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COMPANY

मैटेरियल मैनेजमेंट (पुर्चार्स)  
**MATERIAL MANAGEMENT (PURCHASE)**  
केन्द्र (हैरिद्वार), सीएफपी, बीएल  
**CENTRAL FOUNDRY FORGE PLANT, BHEL**  
हैरिद्वार, उत्तरांचल प्रदेश  
RANIPUR, HARIDWAR (INDIA) – 249403  
Phone No.+91-1334-281639, FAX No. 225892  
e-mail : [s\\_kumar@bhelhwr.co.in](mailto:s_kumar@bhelhwr.co.in)

M/S

**Sub: Tender Enquiry No: FF/PPX/ 3019/P/950/75572P/1 dated 10/10/2007 due on 04/12/2007.**

Dear Sir,

We are pleased to invite offer as per enclosed specifications, terms and conditions and instruction to bidders, in sealed covers for the under mentioned equipment/systems .

Sl No	Tender No	Description of Material	Qty No	Date & Time of Opening
01	3019/P/950/75572P/1	CENTRE LATHE MACHINE	01 NO	04 <sup>TH</sup> DEC 2007 2.00 PM

**KINDLY READ INSTRUCTIONS TO BIDDERS. OFFER NOT IN ACCORDANCE WITH THE INSTRUCTIONS IS LIABLE TO BE DISQUALIFIED AND IGNORED.**

PLEASE VISIT [www.bhel.com](http://www.bhel.com) or [www.bhelhwr.co.in](http://www.bhelhwr.co.in) for more details and tender documents.

Thanking You,  
Yours Faithfully,  
For & ON BEHALF OF CFFP, BHEL, HARIDWAR

(SUNIL KUMAR)  
SR.MANAGER (PUR)  
CFFP, BHEL, HARIDWAR

**LIST OF DOCUMENTS:**

1. Instruction to bidders.
2. Acceptance of commercial terms by vendor: Annexure-I.
3. List of consortium banks: Annexure-II.
4. Proforma for bank guarantee (security deposit): Annexure-III.
5. Proforma for bank guarantee (performance bank guarantee): Annexure-IV.
6. Technical specification.

## **Instruction to bidders**

1. Tender opening date & time **04/12/2007 at 2.00 P.M.**

2. **TENDER** addressed to The **Material Manager, CENTRAL FOUNDRY FORGE PLANT, BHEL, HARDWAR** must be posted with due allowance for postal delay or deposited in the Tender Box, placed in the office of **Purchase Department, Administrative Building Ground Floor, CFFP**. Tender must reach this Office or deposited in the Tender Box before 2.00 PM on or before the tender opening date.

3. **TENDERS RECEIVED AFTER OPENING TIME & DATE ARE LIABLE TO REJECTION.**

4. Submit the tender in two parts i.e.

**Part-I Technical / Commercial Bid**  
**Part-II Price Bid**

Technical / Commercial (part one) & Price Bid (part two) should be put in separate sealed envelopes. Both envelopes should be super scribed with **Tender Number, Date of Opening & Technical / Commercial Bid and Price Bid** respectively along with name of firm.

Both the envelopes i.e. containing Technical / Commercial Bid and Price Bid should again be kept in one envelope super scribed again with Tender No. and Date of Opening and the name of firm submitting the tender.

**Part-I** Envelopes super scribed with Technical / Commercial Bid must contain all information especially:-

(a) Specification of the material being offered as compared with the specifications mentioned in tender documents.

**Deviations if any should be clearly mentioned.**

(b) All commercial terms i.e. packing, forwarding, ST/STT/VAT/CST, Excise duty, Bank Charges, payment terms & Insurance etc. Mention present rate of applicable taxes & duties even if inclusive in rates.

(c) Delivery terms & period required for supply from order.

(d) Confirm to submit all required commercial documents (tax invoice, cenvatable duplicate copy of invoice, packing list, transit sale agreement etc.) & technical documents (TC/GC/QP etc.)

(e) Registration Numbers of SSI, Central Excise, Sales tax, Income tax, DGS & D, ECC etc.

(f) Unpriced copy of Price Bid.

**Part-II** Envelopes super scribed with Price Bid should contain priced copy of Price Bid. The price should be mentioned both the figures and words.

5. Authorized Signatory should authenticate tender documents.

6. **Techno-commercial bid ( Part-I )** will be opened on the due date at 2.00 PM. in the presence of participating vendors or authorized representatives, who may wish to be present. Representative deputed to witness tender opening must produce an authority letter from the signatory of offer. After evaluation of technical bids & finalization of technical, commercial terms & condition, price bid of only successful vendors will be opened. Priced bid opening date will be intimated separately.

7. The goods offered must conform to the required BIS/BHEL specification of the latest revision. Manufacture's name, trade name etc. must be mentioned. Enclose complete illustrative Technical literature/catalogue drawing etc.. Original manufacturer or processor's details must be mentioned in the offer for assessment of suitability.

8. **Guarantee** the goods offered against all defects for a period of 24 months from the date of commissioning. The supplier shall remove any defect, free of cost and at their risk.

9. **Terms of payment:**

1) 80% of the material cost to be paid on receipt of equipment. Balance 20% of material cost will be paid after satisfactory erection & Commissioning and on submission of performance bank guarantee equal to the value of 20% of the total order value valid for entire guarantee period.

2) 100% Erection and commissioning and job proving charges shall be paid after satisfactory erection and commissioning of equipment at CFFP, BHEL

10. **Inspection** shall be carried out after receipt of material in CFFP. The results obtained at CFFP shall be final and binding. BHEL may carry out inspection at vendors works too.

wherever applicable without any extra cost. This may please be clearly confirmed in the quotation without which the offer may not be considered.

12. **Please quote minimum prices.** Prices shall be compared on the basis of total cost to CFFP /BHEL, Hardwar. Charges, if any, such as packing, forwarding, taxes, transportation up to CFFP Stores, as applicable in addition to ex works prices should be clearly mentioned. For supplies originating from out side India price should be quoted both on FOB and CIF basis. Port of discharge Mumbai & port delivery CFS Mulund.

13 **Validity** of offers for acceptance in part or in full should be for 6 month from the date of tender opening. Price should remain fixed till the supplies are completed unless specified otherwise.

14. **Delivery** in the promised period is the essence of contract. The supply must be made with in the delivery period mentioned. Alternative delivery period may be offered if supply during the required delivery period cannot be arranged. Please note that

(a) If the delivery is not completed with in the prescribed period specified in the order, supplier shall be liable to pay an unconditional penalty of 1/2% of the price of goods in arrears per week or part there of subject to a maximum of 10%

(b) For material not supplied in time and/or not conforming to specification, the purchaser shall have the discretion to resort purchase from else where on the risk and cost of the supplier without any notice.

15. **Penalty:** Orders placed against this enquiry will be subjected to normal clauses for imposing of penalty, liquidated damages, risk purchase, cancellation and arbitration etc. as per terms of purchase order in case of delay in effecting supply or any other defaults.

16. Bharat Heavy Electricals Ltd. Ranipur (Hardwar) reserves the right to accept or reject any or all tenders without assigning any reason there of.

17. Specific confirmation to the acceptance to the above terms and condition should be given in the quotation by the tenderer,

18. Tenders not submitted in the prescribed manner are likely to be ignored/ rejected.

19. TENDERER MUST ENSURE THAT ALL STATUTORY & ISO REQUIREMENTS ARE COMPLIED WITH.

20. CFFP, BHEL, HARIDWAR reserves the right to opt for e-auction/reverse auction for obtaining best prices.

21. CFFP, BHEL, HARIDWAR reserves the right to amend technical or commercial terms and conditions of enquiry.

**IMPORTANT NOTE:**

**IN CASE OF ANY DIFFERENCE IN TECHNICAL SPECIFICATION AND GENERAL TERMS AND CONDITIONS, TECHNICAL SPECIFICAION WILL PREVAIL.**

