



429-002/A

**BHARAT HEAVY ELECTRICALS LIMITED**

( A Government of India Undertaking )  
HIGH PRESSURE BOILER PLANT  
PURCHASE DEPARTMENT - FOSSIL BOILERS  
THIRUCHIRAPALLI - 620014  
TAMILNADU (INDIA)

PHONE :2577938  
GRAMS : BHARATELEC  
FAX NO: 2520719  
E-mail: tvenkat@bheltry.co.in  
Web:

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	<b>Enquiry No</b> 2681600016 - 79	<b>Enquiry Date</b> 12.07.2016	<b>Due Date for Quotation</b> 08.08.2016
<p>Please quote Enquiry No, Date and due date in all correspondences. This is only a request for quotation and not an order. <b><i>Bid should be submitted in two parts. 1.Techno-commercial bid (Part-I) and 2.Price bid(Part-II) in a separate sealed cover and both covers must be placed in a third cover and sealed. Our Enquiry No., Enq. date &amp; Enq. Due date must be written on all three covers.</i></b></p>			

Item	Description	Unit	Quantity	Delivery Quantity	Schedule Date
10	VA 50 CNC MACHINE Retrofitting and reconditioning works in VA 50 CNC machine, Bay 6,Bldg 5 as per the Qualifying Criteria in ANNEXURE I and Scope of supply and work as per ANNEXURE II.	SET	1.000	1.00	27.12.16

**General Note:**

1. Please submit your detailed offer in two part bid system i.e Part-I. Technical bid + Checklist (Annexure-A) + Unpriced bid indicating taxes & duties (Annexure-B) in a sealed cover, super scribing on the cover as "TECHNICAL & COMMERCIAL BID / PART-I"

Part-II. Priced offer in another separate sealed cover super scribing on the cover as "PRICE BID / PART-II"

Both the covers shall be duly super-scribed with tender reference and due date of opening. These covers shall be put in a single cover duly super-scribed with tender reference and due date of opening and addressed to us.

2. Point-to-point confirmation to BHEL's specification and commercial terms & conditions shall be provided. The supplier must fill and send all the Annexures as indicated in the list of attachments. Annexure-A & Annexure-B (with taxes and duties, without indicating prices) should be filled and submitted along with the technical bid, else your offer is liable for rejection.

3. Offers with validity of less than 120 days and non-acceptance of LD & RP clause and reverse auction will lead to rejection of submitted offer.

4. If the due date of tender opening happens to be a holiday, the tenders will be opened on the next working day.

5. All clarifications may be sought at least ten days prior to tender due date, from the undersigned with due written request.

The offers should reach us 30 minutes before the time of opening of tenders. The offers will be opened at 14.30 hrs on the due date of tender in the presence of tenderers who have submitted their offer and who may like to be present for the tender opening. Late and delayed offers are liable to be rejected.

Yours faithfully,  
For BHARAT HEAVY ELECTRICALS LIMITED

**R.I. PETER IRUDAYARAJ**  
Senior Manager  
Materials Management /  
BHEL, TIRUCHY - 620 014.

MANAGER / PURCHASE  
(FOSSIL BOILERS)  
Yours faithfully,



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6. BHEL reserves the right to go for a reverse auction (RA) instead of opening the submitted sealed price bid, which will be decided after technical and commercial evaluation. Information and general terms and conditions covering RA are given in commercial terms and conditions (Annexure-A/Point No.18)

7. Order shall be placed on single vendor on cumulative L1 basis for total package.

8. BHEL will consider MSE vendor as per Government guidelines.

9. Vendors are requested to avoid the following points while submitting the Bid Documents:

- Loose or spiral bound bid documents are not encouraged.
- In case of any corrections/overwriting in the tender documents, the same shall be duly attested by the bid submitter.

10. Corrigendum if any, with respect to this tender will be hosted only in the website <http://www.bhel.com> or <http://tenders.gov.in>. You are requested to visit the website regularly for updates.

11. List of Attachments:

- Qualifying Criteria: Annexure-I
- Specification & Scope of Works: Annexure-II
- Commercial Terms & Conditions: Annexure-A
- Price Bid Format: Annexure-B
- CA certificate for MSE vendors: Annexure-C.

All the tenders may be addressed to the following address:

**The Tender Opening Cell / MM  
Room No: 26, Building 24, Ground Floor  
Bharat Heavy Electricals Limited  
TIRUCHIRAPALLI 620014**

In case personal delivery of the offer, it shall be dropped into the respective box kept in Room No: 26, after duly entering the data in the system.

Offers will be accepted only up to 14.00 Hrs on the due date. Therefore, vendors shall ensure to submit the offers well before this time. All due date extension requirements should be addressed to the respective Purchase mail IDs. All the due date extension requests from vendors will be considered only up to 48 hours before the due date and time.

Vendors are requested to avoid submission of offers through e mail / fax. In case of any unavoidable situation, offers shall be sent through e mail to the following mail ID only [tender\\_cell@bheltry.co.in](mailto:tender_cell@bheltry.co.in).

As tenders are being opened by Common Tender Opening Cell, offer covers should be sealed with

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tenderer's distinctive seal and super scribed with correct Tender No. item of supply and due date of opening.

The offers will be opened at 14.30 hrs on the due date of the tender in the presence of tenderers who have submitted their offer and who may like to be present for the tender opening. Late and delayed offers are liable to be rejected.

The bidder along with its associate/ collaborators/ sub-contractors/ sub-vendors/ consultants/ service providers shall strictly adhere to BHEL fraud prevention policy displayed on BHEL website <http://www.bhel.com> and shall immediately bring to the notice of BHEL management about any fraud or suspected fraud as soon as it comes to their notice.

The supplier shall submit EI/EII forms to BHEL time to time as indicated by the BHEL and in case of inordinate delay in issuing EI/EII forms, then BHEL reserves the right to deduct 5% of the value of the supplied items against which EI/EII forms pending to be issued

**Enclosures:**

"LD clause has to be confirmed without fail."

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Yours faithfully,  
For BHARAT HEAVY ELECTRICALS LIMITED

MANAGER / PURCHASE  
(FOSSIL BOILERS)  
Yours faithfully,

**R.I. PETER IRUDAYARAJ**  
Senior Manager  
Materials Management /  
BHEL, TIRUCHY - 620 014.

**RETROFITTING & RECONDITIONING OF HMC800 M/C.****ANNEXURE I****PRE QUALIFICATION CRITERIA**

S.No	Description	Vendor Comments
	Vendors who satisfy the following pre qualification criterion are only eligible to participate.	
1	<p>The vendor shall have experience of having successfully carried out CNC retrofitting &amp; reconditioning work in India.</p> <p>Experience of having successfully completed similar works during last 7 years (ending last day of month previous to the one in which applications are invited) should be either of the following: -</p> <p>a. Three similar completed works, each costing not less than the amount INR 16.56 lakhs.</p> <p>or</p> <p>b. Two similar completed works, each costing not less than the amount INR 20.70 lakhs.</p> <p>or</p> <p>c. One similar completed work costing not less than the amount INR 32.12 lakhs.</p> <p>“Similar work” here means CNC retrofitting / reconditioning of machine tools.</p> <p>Documentary evidences like PO copy, Final MOM or Completion Report to be submitted in support of the above.</p>	
2	<p>The vendor should submit at least one <b>Performance Certificate</b> issued by customer regarding satisfactory performance of the retrofitted CNC machine within the last 7 years. (Hardcopy of the certificate or through Email directly from the customer).</p> <p>Copies of purchase orders/work orders should also be submitted for verification.</p>	

