	VENDOR's OFFER [with Technical Details]
10.6	BIDDER has to submit with the OFFER, unit rate for the variety of consumables used in this proposed machine like Grinding Belt of Various Sizes, Grinding Wheels / Disc of Various Sizes, Wire Brushes for Buffing , etc. along-with minimum order quantity in each variety and shelf-life period (from the date of manufacture) .	
10.7	BIDDER to submit with the OFFER, unit rate for the Spare Grinding Heads.	

11. DOCUMENTATION :

S.No.	DESCRIPTION / PARTICULARS	VENDOR's COMPLIANCE
11.1.0	Set of Documents **to be submitted along with the Offer** for technical evaluation:	
11.1.1	General Lay-out of the machine with major and critical dimensions in line with the specification	
11.1.2	General Assembly drawing of the machine with bill of materials and critical dimensions.	
11.1.3	Sub-assembly / Arrangement drawings with bill of materials and critical dimensions for the following: a) Carriage long travel drive arrangement. b) Column rotation / clamping arrangement. c) Boom vertical travel drive / clamping arrangement. d) Boom Horizontal travel drive arrangement. e) Grinding Head Slides (Horizontal & Rotation) arrangement. f) Grinding Head swing mechanism for Belt mode / Grinding disc mode conversion g) Dust Extraction Unit .	
11.1.4	List of bought out items with make and specification along with catalogues: Controllers, Drives, Motors, Gear Boxes, Air Drier, Grinding Belts, Wheels, Wire-Brush, etc.	
11.1.5	Details of Grinding head.	
11.1.6	Pneumatic Circuit with Bill of Materials	
11.1.7	Electrical Circuit with Bill of Materials.	
11.1.8	Video images on CD /Hard copy of literature with photographs & drawings explaining the technical features.	

S.No.	DESCRIPTION / PARTICULARS	VENDOR's COMPLIANCE
11.2.0	Set of Documents **to be submitted after placement of order** for approval / verification before manufacturing:	
11.2.1	General Lay-out of the Machine with major and critical dimensions in line with the specification and Preliminary Foundation Drawing for the Rails.	
11.2.2	General Assembly Drawing of the machine with bill of materials and critical dimensions.	
11.2.3	Sub-assembly / Arrangement drawings with bill of materials and critical dimensions for the following: a) Carriage long travel drive arrangement. b) Column rotation / clamping arrangement. c) Boom vertical travel drive / clamping arrangement. d) Boom Horizontal travel drive arrangement. e) Grinding Head Slides (Horizontal & Rotation) arrangement. f) Grinding Head swing mechanism for Belt mode / Grinding disc mode conversion g) Dust Extraction Unit .	
11.2.4	Details of Grinding head.	
11.2.5	Pneumatic Circuit with Bill of Materials	
11.2.6	Electrical Circuit with Bill of Materials.	
11.2.7	Quality Plan	
11.3.0	Set of Documents **to be submitted along with machine:**	
11.3.1	**Three sets** of following documents as Hard copies and 1 set of all documents including bought out item catalogues – soft copy in CD in English Language should be supplied along with the machine.	
11.3.2	**One set** of complete documents as Hard copy and complete documents in CD / Pen drive to be submitted during inspection at Supplier's Works for verification.	
11.3.3	Operating Manuals of equipments	
11.3.4	Programming Manuals if any for the station.	
11.3.5	Detailed Maintenance manual of machine with all drawings of machine assemblies/sub-assemblies/parts including Electrical /PCB circuit diagrams/ Pneumatic Circuit Diagrams. All Assembly/ Sub Assembly Drawings shall be supplied with the part list / Bill of Materials giving complete specification and make of components.	
11.3.6	Maintenance, Interface & Commissioning Manuals for speed drives, if any.	

S.No.	DESCRIPTION / PARTICULARS	VENDOR's COMPLIANCE
11.3.7	Manufacturing drawings for all wearing components like bushes, pulleys, gears, etc.	
11.3.8	Catalogues, O&M Manuals of all bought out items including drawings, wherever applicable highlighting the specific model used in the supplied machine.	
11.3.9	Detailed specification of all rubber items, hoses, fittings, etc. List of bearings, belts used to be provided.	
11.3.10	Operating Manuals, Maintenance Manuals & Catalogues for all supplied Accessories.	
11.3.11	Complete Master List of parts used in the equipment.	
11.3.12	Complete list of spares for equipments and accessories, along with item part no / specification / type / model, and name & address of the spare supplier shall be furnished.	
11.3.13	PLC (if any) program print-outs with comments in English.	
11.3.14	PLC (if any) Program / Ladder Diagram on CD, NC Data & PLC Data on Floppy Disc.	