(SUNIL KUMAR)  
SR.MANAGER (PUR)  
CFFP, BHEL, HARIDWAR

**ACCEPTANCE OF COMMERCIAL TERMS BY BIDDERS:**

DESCRIPTION	VENDOR'S CONFIRMATION
<p><b>1) <u>PAYMENT TERMS:</u></b></p> <p>1) 80% of the material cost to be paid on receipt of equipment. Balance 20% of material cost will be paid after satisfactory erection &amp; Commissioning and on submission of performance bank guarantee equal to the value of 20% of the total order value valid for entire guarantee period.</p> <p>2) 100% Erection and commissioning and job proving charges shall be paid after satisfactory erection and commissioning of equipment at CFFP, BHEL</p> <p><b><u>NOTE:</u></b></p> <p>a) As per payment terms, minimum 20% will be released by BHEL after successful erection, commissioning and job proving.</p> <p>b) Further this 20% can be released against submission of performance bank guarantee valid for entire warrantee period from the date of commissioning.</p> <p>c) The security deposit is to be as per the tender condition.</p>	
<p><b><u>1.1 LOADING ON PAYMENT TERMS IF NOT AGREED BY VENDOR WILL BE AS FOLLOWS:</u></b></p> <p><b>Loading: Advance amount, if any (Amount X):</b>1.5% per month for the quoted delivery period for the amount 'X'</p> <p><b>Payment at the time of dispatch against shipping/dispatch documents (Amount Y):</b>"1.5% per month for the amount X+Y exceeding 80% of contract value i.e. 1.5% of (X+Y-0.8Z) where Z is the contract value".</p> <p>In case any bidder does not accept any of the condition at (a) to (c) above then, their offer is likely to be rejected by BHEL and technical bid will not be processed, and no correspondence in this regards will be entertained.</p>	
<p><b>1.2 <u>P.B.G. TERMS:</u></b> Performance Bank Guarantee to be submitted on the prescribed format equal to the value of 20% of the total order value valid WARRANTY / GUARANTEE agreed period. This bank guarantee, in the format to be prescribed by BHEL, shall have to be submitted before release of last balance payment(see annexure II and IV)</p>	
<p><b>1.3 <u>CURRENCY OF PAYMENT:</u></b> Mention the currency in which payment has to be made.</p>	
<p><b>1.4 <u>FOR INDIGENOUS SUPPLY:</u></b> For indigenous supply the currency shall be Indian Rupees</p>	
<p><b>1.5 <u>ERECTION AND COMMISSIONING CHARGES:</u></b></p> <p><b>For Indian Suppliers:</b> It should be quoted in Rupees.</p> <p><b>For Foreign Suppliers:</b> If erection and commissioning is being carried out by persons residing in India, it should be quoted in Indian Rupees.</p>	
<p><b>1.6 <u>TAXES:</u></b> All statutory taxes, if any, will be deducted at source &amp; to be borne by the beneficiary. Tax deduction certificate shall be issued at the end of financial year if required.</p>	
<p><b>2.) <u>SECURITY DEPOSIT:</u></b> Vendor has to submit security equal to the amount of 10% of the total order value in the currency of order within one month of receipt of order in the form of Bank Guarantee in BHEL format valid for delivery period.</p>	

<p><b>2.1 SUBMISSION OF BANK GUARANTEE :</b> All bank guarantees for security deposit as well as for performance should be from one of the BHEL consortium banks and the bank guarantee should be in the Performa prescribed by BHEL (see annexure-II &amp; III).</p>	
<p>3) <b>PENALTY FOR LATE DELIVERY:</b> Penalty shall be applicable for delayed delivery @ 0.5% per week and part thereof subject to a maximum of 10% for total P.O. value.</p> <p><b>3.1 LOADING ON PENALTY FOR LATE DELIVERY IF NOT AGREED BY VENDORS ON ABOVE TERMS:</b> If any vendor do not accept the LD @ of 0.5% per week and part thereof subject to a maximum of 10% of total PO value, their offer may be ignored. Vendors accepting LD terms different from the proposed terms of 0.5% ,maximum 10% will be loaded @ %age deviation from the range of 10% on their prices (FOB for imported and ex-factory for indigenous). If the vendor does not accept as above their offer is likely to be ignored and technical bid will not be processed.</p>	
<p>4) <b>DELIVERY OF THE EQUIPMENT:</b> Firm delivery period for the equipment to be stated w.e.f. date of LOI/ Order.</p>	
<p>5) <b>SETTLEMENT OF DISPUTES:</b></p> <ul style="list-style-type: none"> <li>Settlement of disputes through arbitration shall be in accordance with Arbitration Rules of Conciliation and Arbitration of the ICC, Paris. The venue of arbitration shall be Delhi. The courts of Delhi shall have exclusive jurisdiction.</li> <li>For Indigenous Source. The venue of arbitration shall be Haridwar Court, which will have exclusive jurisdiction.</li> </ul>	
<p>6) <b>AUTHORIZATION OF PRE-INSPECTION:</b> BHEL is authorized to pre inspect the material at works. In case CFFP,BHEL wants to pre inspect the material, then it will be dispatched only after getting clearance form BHEL.</p>	
<p>7) <b>DRAWING / DATA APPROVAL:</b> Any drawing / data approval required from BHEL after placement of order shall be the responsibility of the vendor and any delay on account of the same shall be the responsibility of the vendor and have no bearing on the penalty applicable.</p>	
<p>8) <b>DRAWING/DESIGN/ INFORMATION USE:</b> The vendor will have to give an undertaking that the drawing / design / information enclosed with the enquiry / proposed order will not be parted to any agency and will also not be used for manufacturing for any other customer.</p>	
<p>09) <b>5 SETS OF O&amp;M MANUAL:</b> 5 Sets of Operation &amp; Maintenance Manual shall have to be supplied along with the equipment. Final payment will be released only after receipt of the required documentation.</p>	
<p>10) <b>TOOLS AND SPARES:</b> Special tools and recommended spares required.</p>	
<p>11) <b>TRAINING:</b> Vendor shall provide required training to BHEL personnel free of cost.</p>	
<p>12) <b>WARRANTY/ GUARANTEE:</b> 24 months from the date of commissioning.</p>	

13) <u>CONTACT DETAILS</u> : Name of contact person, name, designation, Department complete postal, E-mail address & Fax no, phone, Mobile no. to be mentioned.	
14) <b>PHYTO SANITARY CERTIFICATE</b> : Phyto sanitary Certificate essential for packages (Wooden).	
15) <b>VALIDITY</b> : Validity of the offer should be 180 days from tender opening.	
16) <b>BANK CHARGES</b> : Bank Charges to be borne by vendor.	

**Note:** Attach separate sheet for additional information if necessary. The above terms & condition supersedes the terms & conditions found contract.

## **ANNEXURE II**

### **LIST OF CONSORTIUM BANKS:**

- |   |  |
|---|--|
| <p>1. State Bank of India<br/>CAG Branch,<br/>10-th Floor, Vijaya Building,<br/>Barakhamba Road,<br/>New-Delhi-110001</p>             | <p>10. HDFC Bank Ltd<br/>5<sup>th</sup> Floor, HT House,<br/>K G Marg,<br/>New-Delhi-110001</p>            |
| <p>2. Canara Bank<br/>74, Janpath,<br/>New-Delhi-110001</p>   | <p>11. CITI Bank N A<br/>Jeevan Vihar Building,<br/>Sansad Marg,<br/>New-Delhi-110001</p>                  |
| <p>3. Punjab National Bank<br/>74, Janpath,<br/>New-Delhi-110001</p>  | <p>12. Standard Chartered Bank<br/>H2 Block, Connaught place,<br/>New-Delhi-110001</p>                     |
| <p>4. Bank of Baroda<br/>Corporate Banking Branch,<br/>11<sup>th</sup> Floor, BOB Building,<br/>Sansad Marg,<br/>New-Delhi-110001</p> | <p>13. ICIC Bank Ltd.<br/>ICIC Tower,<br/>Bisham Pitamah Marg,<br/>Pragati Vihar,<br/>New Delhi 110003</p> |
| <p>5. Deutsche Bank<br/>Tolstoy Marg,<br/>New-Delhi-110001</p>  | <p>14. IDBI Bank Ltd.<br/>19, K G Marg,<br/>Surya Kiran Building,<br/>New-Delhi-110001</p>                 |
| <p>6. State Bank of Hyderabad<br/>Surya Kiran Building,<br/>K. G. Marg,<br/>New-Delhi-110001</p>                                      | <p>15. HSBC Ltd.<br/>ECE House,<br/>28 KG Marg,<br/>New-Delhi-110001</p>                                   |
| <p>7. State Bank of Mysore<br/>Antriksh Bhawan,<br/>K. G. Marg,<br/>New-Delhi-110001</p>  |  |
| <p>8. State Bank of Mysore<br/>Industrial Finance Branch,<br/>Ramanashree Arcade,<br/>MG Road,<br/>Bangalore-560001</p>               |  |
| <p>9. State Bank of Travancore<br/>Travancore House,</p>  |  |

H. Bhatnagar, B. C. Choudhary,  
New-Delhi-110001

**PROFORMA FOR SECURITY DEPOSIT  
(TO BE STAMPED IN ACCORDANCE WITH STAMP ACT)**

This deed of guarantee made this .....day of .....Two Thousand.....by (bank) hereinafter called 'the Guarantor') which expression shall unless repugnant to the context or meaning thereof be deemed to include its successors and assigns)IN FAVOUR OF M/s Bharat Heavy Electricals Limited (A Government of India Undertaking ) a Company incorporated under the Companies Act, 1956 having its registered office at "BHEL House" Siri Fort, New Delhi 110 049 , through its Unit/Division at Hardwar (Central Foundry Forge Plant) hereinafter called " the Company" (which expression shall unless repugnant to the context of meaning thereof be deemed to include its successors and assigns).