**Up gradation of the existing CNC System, axis & spindle motors and drives in VA 50 CNC machine.(4285-2926)(Bay 6 - bldg 5)**

**ANNEXURE-II**

**SPECIFICATION & SCOPE OF WORK**

S.No	Description	
<b>Section A: Details of existing machine</b>		
1	<b>CNC SYSTEM: SIEMENS Make SINUMERIK 840C with 3-axis, one spindle, ATC &amp; APC ( automatic tool changer &amp; automatic pallet changer)</b>	
1.1	X axis: MOTOR ; INDRAMAT MAKE ; 3 $\phi$ ~ permaenent magnet motor ; MAC 112C-0-KD-2-C-130-B-0 Drive: Drive servo module INTRAMAT Type:TDM1.2-50-300-w1-000	
1.2	Y axis: MOTOR ; INDRAMAT MAKE ; 3 $\phi$ ~ permaenent magnet motor ; MAC 112C-0-KD-4-C-130-B0 Natrual Condition : mdn - 28.0 Nm ; ldn - 31.0 A ; Surface cooled : mdn - 44.0 Nm ; ldn - 49.0 A ; Tacho - 3.0v / 1000 min-1 ; N=1500 min/1 Drive: Drive servo module INTRAMAT Type:TDM1.2-50-300-w1-000	
1.3	Zaxis: MOTOR INDRAMAT MAKE ; 3 $\phi$ ~ permaenent magnet motor(Brake motor) ; MAC 112C-0-KD-2-C-130-B-2 ; Brake : 40Nm DC 24v +-10% Natrual Condition : mdn - 28.0 Nm ; ldn - 31.0 A ; Surface cooled : mdn - 44.0 Nm ; ldn - 49.0 A ; Tacho - 3.0v / 1000 min-1 ; N=1500 min/1 Drive: Drive servo module INTRAMAT Type:TDM1.2-50-300-w1-000	
1.4	<b>Spindle drive and:</b> <b>AC spindle motor</b> 3 $\phi$ ~ spindle motor ; 2AD-132B-B050-B2-BS01-D2N1(10 KW) ; Base speed =1500 rpm - max speed = 7500 rpm <b>spindle drive:</b> TYPE: KDA 3.2-100-3-A00-W1 CHOKE (L) GLD 13	
1.5	Machine inbuilt with automatic Pallet change and automatic tool change.	
1.6	Hydraulic motor details: 3 $\phi$ ~ induction motor ; Make : NGEF ; 2.0 HP ; 1.5KW ; 3.4 A ; 1400 rpm ; Mount 90LZ ; B class insulation : S1 rating	
1.7	Spindle head lubrication 3 $\phi$ ~ motor : 0.18 KW ; 1440 rpm	
1.8	Lubrication power pack 3 $\phi$ ~ motor : 0.18 KW ; 1440 rpm	
1.9	Chip conveyer 3 $\phi$ ~ motor : 0.75 KW ; 1400 rpm	
1.10	Coolant 3 $\phi$ ~ motor : Make : Bharat Bijilee Limited ; Frame : 100L 415v $\Delta$ 50Hz 2.2KW/3HP ; I=5A ; 1430 rpm ; Duty : S1	
1.11	a)Isolation Transformer: b)Stabilizer Details: NEEL Servo Controlled Voltage Stabilizer: Input: Min. to Max-310V-480V ; Output: 415V ; Accuracy +/- 1% Rating: 45 KW ; Current: 63A ; Type : 763 OC	

2.11	Supply of required input transformers to the feed /spindle drives and 24V,20A SMPS power supply.	
2.12	The CNC system offered shall have the following features for a machining center. The memory capacity required for programming minimum of 2GB and the number of programs stored around 400 Cycles: Stock removal cycle (Facing, Finishing, Pattern repeating) Grooving cycle Threading cycle Drilling cycles:(Drill center, Drill sinking, Deep Hole, Boring, Back Boring, Fine Boring, Tapping, Left hand Tapping) Drill Pattern: Single Hole, Row Hole, Circle of Hole Milling Cycles: Rectangle Pocket, Circular pocket Milling Pattern: Slot, Elongation Hole, Circle Slot Parameter Programming ( macro - A, B & Macro Call)	
2.13	The existing inputs/outputs are around 144/ 96 .	
2.14	supply of required CNC KEY BOARD and machine control panel.	
2.15	Supply of suitable handheld unit along with 5 metres cable and adapter as required.	
2.16	Supply , mounting and wiring of suitable capacity MCB switch for incomer D.C, regulated power supply, 3ph digital energy meter and suitable ratings of MPCB (Motor Protection Circuit Breakers),relays,fuses, and other control elements for all the auxiliary motors / equipments in the new panel.	
2.17	The equipments should be suitable for 415V, 3ph, 50Hz, a.c. supply.	
2.18	Supply of voltage stabilizer & isolation transformer of rating 63 kVA or higher. Isolation Transformer Isolation Transformer & Stabilizer shall be of following make: i)M/s. NEEL ii)M/s. AEI iii)M/s. POWER AID or any other make acceptable to BHEL.	
2.19	Supply of limit switches/microswitches for the axes,proximity sensors for the replacement of existing sensors in the machine and pressure switches,solenoid valves,flow control valves for the hydraulic sets and ATC and APC.	
2.20	Supply of new operating pendant for mounting the new CNC system and keyboard.	
2.21	a) Three sets of O&M manual for the CNC system, servo motors, spindle motors, drives ,spare parts list and manuals of bought-out components should be supplied along with the hardware. b)Three sets of power circuit ,control circuit and logic circuit of updated wiring drawing for entire machine should be supplied after retrofitting. c)Three sets of system NC MD,PLC MD, Setting Data and PLC program should be supplied in the CD and Hard copy in Ladder logic and STL logic of original copy.	
2.22	M/C spindle area LED spot light & Panel area sufficient LED lighting to be provided.	
2.23	Supply of tools for maintenance of the machine. 1. Digital multi meter (AC/DC 0-600V) - 1 no 2. Clamp meter (AC/DC 0-600A) - 1 no 3. Hand driven analog insulation tester (Insulation Resistance: 0–2000 M ohm, Nominal Test Voltages d.c.: 250 V 500 V 1000 V) - 1 no 4. Electrician tool set 14 piece - 1 set	
2.24	Any material not specified in scope of supply but required for successful commissioning in the scope of the contractor.	
3 (A)	<b>SCOPE OF SUPPLY - MECHANICAL ITEMS</b>	

