



# Bharat Heavy Electricals Limited

(High Pressure Boiler Plant)

Tiruchirappalli – 620014, TAMIL NADU, INDIA

CAPITAL EQUIPMENT / MATERIALS MANAGEMENT

<b>ENQUIRY</b>	Phone: +91 431 257 76 53 Fax : +91 431 252 00 31 Email : <a href="mailto:skaruna@bheltry.co.in">skaruna@bheltry.co.in</a> Web : <a href="http://www.bhel.com">www.bhel.com</a>
<b>NOTICE INVITING TENDER</b>	

<b>TWO PART BID</b> Tender to be submitted in two Parts	<b>Enquiry Number:</b> <b>2851300033</b>	<b>Enquiry Date:</b> <b>27.11.2013</b>	<b>Due date for submission of quotation:</b> <b>30.12.2013</b>
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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 Required	Delivery Terms Required
10	<b>Radial Drilling Machine</b> as per the technical specification & commercial conditions applicable (to be downloaded from web site <a href="http://www.bhel.com">www.bhel.com</a> or <a href="http://tenders.gov.in">http://tenders.gov.in</a> )	04 Nos.	8 Months from the date of order	F.O.R, BHEL Stores, POWER EQUIPMENT FABRICATION PLANT, BHARAT HEAVY ELECTRICALS LIMITED, Mundipar- 441804, Sakoli Taluk, Bhandara District, Maharashtra State.

**Important points to be taken care during submission of offer**

- The rate of EMD for this Tender will be ( INR ) : 1,50,000/-
- The Compliance Form for Commercial Terms & Conditions to be filled and enclosed along with the offer failing which, the offer will not be considered for evaluation.
- 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.
- All the Technical Documents to be provided in duplicate.

**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 above Enquiry reference.**

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 <b>BHARAT HEAVY ELECTRICALS LIMITED</b>   Engineer / Capital Equipment / MM
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An ISO 9001  
Company

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For **BHARAT HEAVY ELECTRICALS LIMITED**

Engineer / Capital Equipment / MM

## RADIAL DRILLING MACHINE

### PART A

#### **SECTION – 1: QUALIFYING CRITERIA**

The BIDDER has to compulsorily meet the qualifying criteria indicated in SECTION –I 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 “ <b>Radial Drilling Machine</b> ”. 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 (10) years (on the original date of opening of Tender) at least ONE ‘<b>RADIAL DRILLING MACHINE</b>’ having all the following features:</p> <ol style="list-style-type: none"> <li><b>1. Spindle power of 10 KW or more,</b></li> <li><b>2. Drilling and Tapping capacity of minimum 75 mm on alloy steel</b></li> <li><b>3. Drilling radius of 2000 mm or more from column center</b></li> </ol> <p><b>EITHER</b> (i) in at least one country other than the country of origin to establish vendor's (OEM's) global business activity <b>OR</b> (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 to furnish Reference List of Customers, with full address, details of contact person, where RADIAL DRILLING MACHINES have been supplied in the past.	
2.2	Details of RADIAL DRILLING MACHINES supplied to other BHEL units, if any. (Year of commissioning, Spindle power and Drilling capacity).	
2.3	Details on SERVICE-AFTER-SALES Set-Up in India including the Address of Agents / Service Centers in South India.	
2.4	Any Additional Data to supplement the manufacturing capability of the BIDDER for the subject equipment.	

**SECTION – III**

The BIDDER to note:

S No.	REQUIREMENTS	VENDOR'S RESPONSE
3.1	The BIDDER shall submit the offer in TWO PARTS. 1. Technical offer (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. Machine Supplied by(Manufacturer’s name)		
2. Machine supplied to (Customer’s name)		
3. Make & Model Number of the Machine		
4. Month & Year of Commissioning		
5. Application for which the Machine is used		
6	a) Spindle Motor Power (cont. rating) b) Drilling Capacity on steel c) Max Drilling radius in mm d) Spindle Taper (Morse No) e) Spindle speed range(RPM) f) Spindle feed range (mm/rev)	
7. Performance of the Equipment (Please tick appropriately)		Not Satisfactory
		Average
		Good
		Satisfactory
8. Service after sales (Please tick appropriately)		Not Satisfactory
		Average
		Good
		Satisfactory
9. Other remarks (if any)		
Signature & Seal of the Authority Issuing the Performance Certificate		
Date:		

