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HEEP, Hardwar - 249403
WORKS ENGG. & SERVICES DEPTT.
CNC DIVISION

Ref. No.: WEX/CNC/WC/EN/1-119

Annexure-A

RETROFITTING OF SKODA CNC HORIZONTAL RAM BORER PLAN No. 1-119, Block-3

Requirement:

Skoda CNC Horizontal Ram Borer W200 HB NC with SEA60 Rotary table from M/s. SKODA, Czech. with the following Specifications is to be retrofitted with Sinumerik 840D Solution line / Fanuc 31i system along with AC servomotors and AC servo drives for Horizontal traverse (X), Vertical traverse (Y), Spindle & Ram (Z), table Rotary (B) & Transverse (W) axis & DC spindle drive for Spindle. Spindle motor and all existing features and functions of the machine need to be retained as such.

Description of Machine:

1. SKODA MAKE Model W200 HB NC is a CNC Horizontal Boring Machine with four linear axes (X, Y, Z & W) and one rotary axis (B). Spindle speed is infinitely variable through DC motor/drive. Presently the machine is interfaced with SINUMERIK 850 CNC system, Siemens make DC servo Drives/Motors for feed and Siemens make DC drive for SKODA make DC Spindle motor.
2. The CNC system displays five axes viz. X, Y, Z, W & B. All axes are programmable axes.
3. Z axis (RAM) and Spindle extension are driven by common servo motor and have common position feedback device but both are otherwise independent axis in all aspects. Selection of RAM or Spindle feed is through a clutch. Existing method of RAM reference prior to spindle reference is to be adapted to the new CNC control as per the old CNC control. Z-axis position updating on CNC is common to both RAM and spindle feed depending on selection.

Broad Specifications:

CNC Horizontal Borer W200 HB NC from M/s. SKODA, Czech	
Spindle Diameter	200mm
Ram size	520mm*520mm
Spindle traverse (Z)	2000mm
Ram extension(Z)	1600mm
Head stock vertical traverse(Y)	5240mm
Column horizontal traverse(X)	15040mm
Table traverse (W axis)	2240mm
Spindle rpm	0.8 to 800
No. of gear ranges	4
Spindle extension & ram feed	1 to 3000mm/min
Headstock & Column feed	1 to 6000mm/min
Spindle extension & ram rapid	3000mm/min
Headstock & Column	6000mm/min
CNC System	SIEMENS Sinumerik 850 MEC
PLC	SIEMENS Simatic 5S, ZG 150;./U

Existing Feed Motors:

Axes	Motor Detail
X, Y, Z, W & B	SIEMENS MAKE DC MOTOR, 1HU3138-0AF01-ZA31 Z=G45 Y60 Stalled torque(Mo) 115Nm, 8.8 KW, 170V, 59 Amp, 1800rpm

Existing Spindle Motor:

	Motor Detail
Spindle	SKODA MAKE DC MOTOR 83KW, 0-1000-2485 rpm, Armature 440V/205A, Excitation 220V/4.7A

Existing Feed Drives:

Axes	Drive Detail
X, Y, Z, W & B	SIEMENS MAKE Servo Drive 6RA2674-6MV30-0 Input 190v, 143Amp, Output 200V, 175Amp

Existing Spindle Drive:

	Drive Detail
Spindle	SIEMENS MAKE SIMOREG DC DRIVE 6RA2777-6DU57-0

Existing Feedback System:

Axis	Position Feedback Device	Make of Scale /Encoder	Model	Type of EXE module	Type of Signal
X	Linear Scale	Heidenhain	LB326 (15040mm)	EXE 808	TTL
Y	Linear Scale	Heidenhain	LB326 (5240mm)	EXE 808	TTL
Z	Rotary Encoder	Heidenhain	ROD 426, 2000 ppr	NA	TTL
W	Linear Scale	Heidenhain	LB326 (2240mm)	EXE 808	TTL
B	Rotary Encoder	Heidenhain	ROD 700, 18000 ppr	EXE 602	TTL
Spindle	Rotary Encoder	Heidenhain	ROD 426, 1024 ppr	NA	TTL

