ANNEXURE-A

Retrofitting of CNC/PLC system, spindle drive & spindle motor, Feed drives & Feed motors, Position feedback system on KARATSU LATHE, Plan no.2-436, Block-3

Specifications of Machine

Model &Type : L-18 N, CNC Lathe, Swing Over Carriage=1100mm, CD=4500mm, Weight Capacity = 20T
OEM : Karatsu Iron works, Japan.
CNC system : Fanuc 11T A.
PLC : Fanuc & Fuji approx.: 300 I/P's and 200 O/P's.
Feed motors : DC servo motor, GE Fanuc make, model 30MH, 53 Nm, 1200 RPM, 217 V, 36A model A06B-0653-B305 for X & Z axes.
Spindle Motor : DC motor, Fuji make, Type GGF 5286A, 400VDC, 217A, 500/1600rpm, 75 KW, separately excitation 150V.
Spindle Speed : 1.5-320rpm (range-1: 1.5-108.6rpm, range-2: 4.4-320rpm)
Position Feedback system :
Following scales with specified accuracy are installed.

- X-axis: Heidenhein LS703, ML 720 mm, Resolution 0.0005mm, Accuracy +/- 0.005mm/m
- Z-axis: Heidenhein LB326, ML 1800*3 = 5400 mm, Resolution 0.001mm, Accuracy +/- 0.005mm/m

Rapid traverses : Z – 5000mm/min, X – 2500mm/min
Feed : X/Z: 0.01 – 500mm/rev.

Tool Post : Swiveling type tool post with 8 positions Turret along with Boring bar Holder.

Other Features : Recirculating Type high pressure/flow Flood Coolant System, Roller type Steady Rests, Oil Controller for Headstock Lubrication, Chip Conveyor, Separate panel for headstock /chuck operation (jogging, forward/reverse main spindle, Emergency stop), Separate panel for tailstock & quill operation (clamping/unclamping, movements, lubrication), Automatic Tool Offset System, Hand Held Unit, Oil cooling Unit etc.

Machine has provision to run without CNC controller

Manual machining is possible from Main operator panel independent of CNC part program / MDI.
following operations can be performed manually

- Inching (CW&CCW) and regular operation of main spindle rotation with start /stop and direction switches and speed regulator.
- Inching and regular feed in X & Z axis with start /stop and direction switches and feed regulator
- Digital readout of movement in X & Z axes on external DRO.

A. SCOPE OF SUPPLY

Sl.No.	Item	Qty.	Accepted (Yes/No)	Deviation	Remarks
1.0	A CNC Controller with PLC, able to perform all the machine functions should be provided. The CNC controller should be **FANUC 0i TD** with 10.4 inch TFT monitor or more, Full alphanumeric CNC key board and standard Machine Control Panel (MCP) for turning operations and to cater all existing features(or more) and existing PLC Inputs and Outputs(Input / Output approx. 250/150) (**CNC features, operation features and programming features as per** para A.1.0.1)	01 Set.			Vendor to provide details & comply
2.0	i). AC Servo drives and Servo Motors of suitable rating for Cross (X) and Longitudinal (Z) feeds should be provided. The AC Servo drives & motors should be Fanuc Alpha i series. ii). AC Digital spindle drive of suitable rating iii) AC spindle motor of suitable rating (75 KW min)	01 Set.			Vendor to provide details & comply
3.0	i.) Ultra isolation transformer of reputed make 150KVA rating(Delta / Star Configuration) ii.)Power disconnector (400 Amp rating) with rotary knob.(Switch to be mounted on electrical panel at suitable place)	01 No.			Vendor to provide details & comply
4.0	New Linear Scale encoders (**Heidenhein make**) in place of existing scales compatible to new CNC control system for both axes X and Z with same or better accuracies than the existing scales (Refer to Specifications) along with mounting brackets, plates and accessories for mounting of scales and transducers and other items required for ensuring accuracy and repeatability of the feed axis, wave shaping unit (if required), cables and connecters.	01 Set.			Vendor to provide details & comply
5.0	Two-Axes External DRO for X and Z axis with cables & connectors and interface unit for additional external position display.	01 Set.			Vendor to provide details & comply
6.0	Spindle encoder along with mounting accessories, cables & connectors for RPM display and Threading, spindle orientation (M19) operation.	01 Set.			Vendor to provide details & comply

7.0	Separate Digital Indicators for displaying spindle actual RPM, Spindle load (current).	01 Set.			Vendor to provide details & comply
8.0	Signal cables, power cables, control cables, cable glands, cable conduits to interface CNC system, spindle drive and spindle motor, Feed Drives, Feed motors, Position feedback system along with mounting brackets, motor flanges, couplings and accessories for mounting of feed motors and spindle motor. (**Design, modification / re-engineering, manufacturing of feed and spindle motors couplings and flanges as per requirement**) (Cable length from feed motors, Position feedback sensors to Electrical cabinet is approx. 30m; Cable length from Operator panel to Electrical Cabinet is also 30m approx.)	01Set.			Vendor to provide details & comply
9.0	Terminal boards, relay modules, field wiring, cable terminations, ferrules, and identification tags to interface field devices to the PLC I/O modules	01 Set.			Vendor to comply
10.0	**New Operator console swiveling type, Rittal or equivalent make** (To be mounted on the hanging type sliding arm existing on the machine), with required control elements, indicators, manual pulse generators etc., to house switches/ keys. It should replicates all the existing control elements including separate manual pulse generators (hand wheel) for X and Z axis, for manual and automatic movement of feed, spindle , steady rests ,tail stock & quill, turret & boring bar ,coolant, chip conveyer and other auxiliaries control. **Lay out of existing panel As per annexure 'B'**	01 Set.			Vendor to provide details & comply
11.0	**Electrical Cabinets Rittal or equivalent make** for housing CNC, drives, Power supply, PLC I/O modules, complete new switch gear and accessories with proper air conditioning and well illuminated control with door limit switches.	01 Set			Vendor to provide details & comply
12.0	**Stand-alone panel (Rittal or equivalent make)** on machine carriage with proper air conditioning and well illuminated control with door limit switches to house CNC display unit, Full CNC key board with alphanumeric keys, Machine control panel and External DRO (To be mounted at the same place as existing panel on machine carriage).	01 Set			Vendor to provide details & comply
13.0	i). Hand held control Panels for steady rest replicate all existing control functions ii).Fix mounted panel for tailstock and quill functions replicating the existing controls functions	01 set			Vendor to comply
14.0	Control and switch gear elements (pushbuttons, joysticks, Contactors, circuit breakers, fuses, relays, timer, indicators, MCCBs etc.) as per the new scheme for entire machine.	01 set			Vendor to comply