PART-B

**TECHNICAL SPECIFICATION FOR RADIAL DRILLING MACHINE – Dia. 80mm – Qty.4 nos.**

Clause No	PARTICULARS AND BHEL SPECIFICATION	BIDDER'S OFFER With Technical Details																																				
1.0	<p><b>PURPOSE:</b> This machine is intended for Drilling, Counter Boring, Tapping, Reaming and Spot facing (Internal &amp; External) on large diameter power and utility Boiler Pipes and Piping components. The work piece material will be <b>Steel Pipes / Castings / Forgings</b>.</p>																																					
1.1	<p><b>WORK-PIECE MATERIAL DATA:</b></p>																																					
1.2	<p>Max. work piece size in mm: <b>3500</b> Length <b>x1400</b> Width <b>x 900</b> Height</p>																																					
1.3	<p>Work piece Weight : <b>2000 Kgs.</b></p>																																					
1.4	<table border="1"> <thead> <tr> <th data-bbox="756 416 794 674">Work piece type</th> <th data-bbox="756 674 794 920">Material</th> <th data-bbox="756 920 794 1301">ASTM Specification</th> <th data-bbox="756 1301 794 1487">Hardness</th> </tr> </thead> <tbody> <tr> <td data-bbox="684 416 756 674" rowspan="2">Steel Pipes</td> <td data-bbox="684 674 756 920">Carbon Steel</td> <td data-bbox="684 920 756 1301">SA 106 Gr A,B,C</td> <td data-bbox="684 1301 756 1487">185 BHN</td> </tr> <tr> <td data-bbox="684 674 756 920">Alloy Steel</td> <td data-bbox="684 920 756 1301">SA 335 P91, 11, 12, 22, 92</td> <td data-bbox="684 1301 756 1487">225 BHN</td> </tr> <tr> <td data-bbox="612 416 684 674" rowspan="2">Steel Castings</td> <td data-bbox="612 674 684 920">Carbon Steel</td> <td data-bbox="612 920 684 1301">A216 WCB, WCC</td> <td data-bbox="612 1301 684 1487">185 BHN</td> </tr> <tr> <td data-bbox="612 674 684 920">Alloy Steel</td> <td data-bbox="612 920 684 1301">A352 LCB, LCC</td> <td data-bbox="612 1301 684 1487">225 BHN</td> </tr> <tr> <td data-bbox="541 416 612 674" rowspan="2">Steel Castings</td> <td data-bbox="541 674 612 920">Alloy Steel</td> <td data-bbox="541 920 612 1301">A 217 WC5, WC6, WC9, C12A</td> <td data-bbox="541 1301 612 1487">210 BHN</td> </tr> <tr> <td data-bbox="541 674 612 920">Stainless Steel</td> <td data-bbox="541 920 612 1301">A351 CF3M, CF8, CF8C and CF8M</td> <td data-bbox="541 1301 612 1487">230 BHN</td> </tr> <tr> <td data-bbox="469 416 541 674" rowspan="2">Steel Forgings</td> <td data-bbox="469 674 541 920">Carbon Steel</td> <td data-bbox="469 920 541 1301">SA105</td> <td data-bbox="469 1301 541 1487">185 BHN</td> </tr> <tr> <td data-bbox="469 674 541 920">Alloy Steel</td> <td data-bbox="469 920 541 1301">SA 182 F22 Class 3</td> <td data-bbox="469 1301 541 1487">210 BHN</td> </tr> <tr> <td data-bbox="370 416 469 674"></td> <td data-bbox="370 674 469 920">Alloy Steel</td> <td data-bbox="370 920 469 1301">SA 182 F91</td> <td data-bbox="370 1301 469 1487">225 BHN</td> </tr> </tbody> </table>	Work piece type	Material	ASTM Specification	Hardness	Steel Pipes	Carbon Steel	SA 106 Gr A,B,C	185 BHN	Alloy Steel	SA 335 P91, 11, 12, 22, 92	225 BHN	Steel Castings	Carbon Steel	A216 WCB, WCC	185 BHN	Alloy Steel	A352 LCB, LCC	225 BHN	Steel Castings	Alloy Steel	A 217 WC5, WC6, WC9, C12A	210 BHN	Stainless Steel	A351 CF3M, CF8, CF8C and CF8M	230 BHN	Steel Forgings	Carbon Steel	SA105	185 BHN	Alloy Steel	SA 182 F22 Class 3	210 BHN		Alloy Steel	SA 182 F91	225 BHN	
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<b>2.0.0</b>	<b>MACHINE CONFIGURATION:</b>	
	The machine shall have a thick base plate and vertical column to which is mounted a horizontal radial arm. The horizontal arm shall move up and down the column and can be rotated / locked at any position. The drilling head shall move along the radial arm towards or away from the column and can be locked at any position. The spindle shall be housed in the drilling head and shall rotate and also move up / down. The drilling head shall have counter balance arrangement.	Vendor to confirm
<b>2.1</b>	<b>CAPACITY</b>	
2.1.1	Drilling capacity in steel ( <b>Min 80 mm</b> )	Vendor to specify
2.1.2	Drilling capacity in cast iron ( <b>Min 100 mm</b> )	Vendor to specify
2.1.3	Tapping capacity in steel ( <b>75mm</b> )	Vendor to specify
2.1.4	Tapping capacity in cast iron ( <b>75mm</b> )	Vendor to specify
<b>2.2</b>	<b>SPINDLE</b>	
2.2.1	Spindle Taper	MT 6
2.2.2	Quill diameter ( <b>Not less than 100 mm</b> )	Vendor to specify
2.2.3	Spindle motor power ( <b>Min required=11 KW</b> )	Vendor to specify
2.2.4	Spindle travel or stroke: ( <b>Min required=450 mm</b> )	Vendor to specify
2.2.5	Braking System to slow down and stop the spindle	Vendor to describe
<b>2.3</b>	<b>SPINDLE SPEED AND FEED</b>	
2.3.1	Spindle speed range: <b>15 to 1400 rpm</b>	Vendor to specify
2.3.2	Number of steps for Spindle speed : <b>Min 16 steps</b>	Vendor to confirm
2.3.3	Spindle feed range     Min / Max : <b>0.04 to - 2.8 mm/rev</b>	Vendor to specify
2.3.4	No of feed steps: <b>Min 16 steps</b>	Vendor to confirm