12. TRAINING OF BHEL PERSONNEL

S.No.	DESCRIPTION / PARTICULARS	VENDOR's COMPLIANCE
12.1	Air-fare, boarding & lodging for the trainees shall be borne by BHEL.	
12.2	Competent, English speaking experts shall be arranged by the vendor during training for satisfactory & effective training of BHEL personnel.	
12.3	BHEL Personnel shall be trained at Supplier's Works for mutually agreed period (Five Days) in the area of a. Mechanical, Electrical & Electronic Maintenance for Machine & other Accessories supplied c. Operation of the Machine & other Accessories supplied	
12.4	Bidder to quote for training on man-day / week basis	

13. INSPECTION & MACHINE ACCEPTANCE

S.No.	DESCRIPTION / PARTICULARS	VENDOR's COMPLIANCE
13.1.0	**MACHINE ACCEPTANCE**: (Tests/Activities to be performed by Vendor at Vendor's works, on the machine, before dispatch:)	
13.1.1	Physical Inspection and Verification of Certificates or Records for Materials of Construction, Bought-out Items, Adherence to Machine Building Procedures given by the Vendor, etc.	
13.1.3	Demonstration of all features of the machine, control system & accessories	
13.1.4	Verification of geometrical accuracy, vibration and noise level, etc.	
13.1.5	Grinding of sample test plate and curved/cylindrical shells / segments and the sub-sequent testing for establishing the quality of weld, for performance rating of the machine.	
13.2.0	**Tests / Activities to be carried out at BHEL Works / INDIA, while commissioning the machine:**	
13.2.1	Demonstration of all features of the machine, control system & accessories to the satisfaction of BHEL for efficient and effective use of the machine	
13.2.2	Demonstration by actual use of all supplied attachments and accessories to their full capacity.	
13.2.3	Verification of geometrical accuracy, vibration and noise level, etc.	
13.2.4	The details of prove-out trials shall be based on the mutually agreed job pattern (grinding sample test plate and actual jobs) arrived at, during the technical discussions, to be held at BHEL Works after the tender opening.	
13.2.5	Supervision by BIDDER of independent operation of machine by BHEL after job prove-out during the training period of 5 working days	

14. MACHINE ERECTION & COMMISSIONING

S.No.	DESCRIPTION / PARTICULARS	VENDOR's COMPLIANCE
14.1	Vendor to take full responsibility for supervision of the erection, vendor shall start up, test the machine, it's control & all types of other supplied equipment, carrying out grinding of test pieces etc. Service requirement like power & air shall be provided by BHEL at only one point to be indicated by Vendor in their foundation/layout drawings. Other requirements like crane and helping personnel shall also be provided by BHEL.	

S.No.	DESCRIPTION / PARTICULARS	VENDOR's COMPLIANCE
14.2	Successful proving of BHEL components by the Vendor shall be considered as part of commissioning. All tests, as mentioned in Clause No.13.2.0 shall form part of the commissioning activity.	
14.3	Tools, Tackles, Testing Instruments and other necessary equipment required to carry out all above activities shall be brought by the Vendor.	
14.4	Commissioning spares, required for commissioning of the machine within stipulated time, shall be brought by the Vendor on returnable basis.	
14.5	Portion, if any, of the machine, accessories and other supplied items where paint has rubbed off or peeled during transit or erection should be repainted and merged with the original surrounding paint by the vendor. For this purpose, the Vendor should supply sufficient quantity of touch-up paint of various colours of paint used.	
14.6	Charges, duration, terms & conditions for Erection & Commissioning should be furnished in detail separately by Vendor along with the Technical Offer.	
14.7	LEVELLING & ANCHORING SYSTEM : Vendor to supply the required foundation details for mounting the machined rails on the floor. Machined rails with anchoring and leveling materials shall form part of the scope of supply, by the vendor. BHEL shall construct complete foundation for the machine as per the Vendor's recommendation.	

15. MACHINE PACKING

S.No.	DESCRIPTION / PARTICULARS	VENDOR's COMPLIANCE
15.1	Sea worthy & rigid packing for all items of complete machine, control panels , 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	

16. MACHINE DATA [GENERAL] – *DESIRED TO BE INDICATED WITH THE OFFER*

S.No.	DESCRIPTION / PARTICULARS	VENDOR's RESPONSE
16.1	Machine Model Number	
16.2	Total Connected Electrical Load in kVA / kW	
16.3	Floor area required (Length, Width, Height) for Complete Machine & Accessories	
16.4	Painting of Machine / Electrical Panels	
16.5	Total weight of the Machine	
16.6	Weight of heaviest part of Machine	
16.7	Weight of the heaviest assembly / sub-assembly of the Machine	
16.8	Dimensions of largest part/ sub-assembly/ assembly of the Machine	
16.9	Earliest delivery period from the date of issue of Purchase Order by BHEL.	