WHEREAS M/s..... (hereinafter referred to as the vendor) have entered into a contract bearing no.....Dated.....(Hereinafter referred to as "the Contract") for the supply of .....With the Company.

AND WHEREAS the Contract interalia provides that the vendor shall furnish Security Money to the Company in the form a Bank Guarantee for a sum of Rs.....(Rs.....only) as Security for due and faithful execution of deliveries within specified period in the contract.

AND WHEREAS THE VENDOR has approached the Guarantor and in consideration of the arrangement arrived at between the Vendor and Guarantor; the Guarantor has agreed to give the guarantee as hereinafter mentioned in favour of the Company.

**NOW THIS DEED WITNESS AS FOLLOWS:-**

- (1) The Guarantor do hereby guarantee to the Company the due and faithful performance, observance or discharge of the Contract by the Vendor and further unconditionally and irrevocable undertake to pay the Company without demur and merely on demand to the extent of ..... Any claim made by the Company on them for any loss, damage, costs charges and expenses caused to or suffered by the company by reason of the vendor making any default in the performance, observance or discharge of the terms , conditions stipulations or undertakings or any one of them gas contained in the Contract.
- (2) The decision of the Company whether any default has occurred or has been committed by the Vendor in the execution of the supplies, observance or discharge of any of the terms, conditions stipulations or undertakings or any one of them as contained in the Contract and or as to the extent of loss, damage, costs ,charges and expenses caused to or suffered by the Company by reason of the vendor making any default in the performance, observance or discharge of any of the terms, conditions, stipulations or undertakings or any one of them shall be conclusive and binding on the Guarantor irrespective of the fact whether the vendor admits or denies the default or questions the correctness of any demand made by the company in any Court, Tribunal or Arbitration Proceedings or before any other authority.
- (3) The Company shall have fullest liberty without affecting in any way the liability of the Guarantor under this guarantee, from time to time to enforce or forbear from enforcing any of the terms and conditions governing the contract or securities available to the Company and the Guarantor shall not be released from its liability under these presents by any exercise by the Company of the liberty with reference to the matters aforesaid or by reason of time being given to the vendor or any other forbearance, act or commission of the part of the company or any indulgence by the company to the vendor or of any other matter or thing whatsoever which under the law relating to sureties, would but for this provision have the effect of so releasing the Guarantor from its liability under this Guarantee.
- (4) The Guarantor further agree that the Guarantee herein contained shall remain in full force and effect during the period that would be taken to the performance of the Contract and that it shall continue to be enforceable till all the dues of the Company under or by virtue of the said Contract have been fully paid and its claims satisfied or discharged and till the Company certifies that the terms and conditions of the Contract have been fully and properly carried out by the Vendor and accordingly discharges this Guarantee, subject, however, that this Guarantee is only valid for written demands by the Company on or before.....(specify date).



The Guarantor undertake not to revoke this Guarantee during the period it is in force except with the previous consent of the Company in writing and agree that any liquidation or winding up or insolvency or dissolution or any change in the constitution of the Vendor or the Guarantor shall not discharge the Guarantor's liability hereunder:

It shall not be necessary for the Company to proceed against the Vendor before proceeding against the Guarantor and the Guarantee herein contained shall be enforceable against them notwithstanding any security which the Company may have obtained or obtain from the Vendor shall at the time where proceedings are taken against the Guarantor hereunder by outstanding or unrealized.

The Guarantor hereby declares that it has power to execute this guarantee under its Memorandum and Articles of association and the executants has full powers to do so on its behalf under the Power of Attorney dated.....granted to him by the proper authorities of the Guarantor..

IN WITNESS whereof the ..... (Bank) have caused this deed to be signed hereunder on their behalf on the date first above mentioned.

**Signed for and on behalf of the (Bank)**

Name:

Designation:

Address:

Fax No. (With country code):

E-mail address:

**NOTE: IN CASE A BANK IN INDIA IS GIVING THIS BANK GUARANTEE; IT WILL BE EXECUTED ON A STAMP PAPER OF RS. 62.50 BUT IF IT WILL BE FROM AN OVERSEAS BANK, IT WILL HAVE TO BE EXECUTED AS PER LAWS OF THAT COUNTRY.**

**PROFORMA BANK GUARANTEE  
(TO BE STAMPED IN ACCORDANCE WITH STAMP ACT)**

This deed of guarantee made this .....day of.....Two Thousand.....by (bank)hereinafter call ‘the Guarantor’) which expression shall unless repugnant to he context or meaning thereof be deemed to include its successors and assigns)IN FAVOUR OF M/s Bharat Heavy Electricals Limited (A Government of India Undertaking) a Company incorporated under the Companies Act,1956 having its registered office at “BHEL House” Siri Fort, New Delhi 110 049, through its Unit/Division at Hardwar (Central Foundry Forge Plant) hereinafter called “the Company” (which expression shall unless repugnant to the context or meaning thereof be deemed to include its successors and assigns).

WHEREAS M/s.....(hereinafter referred to as the vendor) have entered into a Contract bearing no.....dated.....(hereinafter referred to as “ the Contract”) or the supply of.....with the Company.

AND WHEREAS the contract interalia provides that the vendor shall furnish to the Company a Performance Bank Guarantee for a sum of .....as security for due a faithful performance of the Contract in the form and manner specified therein.

AND WHEREAS THE VENDOR has approached the Guarantor and in consideration of the arrangement arrived at between the Vendor and Guarantor; the Guarantor has agreed to give the Guarantee as hereinafter mentioned in favour of the Company.

**NOW THIS DEED WITNESS AS FOLLOWS:**

- (1) The Guarantor do hereby guarantee to the Company the due and faithful performance, observance of discharge of the Contract by the Vendor and further unconditionally and irrevocably undertake to pay the Company without demur and merely on demand to the extent of .....any claim made by the Company on them for any loss, damage, costs, charges and expenses caused to or suffered by the Company by reason of the vendor making any default in the performance, observance or discharge of the terms, conditions stipulations or undertakings or any one of them as contained in the Contract.
- (2) The Company shall have fullest liberty without affecting in any way the liability of the Guarantor under this Guarantee, from time to time to enforce or forbear from enforcing any of the terms and conditions governing the contract or securities available to the Company and the Guarantor shall not be released from its liability under these presents by any exercise by the Company of the liberty with reference to the matters aforesaid or by reason of time being given to the Vendor any other forbearance, act or commission on the part of the Company or any indulgence by the Company to the Vendor or of any other matter or thing whatsoever which under the law relating to sureties, would, but for this provision have the effect of so releasing the Guarantor from its liability under this Guarantee.
- (3) The Guarantor further agree that the Guarantee herein contained shall remain ion full force and effect during the period that would be taken for the performance of the Contract and that it shall continue to be enforceable till all the dues of the Company under or by virtue of the said Contract have been fully paid and its claims satisfied or discharged and till the Company certifies that the terms and conditions of the Contract have been fully and properly carried out by the Vendor and accordingly discharges this Guarantee, subject, however, that this Guarantee is only valid for written demands by the Company on or before.....(specify date).

The Guarantor undertake not to revoke this Guarantee during the period it is in force except with the previous consent of the Company in writing and agree that any liquidation or winding up or insolvency for discharge the Guarantor’s liability hereunder:

It shall not be-necessary for the Company to proceed against the Vendor before proceeding against the Guarantor and the Guarantee herein contained shall be enforceable against them notwithstanding any security which the Company may have obtained or obtain form the Vendor shall at the time where proceedings are taken against Guarantor hereunder be outstanding or unrealized.

The Guarantor hereby declares that it has power to execute this guarantee under it is Memorandum and Articles of Association and the executants has full powers to do so on its behalf under the Power of Attorney dated.....granted to him by the proper authorities of the Guarantor.

IN WITNESS whereof the ..... (Bank) have caused his deed to be signed hereunder or their behalf on the date first above mentioned.