	<b>Erection commissioning and Prove out of CNC System, axis &amp; spindle motors and drives in VA 50 CNC machine</b>	
4.1	Removing of existing AC spindle motor, three numbers of AC servo motors and its drives along with coupling and pulley and note down all the parameters, inter connections of power, control and signal cables.	
4.2	Fixing of the new AC spindle motor and three numbers of AC servo motors with new mounting brackets.	
4.3	Installation and Commissioning of the New CNC system, drives, motors, lubrication pumps, systems etc.	
4.4	Erection of the new operating pendent and mounting the CNC system on it.	
4.5	Fixing of external encoders for all axes with cables & end connectors and interfacing it to the new CNC system..	
4.6	Mounting of X,Y, Z axis and spindle drives in the control panel.	
4.7	Inter connecting the CNC signals with the machine electrical elements I/O, Feedback, command and other signals.	
4.8	Erection and commissioning of the new control Panel with switch gears and Interfacing the machine control elements like limit switches, pressure switches, level switches ,pushbuttons etc., with the new controls in this new control panel with required wiring materials.	
4.9	Interfacing with the new system, ac spindle drive and X, Y, Z axis drives with spindle and servo motors along with power cables, command signal cables, velocity feedback cables etc.	
4.10	Replacement of all limit switches and sensors in the machine.	
4.12	The ATC and APC has to be serviced & bring into operation. Any components required for ATC and APC operation has to be supplied.	
4.13	Developing and prove out of PLC software to incorporate all the existing machine functions. The complete system will be integrated and should be proved out by the supplier for performance with a standard test piece and also regular production components	
4.14	Prove out of the positioning accuracy and repeatability of the axis using laser interferometer. (The positioning accuracy and repeatability to be taken once before undertaking the retrofit work also. The accuracy after the retrofit to be the same or better than the accuracy before the retrofit.)	
4.15	Commissioning of isolation transformer and voltage stabilizer.	
5	<b>DOCUMENTATION:</b> Three sets of the following documents will be supplied along with the retrofitting packages.	
	1) Original CNC system manual, drives manual ,motors catalogues and also For the other bought out items.	
	2) Original programming manual for the CNC system	
	3) Original CNC Interfacing/ Installation/ Diagnostics Manuals.	
	4) Drives commissioning/ Trouble Shooting manuals for spindle and feeds.	
	5) Complete Electrical and Electronics wiring diagram as per retrofitting / modification.	
	6) Hardcopy of PLC programs / machine Data / Alarm Text messages.	
6	<b>BACK UP:</b> The back up of PLC program and parameters to be given in CD as well as in flash card compatible with the CNC system.	
7	<b>TRAINING:</b>	

**BHARAT HEAVY ELECTRICALS LIMITED TIRUCHIRAPALLI**  
**CAPITAL PURCHASE**

**Annexure-A**

**ACCEPTANCE OF COMMERCIAL TERMS AND CONDITIONS BY THE VENDORS.**

(This should be essentially filled in and sent along with the techno-commercial offer without fail. If this check list is not filled and submitted along with techno-commercial offer (Part I) or if the vendor does not confirm acceptance to the terms and conditions proposed, BHEL reserves the right to reject such offer)

**CHECK-LIST FOR VENDORS**

Sl. No.	DESCRIPTION
1.	<p>The Bidders shall submit their offer in <b>TWO INNER ENVELOPES</b> as indicated below which shall be sealed in one outer envelope.</p> <ul style="list-style-type: none"> <li>❖ <b>Envelope I:</b> This sealed envelope should contain all the copies of technical bid together with un-priced commercial bid. This envelope should be clearly marked "<b>Part I - Technical and commercial bid</b>", indicating Enquiry No., Due Date and Address &amp; Reference of the Bidder.</li> <li>❖ <b>Envelope II:</b> This sealed envelope should contain <b>Price Details</b>. This envelope should be clearly marked "<b>Part II - Price Bid</b>", indicating Enquiry No., Due Date and Address &amp; Reference of the Bidder. This part should contain the schedule of price particulars and must be co-related to the technical details provided in Part I.</li> </ul> <p>All the two envelopes (Part I&amp;II) shall be put in one cover, duly sealed, super scribing as "<b>Part I and Part II of Enquiry No., Due date of opening</b>" and the address and reference of the Bidder. The offer received without the above guidelines, will not be considered for opening.</p> <p>Offers will be accepted &amp; received till 14.00 Hr. on the due date. Therefore Vendors shall ensure to submit the offers before this time. Late offers will not be considered.</p> <p>The Tenders should be addressed to the following address to  <b>The Tender Opening Cell/MM</b>  <b>Room No-26 , Building – 24 , Ground Floor</b>  <b>Bharat Heavy Electrical Limited</b>  <b>Tiruchirapalli - 620014.</b></p> <p>In case personal delivery of the offer, it shall be dropped into the respective box after duly entering the data in the system kept in Room No 26.</p> <p>Vendors are requested to avoid submission of offers thro email / fax. In case of any unavoidable situation, offers shall be sent thro email to the following mail ID only "<b>tender_cell@bheltry.co.in</b> "</p> <p>As such Tenders are being opened by Common Tender opening Cell , offer covers should be sealed with tender's distinctive seal and super scribed with correct Tender NO, item of supply and due date of Opening</p> <p>Tenders should be free from <b>CORRECTIONS AND ERASURES</b>. Corrections if any, must be attested. All amounts shall be indicated both in words as well as in figures. In case of any difference between amount quoted in words and figures, amount quoted in words shall prevail.</p> <p>Offers should be in <b>ENGLISH</b> and accompanied by detailed technical literature, catalogue and detailed dimensional drawings in <b>ENGLISH</b> or otherwise, the offers will not be considered.</p>
2.	<p><b><u>OPENING OF TENDERS</u></b></p> <p>The Part I- Technical &amp; commercial bid would be opened on the Tender opening date.  The Part II - Price bid of Technically suitable Bidders alone would be opened. The Technically suitable Bidders would be informed about the tender opening date.  Clarifications if any required by BHEL for Technical evaluation would be sought from bidders before opening of Part II - price bid.</p>
3.	<p><b><u>Taxes and Duties</u></b></p> <p>All Taxes and Duties payable as extra to the quoted price should be specifically stated in offers along with CST &amp; TIN No / Tariff No. etc., failing which the purchaser will not be liable for payment of such Taxes and Duties. Our TIN No. 33243560005, TNGST No. 3560005, CST. No. 239383 Dt. 11-06-1991 &amp; BHEL ECC No. AAACB4146PXM012, Service Tax Registration No (STC)- AAACB4146PST006. Assessment circle Tiruverambur.</p>
4.	<p><b><u>Special Provisions for Micro and Small Enterprises (MSE)</u></b></p> <ol style="list-style-type: none"> <li>1. 20% of the tendered quantity is earmarked for MSE suppliers in this tender.</li> <li>2. Out of the 20% tendered quantity reserved for MSE suppliers, 4% shall be earmarked for procurement from MSE owned by SC/ST entrepreneurs.</li> <li>3. In case MSE vendor participating in the tender quotes within the price band of L1+15%, they will be allowed to supply the portion of the requirement subject to acceptance of L1 price by MSE vendor. In case of more than one such MSE, the supply shall be shared proportionately.</li> <li>4. MSE suppliers can avail the intended benefits only if they submit along with offer, attested copies of either EM II (Entrepreneur Memorandum Part II) certificate having deemed validity (five years from the date of issue of acknowledgement in EM II) or valid NSIC certificate or EM II certificate along with attested copy of a CA certificate (Format enclosed as per <b>Annexure - C</b>) applicable for the relevant financial year (latest audited), certifying quantum of investment in plant and machinery within the permissible limit as per the act for relevant status (Micro or small) where the deemed validity of EM II is over. Date to be reckoned for determining the deemed validity will be the last date of technical bid submission. Offer/s received without these documents will lead to consideration of their offer at par with other bidders and MSE status of such suppliers shall be shifted to Non MSE supplier.</li> </ol>