Clause No	PARTICULARS AND BHEL SPECIFICATION	BIDDER'S OFFER With Technical Details
2.3.5	Mode of pre selection of feed and speed	Vendor to specify
2.3.6	Auto depth control mechanism for spindle travel	Vendor to confirm
2.3.7	Powered Feeding	Vendor to confirm
<b>2.4</b>	<b>ARM</b>	
2.4.1	Column face to spindle center - Max	2500 mm
2.4.2	Column face to spindle center - Min	500 mm
2.4.3	Spindle head travel on radial arm	2000 mm
2.4.4	Base plate surface to spindle end - Max	2000 mm
2.4.5	Base plate surface to spindle end - Min	500 mm
2.4.6	Spindle travel or stroke: (Min required=450 mm)	Vendor to specify
2.4.7	Vertical travel of radial arm : (Min required=1200 mm )	Vendor to specify
2.4.8	Arm rotation ( Right & Left)	180 °
2.4.9	Centralized Clamping / unclamping for the arm with push button	Vendor to specify
2.4.10	Power of Arm Locking motor, if any	Vendor to specify
2.4.11	Power locking of sleeve on column	Vendor to specify
2.4.12	Powered Drill head traverse on Arm	Vendor to confirm
2.4.13	Arm Elevating motor power: (Min required=3.7 KW )	Vendor to specify
<b>2.5</b>	<b>COLUMN</b>	
2.5.1	Column sleeve dia. (Not less than 500 mm)	Vendor to specify
<b>2.6</b>	<b>MACHINE GUIDE WAYS</b>	
2.6.1	Width of Arm guide ways	Vendor to specify
2.6.2	Hardness of guide ways	Vendor to specify
<b>2.7</b>	<b>BASE PLATE</b>	