15.0	**i)** Sufficient lighting should be provided on the machine for clear view of working area, tool, operator panel etc. Machine illumination light of reputed make. Well-guarded from chips and coolant. Illumination light in all electrical cabinets and Operator control panel fixed type. **ii)** Portable machine lamp with magnetic base operating at 220 V AC with 3 meter cable with conduit.	01 set			Vendor to comply
16.0	Supply and Establishment of **PC based Program Conversion Software** to convert all the part programs, subroutines and cycles of existing Fanuc 11TA system to New CNC control system. **(Details as per annexure-C)**	01No.			Vendor to comply
17.0	Pre-assembled communication cables to connect laptop with the CNC controller and drives for commissioning and diagnostic purposes, Drives commissioning software on CD/DVD.	01 set			Vendor to comply

Note: Complete breakup of all the constituent items with FANUC type number for CNC system, feed motors, spindle motor and drive modules shall be provided.

Para A.1.0.1

CNC FEATURES:

The CNC controller should be offered with following features:

1. Full Alphanumeric Keyboard and Colour Display (TFT/LCD monitor) of 10.4" or more.
2. Constant Cutting Speed Control (using G96).
3. Diameter Programming.
4. Traversing in X & Z axes using two separate hand wheels in Jog mode.
5. Dry Run with safety key.
6. Block search preferably with calculation.
7. Direct Drawing Dimension/ Contour Definition Programming: A,C,R Programming.
8. Graphic Machining Simulation of tool paths in part programs with Dynamic Graphic Display.
9. Program Memory (maximum available)
10. Thread cutting.
11. Manual measurement and automatic storage of tool offsets in tool offset memory.
12. Manual measurement and automatic storage of settable zero offsets (G54-G59 or equivalent) in zero offset memory.
13. Repositioning/Re-approach after interruption.
14. Program Jumps.
15. Fixed Cycles (Canned/Multiple Repetitive Cycle) for Turning, Boring, Grooving , Threading and Drilling
16. Programming of Cycles
17. Manual Guide " i " for Turning Operations

18. Program Editing Operations
19. Programming for Turret Indexing/tool position in respective tool code as in existing system.
20. Tool nose radius compensation
21. Optional Block Skip
22. Custom Macro/ Custom Macro Common Variables/Parametric Programming with logical/mathematical functions
23. Program Restart
24. Programmable coolant on/off
25. RS232 interface, if possible, with suitable cables for data input/output with standard Laptop and additionally USB interface for data input/output with its drive/card/card reader &cables etc. (Qty. - 2 nos.).
26. The System to be Ethernet Network (LAN) Ready with required hardware and software for connection with existing DNC network for two-way data/program transfer between existing PC and CNC System using additional interface

B. SCOPE OF WORK

S.No.	Activities	Accepted (Yes/No)	Remarks
1.0	Dismantling and removal of old Electrical cabinets, CNC control panel, operator panel switch gear ,CNC,PLC, feed motors, spindle motor, Drives , linear scales and field devices along with old cabling and wirings.		Vendor to comply
2.0	Installation of new electrical cabinet(s) along with the CNC ,PLC , Drive controller and switchgear. (**Switch gear and electrical system as per PARA B.2.0.1)**		Vendor to comply
3.0	Dismantling of old operator panels and Installation of new operator panels.		Vendor to comply
4.0	Mounting and installation of feed motors, spindle motor and linear scales. Design, Modification / re-engineering, manufacturing of feed motor couplings and flanges as per requirement.		Vendor to comply
5.0	Cabling and wiring of CNC, PLC, Drive system, control panels and field devices. Entire Cabling including Position Feedback & Analog Set point cables of the machine routed through the caterpillar/ Drag chain is to be replaced with the new cabling. Laying and routing of new conduits, cables from electrical cabinet to machine and operator console through new conduits. Refurbishment and rewiring of all the terminal boards, Junction Boxes as per requirement		Vendor to comply
6.0	Interfacing of new operator panels.		Vendor to comply
7.0	Interfacing of the operating panels for steady rests, tail stock, cooling unit, chip conveyer with the new scheme		Vendor to comply
8.0	Installation, Interfacing & commissioning of the CNC, PLC, Position feedback, , spindle & Feed drives systems, Machine lights and portable lamps and ultra-isolation transformer		Vendor to comply
9.0	Development of PLC program as per the new CNC controller and implementation on machine.		Vendor to comply
10.0	Laser calibration of X & Z axes and generation of compensation data for pitch error and backlash from a reputed agency.		Vendor to comply
11.0	Prove-out of the main functions (axes & spindle),prove-out and demonstration of all programming features of new CNC System .		Vendor to comply
12.0	Prove-out of the auxiliary functions (turret and boring bar, tail stock, steady rests, Coolant system, hydraulics, hydrostatics, chip conveyer etc.).		Vendor to comply
13.0	Prove-out of the alarms and message prompts with remedial description as in existing system or more. PLC alarms & messages should include the device number and/or the operand on the screen.		Vendor to comply