**Signed for and on behalf of the (Bank)**

Name:

Designation:

Address:

Fax No.: (with country code)

Email address

**NOTE: IN CASE A BANK IN INDIA IS GIVING THIS BANK GUARANTEE, IT WILL BE EXECUTED ON A STAMP PAPER OF RS. 100.00 BUT IF IT WILL BE FROM AND OVERSEAS BANK. IT WILL HAVE TO BE EXECUTED AS PER LAWS OF THAT COUNTRY.**

		FF07006 DATE-12/09/07	
	<b><u>CFFP/BHEL HARDWAR</u></b>		
	<b><u>SPECIFICATION FOR CENTRE LATHE MACHINE</u></b>		
	<b>NOTE:-</b>		
	<b>1. The "VENDOR TO CONFIRM/SPECIFY" Column and "REMARKS" Column of this format shall be filled in by the Vendor and submitted along with the offer. Inadequate / incomplete, ambiguous, or unsustainable information against any of the clauses of the specifications/requirements shall be treated as non-compliance.</b>		
	<b>2. The offer and all documents enclosed with offer should be in English language only.</b>		
	<b>SCOPE: SUPPLY, ERECTION &amp; COMMISSIONING OF CENTRE LATHE MACHINE COMPLYING WITH SPECIFICATION AS BELOW</b>		
SL.NO.	DESCRIPTION FOR REQUIREMENT	SPECIFIED/ TO BE CONFIRMED BY VENDOR	REMARKS
<b>1.0</b>	<b>PURPOSE &amp; WORKPIECE MATERIAL :</b>		
<b>1.1</b>	<b>Purpose:</b> The machine shall be used mainly for rough machining of Turbine and Generator Rotors & Hydros shafts forging which are components of high precision. The machine shall be used for all types of turning/grooving operations on diameters & faces, Facing, Boring, Taper turning & Profile machining operations.	To Confirm	
<b>1.2</b>	<b>Work Piece Material:</b> Steel Forgings shall be in black condition. Machine should be suitably designed to withstand toughest conditions as our forgings generally have black spots, hard spots, sand inclusion, bend, cracks, etc. Machine shall be utilized for bulk material removal. Intermittent cutting shall also be there. At times finish machining shall also be done. These forgings are of high strength alloy steels like 26NiCrMoV145 and similar other materials which are generally used in power producing equipment having Tensile Strength 980 N/mm <sup>2</sup> & Hardness 350 BHN.	To Confirm	
<b>2.0</b>	<b>SPECIFICATIONS:</b>		
<b>2.1</b>	<b>CAPACITY &amp; SIZE :</b>		
<b>2.1.1</b>	Turning Diameter	1500 mm or more	
<b>2.1.2</b>	Max. Turning Length	10000 mm	
<b>2.1.3</b>	Weight of Work-piece	50000 kg or more	
<b>2.1.3.1</b>	Held between centers without steady	50000 kg or more	
<b>2.1.3.2</b>	Held in head stock with one steady rest	50000 kg or more	
<b>2.1.3.3</b>	Held only in chuck	Vendor to specify	
<b>2.1.3.3.1</b>	Distance of center of gravity from face plate, in case the workpiece is held only in chuck	Vendor to specify	
<b>2.1.4</b>	Admit Between Centers (ABC)/Center Distance (CD) (Facing at maximum length should be possible)	10000 mm	
<b>2.1.5</b>	Center Height	Vendor to specify	
<b>2.1.6</b>	Swing over bed (SOB)	Vendor to specify	
<b>2.1.7</b>	Swing Over Carriage (SOC)	1600 mm	
<b>2.1.8</b>	Face plate Diameter. (Drg. To be submitted)	Vendor to specify	
<b>2.1.9</b>	No. of Hard Jaws	04 Nos	
<b>2.1.9.1</b>	Drawing of Jaws and Lead Screws	Vendor to submit	
<b>2.1.10</b>	Min. & Max. Chucking Diameters (with single set of jaws and single screw with force multiplier for each jaw - for rigid clamping of maximum weight/length of workpiece i.e. 50 tons/10M for performing all types of specified rough & finish machining operations.)		

SL.NO.	DESCRIPTION FOR REQUIREMENT	SPECIFIED/ TO BE CONFIRMED BY VENDOR	REMARKS
2.1.10.1	External clamping diameter	200-1200 mm	
2.1.10.2	Internal	Vendor to specify	
2.1.11	Min distance between Head stock & Tail stock	Vendor to specify	
2.1.12	Min and Max facing diameters without Tool holder extension	Vendor to specify	
2.2	<b>HEAD STOCK :</b>		
2.2.1	Spindle Motor Rating (Min.) AC, S1 Continuous Duty 75 kw or more	Vendor to specify	
2.2.2	Spindle Motor Make, Model, Type, noise level etc.	Vendor to specify	
2.2.3	Spindle Bearing Type & Diameters (Radial & Axial)	Vendor to specify	
2.2.4	Spindle nose details (Drg. to be submitted )	Vendor to specify	
2.2.5	Spindle speed (Infinitely variable)	0.5-200 rpm	
2.2.6	Detail of speed ranges	Vendor to specify	
2.2.7	Range of spindle speed at constant power.	Vendor to specify	
2.2.8	Max permissible torque at face plate	Vendor to specify	
2.2.9	RPM at which max. permissible torque is available	Vendor to specify	
2.2.10	Torque/Power/Speed diagram of spindle motor	Vendor to submit	
2.2.11	Head stock center, 60° with cover plate to cover the space when headstock center is removed.( To submit center drg / details)	Vendor to offer	
2.2.12	Spindle bore diameter and its depth from chuck face	Vendor to specify	
2.2.13	Detail of Hard Jaws, Force Multipliers for easy movement & clamping of jaws, T-slots on chuck etc.	Vendor to specify	
2.2.14	Clamping Force available on each Jaw	Vendor to specify	
2.2.16	Jaws Extention:- Our Black forgings generally have Tapered/Bulge Ends(Upto 300 mm). Therefore, for safe loading & clamping of these Jobs, Jaws alongwith their Extentions to be suitably designed & offered	Vendor to offer	
2.3	<b>MACHINE BED :</b>		
2.3.1	Machine bed & base should be made of high quality cast iron alloy / steel duly stress relieved to withstand thrust & vibration during maximum load. This should be ribbed for greater strength & stability. Head stock, Carriages & Tailstock and at times Steady rests are to be mounted on the bed. High quality ground guideways required for smooth movement of steady rests, carriages & Tailstock	Vendor to confirm	
2.3.2	No. of Guide ways : 03 Nos.such that carriage can bypass steady rest and tail stock.	Vendor to confirm	
2.3.3	Bed width across ways	Vendor to specify	
2.3.4	Construction & type of guide ways (Details should be submitted)	Vendor to offer	
2.3.5	Hardness of guideways	Vendor to specify	
2.4	<b>FEEDS :</b>		
2.4.1	Feed range in X & Z axes (Infinitely variable) 0 - 3500mm/min	Vendor to confirm	
2.4.2	Rapid traverse in X & Z axes (Infinitely variable) Min. 3500mm/min	Vendor to confirm	
2.4.3	Feed drives/motors X & Z axes [AC servo motors] of Siemens ( digital type) (detail of model, make, type etc. should be submitted)	Vendor to offer	
2.4.5	Details of System to ensure zero backlash for X & Z axes.	Vendor to specify	
2.4.6	Mechanism for locking X & Z axis	Vendor to specify	
2.4.7	Maximum feed force in X and Z axes	Vendor to specify	
2.4.8	Maximum Torque in X and Z axes	Vendor to specify	
2.5	<b>STEADY RESTS</b>		
2.5.1	Job Range Ø150 - Ø 1200mm	Vendor to confirm	
2.5.2	Range of Supporting Diameters for Roller type steady rests.	Ø150 - Ø 1200mm	
2.5.3	Range of supporting dia for Bush Type Steady Rests	Ø150 - Ø 1200mm	
2.5.4	No. of Steady Rests to cover the specified range	Vendor to specify	