Clause No	PARTICULARS AND BHEL SPECIFICATION	BIDDER'S OFFER With Technical Details
2.7.1	Base plate area (Min 3500x1400 mm)	Vendor to specify
2.7.2	Base plate thickness (min. 300 mm)	Vendor to specify
2.7.3	Base plate working surface	Vendor to specify
2.7.4	Size of T-slots: M24	Vendor to confirm
2.7.5	T-slot pitch (as per DIN standard)	Vendor to specify
2.8	<b>COOLANT FACILITY</b> 1. Flood coolant with suitable pump, motor & filtration system shall be offered. 2. Proper collection and recirculation shall be ensured. 3. Coolant on/off facility through push buttons on control panel	Vendor to confirm
2.8.1	Coolant flow: Minimum 30 Litres / min	Vendor to confirm
2.8.2	Coolant motor power : min 0.18 Kw	Vendor to confirm
2.9	<b>LUBRICATION SYSTEM</b> Centralized auto lubrication shall be offered with metering cartridges and necessary electrical interlock.	Vendor to Confirm
2.10	<b>CONSTRUCTION</b> Vendor has to furnish constructional details of the machine including explanatory drawings / Catalogues of various components/ assemblies like Column, Base plate, Arm, Drilling unit, Spindle etc.	Vendor to furnish
2.11	<b>OPERATION CONTROL</b> Machine's operation control shall be provided on the drill head itself. No separate switch box is needed. Joy Stick / push button arrangement shall be provided for head & arm movement. All switches should be within reach of operator for convenient, efficient & safe operation. All indications should also be conveniently placed.	Vendor to confirm
3.0	<b>MACHINE LIGHTS:</b>	
3.1	Machine Light of 24V to be provided in the Headstock for sufficient illumination of working area.	Vendor to confirm

Clause No	PARTICULARS AND BHEL SPECIFICATION	BIDDER'S OFFER With Technical Details
3.2	All light fittings, consumables, adapters / receptacles should have compatibility with Indian equivalents	Vendor to confirm
4.0	<b>HYDRAULIC SYSTEM</b> If the machine has hydraulics, then the details of the system should be furnished	Vendor to provide
<b>5.0</b>	<b>ELECTRICAL SYSTEM:</b>	
5.1	AC Power Supply of 415V $\pm$ 10%, 50HZ $\pm$ 1.5 HZ. (3 Phase 3 wire system) 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.	Vendor to confirm
5.2	Tropicalization: All electrical equipment shall be tropicalized	Vendor to confirm
5.3	All electrical controls & systems should be dust and vermin proof	Vendor to confirm
5.4	All electrical components in the cabinets should be mounted on DIN Rail	Vendor to confirm
5.5	All electrical panels should be provided with fluorescent lamps for sufficient illumination and power receptacles of 220Volts, 5/15 Amp AC. All adapters/receptacles should have compatibility with Indian equivalents.	Vendor to confirm
5.6	Vendor should ensure the proper earthing for the machine and its accessories.	Vendor to confirm
5.7	All motors shall be from M/s <b>Siemens/KEC/ ABB</b> or any other makes acceptable to BHEL and confirming to IEC standard.	Vendor to confirm
5.8	All electrical devices like contactors, relays and limit switches, push buttons etc. shall be from <b>Siemens / Alstom / BCH / Telemecanique</b> .	Vendor to confirm
5.9	All components/devices/terminals are to be incorporated with ferrules. (Numbered)	Vendor to confirm
<b>6.0</b>	<b>SAFETY ARRANGEMENTS:</b> Following safety features in addition to other standard safety features should be provided on the machine:	Vendor to confirm