No row shall be left blank. Please indicate NA, in case the item is "Not Applicable"	Vendor's confirmation
<p>5. <b>Validity:</b> Validity of the offer should be 120 days from the date of tender opening.</p>	
<p>6. <b>Release of Purchase Order:</b>                  &gt; Purchase Orders will be released on successful L1 vendor.                  &gt; Separate orders for supply &amp; service will be released on the successful L-1 vendor for each line item. (Service order released only in the case of, Installation / erection / commissioning portion are applicable on tender scope &amp; quoted separate charge for same by vendor).</p>	
<p>7. <b>Payment Terms for supply Portion:</b>                  a) 80% of payment will be released after receipt &amp; acceptance of material.                  b) Balance 20% of payment will be released within 45-90 days after receipt, acceptance &amp; commissioning of supply materials against submission of 10% PBG for a Warrantee period of 18 Months.</p>	
<p><b>Installation &amp; Commissioning Portion (if applicable only):</b>                  100% of the installation / commissioning charges (in case contract involves erection / installation / commissioning) shall be paid only on completion of such erection / commissioning at BHEL, Tiruchirapalli.</p>	
<p>Any deviation in the above payment term will attract loading as mentioned below.                  "Base rate of SBI (as applicable on the date of bid opening. Techno commercial bid opening in case of two part bids) + 6% shall be considered for loading for the period of relaxation sought by bidders.</p>	
<p>8. <b>Performance Bank Guarantee (PBG):</b>                  The bidder in the event of an order, should furnish a Bank Guarantee from an Indian Bank approved by BHEL, at no extra cost in a format prescribed by BHEL, along with the order, for an amount equivalent to 10% (Ten percent) of the value of the contract. The PBG shall be valid for a period of 18 months from the date of despatch or 12 months from the date of receipt / acceptance / commissioning of equipment at BHEL, Tiruchirapalli whichever is more, with a claim period of two months.                  The Performance Bank Guarantee shall be obtained from any one of the following banks which is a member bank in our consortium of Banks:  <b>List of Consortium Banks</b>                  DEUTSCHE BANK, HDFC BANK, ANZ GRINDLAYS BANK, CITI BANK, STANDARD CHARTERED BANK, BANK OF AMERICA, ABN AMRO BANK, IDBI LTD, ICICI BANK LTD, THE HONGKONG &amp; SHANGHAI BANKING CORPORATION LTD.  <b>List of Nationalised Banks</b>                  ALLAHABAD BANK, ANDHRA BANK, BANK OF INDIA, BANK OF BARODA, BANK OF MAHARASHTRA, BHARAT OVERSEAS BANK, CANARA BANK, CENTRAL BANK OF INDIA, CORORATION BANK, DENA BANK, INDIAN BANK, INDIAN OVERSEAS BANK, ORIENTAL BANK OF COMMERCE, PUNJAB NATIONAL BANK, PUNJAB &amp; SINDH BANK, STATE BANK OF INDIA, STATE BANK OF TRAVANCORE, STATE BANK OF MYSORE, STATE BANK OF BIKANER &amp; JAIPUR, STATE BANK OF HYDERABAD, STATE BANK OF PATIALA, STATE BANK OF MAHARASHTRA, STATE BANK OF SOURASTHRA (SBI-13.09.08), SYNDICATE BANK, UCO BANK, UNION BANK OF INDIA, UNITED BANK INDIA, VIJAYA BANK.                  If PBG is issued by foreign counter part of the BHEL consortium Indian Bank, in case of claim against the PBG, it will be lodge in any one of the Indian counters of the Foreign Bank which issued the PBG.</p>	
<p>9. <b>Liquidated Damages (LD):</b>                  The delivery of the goods specified in the purchase order should be made within the time prescribed. LD for delay in 'Supply' and/or 'E&amp;C' will be applicable to the delays attributed to vendor. LD will be considered separately for 'Delivery' and 'E&amp;C'. Where the seller supplies or dispatches the goods, beyond the delivery period Liquidated damages shall be applicable 0.5% of the total order value per week or part thereof subject to a maximum of 10% of the total order value. Detail of LD mode are shown below  <b>Single Delivery Date (Material Dispatched after Due date)</b> Once the delivery due date is crossed, bills have to be clubbed till final despatch and forwarded for processing of payment as a single bunch. LD percentage will be calculated from Delivery due date to final despatch date. (100% Order should be completed for processing the bill)  <b>Staggered Delivery</b> LD shall be 0.5% of the undelivered portion per week of the delay or part thereof subject to a maximum of 10% of the total order value. PO Pending value (each Bill Value) up to Max 10 % of Total PO value)                  Any deviation from the above LD clause, loading will be applied to the extent to which it is not agreed by the bidder (at offered value). For the purpose of Imposing LD, the FOB delivery (B/L date) shall be considered. Bidder should indicate the LD mode (single delivery or staggered delivery) on the confirmation column, otherwise single delivery date will be considered for further evaluation</p>	
<p>10. <b>Risk Purchase:</b>                  Alternatively the purchaser at his option will be entitled to terminate the contract and to purchase elsewhere at the risk and cost of the seller either the whole of the goods or any part which the supplier has failed to deliver or despatch within the time stipulated as aforesaid or if the same were not available from the best and the nearest available substitute. The supplier shall be liable for any loss which the Purchaser may sustain by reason of such risk purchases.</p>	
<p>11. <b>Delivery Terms and evaluation process:</b>                  Indian Bidders should submit their offer for FOR-BHEL, Tiruchirapalli basis. Packing &amp; Forwarding and Freight &amp; Insurance charges from works to BHEL, Tiruchirapalli to be indicated separately if extra from basic rate. Applicable % of ED &amp; Sales Tax, Commissioning Charges should be clearly indicated.                  Evaluation of offers shall be on the basis of delivered cost (Net cash outflow to BHEL-Trichy).</p>	