SL.NO.	DESCRIPTION FOR REQUIREMENT	SPECIFIED/ TO BE CONFIRMED BY VENDOR	REMARKS
2.5.5	Swiveling type upper portion of steady rests or equivalent for job loading/unloading (Details should be submitted)	Vendor to offer	
2.5.6	Clamping of steady rests should be with quick clamping fasteners. (Details should be submitted)	Vendor to offer	
2.5.7	Drawings for complete range of each type of steady rests are to be submitted.	Vendor to submit	
2.5.8	Minimum distance from face plate (up to position of steady pad), at which the steady rest can be placed on bedways for supporting the Job.	Vendor to specify	
2.5.9	The body of steady should not obstruct in any way while machining near steady support dia, when the component is supported on steady with other end in chuck. Carriage must bypass the steady.	Vendor to specify	
2.6	<b>TAIL STOCK :</b>		
2.6.1	Motorised movement on bed through push buttons	Vendor to offer	
2.6.2	Quill stroke	Vendor to specify	
2.6.3	Quill movement should be equipped with following : (Details should be submitted)	Vendor to specify	
2.6.3.1	Presetting, display & automatic control of thrust applied	Vendor to offer	
2.6.3.2	Compensation for thermal expansion of work piece	Vendor to offer	
2.6.3.3	Motorised Drive ( Details to be submitted)	Vendor to offer	
2.6.4	Quill diameter	Vendor to specify	
2.6.5	Rapid Traverse rate of tail stock body on bed	Vendor to specify	
2.6.6	Traverse of quill with traverse rate	Vendor to specify	
2.6.7	Provision of Pressure adjustment between workpiece & centre, even while machining under progress.	Vendor to specify	
2.6.7	Tail stock center - 60 degree (Drg. to be submitted)	Vendor to offer	
2.6.8	Detail of Positive Clamping & Unclamping of tail stock on bed like type & no. of clamps, clamping force etc.	Vendor to specify	
2.6.9	Max thrust on the Quill	Vendor to specify	
2.6.10	Details of provision for re-alignment of tailstock, if required in future, to be submitted.	Vendor to submit	
2.7	<b>CARRIAGE/ CROSS-SLIDE :</b>		
2.7.1	Z-axis travel	Vendor to specify	
2.7.2	X-axis travel (specify movement beyond center i.e. X negative side)	Vendor to specify	
2.7.3	Cutting force available at the carriage	Vendor to specify	
2.7.4	Layout showing extreme positions of the all axes movements	Vendor to submit	
2.7.5	Carriage to clear chuck, tailstock and all steady rests	Vendor to confirm	
2.7.6	Carriage should be of very rigid and sturdy design to take all vertical & axial stresses.	Vendor to confirm	
2.8	<b>TOOL POST :</b>		
2.8.1	<b>Type of Tool Post:</b> Rigid tool post having provision of mounting Boring Bar Holder. It should be suitably designed to perform all types of machining operations without any difficulty on the Job. Alternatively, vendor may suggest superior configuration of tool post, if possible, for efficient & effective use of the machine for the required applications. Tool post should be designed such that it could withstand maximum vertical and axial stresses.	Vendor to offer	
2.8.2	<b>Tool Carrier No.1 :</b> This tool carrier will be used for turning, facing, grooving, taper , profile machining operations etc. using square shank tools clamped on left and right hand face of carrier. So, provision of clamping should be there on both left & right side of the tool carrier and also on front face. Clamping details to be submitted.	Vendor to offer	

SL.NO.	DESCRIPTION FOR REQUIREMENT	SPECIFIED/ TO BE CONFIRMED BY VENDOR	REMARKS
2.8.3	<b>Tool Carrier No.2 :</b> This tool carrier will be used for turning, facing, grooving, taper , profile machining operations etc. using square shank tools clamped on left and right hand face of carrier. So, provision of clamping should be there on both left & right side of the tool carrier and also on front face. Clamping details to be submitted.	Vendor to offer	
2.8.4	All tool carriers at their maximum projection of all carriers, with standard tools clamped on them, should clear all offered steady rests.	Vendor to offer	
2.8.5	Max. permissible cutting force on each tool carrier and tool post.	Vendor to specify	
2.8.6	Drawings showing details/configuration of the tool post and all tool carriers.	Vendor to submit	
2.8.7	Drawing showing extreme movements of tool post with different projections of tool carriers in both X and Z axes etc. to be submitted.	Vendor to submit	
2.8.8	Tool post should be so designed to ensure clear visibility of the tool to the operator, standing on operator's platform, while operating operator's panel for machining very near to chuck.	Vendor to confirm	
2.9	<b>CONSTRUCTION :</b>		
2.9.1	Our forgings generally have 50-100 mm material on tool point for cutting. Machine should be able to perform satisfactorily with a 15 mm depth of cut and Cutting speed of 50 m/min	Vendor to Confirm	
2.9.2	Vendor to furnish details of material, hardness & constructional details including explanatory drawings of various components/assemblies like Headstock, Steady Rest, Chuck, Tailstock, Carriage, Tool post, Machine bed, Feed Transmission system etc.of the machine.	Vendor to explain & submit, as applicable.	
2.9.3	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 explain & submit, as applicable.	
2.10	<b>OPERATOR'S PLATFORM :</b>		
2.10.1	Independent operator's platform should be provided on both sides , i.e. left & right , of the tool post with staircases and having sufficient space for safe swiveling of tool post and for left to right or vice versa movement of operator without any obstruction & without stepping down . The platform should provide sufficient space for convenient and safe operation of the machine and its control from both sides of tool post for external & internal turning operations using different tool carriers. It should be provided with two different staircases (parallel to z-axis) for left and right portions of platform.	Vendor to offer	
2.10.2	The platform should clear all steady rests, tailstock and also headstock while working near chuck.	Vendor to confirm	
2.10.3	Operator's platform should have suitably located sufficient illumination (for clear view of tool, job, operator's panel etc.)	Vendor to offer	
2.11	<b>OPERATION &amp; CONTROL SYSTEM :</b>		
2.11.1	<b>OPERATOR'S PANEL :</b> Swiveling and Sliding type operator's panel having complete machine control system with display of specified configuration should be provided on the operators platform for safe, convenient and efficient operation from both left and right sides of tool post. All switches should be within reach of operator of average height (5' 5") for easy operation. All displays/indications should also be conveniently placed accordingly. Layout showing complete details should be submitted.	Vendor to offer	

SL.NO.	DESCRIPTION FOR REQUIREMENT	SPECIFIED/ TO BE CONFIRMED BY VENDOR	REMARKS
2.11.3	<b>MANUAL CONTROL :</b>		
2.11.3.1	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, spindle rpm, cutting feed on/off, display of axis position values etc, for manual turning operation. Sketch showing switches / keys provided on operators panel should be submitted.	Vendor to offer	
2.11.4	<b>HAND HELD UNIT:</b>		
2.11.4.1	Hand Held unit (auxiliary pendant) with spindle inching, which can be taken near to the chuck for job setting and similar other purposes.	Vendor to offer	
2.12	<b>MACHINE LIGHTS :</b>		
2.12.1	Machine Lights for sufficient illumination of complete working area on both sides of operator's platform for clear visibility.	Vendor to offer	
2.12.4	All light fittings, consumables, adapters / receptacles should have compatibility with Indian equivalents.	Vendor to confirm	
2.13	<b>Digital Read Out required for:</b>		
2.13.1	Chuck rpm	Vendor to confirm	
2.13.2	Feed rate for X & Z axis	Vendor to confirm	
2.13.3	Linear traverse in X & Z axis ( Straight Turning & Facing)	Vendor to confirm	
2.13.4	Linear traverse in X & Z axis ( Taper machining / Profile machining )	Vendor to confirm	
2.13.5	Current , Voltage , Thurst force , Cutting force etc.	Vendor to confirm	
2.14	<b>AIR CONDITIONERS :</b>		
2.14.1	Door mounted Air Conditioners of reputed make with Dehumidifiers for all Electrical / Electronic Panels / Cabinets including Operator's Panel (One no. of sufficient capacity for each cabinet / panel considering specified ambient & operating conditions). The blow of cool air from the air conditioners shall not fall directly on the electronic circuits/modules. Detailed specifications of the same are to be submitted.	Vendor to offer & submit	
2.15	<b>HYDRAULIC SYSTEM :</b>		
2.15.1	Re-circulating type Hydraulic System for Headstock, Tailstock, Carriage, Steadies etc. Hydraulic Tank should be preferably placed at shop floor.	Vendor to offer	
2.15.2	Make : Rexroth / Vickers Sperry or equivalent reputed manufacturer.	Vendor to specify	
2.15.3	Filtration System: Sufficient no. of filters ( with electric clogging indicator and alarm on PLC ) should be used to avoid frequent clogging of the filters and other maintenance related problems.. Details should be submitted.	Vendor to offer & submit	
2.15.4	Automatic shut off provision, Details should be submitted.	Vendor to offer	
2.15.5	Refrigerated type cooling and electric heating ( Electric heating, only if required ) system of sufficient capacity to maintain complete Hydraulic System, including lubrication oil, hydrostatic oil and gearbox oil, etc. at a temperature not exceeding 40 deg Celsius irrespective of the ambient conditions. Complete details should be submitted	Vendor to offer & submit	
2.15.6	Hydraulic pump capacity ( flow / pressure )	Vendor to specify	
2.15.7	Each pump should have an independent motor. Tandem pumps should not be used. Maximum desired permissible pressure is 100 bar. If anywhere, pressure is more than 100 bar then one set of such pipeline should be offered in spare in addition to other spares.	Vendor to confirm & offer	
2.15.8	<b>First filling of all required Oils &amp; Grease</b> etc. to be supplied by vendor. Indigenous (Indian) source or Indian equivalent and specifications of oils/ greases are also to be provided by the vendor.	Vendor to offer & submit	