Clause No	PARTICULARS AND BHEL SPECIFICATION	BIDDER'S OFFER With Technical Details
6.1	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.	Vendor to confirm
6.2	All the pipes, cables etc. on the machine should be well supported and protected.	Vendor to confirm
6.3	All the rotating parts used on machine should be statically & dynamically balanced to avoid undue vibrations.	Vendor to confirm
6.4	Emergency Switches at suitable locations as per International norms are to be provided.	Vendor to confirm
6.5	Oil & water pipe lines should not run with electrical cable.	Vendor to confirm
6.6	A detailed list of safety alarms / indications provided on machine should be submitted by the supplier.	Vendor to confirm
<b>7.0</b>	<b>ENVIRONMENTAL PERFORMANCE OF THE MACHINE: The Machine shall conform to following factors related to environment</b>	Vendor to confirm
7.1	Noise level shall not exceed 80 dB (A) at normal load condition, 1 meter away from the machine with correction factor for back ground noise, if necessary.	Vendor to confirm
7.2	If any safety / environmental protection enclosure is required it should be built in the machine by the vendor.	Vendor to confirm
7.3	Paint of the machine should be oil / coolant resistant and should not peel off and mix up with coolant.	Vendor to confirm
<b>8.0</b>	<b>LEVELLING &amp; ANCHORING SYSTEM</b>	
8.1	Complete anchoring system including foundation bolts; anchoring materials, fixators, leveling shoes etc shall be supplied by the vendor. BHEL shall construct foundation for the machine. Vendor shall furnish the foundation details in advance.	Vendor to confirm

Clause No	PARTICULARS AND BHEL SPECIFICATION	BIDDER'S OFFER With Technical Details
<b>9.0</b>	<b>TOOLS FOR OPERATION &amp; MAINTENANCE</b>	
9.1	Necessary tools like Torque Wrench, Spanners, Keys, grease guns etc for operation and maintenance of the machine should be supplied. List of such tools should be submitted with offer	Vendor to confirm
9.2	Test mandrel if any for checking spindle run-out & alignment should be supplied	Vendor to confirm
9.3	Utility tools like drifts , cotter pins of all sizes (2 sets)	Vendor to confirm
9.4	<b>Reduction Sleeves:</b> MT6 to MT5 - 2 Nos. MT6 to MT4 - 2 Nos. MT4 to MT3 - 2 Nos. MT4 to MT2 - 2 Nos.	Vendor to offer
9.5	Tapping Attachment with collets- M6 to M24 - 2 Sets	Vendor to offer
9.6	Tapping Attachment with collets- M24 to M48 - 2 Sets	Vendor to offer
9.7	Tapping Attachment with collets- M48 to M60 - 2 Sets	Vendor to offer
<b>10.0</b>	<b>ACCESSORIES</b>	
10.1	Cast iron Box Table - 1 No 1000mm (L) x 750mm (B) x 500mm (H) with T-Slots for M 24	Vendor to offer
10.2	Tilting Table - 1 No 725mm (L) x 500mm (B) x 600mm (H) with T-Slots for M24	Vendor to offer
10.3	Safety interlocks for feed mechanism to prevent overloading.	Vendor to specify
<b>11.0</b>	<b>SPARES:</b>	
11.1	The Vendor shall recommend and submit list of spares required for the machine for two years of trouble free operation on three shifts /day basis under two headings as <b>a) Mechanical spares:</b>	Vendor to furnish