14.0	Interfacing & Installation of DRO with position feedback from the same transducer (Both the axis X & Z) which is used for CNC control.		Vendor to comply
15.0	Prove-out of the DNC function (Part program & parameter transfer).Part program & parameters can be transfer easily from/to DNC PC.		Vendor to comply
16.0	Prove out & demonstration of Manual Control of Machine independent of MDI/ CNC Part Program: Presently, following operations can be performed manually independent of MDI/ CNC Part Program. Same status is to be maintained after retrofitting also: a. Start (CW/CCW) & Stop of spindle rotation b. Inching (CW&CCW) of spindle rotation c. Regulation & Indication of spindle speed d. Start, Stop, Regulation & Indication of feed, fast traverse, inching in X & Z e. Set tool / cutting point w.r.t. pre-machined diameter or face of known dimensions & set matching values on display. f. Select direction of cut in any of available machining axes (+ or -) through separate keys provided on operator's panel. g. Start feed by single pressing of feed on key (i.e. without continuously holding the key pressed) for cutting without CNC Program.		Vendor to comply
17.0	Successful conversion of existing programs (around 100 nos.) using supplied software & checking their suitability on new system by simulation or equivalent (without machining) .		Vendor to comply
18.0	Successful machining of a work piece provided by BHEL by machining of different straight, taper, radius turning cuts, Grooving & Threading cuts using CNC program.		Vendor to comply

PARA B.2.0.1

SWITCH GEAR AND ELECTRICAL SYSTEM:

1. Electrical panel(s) along with switch gear, relay, contactors, overloads, fuses, MCB's should be suitably positioned and all compartments should be illuminated for ease of maintenance and proper air conditioning ensured for the cooling of the devices.

2. The switchgear (MCBs, Overloads, Contactors, Relays etc) should be of any one of the following makes: Fanuc, **Siemens, Schneider, Telemecanique or ABB**.

3. Electrical Cabinet, CNC control panel & Operator Panel should be of **Rittal** make with proper air Conditioning and vermin proof.

4. The operator's pendant & CNC control panel should be suitably positioned in the existing location

for ease of operation & maintenance.

5. All the panels, Junction boxes, devices should have nomenclatures and individual wires ferruled as per the electrical schematics. The field devices if found unhealthy will be replaced by the party.

6. The wiring of the entire machine should be replaced by new ones of adequate capacity and reputed make preferably Lapp make.

7. 220VAC, 5A plug points should be provided in the Electrical Cabinet, stand-alone control panel and on the Operator Panel.

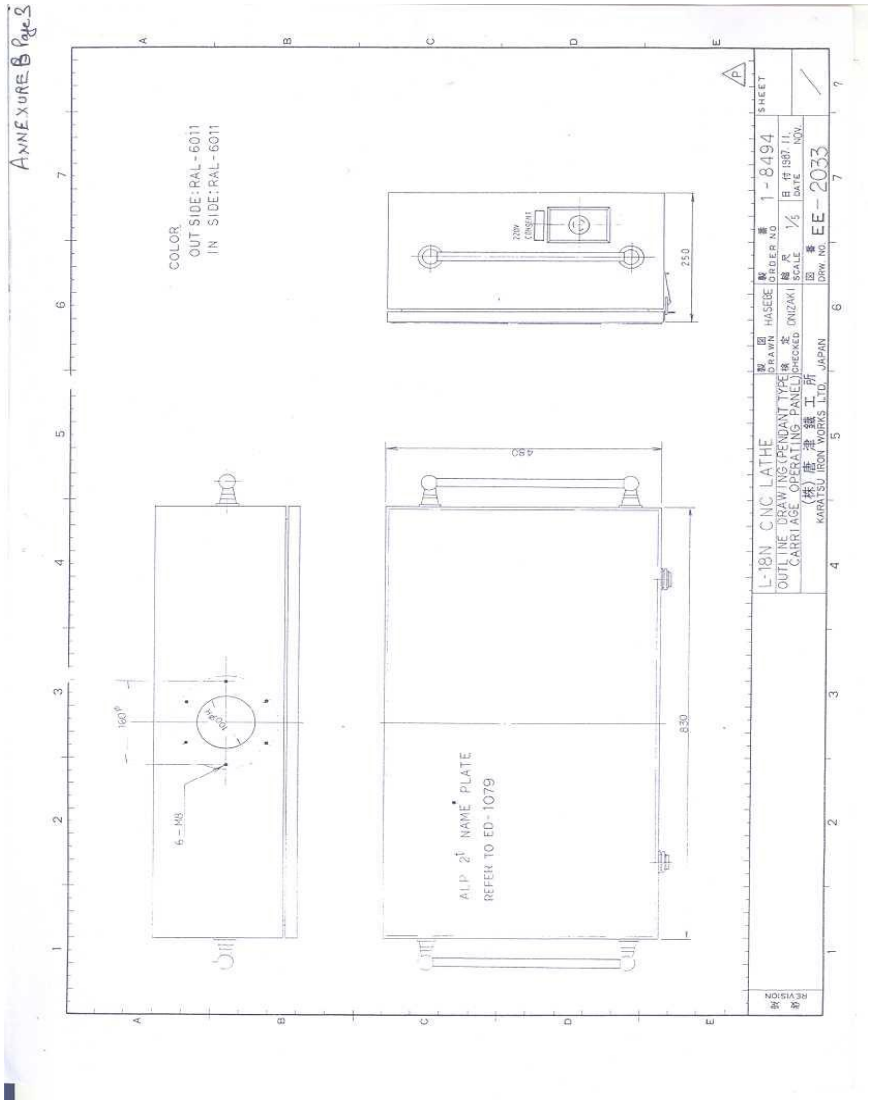
8. Sufficient lighting should be provided on the machine for clear view of working area, tool, operator panel etc. It should be well guarded from the chips & coolant.