12.	<b>Guarantee:</b> Vendors shall provide a guarantee for a period of 12 months from the date of commissioning of the equipment or 18 months from date of supply, whichever is earlier. The date of B/L or AWB shall be taken as the date of supply. <u>Offers from vendors not accepting the requested guarantee period will be rejected.</u>	
13.	<b>Short shipment / Warranty replacement:</b> In case of any short shipment in the main equipment / spares, customs duty levied on such supplies, shall be borne by the supplier. Any warranty replacement during the warrantee period shall be on FOR-BHEL, Tiruchirappalli basis.	
14.	<b>Inspection &amp; Testing:</b> All goods shall be subject to inspection by BHEL or its authorized representatives at supplier's works or at BHEL stores or at any other place in India indicated by BHEL as the case may be. The supplier will not charge for the facilities provided for inspection of goods. In case of machine tools, the machine would be inspected and proved at supplier's works prior to dispatch however, final inspection and acceptance of the machine will be carried after installation of the machine at BHEL, Tiruchirappalli.	
15.	<b>Test certificates / Operating and Maintenance manuals :</b> The Bidders shall clearly mention in their offer, that Test Certificates and Operating Maintenance Manuals, etc., as called for in the Technical Specification, in the required number of copies will be provided at no extra cost	
16.	Payment through Bank is not preferred. In case of Payment through Bank is opted by Supplier, BHEL prefers documents submission through bank with copy of LR and door delivery of Goods to Site/Stores with Consignee copy attached. In this case Loading will be 3% on the offered value. <b>Offers of indigenous Suppliers with payment terms as LC/Advance Payment are liable for rejection.</b>	
17.	<b>BHEL will consider the ranking after the loading is applied as referred above wherever deviations are observed.</b>	
18.	<b>Reverse Auction (RA):</b> BHEL reserve the right to conduct on-line internet Reverse Auction i.e. ONLINE BIDDING (THROUGH A SERVICE PROVIDER) for finalising the tender. This decision will be communicated to the techno-commercially qualified vendors after evaluation. Details / General terms / guidelines for conduct of RA are shown below: Vendors are requested to confirm their acceptance for BHEL proceeding with RA route for finalisation of the enquiry. <ol style="list-style-type: none"> <li>1. Technically and Commercially acceptable Bidders shall only be eligible to participate in the Reverse Auction.</li> <li>2. BHEL shall engage the services of a Service Provider, who shall extend all necessary training and assistance before commencement of ON-LINE-BIDDING through Internet, at NO extra-cost to the Bidders.</li> <li>3. Eligible Bidders shall be informed in writing, about the details of Service Provider, to enable Vendors to contact the Service Provider and get trained.</li> <li>4. Event Date, Time, Start Price, Bid Decrement, Time-Extensions, etc. shall also be communicated through the Service Provider for compliance by Bidders.</li> <li>5. Vendors have to FAX the Compliance Form (Annexure-IV), before start of RA. Without furnishing the above Compliance Form, Bidders shall not be eligible to participate in the RA.</li> <li>6. BHEL shall provide the calculation sheet through the Service Provider, which shall be helpful to arrive at "TOTAL COST to BHEL", like Packing and Forwarding Charges, Taxes and Duties, Freight Charges, Insurance, Service Tax and other loading factors (for non-compliance to BHEL Standard Commercial Terms and Conditions), for each of the Bidder, to enable them to fill in the price and keep it ready for inputting data during the RA.</li> <li>7. RA shall be conducted on a pre-determined Date and Time.</li> <li>8. At the end of RA, the lowest Bid Value will be known on the Network.</li> <li>9. Lowest Bidder has to FAX the Prescribed Format, duly filled in and signed in, as provided, on a case-to-case basis, to the Service Provider, within 24 Hours of RA without fail.</li> <li>10. Any variation between the ON-LINE Bid Value and the signed document will be considered as unethical the Tender process and will invite disqualification of Bidder, for further business dealings with BHEL as per the prevailing procedure.</li> <li>11. In case BHEL decides not to go for Reverse Auction procedure for this tender, the Price Bids &amp; Price Impacts, if any, already submitted &amp; available with BHEL shall be opened as per BHEL's standard practice.</li> <li>12. BHEL reserves the right to negotiate if need be, with the L-1 vendor of the RA.</li> <li>13. <b>BHEL reserves the right not to consider offers from vendors not complying with the RA process for finalisation of the enquiry.</b></li> <li>14. If the Bidder or any of his representatives are found to be involved in Price manipulation / cartel formation of any kind, directly or indirectly by communicating with other bidders, action as per extant BHEL guidelines shall be initiated by BHEL and results of the RA scrapped / aborted.</li> <li>15. In case BHEL decided to go for Reverse auction, the H-1 bidder(s) (whose quote is highest in the online sealed bid) may not be allowed to participate in further Reverse Auction.</li> </ol>	
19.	<b>ARBITRATION:</b> All disputes or differences whatsoever which may arise at any time during execution of the Contract shall be mutually settled by BHEL and Contractor as per provision of the Contract. However, in the event such disputes cannot be settled mutually, such disputes shall be settled as per the Arbitration and reconciliation Act, 1996 of the Govt. of India and it's subsequent amendments. In case of disputes with the Central PSUs, the same shall be settled at Tiruchirappalli as per the Guidelines of the Govt. of India. However, during the period such disputes are settled either by mutual discussions between the parties or by legal means, Contractor shall continue to do the work as per terms & conditions of Contract.	

<b>20.</b>	<ul style="list-style-type: none"> <li>➤ Point to point confirmation for the Technical Specification enclosed to be provided. If there are any deviations, the same should be clearly specified. Offers received without confirmation to our specifications will be liable for rejection. If needed additional sheets shall be used.</li> <li>➤ Equipment offered shall be "New". Re-built / Re-conditioned / Used equipment's will not be accepted. Incomplete offers will not be considered for further processing Fixed price:</li> <li>➤ BHEL reserves its right to reject a tender due to unsatisfactory past performance in the execution of a contract at any of BHEL projects / units.</li> <li>➤ BHEL shall be at liberty to reject or accept any tender, part or in full, at their own discretion and any such action is not liable for any question or claim against BHEL.</li> <li>➤ The vendor shall provide necessary drawings, Test Certificates and Operating Maintenance Manuals etc., as called for in the Technical Specification, in the required number of copies at no extra cost</li> <li>➤ The Supplier shall arrange for securely protecting and packing the stores to avoid loss or damages during transit.</li> </ul>	
<b>21.</b>	<b>Company Details &amp; Contact</b>	
	Full Address of the company for future correspondence / placing order. (Copy of address proof & PAN card shall be attached along with Part-I)	
	Company Email ID:	Phone No.:
	Fax No	Pan No with copy
	CST /TIN No	
	Name of the contact person:	Mobile No.:
	e-mail ID	
<b>22.</b>	<b>TO BE CONFIRMED BY VENDOR</b>	
	Country of origin:	
	Station of dispatch / Port Of Shipment	
	Delivery Terms (FOR Destination / Ex-works)	
	Packing & Forwarding Charges in % or Lump sum, if extra from basic rate	
	% of Excise Duty with cess	
	% of TAX (CST / VAT) (TNGST with FORM-17 or CST with C-FORM)	
	(If applicable only) Installation & Commissioning charge is inclusive (or) exclusive on basic rate.	
	Service Tax extra or Not	
	Freight & Transit insurance charges (if any, in Lump sum (or) percentage) from Dispatching station to BHEL Tiruchirappalli.	
<b>23.</b>	<b>DELIVERY SCHEDULE:</b>	
	<b>Supply Portion:</b> Delivery schedule from the date of Letter of Intent / Purchase Order. <b>(This should be inclusive of Order acceptance, drawing approval and time period required for receiving goods at BHEL Trichy etc.)</b>	
	Time period required for Installation / Erection & Commissioning from date of site clearance given by BHEL, Trichy.	
<b>24.</b>	<b>Weight &amp; Cubage of package:</b>	
	Approximate Net weight of the total consignment:	
	Approximate Gross weight of the total consignment:	
	Approximate volume of the total consignment:	
<b>For any queries / clarifications the bidders may contact us through our FAX NO. +91 431 2520719 or through e-mail &lt;peterrri@bheltry.co.in&gt;</b>		