	<p><b>b) Electrical / Electronic spares:</b>  <b>c) Un-priced list of spares</b> (mentioned in a&amp;b above) with quantities should be submitted with the technical offer.  <b>d) Priced list of the spares</b> (mentioned in a&amp;b above) shall be submitted in a sealed cover with the commercial bid.</p>		
11.3	All types of spares should be available for at least ten years after supply of the machine. In case the machine is likely to become obsolete within ten years period, the vendor should inform BHEL to procure the spares in advance.	Vendor to confirm	
11.4	Vendor to confirm for provision of complete list of spares for the machine and accessories with specification / type / model, and name & address of the spare supplier along with documentation in case of ordering	Vendor to confirm	
<b>12.0</b>	<b>DOCUMENTATION:</b>		
12.1	Three sets of following documents (Hard copies) in English language should be supplied along with the machine	Vendor to confirm	
12.2	Detailed Operation and Maintenance manual of machine with all drawings of machine assemblies/sub-assemblies/parts including Electrical / Coolant circuit diagrams.	Vendor to confirm	
12.3	Catalogues, O&M Manuals and drawings of all bought out items, bearings etc.	Vendor to confirm	
12.4	Electronic and electrical interconnecting drawings (i.e. Between machine, control panel and drives). <b>Hard copy: 3 Nos</b>	Vendor to confirm	
12.5	Electrical circuits and Hydraulic circuits, if any with BOM	Vendor to confirm	
12.6	Detailed specification of all rubber items and hydraulic / Lubrication fittings	Vendor to confirm	
12.7	The vendor shall submit complete Master List of parts used in the machine.	Vendor to confirm	
12.8	One additional set of all the above documentation on CD ROM.	Vendor to confirm	

Clause No	PARTICULARS AND BHEL SPECIFICATION	BIDDER'S OFFER With Technical Details
<b>13.0</b>	<b>ERECTION &amp; COMMISSIONING</b>	
13.1	<ol style="list-style-type: none"> <li>1. Vendor to supervise erection &amp; commissioning including start up, testing of machine, it's control system &amp; all other supplied equipment, machining of test pieces etc.</li> <li>2. The vendor shall bring special tools and equipment required for erection of the machine</li> <li>3. Service requirement like power, air &amp; water shall be provided by BHEL at only one point to be indicated by Vendor in their foundation/layout drawings.</li> <li>4. Material handling shall be arranged by vendor if cranes are not commissioned at BHEL at the moment of E&amp;C.</li> </ol>	Vendor to confirm
13.2	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.	Vendor to confirm
13.3	Duration, terms & conditions for E&C should be furnished with this technical offer in detail.	Vendor to specify
<b>14.0</b>	<b>ACCURACY TESTS</b>	
14.1	<b>GEOMETRICAL ACCURACIES</b>	
14.2	Geometrical Accuracy Tests shall be in accordance with IS: 2199, ISO 2423 standard or equivalent applicable standard. Detailed Test Charts for the same, clearly showing the accuracies to be achieved on the machine, shall also be submitted with the offer.	Vendor to confirm
14.3	All the above accuracies to be demonstrated to BHEL engineers during pre-acceptance tests at Suppliers works and during Commissioning at BHEL Works.	Vendor to confirm
<b>15.0</b>	<b>AMBIENT CONDITIONS &amp; THERMAL STABILITY</b>	
15.1	Ambient Temperature: max. 50 deg C (in a year) Relative Humidity - 85%	Vendor to note