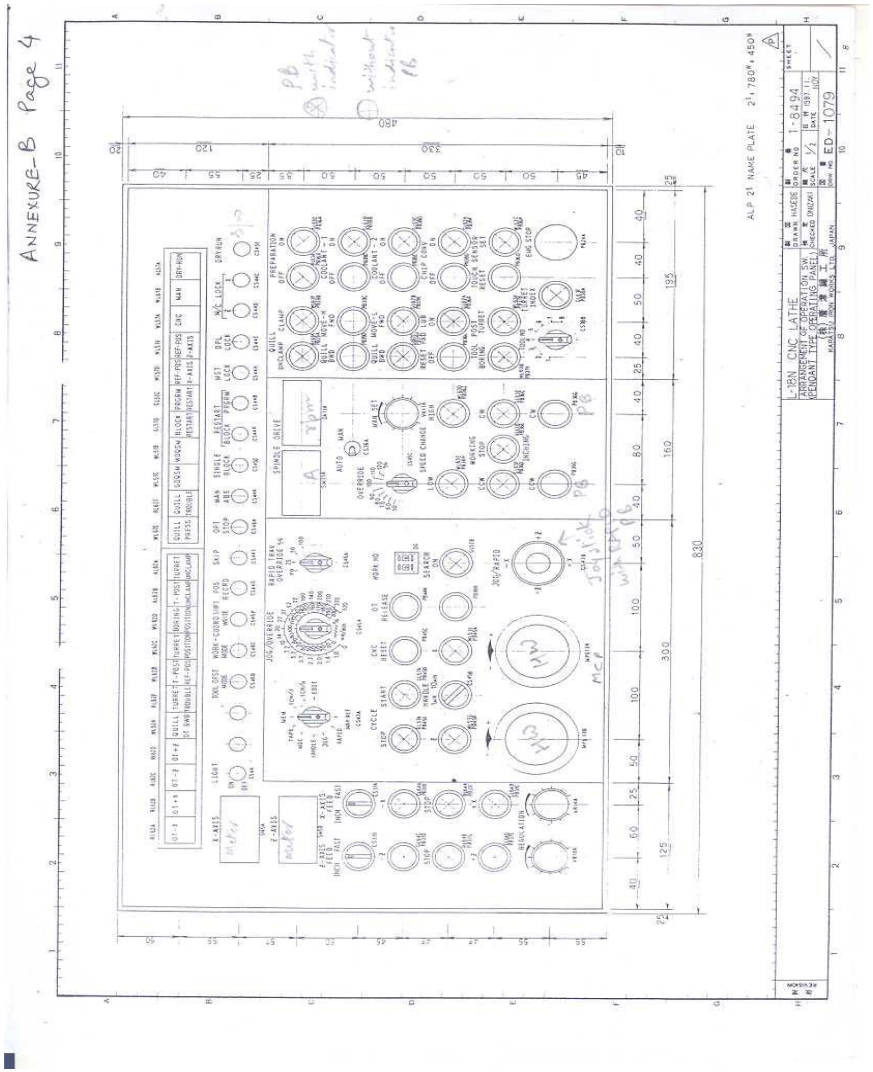
C.	**DOCUMENTATION:**		**Accepted (Yes/No)**	**Remarks**
	Following documents shall be supplied with above supply	Qty.		Vendor to to comp
	Documents consisting of			
	□ Electrical circuit diagram (HARD COPY & SOFT COPY)	3 sets.		
	□ PLC printout in ladder form with symbols & comments in English	3 sets.		
	□ O&M manuals (hard copy) for CNC, PLC, Drives & Measuring systems.	3 sets.		
	□ Programming manual (hard copy) for CNC system	3 sets.		
	□ Machine data (NC, PLC, Setting & Alarm texts), Drives data & PLC program (soft copy)			
	□ Details of all mechanical modifications & fittings with drawings.	3 sets.		
D.	**WARRANTY:**			
	Party shall stand warranty for all the supplied material and work executed for a period of **one year** from the date of successful final acceptance (as per clause –F) at HEEP,BHEL,HARIDWAR.			Vendor to comply
E.	**TRAINING:**			
	Party shall impart training one week to each BHEL staff in the field of **(i)**part programming with all CNC features of system(**one person**) **(ii)** system commissioning and PLC programming **(one person)** **(iii)** operation of the machine with new system at the Vendor's/ manufacturers works (**two persons**) **Expenses for boarding & lodging of BHEL personnel during training shall be borne by BHEL.**			Vendor to comply
F.	**FINAL ACCEPTANCE:**			
	Upon completion of the scope of supply and scope of work, successful machining of 1 no. of component provided by BHEL using CNC program(converted & provided by vendor) under supervision of vendor shall constitute the FINAL HAND-OVER of the machine and completion of the job.			Vendor to comply