**NOTE:-**

- a) Your specific acceptances to our Payment terms, LD, Risk Purchase Clause are essential for consideration of your offer. Otherwise your offer is liable for rejection.
- b) No row shall be left blank. Please indicate NA, in case the item is "Not Applicable"

**Declaration:-**

We have gone through and understood the 'General guidelines & instructions to bidders for submitting offer' enclosed as a part of the Tender and confirm that our offer has been made in line with the same.

Signature with date:

(AFFIX OFFICIAL SEAL HERE)

Name:  
Designation:  
Department:

**(Please Affix Your Signature with Seal on Each Page)**

**Annexure-B****Bharat Heavy Electricals Limited TIRUCHIRAPPALLI/CAPITAL PURCHASE****MODEL PRICE BID FORMAT FOR INDIAN BIDDERS**

Enquiry No. &amp; Date:

Bidder's Offer No. &amp; Date:

Sl. No.	Description of item	Unit (Set / No.)	QTY	Basic Rate / Qty. in Rs. (excluding all Taxes)	ED in %	VAT / CST in % (TNGST with FORM-17 or CST with C-Form)	Service Tax in %	Total Value in Rs. (Including all taxes & duties)
10	Supply Portion							
20	Installation & Commissioning Charges for Sl. No: 10 (if available in tender scope & exclusive from basic rate for supply portion)							
	Packing & Forwarding charges (if any) in percentage (or) Lump sum							
	FOR Dispatching station value in Rs.							
	Percentage of Freight & transit insurance charges, if any (Lump sum or %) Freight & Insurance charges from Dispatching station to BHEL, Tiruchirapalli							
	Approximate Net weight of the total consignment							
	Approximate Gross weight of the total consignment							
	Approximate Dimensions of the Consignment							

Signature &amp; Seal of Vendor

The price bid should be submitted only as per the above format. No row shall be left blank. Please indicate NA, in case the item is "Not Applicable".

**Bharat Heavy Electricals Limited TIRUCHIRAPPALLI/CAPITAL PURCHASE**

**CERTIFICATE BY CHARTERED ACCOUNTANT**

This is to Certify that M/s. ....  
hereinafter referred to as 'company') having its registered office at  
..... is registered under MSMED Act 2006,  
Entrepreneur Memorandum No (Part - II) .....  
dtd:.....,  
Category :.....( Micro / Small)). (Copy enclosed).

Further verified from the Books of Accounts that the investment of the company  
as on date ..... as per MSMED Act 2006 is as follows:

1. For Manufacturing Enterprises: Investment in plant and machinery (i.e.  
original cost excluding land and building and the items specified by the  
Ministry of Small Scale Industries vide its notification No.5.0.1722(E) dated  
October 5, 2006:

Rs.....Lacs

2. For Service Enterprises: Investment in equipment (original cost excluding  
land and building and furniture, fittings and other items not directly related  
to the service rendered or as may be notified under the MSMED Act, 2006:

Rs.....Lacs

The above investment of Rs..... Lacs is within permissible limit of  
Rs.....Lacs for Micro / Small (Strike off which is not applicable) Category under  
MSMED Act 2006.

Date:

(Signature)

Name -

Membership Number -

Seal of Chartered Accountant

**RETROFITTING & RECONDITIONING OF HMC800 M/C.**

**ANNEXURE I**

**PRE QUALIFICATION CRITERIA**

S.No	Description	Vendor comments
	Vendors who satisfy the following pre qualification criterion are only eligible to participate.	
1	<p>The vendor shall have experience of having successfully carried out CNC retrofitting &amp; reconditioning work in India.</p> <p>Experience of having successfully completed similar works during last 7 years (ending last day of month previous to the one in which applications are invited) should be either of the following: -</p> <p>a. Three similar completed works, each costing not less than the amount INR 16.56 lakhs. or</p> <p>b. Two similar completed works, each costing not less than the amount INR 20.70 lakhs. or</p> <p>c. One similar completed work costing not less than the amount INR 32.12 lakhs.</p> <p>“Similar work” here means CNC retrofitting / reconditioning of machine tools.</p> <p>Documentary evidences like PO copy, Final MOM or Completion Report to be submitted in support of the above.</p>	
2	<p>The vendor should submit at least one <b>Performance Certificate</b> issued by customer regarding satisfactory performance of the retrofitted CNC machine within the last 7 years. (Hardcopy of the certificate or through Email directly from the customer).</p> <p>Copies of purchase orders/work orders should also be submitted for verification.</p>	

**Up gradation of the existing CNC System, axis & spindle motors and drives in VA 50 CNC machine.(4285-2926)(Bay 6 - bldg 5)**

**ANNEXURE-II**

**SPECIFICATION & SCOPE OF WORK**

S.No	Description	
<b>Section A: Details of existing machine</b>		
1	<b>CNC SYSTEM:</b> SIEMENS Make SINUMERIK 840C with 3-axis, one spindle, ATC & APC ( automatic tool changer & automatic pallet changer)	
1.1	X axis: MOTOR ; INDRAMAT MAKE ; 3 $\phi$ ~ permaenent magnet motor ; MAC 112C-0-KD-2-C-130-B-0 Drive: Drive servo module INTRAMAT Type:TDM1.2-50-300-w1-000	
1.2	Y axis: MOTOR ; INDRAMAT MAKE ; 3 $\phi$ ~ permaenent magnet motor ; MAC 112C-0-KD-4-C-130-B0 Natrual Condition : mdn - 28.0 Nm ; Idn - 31.0 A ; Surface cooled : mdn - 44.0 Nm ; Idn - 49.0 A ; Tacho - 3.0v / 1000 min-1 ; N=1500 min/1 Drive: Drive servo module INTRAMAT Type:TDM1.2-50-300-w1-000	
1.3	Zaxis: MOTOR INDRAMAT MAKE ; 3 $\phi$ ~ permaenent magnet motor(Brake motor) ; MAC 112C-0-KD-2-C-130-B-2 ; Brake : 40Nm DC 24v +-10% Natrual Condition : mdn - 28.0 Nm ; Idn - 31.0 A ; Surface cooled : mdn - 44.0 Nm ; Idn - 49.0 A ; Tacho - 3.0v / 1000 min-1 ; N=1500 min/1 Drive: Drive servo module INTRAMAT Type:TDM1.2-50-300-w1-000	
1.4	<b>Spindle drive and:</b> <b>AC spindle motor</b> 3 $\phi$ ~ spindle motor ; 2AD-132B-B050-B2-BS01-D2N1(10 KW) ; Base speed =1500 rpm - max speed = 7500 rpm <b>spindle drive:</b> TYPE: KDA 3.2-100-3-A00-W1 CHOKE (L) GLD 13	
1.5	Machine inbuilt with automatic Pallet change and automatic tool change.	
1.6	Hydraulic motor details: 3 $\phi$ ~ induction motor ; Make : NGEF ; 2.0 HP ; 1.5KW ; 3.4 A ; 1400 rpm ; Mount 90LZ ; B class insulation : S1 rating	
1.7	Spindle head lubrication 3 $\phi$ ~ motor : 0.18 KW ; 1440 rpm	
1.8	Lubrication power pack 3 $\phi$ ~ motor : 0.18 KW ; 1440 rpm	
1.9	Chip conveyer 3 $\phi$ ~ motor : 0.75 KW ; 1400 rpm	
1.10	Coolant 3 $\phi$ ~ motor : Make : Bharat Bijilee Limited ; Frame : 100L 415v $\Delta$ 50Hz 2.2KW/3HP ; I=5A ; 1430 rpm ; Duty : S1	
1.11	a)Isolation Transformer: b)Stabilizer Details: NEEL Servo Controlled Voltage Stabilizer: Input: Min. to Max-310V-480V ; Output: 415V ; Accuracy +/- 1% Rating: 45 KW ; Current: 63A ; Type : 763 OC	