SL.NO.	DESCRIPTION FOR REQUIREMENT	SPECIFIED/ TO BE CONFIRMED BY VENDOR	REMARKS
<b>2.16</b>	<b>ELECTRICAL :</b>		
<b>2.16.1</b>	Voltage = 415V +10% / -10% , Frequency= 50Hz +3 / -3 , No. of phases = 3 phase with neutral. Power Supply source, as above, 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 including Voltage Stabilizer, Transformer & Air-Compressor etc. shall be the responsibility of vendor. Requirement of grounding/earthing with required material details should be informed by vendor well in advance so that same could be incorporated during construction of foundation.	Vendor to accept.	
<b>2.16.2</b>	Tropicalisation: All electrical / electronic equipment shall be tropicalized to suit specified ambient & operating conditions.	Vendor to confirm	
<b>2.16.3</b>	All electrical & electronic control cabinets & panels should be dust and vermin proof.	Vendor to confirm	
<b>2.16.4</b>	All electrical components in the cabinets should be mounted on DIN Rail.	Vendor to confirm	
<b>2.16.5</b>	All electrical and electronic panels including operator's panel 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	
<b>2.16.6</b>	Motors shall conform to IEC or Indian Standards.	Vendor to confirm	
<b>2.16.7</b>	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	
<b>2.16.8</b>	Vendor should ensure the proper earthing for the machine and its peripherals.	Vendor to confirm	
<b>2.17</b>	<b>SAFETY ARRANGEMENTS :</b> Following safety features in addition to other standard safety features should be provided on the machine:		
<b>2.17.1</b>	Machine should have adequate and reliable safety interlocks / devices to avoid damage to the machine, workpiece and the operator due to the malfunctioning or mistakes. Machine functions should be continuously monitored and alarm / warning indications through lights/ alarm number with messages should be available.	Vendor to offer	
<b>2.17.2</b>	A detailed list of all alarms / indications provided on machine should be submitted by the supplier.	Vendor to submit	
<b>2.17.3</b>	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.	Vendor to offer	
<b>2.17.4</b>	All the rotating parts used on machine should be statically & dynamically balanced to avoid undue vibrations & noise.	Vendor to confirm	
<b>2.17.5</b>	Emergency Switches at suitable locations as per International Norms should be provided.	Vendor to offer	
<b>2.17.6</b>	Oil lines should not run with electrical cable in the same trench.	Vendor to offer	
<b>2.18</b>	<b>ENVIRONMENTAL PERFORMANCE OF THE MACHINE :</b> The Machine should conform to following factors related to environment :		
<b>2.18.1</b>	Maximum noise level shall be 85 db at 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. Supplier to demonstrate compliance to noise level, if asked for.	Vendor to confirm	
<b>2.18.2</b>	There shall not be any emissions from the machine except fumes of cutting fluid during machining.	Vendor to confirm	
<b>2.18.3</b>	There should not be any effluent from the machine. In case there are any effluents from the machine, requisite effluent treatment plant or pollution control device should be built into the machine by the supplier.	Vendor to confirm	
<b>2.18.4</b>	No hazardous chemicals shall be required to be used in the machine.	Vendor to confirm	
<b>2.18.5</b>	If any safety / environmental protection enclosure is required it should be built in the machine by the vendor.	Vendor to confirm	
<b>2.18.6</b>	Paint of the machine should be oil resistant and should not get peeled off	Vendor to confirm	

SL.NO.	DESCRIPTION FOR REQUIREMENT	SPECIFIED/ TO BE CONFIRMED BY VENDOR	REMARKS
<b>3.0</b>	<b>SERVO VOLTAGE STABILIZER :</b>		
<b>3.1</b>	Indian make Oil / Air Cooled servo Controlled Voltage Stabilizer suitable for complete machine, its drives, controls, PLC etc with no undesirable Harmonics in the stabilizer output for unbalanced load & supply conditions considering specified power supply & ambient conditions.	Vendor to offer	
<b>3.2</b>	Make (Neel, Mumbai or equivalent)	Vendor to specify	
<b>3.3</b>	Model & Rating	Vendor to specify	
<b>3.4</b>	Spares Package for the Voltage Stabilizer for 2 years working should also be offered. List to be submitted.	Vendor to offer & submit	
<b>3.5</b>	Catalogue of the Voltage Stabilizer shall be submitted with the offer.	Vendor to submit	
<b>4.0</b>	<b>ULTRA ISOLATION TRANSFORMER :</b>		
<b>4.1</b>	Indian make Ultra Isolation Transformer suitable for complete machine , its drives, controls, PLC etc. shall be supplied for unbalanced load & supply conditions considering specified power supply & ambient conditions.	Vendor to offer	
<b>4.2</b>	Make (Neel, Mumbai or equivalent)	Vendor to specify	
<b>4.3</b>	Model and Rating	Vendor to specify	
<b>4.4</b>	Spares Package for the Ultra Isolation Transformer for 2 years working should also be offered, if recommended. List to be submitted.	Vendor to offer & submit	
<b>4.5</b>	Catalogue of the Ultra Isolation Transformer shall be submitted with the offer.	Vendor to submit	
<b>5.0</b>	<b>PNEUMATIC SYSTEM :</b>		
<b>5.1</b>	<b>AIR COMPRESSOR :</b>		
<b>5.1.1</b>	Vendor to specify any requirement of compressed air supply for the operation of the machine.If so, then the system should be so designed to have additional provision and required accessories before Refrigerated type Air Dryer so that BHEL compressed air supply having pressure 5 Kg/sq.cm with high moisture could be used as and when required.	Vendor to offer	
<b>6.0</b>	<b>Other Tooling Requirements ( optional ) :</b>		
<b>6.1</b>	Additional set of 4 Jaws	Vendor to offer	
<b>6.2</b>	Steady Rests to cover the specified range. (Price for unit quantity of each steady rest is to be quoted):	Vendor to offer	
<b>7.0</b>	<b>LEVELING &amp; ANCHORING SYSTEM:</b> Complete set of anchoring materials including foundation bolts, nuts, washers, fixators, leveling shoes etc for alignment of bed and to fix the machine to the foundation should be supplied. Details to be submitted.	Vendor to offer	
<b>8.0</b>	<b>TOOLS FOR ERECTION, OPERATION &amp; MAINTENANCE</b>		
<b>8.1</b>	Special tools and equipment 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. List of such tools should be submitted with offer	Vendor to offer	
<b>8.2</b>	Set of Test Mandrels/Cylindrical Bars for checking spindle run-out & alignment of headstock/tailstock etc. should be supplied with protection boxes.	Vendor to offer	
<b>9.0</b>	<b>SPARES :</b>		
<b>9.1</b>	Itemised breakup of mechanical, hydraulic, electrical and electronic 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)	Vendor to offer	
<b>9.1.1</b>	<b>Mechanical &amp; Hydraulic Spares :</b> Following Spares of reputed make are to be offered.(Like Rexroth/ Vickers Sperry make hydraulic spares)	Vendor to offer	
<b>9.1.1.1</b>	Pumps used on machines i.e. Hydraulic, lubrication and oil cooling pumps ( 1 no. each type ) like Rexroth / Vickers Sperry or equivalent reputed manufacturer.	Vendor to offer	