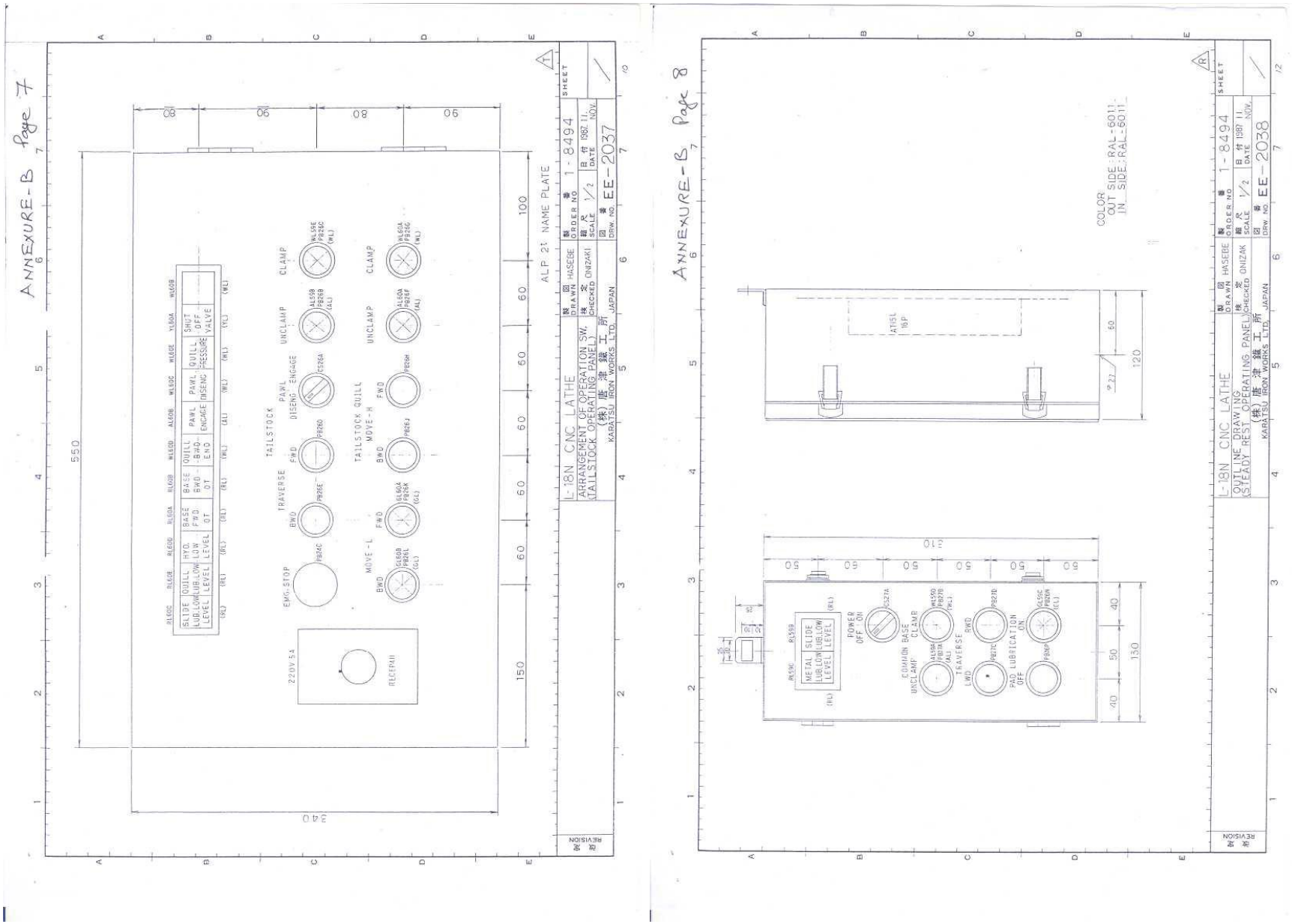
ANNEXURE-B

OPERATIONAL FEATURES

The hanging and swivel type operator panel, steady rest panel and tailstock and quill panel shall have all the provisions of operation features, alarms, messages or more as provided in the existing operator panels (Lay out of existing panels as per **ANNEXURE-B)**


ANNEXURE B Page 3
COLOR
OUT SIDE: RAL-6011
IN SIDE: RAL-6011
L-18N CNC LATHE
OUTLINE DRAWING (PENDANT TYPE CARRIAGE OPERATING PANEL)
KARATSU IRON WORKS LTD. JAPAN
DRAWN HASEBE
CHECKED ONIZAKI
DATE 16 NOV 1987
SCALE 1/5
ORDER NO 1-8494
DRW NO EE-2033
SHEET
REVISION
ALP 21 NAME PLATE
REFER TO ED-1079
6-M8
220W
830


ANNEXURE-B Page 4
L-18N CNC LATHE
OPERATION PANEL
ORDER NO 1-8494
DRW NO ED-1079
ALP 21 NAME PLATE


ANNEXURE-B Page 7
ALP 21 NAME PLATE
L-18N CNC LATHE
ARRANGEMENT OF OPERATION SW.
TAILSTOCK OPERATING PANEL
(株) 唐津鐵工所
KARATSU IRON WORKS LTD. JAPAN
EE-2037
ANNEXURE-B Page 8
COLOR
OUT SIDE : RAL-6011
IN SIDE : RAL-6011
L-18N CNC LATHE
OUTLINE DRAWING
STEADY REST OPERATING PANEL
(株) 唐津鐵工所
KARATSU IRON WORKS LTD. JAPAN
EE-2038

ANNEXURE-C

SPECIFICATIONS OF CONVERSION SOFTWARE FOR MACHINE WITH RETROFITTED CNC SYSTEM

(CONVERSION OF NC PROGRAMS IN USE WITH EXISTING CNC SYSTEM TO EQUIVALENT NC PROGRAMS FOR CNC SYSTEM TO BE RETROFITTED)

1.0 INTRODUCTION:

The existing CNC programs for the earlier CNC System in the retrofitted machine were prepared and then finalized by actual machining of the component requiring a great deal of time and effort. These proved programs, whose accuracy has been established, are of great importance to the programmer and the operator of the machine. Therefore, with the retrofitting of the machine with the new CNC system, it is very important that the effort and time spent earlier is not repeated and the equivalent programs for the new CNC System are available for machining of the component without any further delay leading to productive use of machine.