1.12	Specifications of the Hydraulic solenoid DC valves available in the machine: 1) DG4V-3S-2N-M-U1-D5-60 ( 1 No's) 2) DG4V-3S-2A-M-U1-D5-60 ( 1 No's) 3) DG4V-3S-6C-M-U1-D5-60 ( 2 No's) 4) DG4V-3S-2C-M-U1-D5-60 ( 1 No's) Note: All are "vickers" make.	
1.13	The pressure switches existing in the machine are as follows: Type: IPS ( industrial pressure switch) - 2 No's; Make : Indfos	
1.14	Pumps available in the machine is as below: PYB 10RS Y31 C11 IN154	
<b>Section B: SCOPE OF SUPPLY</b>		
S.No	Description	Quantity
2	Design, selection and supply of suitable CNC systems, drives, motors , components etc. PACKAGE :Latest version of SIEMENS 828 D package or FANUC 0iF CNC system with minimum 10" Colour monitor package only.	
2.1	Supply of CNC system for controlling of 3-axis and a spindle with color display in a suitable pendant box. Note:The CNC system should have the provision for 5 th axis ( for rotary table axis )	
2.2	Supply of 3 numbers of A.C.servo motors with inbuilt high resolution encoders of suitable capacity for all three axis. (X,Y,Z).Z axis Motor is brake inbuilt.Torque and speed to match with the parameters of the existing A.C. servo motors mentioned above and suitable to interface with the CNC system offered. Any mechanical interfacing arrangement required (torque limiter coupling) to match the offered motor with the existing mechanical drive system should be included in their offer.	
2.3	The type number / model of the motors selected should be indicated in their offer and the technical leaflet showing the parameters and dimensional details should be enclosed.	
2.4	Supply of new Power cable, command signal cable, velocity feedback cable and external(Incremental) encoder with end connectors and of required length to suit the machine for all the three servo motors. (X,Y,Z).	
2.5	Supply of AC digital independent servo amplifier modules for all the three axis with suitable capacity for the proposed individual servo motors. The type number of the module and technical leaflet should be provided.	
2.6	Supply of suitable external encoders(incremental) for all three axis (for X,Y,Z ) and spindle .Encoders should be supplied with suitable end connectors. Make: Heidenhain/Fanuc/Siemens only acceptable. The specifications of the external encoders should be same as that of the existing encoders in the machine.	
2.7	Interfacing and commissioning with the new CNC system with new external encoder- feedback along with cables and required connectors for all the axis.	
2.8	Supply of one number of A.C. spindle motor of suitable capacity with inbuilt high resolution encoder , Torque and speed to match with the parameters of the existing spindle motor mentioned above and suitable to interface with the CNC system offered. The type number of the motor selected should be indicated in the offer and the technical leaflet showing the Parameters and dimensional details should be enclosed.	
2.9	Supply of new Power cable, command signal cable, velocity Feed back cable of required length to suit the machine for the spindle motor	
2.10	Supply of latest Spindle digital amplifier module for the New spindle motor selected. The type number of the Module and technical leaflet to be provided.	

X

2.11	Supply of required input transformers to the feed /spindle drives and 24V,20A SMPS power supply.	
2.12	<p>The CNC system offered shall have the following features for a machining center.</p> <p>The memory capacity required for programming minimum of 2GB and the number of programs stored around 400</p> <p>Cycles:</p> <p>Stock removal cycle (Facing, Finishing, Pattern repeating)</p> <p>Grooving cycle</p> <p>Threading cycle</p> <p>Drilling cycles:(Drill center, Drill sinking, Deep Hole, Boring, Back Boring, Fine Boring, Tapping, Left hand Tapping)</p> <p>Drill Pattern: Single Hole, Row Hole, Circle of Hole</p> <p>Milling Cycles: Rectangle Pocket, Circular pocket</p> <p>Milling Pattern: Slot, Elongation Hole, Circle Slot</p> <p>Parameter Programming ( macro - A, B &amp; Macro Call)</p>	
2.13	The existing inputs/outputs are around 144/ 96 .	
2.14	supply of required CNC KEY BOARD and machine control panel.	
2.15	Supply of suitable handheld unit along with 5 metres cable and adapter as required.	
2.16	Supply , mounting and wiring of suitable capacity MCB switch for incoming D.C, regulated power supply, 3ph digital energy meter and suitable ratings of MPCB (Motor Protection Circuit Breakers),relays,fuses, and other control elements for all the auxiliary motors / equipments in the new panel.	
2.17	The equipments should be suitable for 415V, 3ph, 50Hz, a.c. supply.	
2.18	<p>Supply of voltage stabilizer &amp; isolation transformer of rating 63 kVA or higher. Isolation Transformer Isolation Transformer &amp; Stabilizer shall be of following make:</p> <p>i)M/s. NEEL</p> <p>ii)M/s. AEI</p> <p>iii)M/s. POWER AID or any other make acceptable to BHEL.</p>	
2.19	Supply of limit switches/microswitches for the axes,proximity sensors for the replacement of existing sensors in the machine and pressure switches,solenoid valves,flow control valves for the hydraulic sets and ATC and APC.	
2.20	Supply of new operating pendant for mounting the new CNC system and keyboard.	
2.21	<p>a) Three sets of O&amp;M manual for the CNC system, servo motors, spindle motors, drives ,spare parts list and manuals of bought-out components should be supplied along with the hardware.</p> <p>b)Three sets of power circuit ,control circuit and logic circuit of updated wiring drawing for entire machine should be supplied after retrofitting.</p> <p>c)Three sets of system NC MD,PLC MD, Setting Data and PLC program should be supplied in the CD and Hard copy in Ladder logic and STL logic of original copy.</p>	
2.22	M/C spindle area LED spot light & Panel area sufficient LED lighting to be provided.	
2.23	<p>Supply of tools for maintenance of the machine.</p> <p>1. Digital multi meter (AC/DC 0-600V) - 1 no</p> <p>2. Clamp meter (AC/DC 0-600A) - 1 no</p> <p>3. Hand driven analog insulation tester (Insulation Resistance: 0-2000 M ohm, Nominal Test Voltages d.c.: 250 V 500 V 1000 V) - 1 no</p> <p>4. Electrician tool set 14 piece - 1 set</p>	
2.24	Any material not specified in scope of supply but required for successful commissioning in the scope of the contractor.	
3 (A)	<b>SCOPE OF SUPPLY - MECHANICAL ITEMS</b>	