SL.NO.	DESCRIPTION FOR REQUIREMENT	SPECIFIED/ TO BE CONFIRMED BY VENDOR	REMARKS
9.1.1.2	Control Valves ( 1 no. each type )	Vendor to offer	
9.1.1.3	All types of flow control, pressure regulators, pressure reducer valves ( 1 no. each type )	Vendor to offer	
9.1.1.4	All types of pressure switches, flow switches and float switches (1 no. each type)	Vendor to offer	
9.1.1.5	All types of filter inserts of regenerative type (20 nos. of each type)	Vendor to offer	
9.1.1.6	All types of filter inserts of disposal type (20 nos. each type)	Vendor to offer	
9.1.1.7	Accumulators with charging kits (1 no each type)	Vendor to offer	
9.1.1.8	All types of pneumatic valves (1 no. of each type)	Vendor to offer	
9.1.1.9	All types of O-rings & Hydraulic Hoses (1 set of each type)	Vendor to offer	
9.1.2	<b>Electrical /Electronic Spares :</b> Following Spares are to be offered.	Vendor to offer	
9.1.2.1	Relays ( 2 Nos each type )	Vendor to offer	
9.1.2.2	Contactors ( 2 Nos each type )	Vendor to offer	
9.1.2.3	RTD temperature transmitter ( 1 No each type )	Vendor to offer	
9.1.2.4	Proximity Switches ( 5 Nos each type )	Vendor to offer	
9.1.2.5	Push Buttons ( 5 Nos each type )	Vendor to offer	
9.1.2.6	Indicating Lamps ( 10 Nos each type )	Vendor to offer	
9.1.2.7	Semiconductor Fuses ( 5 Nos each type )	Vendor to offer	
9.1.2.8	Special Fuses ( 5 Nos each type )	Vendor to offer	
9.1.2.9	Circuit Breakers ( 1 No each type )	Vendor to offer	
9.1.2.10	Main Power Switch ( 1 No each type )	Vendor to offer	
9.1.2.11	Encoders ( 1 No each type )	Vendor to offer	
9.1.2.12	Operator's panel with Display Unit	Vendor to offer	
9.1.2.13	I/O Cards for PLC ( 1 No each type )	Vendor to offer	
9.1.2.14	Servo Motors for Feed Drives	Vendor to offer	
9.1.2.15	Power Module & Control Cards for Main Drive as well as Feed Drives ( 1 Nos each type )	Vendor to offer	
9.1.2.16	One each of the following items : I/R Module, Machine Control Panel, Hand Held Unit, Any other auxiliary drive , if used, Complete Proportional Valve Controller, if used.	Vendor to offer	
9.2	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 inform BHEL sufficiently in advance and provide drawings of parts / details of spares & suppliers to enable BHEL to procure these in advance, if required	Vendor to confirm	
9.3	Vendor to confirm that complete list of spares for machine and accessories, along with specification / type / model, and name & address of the spare supplier shall be furnished along with documentation to be supplied with the machine	Vendor to confirm	
9.4	Repair service contract with supplier of offered service & spares for motor drives etc.	Vendor to offer	
10.0	<b>DOCUMENTATION :</b> Three sets of following documents (Hard copies) in English language should be supplied along with the machine	Vendor to offer	
10.1	Operating manuals of Machine & system	Vendor to offer	
10.2	Detailed Maintenance manual of machine with all drawings of machine assemblies/sub-assemblies/parts including Electrical / Pneumatic / Hydraulic circuit diagrams. All Assembly/ Sub Assembly Drawings shall be supplied with the part list also.	Vendor to offer	
10.3	Interface & commissioning manuals, PLC programming manual, Interface & commissioning manuals for spindle ,feed drives and auxiliary drive.	Vendor to offer	
10.4	Manufacturing drawings for all supplied clamping jaws and its lead screws, tool holders, tailstock center, adapters, sleeves, fixtures etc.	Vendor to offer	
10.5	Catalogues, Operation & Maintenance Manuals of all bought out items including drawings, wherever applicable.	Vendor to offer	
10.6	Detailed specification of all rubber items and hydraulic/lube fittings	Vendor to offer	

SL.NO.	DESCRIPTION FOR REQUIREMENT	SPECIFIED/ TO BE CONFIRMED BY VENDOR	REMARKS
10.7	Operating Manuals, Maintenance Manuals & Catalogues for supplied accessories viz. Voltage Stabilizer, Isolation Transformer, Air-Compressor etc.	Vendor to offer	
10.8	PLC program print-outs ( hard copy ) with comments in English including PLC program for any other auxiliary system if used.	Vendor to offer	
10.9	PLC program & PLC data on CD.	Vendor to offer	
10.10	Complete list of parts/items( Bill of materials) used in the machine in English language.	Vendor to offer	
10.11	One additional set of all the above documentation on CD ROM, wherever possible.	Vendor to offer	
11.0	<b>TRAINING :</b>		
11.1	<p>Four BHEL Persons should be trained at vendor's works for the area &amp; period given below:</p> <p>(a) Electrical, Electronic maintenance for machine &amp; other supplied equipments ( Period 2 weeks )</p> <p>(b) Mechanical &amp; Hydraulic maintenance of the machine &amp; other supplied equipments ( Period 2 weeks )</p> <p>(c) Operation of the machine &amp; other supplied equipments ( Period 2 weeks )</p> <p>Pre-dispatch inspection (ref. SI.No. 17.1) of the machine shall also be carried out by the team during their stay at vendor's works for the training. Vendor may specify days required for pre-dispatch inspection. BHEL reserves the right to choose no. of persons, field &amp; period of training, out of above, while deputing their engineers for training.</p>	Vendor to offer	
11.2	Air-fare, boarding & lodging for the trainees shall be borne by BHEL.	Vendor to note	
11.3	Competent, English speaking experts shall be arranged by the vendor during training for satisfactory & effective training of BHEL personnel.	Vendor to confirm	
12.0	<b>FOUNDATION :</b>		
12.1	Vendor shall submit 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. Complete Foundation Design including details viz. static / dynamic load details etc. and Final Layout drawings shall be submitted by the supplier within three months after getting BHEL's approval keeping in view of the Soil condition also. The layout should consist of all requirements pertaining to complete machine including space requirement for Voltage Stabilizer, Isolation Transformer & 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	
13.0	<b>ERECTION &amp; COMMISSIONING :</b>		
13.1	Supplier to take full responsibility for carrying out the erection, start up, testing of machine, it's control & all types of other supplied equipment , machining of test pieces 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. Other requirements like crane and helping personnel shall also be provided by BHEL. Details of these requirements should be informed by vendor in advance.	Vendor to offer	
13.2	Erection & Commissioning of indigenously supplied items like Voltage stabilizer, Isolation Transformer & Air Compressor shall also be responsibility of the vendor.	Vendor to offer	
13.3	Successful proving of BHEL components by the supplier shall be considered as part of commissioning. All tests, as mentioned at clause no. 17 (Machine Acceptance) shall form part of the commissioning activity.	Vendor to offer	
13.4	Tools, Tackles, Test Mandrels, instruments and other necessary equipment including Laser equipment required to carry out all erection & commissioning activities to be arranged and brought by the supplier. Out of the complete supply, all tools, tackles, mandrels etc. which may be required by BHEL to maintain the machine, after commissioning, shall not be taken back by vendor. Other equipment including Laser equipment shall be arranged by vendor on returnable basis. Vendor to offer accordingly.	Vendor to offer	