2.0 SCOPE OF WORK :

The Conversion Software shall be developed incorporating all logic and features so that all the existing proved NC programs of the earlier CNC system are successfully converted into equivalent NC programs for the new retrofitted CNC system. Further, the conversion software shall meet all the requirements as mentioned at point no. 2.1 and shall be tested & approved as mentioned at point no. 2.2 & 2.3.

2.1 Requirements:

- The conversion software shall be Windows XP based.
- 100 % conversion of program regarding program numbers sequence numbers, operator messages /instructions, G & M coded F/S/T/D codes with their values, Axes values suitable for the new CNC system.
- Preferably 100% conversion of remaining part of CNC Program like Subprogram/Cycle Parameters, Subprogram/Cycle calls Code, Special feature/Code pertaining to any attachment or machine's application. In case of any constraint, minor editing after conversion is permissible at the discretion of BHEL and such data should be retained as it was earlier with identifiable comment so as to enable editing after the conversion.
- The Program conversion should be without any data loss and the converted data should be acceptable to new CNC System without any Syntax/Format error.
- Two sample existing CNC programs shall be provided by BHEL and the vendor can discuss/clarify all their queries with BHEL before start of development work to avoid repeated modifications/changes later on leading to delays.
- The development of the conversion software shall be done either at site or off-site at the expense and suitability of the vendor.

2.2 Testing & Acceptance of the Software:

The vendor shall install the conversion software on a BHEL PC and demonstrate conversion of two sample programs provided earlier to him as per point no. 2.1 (e). The testing of the conversion software shall be done by BHEL Engineers through visual checking of the two sample converted programs whose decision shall be final regarding the correctness of the converted programs. The programs shall be checked with respect to all the requirements mentioned above at point no. 2.1.It includes in Annexure A(Point B 17.0 scope of work).

Additionally, the two sample converted NC programs shall be loaded on the machine and following testing shall be done:

- Block search from the start to the end block which should not generate any syntax or data format error.
- Checking of converted program (including editing as per 2.1.c) by graphic simulation feature, on the retrofitted CNC system.

3.0 DELIVERABLES

- Installable CD

G.	**DELIVERY:**	**Accepted (Yes/No)**	Vendor to comply
1.	**Material :** Max. 4 months from the date of award of contract. Early delivery shall be acceptable.		
2.	**Work :** Within 45 days from the date of release of machine for work.		
H.	**LATE DELIVERY (LD) CLAUSE:-**		
1.	Late delivery @ ½% per week subject to a maximum of 10% of the material cost including spare parts shall be applicable for delay in deliveries.		
2.	In case of delays in commissioning after handing over the machine as per clause G(2) penalty @ 2% per week subject to a max. of 10% of the Commissioning Charges shall be applicable for delay beyond scheduled commissioning date for reasons attributed to the party. Net delay for the purpose of calculating late commissioning will be considered as the delay in commissioning.		
3.	However total LD on account of clause H1 & H2 will be limited to 10% of work awarded value.		
4.	The time period from invitation date for Pre dispatch inspection from vendor to the date of arrival of pre dispatch team to vendor's works and any other reasons attributed to BHEL will not be accounted in delivery period. This period will be excluded for the purpose of calculating LD. Vender should intimate regarding PDI, 7 days in advance.		
I.	**PRE-DISPATCH INSPECTION**		
1.	Pre-dispatch inspection of all the items covered under Scope of Supply at para (A) shall be carried out physically by BHEL at party's works.		
2.	Supplier shall invite BHEL for carrying out pre- inspection.		
3.	Deputed BHEL persons shall do pre acceptance at vendor works and give despatch clearance.		
4.	Expenses of Boarding and lodging of BHEL personnel during PDI shall be borne by BHEL.		
J.	**SUBMISSION OF BILL OF MATERIAL (BOM)**		
	Before inviting BHEL for Pre-dispatch inspection, vendor shall submit to BHEL the Bill of Material (BOM) for scrutiny.		
K.	**EARNEST MONEY DEPOSIT (EMD):**		Vendor to comply
1.	Vendors have to deposit EMD. Works costing more than Rs.30 lakhs and up to Rs. 50 lakhs : Rs.1,00,000/- Works costing more than Rs.50 lakhs and up to Rs. 100 lakhs : Rs.1,50,000/- Works costing more than Rs.100 lakhs : Rs.2,00,000/-		