3.1	Design, selection, supply and fixing suitable brackets for mounting the new AC servomotors for all axes and spindle motor.	
3.2	Supply of new Centralized lubrication system with distributors and copper tubing for the guide ways.	
3.3	Supply of complete set of Hyd. solenoid valves to replace the old ones. The new solenoid valves should be of Rexroth / Vickers make only.	
3.4	Supply of pressure switches equivalent to the existing ones in the machine. Any modification required for mounting the pressure switches to be carried out by the vendor. Any other pressure switch existing in the machine not included in the list above to be studied by the supplier during their visit to BHEL and to be included in the offer.	
3.5	Supply of new ball screw rod and nut for Y and Z axis as per the drawings. Y axis: 3M-14A03-14776 Z axis: 3M-14A03-12537	
3.6	Supply of new pumps with motor for the hydraulic system equivalent to the existing pumps as mentioned above. The new pumps shall be of Vickers or Rexroth makes only.	
3 (B)	<b>Supply of Control Panel :</b>	
3.1	The panel shall be metal enclosed, indoor , floor mounting and freestanding type of Rittal/Pyrotech make. The panel shall be free from flaws, dents and undulations. The panel shall be cold rolled sheet of 2.5mm thickness shall be used for all members expect for doors, covers and partitions where it may be of 2mm.	
3.2	All mating surfaces shall be provided with 3mm thick neoprene gaskets. Panel shall be provided with three point locking arrangement. Hardware used shall be chrome/ nickel - plated. The anti-vibration pad shall be of hard rubber.	
3.3	The pre treatment of all steel work including de greasing ,rust / scale removal, phosphating and oven drying shall be carried out. Panel shall be coated with two coat of anti- rust paint (primer) and two coat of acid alkali resisting epoxy based paint suitable for working in saline and corrosive atmosphere. Exterior : Apple green shade 281 of IS-5/1994. Finish : Semi glossy Interior : Brilliant White Finish : Glossy	
3.4	Degree of protection of panel enclosure: IP 55	
3.5	Removable cable entry shall be provided.	
3.6	The doors shall be suitable for 180 degree opening at front.	
3.7	Mounting Bolt of spring loaded mounting bolts with nuts Shall be supplied by vendor .No of suitable lifting Eye bolts with nuts and washers shall be provided.	
3.8	Supply of air conditioning unit for the Electrical panel and operating panel of sufficient rating. i. M/s Advanced cooling System pvt ltd ii. M/S Werner Finley pvt ltd iii. M/S Avon controls and Systems iv. M/S Chilton Refrigeration Industries or any other make acceptable to BHEL.	
3.9	The above panel should be accommodate all the above drives including and all the electrical and electronic elements used in the machine.	
3.10	The bottom surface of the control panel should be free and no components should be mounted on it.	
	<b>Section C: Scope of work</b>	
<b>S.No</b>	<b>Description</b>	<b>Vendor's remark / Compliance</b>

X

	<b>Erection commissioning and Prove out of CNC System, axis &amp; spindle motors and drives in VA 50 CNC machine</b>	
4.1	Removing of existing AC spindle motor, three numbers of AC servo motors and its drives along with coupling and pulley and note down all the parameters, inter connections of power, control and signal cables.	
4.2	Fixing of the new AC spindle motor and three numbers of AC servo motors with new mounting brackets.	
4.3	Installation and Commissioning of the New CNC system, drives, motors, lubrication pumps, systems etc.	
4.4	Erection of the new operating pendent and mounting the CNC system on it.	
4.5	Fixing of external encoders for all axes with cables & end connectors and interfacing it to the new CNC system..	
4.6	Mounting of X ,Y, Z axis and spindle drives in the control panel.	
4.7	Inter connecting the CNC signals with the machine electrical elements I/O, Feedback, command and other signals.	
4.8	Erection and commissioning of the new control Panel with switch gears and Interfacing the machine control elements like limit switches, pressure switches, level switches ,pushbuttons etc., with the new controls in this new control panel with required wiring materials.	
4.9	Interfacing with the new system, ac spindle drive and X, Y, Z axis drives with spindle and servo motors along with power cables, command signal cables, velocity feedback cables etc.	
4.10	Replacement of all limit switches and sensors in the machine.	
4.12	The ATC and APC has to be serviced & bring into operation. Any components required for ATC and APC operation has to be supplied.	
4.13	Developing and prove out of PLC software to incorporate all the existing machine functions. The complete system will be integrated and should be proved out by the supplier for performance with a standard test piece and also regular production components	
4.14	Prove out of the positioning accuracy and repeatability of the axis using laser interferometer. (The positioning accuracy and repeatability to be taken once before undertaking the retrofit work also. The accuracy after the retrofit to be the same or better than the accuracy before the retrofit.)	
4.15	Commissioning of isolation transformer and voltage stabilizer.	
5	<b>DOCUMENTATION:</b> Three sets of the following documents will be supplied along with the retrofitting packages.	
	1) Original CNC system manual, drives manual ,motors catalogues and also For the other bought out items.	
	2) Original programming manual for the CNC system	
	3) Original CNC Interfacing/ Installation/ Diagnostics Manuals.	
	4) Drives commissioning/ Trouble Shooting manuals for spindle and feeds.	
	5) Complete Electrical and Electronics wiring diagram as per retrofitting / modification.	
	6) Hardcopy of PLC programs / machine Data / Alarm Text messages.	
6	<b>BACK UP:</b> The back up of PLC program and parameters to be given in CD as well as in flash card compatible with the CNC system.	
7	<b>TRAINING:</b>	

	Training shall be given for 2 Maintenance personels on CNC/ Drives maintenance & for 2 Production personels on Operation and Programming of the CNC at the OEM's works for 5 days.	
	Training to be imparted to BHEL personels on operation, programming and maintenance of the CNC machine at BHEL for 2 days.	
8	<b>GENERAL CONDITIONS:</b>	
8.1	The equipments should be suitable for 415V, 3ph, 50Hz, a.c. supply	
8.2	Parties are advised in their own interest to visit BHEL, Trichy on any working day to inspect and study the machine before submitting their offer.	
8.3	Any other work (electrical, mechanical and electronics) not mentioned in this scope of work to keep the machine in working condition with all features and accuracies are in the scope of the contractor.	
8.4	Materials to be used should be of reputed make or as per IS standards.	
8.5	Party shall bring all tools and testing equipment with them during erection and commissioning.	