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15.2	Weather conditions are tropical. Atmosphere may be dust laden during some part of the year. Machine will be installed in the normal shop floor condition.	Vendor to confirm
15.3	Thermal Stability of the machine shall be good enough to withstand the specified ambient conditions in order to meet the accuracy requirements of BHEL components.	Vendor to confirm
15.4	The machine, including attachments and accessories, should be suitable for 3 shifts, continuous operation.	Vendor to confirm
<b>16.0</b>	<b>MACHINE ACCEPTANCE: (Tests/Activities to be Performed by Vendor)</b>	Vendor to confirm
<b>16.1</b>	<b>Tests/Activities to be carried out at supplier's works on the machine before dispatch:</b>	Vendor to confirm
16.1.1	Geometrical Accuracy Tests as per test chart provided by the supplier	Vendor to confirm
16.1.2	<b>Full load test to demonstrate the maximum power, drilling and tapping capacities:</b> The capacity and capability of the machine is to be demonstrated on test pieces and tools (vendor's scope). Successful machining of at least 5 holes and 3 tapping of maximum size will be considered for accepting the machine. The drilling depth shall be min 150mm and tapping depth shall be min 100 mm.	Vendor to confirm
<b>16.2</b>	<b>Test to be carried out at BHEL works while commissioning the machine:</b>	Vendor to confirm
16.2.1	Geometrical Accuracy Tests as per test chart.	Vendor to confirm
16.2.2	<b>Full load test to demonstrate the maximum power, drilling and tapping capacities:</b> The capacity and capability of the machine is to be demonstrated on actual Jobs provided by BHEL with tools supplied by BHEL. Successful machining of at least 10 holes and 5 tapping of maximum size will be considered for accepting the machine. The drilling depth shall be min 150mm and tapping depth shall be min 100 mm.	Vendor to confirm
<b>17.0</b>	<b>TRAINING</b>	

Clause No	PARTICULARS AND BHEL SPECIFICATION	BIDDER'S OFFER With Technical Details
17.1	Training of BHEL machine operators in operation and maintenance of complete machine at BHEL works during commissioning.	Vendor to confirm
<b>18.0</b>	<b>FOUNDATION</b>	
18.1	Vendor shall submit the preliminary General Arrangement Drawing and Layout Drawing of the machine for getting BHEL's approval within 4 weeks from the date of Letter of Intent (LOI) / P.O. Foundation drawing and details like static / dynamic load etc. and final Layout drawings shall be submitted by the supplier within 2 weeks after getting BHEL's approval. BHEL shall construct complete foundation for the machine. The vendor shall also indicate specification of grouting compound.	Vendor to confirm
18.2	Foundation bolts, leveling plates etc. to be supplied with the machine	Vendor to confirm
<b>19.0</b>	<b>PAINTING:</b> Painting of Machine / Electrical Panels: RAL 6011 Apple Green (Polyurethane Paint)	Vendor to confirm
<b>20.0</b>	<b>PACKING</b>	
20.1	Sea worthy & rigid packing for all items of complete machine, 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
<b>21.0</b>	<b>GUARANTEE</b>	
21.1	24 months from the date of acceptance of the machine.	Vendor to confirm
<b>22.0</b>	<b>SPECIAL POINTS:</b>	
22.1	Machine configuration shall be such that drilling head; arm, column and base shall be sturdy enough to withstand all types of reactionary forces developed.	Vendor to specify
22.2	For drill head movement in the arm, hardened guide-ways with linear motion bearings preferred. screw rod should be covered with suitable bellows.	Vendor to specify
22.3	Dial collar on headstock having good quality of chromium plating.	Vendor to confirm
22.4	All locking mechanisms shall be smooth and trouble free to operate.	Vendor to confirm
22.5	Flexible metal hose for coolant is preferable at headstock.	Vendor to specify

Clause No	PARTICULARS AND BHEL SPECIFICATION	BIDDER'S OFFER With Technical Details
22.6	Efficient lubrication system is to be introduced to avoid oil leakage from spindle during higher strokes.	Vendor to confirm
22.7	First fill of lubrication oil & grease is in supplier's scope.	Vendor to confirm
<b>23.0</b>	<b>GENERAL POINTS</b>	
23.1	Machine Model No	Vendor to specify
23.2	Total connected load (KVA):	Vendor to specify
23.3	Floor area required (Length, Width, Height) for complete machine & accessories	Vendor to specify
23.4	Total weight of the machine	Vendor to specify
23.5	The offer shall clearly indicate the list of standard accessories that will be supplied along with the machine	Vendor to list
23.6	Accessories other than those specified shall be quoted separately as optional items.	Vendor to specify
23.7	Hard copy of literature / Catalogs with photographs & drawings explaining the technical features shall be enclosed with the offer	Vendor to furnish
23.8	Coolant tank should not be integral part of the machine. Lubrication pump should be kept outside of head stock	Vendor to confirm