	EMD may be deposited through pay order or through demand draft only in favor of **Account officer(cash), HEEP, BHEL, Hardwar payable at Haridwar**.		
2.	EMD shall be converted to security deposit if the work is awarded.		
3.	EMD of unsuccessful bidders shall be refunded back normally within fifteen days of acceptance of award of work by the successful bidder.		
4.	EMD shall not carry any interest.		
5.	EMD by bidder will be forfeited as per tender document, if		
i)	After opening the tender, the tenderer revokes his tender within the validity period or increases his earlier quoted rates		
ii)	The tenderer does not commence the work within the period as per LOI/contract.		
6.	**Offers without EMD will be rejected and will not be considered for evaluation.** However at discretion of BHEL HARIDWAR, Govt. of India / Central & State PSUs / State Govt. entities / Small Enterprises with validity of registration (under NSIC for similar type of work)on tender opening date may be exempted from submission of EMD and tender documents cost.		
L.	**SECURITY DEPOSIT (SD):-**	**Accepted (Yes/No)**	Vendor to comply
1.	Successful vendor shall deposit security. The rate of security deposit will be as below:		
	• For work Up to **Rs.** 10 Lakhs : 10% of work order value		
	• Above **Rs.** 10 Lakhs upto **Rs.** 50 Lakhs : **Rs**1 Lakh + 7.5% amount exceeding **Rs.**10 Lakhs		
	• Above **Rs.** 50 Lakhs: **Rs.** 4 Lakhs + 5% amount exceeding **Rs.** 50 Lakhs		
2.	The security deposit should be submitted before the start of work in the following forms:		
	i) Pay Order, Demand Draft in favour of **Account officer, HEEP, BHEL, Hardwar payable at Haridwar**		
	ii) Local cheques of Scheduled Banks, subject to realization.		
	iii) Bank Guarantee from Scheduled Banks/Public Financial Institution as defined in the companies Act. The Bank guarantee format should have the approval of BHEL.		
3.	Security Deposit shall not carry any interest.		
4.	EMD of successful tenderer can be converted and adjusted against the Security Deposit.		
5.	100% of the Security Deposit amount shall be refunded to the vendor after final acceptance of the machine. **SD shall be released after the submission of Performance Bank Guarantee(PBG) by the vendor**		
M.	**Performance Bank Guarantee (PBG):**	**Accepted (Yes/No)**	Vendor to comply

1.	Vendor shall be required to submit a performance bank guarantee (PBG) for 10% of the total work order value which shall be valid for a period of 12 months from the date of Final acceptance of machine.		
2.	The PBG shall be submitted on a non-judicial stamp paper of value not less than Rs.80/- issued by any one of the nationalised banks.		
N.	**PAYMENT TERMS:** **(Note : No advance payment shall be made to the vendor.)**		Vendor to comply
1.	Part payment will be made after completion of following milestones		
i)	First payment of 80% of material cost along with 100% taxes & duties shall be payable after receipt of material at HEEP, BHEL, Hardwar		
ii)	Final payment of balance 20% of material cost, 100% of commissioning cost and refund of 100% of the Security Deposit amount will be made after final acceptance, subject to submission of PBG as per para 'M'		
2.	All the payments shall be made through e-payment after submission of following documents along with first bill		
i)	E-payment form duly filled (Form will be provided by BHEL)		
ii)	Income tax exemption letter(if applicable)		
3.	Excise duty & CST/VAT will be paid on material cost and service tax will be paid on commissioning charges at actual. Related original documents to be submitted for availing MODVAT credit by BHEL.		
O.	**COMMERCIAL TERMS :-**		Vendor to to comply
1.	Prices shall be quoted on "Firm Price" basis only. The prices should only on F.O.R BHEL, Haridwar basis inclusive of Packing & Forwarding charges. Applicable % of ED & Sales Tax, Freight & Insurance, Installation & Commissioning Charges should be clearly indicated in attached Price bid format as per "Annexure-B"		
2.	Validity of offer shall be for a minimum period of 120 days from the date of Tender Opening		
3.	Freight & transit insurance charges from Dispatching station to BHEL, Haridwar shall be borne by party.		
P.	**QUALIFYING CRITERIA:-**	**Accepted (Yes/No)**	**Remarks**
	The vendors meeting following criteria would only be considered:		

1.	The party must be a reputed machine tool retrofitter (having done retrofitting atleast 2 number of CNC Lathe machines) with FANUC CNC systems, Spindle drive & motor, Feed drives & motors on center lathes / vertical boring machines(Medium size) in last three years, from the date of tender notice. List of the customers along with respective contracting executive officers addresses (including phone No. / E-mail ID) for whom machines were retrofitted shall be enclosed with the offer. The two retrofitted works mentioned above means completed works costing not less than Rs.45.00 Lacs each or three similar works costing not less than Rs. 35.00 Lacs.		Vendor to provide details & comply
2.	Audited balance sheets for the last three years should be submitted.		Vendor to provide details & comply
3.	Machines previously retrofitted by the party should be running satisfactorily for at least 6 months prior to the date of enquiry. Vendor shall provide performance certificates for satisfactory operation of above similar retrofitted machines from his customers along with name, address & contact details. BHEL reserves the right to verify the information provided.		Vendor to provide details & comply
Q.	**BHEL'S OBLIGATION:**	**Accepted (Yes/No)**	**Remarks**
1.	Existing electrical schematic of the machine shall be provided by BHEL to the vendor.		**Information**
2.	Crane facility and lifting tackles like slings, rope, D-Shackles shall be provided.		
3.	Any machining facility required for rectification/fitting of supplied material, subject to the extent available in BHEL, shall be provided.		
4.	Any civil work required for the erection of panel shall be done by BHEL.		
5.	Electricity, water, fasteners, welding sets, Gas cutting equipment, general purpose welding rods and holders required during commissioning shall be provided for minor work.		
R.	**RISK PURCHASE CLAUSE:** In case of delays in supplies/defective supplies or non-fulfillment of any other terms & conditions given in the work order the purchaser may cancel the work order in full or part thereof and may also make the purchase of the material/ service from elsewhere / alternative source at the risk and cost of supplier. Vendor does not agree to above clause, their offer is liable to be rejected. In case any vendor accepts risk purchase clause initially and subsequently declines to honor the term in the eventuality of RISK PURCHASE, they may be banned for business with BHEL.		Vendor to to comply
S.	**GENERAL CONDITIONS**	**Accepted (Yes/No)**	**Remarks**
1.	**A point wise compliance statement shall be submitted for above scope of supply and work.**		Vendor to to