SL.NO.	DESCRIPTION FOR REQUIREMENT	SPECIFIED/ TO BE CONFIRMED BY VENDOR	REMARKS
13.5	Commissioning spares, required for commissioning of the machine within stipulated time, shall be brought by the supplier on returnable basis.	Vendor to offer	
13.6	All Cover Plates, sheets/plates for chutes for chips flow through bed ways etc. required for the machine and its peripherals including pits, if any, shall be supplied and installed by the vendor.	Vendor to offer	
13.7	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. The vendor shall ensure performing touching after commissioning but before final acceptance.	Vendor to offer	
13.8	Schedule of Erection and Commissioning shall be submitted with the offer.	Vendor to submit	
13.9	Charges, duration, terms & conditions for E&C should be furnished in detail separately by vendor along with offer.	Vendor to submit	
14.0	<b>ACCURACY TESTS :</b>		
14.1	<b>GEOMETRICAL ACCURACIES :</b>		
14.1.1	Geometrical Accuracy Tests shall be in accordance with relevant ISO (Latest Revision) or equivalent applicable Standard/Suppliers Test chart whichever is finer. 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 & submit	
14.1.2	Head Stock Spindle run out: (Radial & Axial) = 0.015 mm	Vendor to confirm	
14.1.3	Tail stock Quill run-out = 0.015 mm	Vendor to confirm	
14.1.4	Cylindricity of turning = 0.015 mm	Vendor to confirm	
14.1.5	True roundness of turning = 0.015 mm	Vendor to confirm	
14.1.6	Facial run-outs = 0.015 mm	Vendor to confirm	
14.1.7	Axial Float of Headstock = 0.010 mm	Vendor to confirm	
14.1.8	Surface finish of Turning & Facing 0.8 microns or better	Vendor to confirm	
14.1.9	All the above accuracies should be demonstrated to BHEL engineers during pre-acceptance at Suppliers works and during Erection & Commissioning at BHEL Works under specified ambient and operating conditions.	Vendor to confirm	
14.1.10	It should be possible to achieve offered accuracies on the components in all types of setups i.e. job held in chuck & supported on steady at other end, job held in chuck & tailstock center at other end and job held in chuck only.	Vendor to confirm	
15.0	<b>OPERATING CONDITIONS &amp; THERMAL STABILITY :</b> Total machine and all supplied items should work trouble free and efficiently under following operating conditions and should give specified accuracies.	Vendor to offer & confirm	
15.1	<b>Power Supply (AC):</b> Voltage = 415V +10% / -10% , Frequency= 50Hz +3 / -3 , No. of phases = 3 phase with neutral. <b>Ambient Operating Conditions:</b> Temperature = 0 to 50 degree Celsius , Relative Humidity = 95% max.	Vendor to accept & confirm	
15.2	Weather conditions are tropical. Atmosphere may be dust laden during some part of the year. Machine shall be kept in the normal shop floor condition without any temperature controlled enclosure/shop. Max. temperature variation is 25 deg Celsius in 24 hours. Vendor to confirm that machine is suitable for above and details of provisions on the machine for the same are to be furnished by Vendor.	Vendor to accept & confirm	
15.3	Thermal Stability of the complete machine keeping in view of specified Ambient Conditions and accuracy requirements of BHEL components and trouble free operation of the machine should be ensured by vendor.	Vendor to accept & confirm	

SL.NO.	DESCRIPTION FOR REQUIREMENT	SPECIFIED/ TO BE CONFIRMED BY VENDOR	REMARKS
15.4	The machine, including attachments and accessories, should be suitable for continuous operation to its full capacity for 24 hour a day and 7 days a week throughout the year. Vendor to ensure and confirm the same.	Vendor to accept & confirm	
15.5	Provision should be there in Headstock Assembly to compensate for thermal expansion in it during continuous running of the machine for specified applications and to have its axial float within specified limits as per SI.No.14.1.7.	Vendor to accept & confirm	
16.0	<b>PROVEOUT OF BHEL COMPONENTS</b>		
16.1	Vendor shall be fully responsible for machining of proveout components as per drawing and other requirements specified by BHEL to the full satisfaction of BHEL. Any additional item required for completion of prove out components shall be supplied by the vendor in the specified quantity without any implications to BHEL. Clarifications, if any required by vendor, regarding accuracy requirements of the proveout components, whether specified or not, should be discussed and cleared by vendor during initial technical discussions. Likely jobs which are generally machined on this type of machine are as follows:- Generator Rotor, Turbine Rotor, HP Rotor, IP Rotor, Hydro Turbine shaft, Hydro Generator Shaft, Exciter Shaft, Armature Shaft etc. However, any two of the above which are available at that time may be used for proveout machining	Vendor to offer	
17.0	<b>MACHINE ACCEPTANCE: (Tests/Activities to be Performed by Vendor)</b>		
17.1	<b>Tests/Activities to be carried out at supplier's works on the machine before dispatch :</b> All these activities shall be part of pre-dispatch inspection of the machine which shall be carried out by BHEL's team during their stay at vendor's works for the training ( Ref. SL.No. 11.1 ). Report of the same shall be submitted to BHEL.	Vendor to accept & offer	
17.1.1	Geometrical accuracies as per SI.No.14.1	Vendor to accept	
17.1.2	The machine should be tested for continuous running of 48 hrs. If any break down occurs during this test, the test should be repeated for 48 hrs from that time.	Vendor to accept	
17.1.3	Demonstration of all features of the machine, control system & accessories	Vendor to accept	
17.1.4	Machining of test piece as per AFNOR/ISO. Vendor to supply test pieces and tools for their machining. Drawing of test pieces to be submitted.	Vendor to accept & submit	
17.2	<b>Tests/Activities to be carried out at BHEL works while commissioning the machine :</b>	Vendor to accept & offer	
17.2.1	Geometrical accuracies as per SI.No.14.1	Vendor to accept	
17.2.2	Full load test to demonstrate the maximum power & cutting capacity of the machine.	Vendor to accept	
17.2.3	The machine should be tested for continuous running of 48 hrs. If any break down occurs during this test, the test should be repeated for 48 hrs from that time.	Vendor to accept	
17.2.4	Demonstration of all features of the machine, control system, supplied attachments & accessories to the satisfaction of BHEL for efficient and effective use of the machine	Vendor to accept	
17.2.5	Machining of test piece as per applicable ISO/DIN Standards. Vendor to arrange test pieces and toolings for their machining.	Vendor to accept & submit	
17.2.6	Proveout machining	Vendor to accept	
17.2.7	Two weeks supervision, by vendor's expert, of independent operation of machine by BHEL after job proveout	Vendor to accept	
17.2.8	Training of BHEL's machine operators in operation of complete machine & accessories etc. by the supplier's experts during their stay at BHEL works for commissioning of the machine. This training is in addition to training requirements at SI.No.11.0	Vendor to accept	
18.0	<b>PACKING :</b> 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 offer	
19.0	<b>GUARANTEE :</b> Guarantee for complete machine and all supplied accessories/equipments for 24 months from the date of acceptance of the machine.	Vendor to offer	
20.0	<b>GENERAL :</b>		
20.1	Machine Model No.	Vendor to inform	

SL.NO.	DESCRIPTION FOR REQUIREMENT	SPECIFIED/ TO BE CONFIRMED BY VENDOR	REMARKS
20.2	Total connected load (KVA)	Vendor to inform	
20.3	Space required (Length, Width, Height) for complete machine & accessories	Vendor to inform	
20.4	<b>Painting of Machine / Electrical Panels</b> : RAL 6011 Apple Green ( Polyurethane Paint )	Vendor to offer	
20.5	Total weight of the machine	Vendor to inform	
20.6	Weight of heaviest part of machine	Vendor to inform	
20.7	Weight of the heaviest assembly of the Machine	Vendor to inform	
20.8	Dimensions of largest part of the machine	Vendor to inform	
20.9	Vendor to submit, along with offer, reference list of customers where similar machines have been supplied mentioning broad specifications of the supplied machine i.e. Model, Swing Over Carriage, Center Distance, Load Carrying Capacity, Main Drive Rating, Application etc	Vendor to submit	
20.10	Hydraulic & Pneumatic piping should be preferably metallic except places where flexible piping are essential. All the pipes required for the same shall be included in the standard scope of the machine.	Vendor to confirm	
21.0	<b>QUALIFYING CONDITIONS :</b>		
21.1	Only those vendors (OEMs), who have supplied and commissioned at least one Lathe of same (Swing Over Carriage , Load Carrying Capacity , ABC) or higher sizes for similar applications in the past ten years (on the date of opening of Tender) and such machine is presently working satisfactorily for more than one year after commissioning (on the date of opening of Tender), should quote. However, if such machine(s) has/had been supplied to BHEL, then such machine should be presently working satisfactorily for more than six months after its commissioning and acceptance (on the date of opening of Tender) in BHEL. The following information should be submitted by the vendor about the companies where referred machines have been supplied. This is required from all the vendors for qualification of their offer.	Vendor to accept & confirm	
21.2	Name of the customer / company where similar machine is installed.	Vendor to inform	
21.3	Complete postal address of the customer.	Vendor to inform	
21.4	Month & Year of commissioning.	Vendor to inform	
21.5	Parameters of machine(s) supplied (Swing Over Carriage, Center Distance, Load Carrying Capacity) and application for which the machine is supplied.	Vendor to inform	
21.6	Name,designation, phone no., Fax no.& email address of the contact person of the customer.	Vendor to inform	
21.7	Performance certificate from the customers regarding satisfactory performance of machine supplied to them (Original Certificate or Through E-mail directly from the customer). The original performance certificate may be returned after verification by BHEL, if required.	Vendor to submit	
21.80	BHEL reserves the right to verify information submitted by vendor including visit to the vendor's works and witnessing the manufacturing & operational procedures. In case the information is found to be false/incorrect, the offer shall be rejected.	Vendor to accept & confirm	
DY.Mgr(M/c shop)      AGM(M/c shop)      SrDGM(Maint.M/c shop)      AGM(M&S)      AGM (P&D,MSX)			