			comply
2.	The offers of the vendors who are on the banned list as also the offer of the vendors, who engage the services of the banned firms, shall be rejected. The list of banned firms is available on BHEL web site www.bhel.com		Vendor to to comply
3.	Complete specifications such as Model/Type of the CNC,PLC, Heidenhein scales, motor and drive controllers etc. shall be stated in the offer by the party. Ordering brochure/catalogue should be attached in which offered parts are highlighted.		Vendor to to comply
4.	Parties are requested to visit the site before making an offer.		**information**
5.	Any material not specified in scope of supply but required for successful commissioning shall be provided by the vendor free of charge.		Vendor to to comply
6.	Material to be used, should be of reputed make or as per IS standards.		Vendor to to comply
7.	Party shall bring all tools and testing equipment with them during erection and commissioning.		Vendor to to comply
8.	RULES AND REGULATIONS OF THE CENTRAL/STATE GOVERNMENT: In the event of award of any contract, vendor will have to comply and abide by all the laws/enactment of state and central government. Documents regarding registration with Sales Tax and Excise authorities may also to be forwarded along with income tax clearance.		Vendor to to comply
9.	**The award of works will be made on basis of the total of material cost, commissioning charges and all taxes, duties as applicable (Total Cost to BHEL).** The vendor should submit their best price at this stage itself and they will not be allowed to revise the price. Any revision/discount given by the vendor subsequently will be ignored.		Vendor to to comply
T.	**OFFER :-** The offer should be submitted in two parts in following manner.		
1.	**Techno-commercial Bid** :	**Accepted (Yes/No)**	**Remarks**
i)	The envelop shall contain the Techno-commercial Bid (ANNEXURE 'A')with technical details and commercial terms & conditions along with relevant documents like copies of ESI, PF code, PAN No., Service Tax Reg. No., TIN No., CST No., Experience Certificates, Audited Balance Sheet of last 3 years and P.O copies & commissioning/Performance certificates (against Pre-qualifying conditions) . Tender document cost, EMD & check list as per ANNEXURE 'D' shall also be accompanied. Offers without the EMD & Tender documents cost will not be considered)		
ii)	The envelop shall be super scribed with "Techno-Commercial Bid", Name of work & NIT No.and Date of opening		

iii)	Point-wise compliance of this scope of supply and work is to be given by vendors while submitting their techno-commercial offer in the format provided by BHEL.Each page of the compliance list has to be ink signed & stamped by the vendor.		
2.	**Price Bid :**		
i)	The second envelope shall contain the price bid with separate price for material & work on Price Bid Format as per **ANNEXURE 'D'**.		
ii)	Any other information in the price bid shall not be considered and the quotation is likely to be rejected. Price bid document shall be ink signed by the bidder at the bottom of each page.		
iii)	The envelope shall be sealed and super scribed with "Price Bid", Name of work & NIT No.		
iv)	Price bids of only techno commercially accepted vendors shall be opened.(In presence of available vendors at the time of opening)		
3.	Both the above two envelopes shall be kept in another sealed cover. The cover shall be super-scribed with "Quotation for (name of work), NIT No. & due date and shall be submitted in the Tender box kept in the tender room of purchase department at the 4th floor of the Main Administrative Building of BHEL,HEEP,HARIDWAR and it should also contain vender's name & contact details.		
4.	Unpriced price bid to be obtained with technical bid with clear undertaking that no deviation from BHEL's price bid format will be entertained in the final evaluation.		

ANNEXURE 'D'

PRICE BID FORMAT

Name of Work :
NIT No. & Date :
Bidder's Offer No. & Date:

Sl. No.	Description of item	Unit	Qty	Basic Rate (in Rs.)	Excise Duty (in %)	VAT/CST (in%) (VAT with FORM-17 or CST with C-FORM)	Service Tax (in %)	Value (in Rs.)
1.	Material Cost	Set	01		%	%	N.A	
2.	Installation & Commissioning	Set	01				%	
3.	Packing & Forwarding charges in both % and Lampsum (in **Rs.**)						**%**	
4.	Transportation Charges F.O.R. HEEP/BHEL, Haridwar (in **Rs.**)							
5.	Transit insurance charges, in both percentage and Lamp sum (in **Rs.**)from Dispatching station to HEEP/BHEL, Haridwar						%	
6.	**TOTAL COST (in words)**							Rs.

Signature & Seal of Vendor

ANNEXURE 'E'
CHECK LIST FOR TENDER

NIT No.:_____

Vendor shall ensure that following documents/particulars have been enclosed with tender. This check list shall be enclosed with Techno-commercial Bid.

S.No.	PARTICULARS	YES/NO	REMARKS
1.	Sealed Techno-commercial Bid as per Annexure 'A' of NIT		
2.	Sealed Price Bid as per Annexure 'D' of NIT		
3.	Compliance to all the points of the Annexure 'A' of NIT		
4.	Audited balance sheets for the last three years should be submitted i.e. 2010-11,2009-10,2008-2009 required as per para P(2) of Annexure 'A' of NIT.		
5.	P.O. copies and commissioning/ Performance certificates required as per clause P(3) of Annexure 'A' of NIT.		
6.	Name, address & contact details of their customers required as per clause P(3) of Annexure 'A' of NIT.		
7.	Tender fee enclosed		
8.	Earnest money deposit (EMD) required as per clause K(1) of Annexure 'A' of NIT.		
9.	Complete breakup of all the constituent items with FANUC type number for CNC system, feed motors, spindle motor and drive modules shall be provided. Ordering brochure/catalogue should be attached required as per Annexure 'A'		
10.	Unpriced price bid obtained with technical bid without any deviation from BHEL's price bid format.		

Signature & Seal of Vendor