Power Supply: 415V +/-10%, 50 Hz +/- 3%, 3 Phase, 250 KVA

A. SCOPE OF SUPPLY

S. No.	Item:-	Qty.	Accepted (Yes/No)	Deviation	Remarks
1.0	The CNC controller Sinumerik 840D solution line / Fanuc 31i with Windows operating system (latest version should be supplied). The System should have operator panel with TFT colour display (15 inch or more), Full Qwerty keyboard & Mouse/Trackball housed in a sliding tray, RS232, USB, Ethernet interface. Network ready with LAN and preinstalled system software (licenced) & other required software's (licenced) for operation of Horizontal Boring Machine. All standard features should be listed in technical offer. Also all available optional features of Sinumerik 840 D Solution line / Fanuc 31i CNC system as mentioned below should be necessarily offered and included in the offer.	01 Set.			Vendor to provide details & comply.
	The CNC System should have the following features:				
1.1	Access lock on operator panel.				Vendor to comply
1.2	Co-ordinate system transformation				Vendor to comply
1.3	Co-ordinate system rotation.				Vendor to comply
1.4	Look ahead of 70 blocks.				Vendor to comply
1.5	Helical/ Spline interpolation				Vendor to comply
1.6	Scaling				Vendor to comply
1.7	Mirroring				Vendor to comply
1.8	Rigid Tapping				Vendor to comply
1.9	All standard milling cycles.				Vendor to comply
1.10	Cylindrical interpolation.				Vendor to comply
1.11	Background editing.				Vendor to comply
1.12	Tool management				Vendor to comply
1.13	Resolution of 0.001 mm				Vendor to comply
1.14	Facility to store up to 999 subroutines & 9999 part programmes				Vendor to comply
1.15	Block search with calculations in automatic mode				Vendor to comply
1.16	Facility to store at least 20 zero offsets & 2 additive zero-offsets				Vendor to comply
1.17	It should be possible to store 128 tool offsets				Vendor to comply
1.18	Automatic tool offset loading facility				Vendor to comply
1.19	Display of NC & PLC Alarms				Vendor to comply
1.20	Part program renaming & copying facility				Vendor to comply

1.21	Power back-up of the CNC control for Automatic unattended shutdown in the case of power failure or if machine switches OFF.				Vendor to comply
1.22	Display of PLC program on Operator Panel with PLC program loaded on hard disk.(Required software should be loaded on hard disk)				Vendor to comply
1.23	Oriented Spindle stop				Vendor to comply
1.24	Measuring system & Bidirectional lead screw compensation				Vendor to comply
1.25	Machine control panel for Mode selection, Feed override, Spindle override, Feed ON/ OFF, Spindle OFF/ON, Cycle ON/ OFF, Axes Jogging option, Reset , Incremental Keys (1,10,100,1000 &10000 micron) and user definable keys.				Vendor to comply
1.26	Electronic Hand Held Unit Interface.				Vendor to comply
2.0	All interface connectors within the CNC cabinet and required for successful commissioning.	1 Set			Vendor to comply
3.0	PLC system (Input Card, Output Card & Interface Card) shall be supplied for distributed I/O's (Min 4 Stations) with approx. 240 nos. of Inputs, 104 nos. of Outputs are to be programmed maintaining the existing logic. In case the vendor perceives that more Inputs/ Outputs are required for completion for the work as per their designed and conceived electrical scheme, the same should be included in the scope of supply.	1 Set			Vendor to comply
3.1	13 Nos. Channel Relay boards each consisting of 8 relays preferably Phoenix contact/Omron make should be provided for driving the PLC outputs to the machine. All PLC outputs to be routed to the machine through these Relay boards.	1 Set			Vendor to comply
4.0	DC Regulated Power Supply 24V DC/40A & 24V DC /20A should be provided for CNC system, PLC I/O's and other auxiliaries. Independent power supplies for CNC system, PLC Inputs and PLC Outputs shall be provided. The power supply should be of Siemens/Phoenix contact/Schneider Electric make.	3 No. each type			Vendor to comply
5.0	All communication cables & license software for data back-up & restoration from machine to laptop to be provided.	1 set			Vendor to comply
6.0	16GB USB Pen drive	3 No.			Vendor to comply
7.0	AC SERVO MOTORS & AC DRIVE:-				
7.1	AC Servo motors (with brake) of Siemens 1FT6, 1FT7 / Fanuc ai series with suitable rating for Horizontal traverse (X axis), Vertical traverse (Y axis), Spindle & Ram traverse (Z axis), Table traverse (W axis) and Table rotary (B axis) should be provided. The AC Servo motors with encoder should have rating equal to or higher than the motor installed on machine. Torque and speed to match with the parameters of the existing system mentioned above and suitable to be interfaced with the CNC system offered. Any mechanical interfacing arrangement required to match the new motor with the existing mechanical drive system should be included in the offer. The type number / model of the motor selected	01Set.			Vendor to provide details & comply

	should be indicated in the offer and the technical leaflet should be enclosed.				
7.2	AC Servo drive of SINAMICS S120/FANUC ai series for Horizontal traverse (X axis), Vertical traverse (Y axis), Spindle & Ram traverse (Z axis), Table traverse (W axis) and Table rotary (B axis) should be provided. The rating of the drive modules selected should support the selected servo motors. The type number / model of the drive module selected should be indicated in the offer and the technical leaflet should be enclosed.	01 Set.			Vendor to provide details & comply
7.3	Control unit/Active Interface module/Active Line module/Power supply module/Sensor module etc. required to interface the servo motor/servo drive etc. to supplied CNC system (SINUMERIK 840D SL / FANUC 31i).	01 Set			Vendor to provide details & comply
7.4	Suitably rated Line filter with Choke for all 5 axes drives against 7.2 above.	01 Set			Vendor to provide details & comply
7.5	Motor Encoder cables of suitable length and type for all axes.	01 Set			Vendor to provide details & comply
7.6	Power cables of suitable length and type for all Servo motors.	01 Set.			Vendor to provide details & comply
7.7	Connecting cables, connectors, and Interface card etc. for interfacing the drives with supplied CNC system.	01 Set			Vendor to provide details & comply
7.8	Shield terminal plates and earthing schematic for all the modules	01 Set			Vendor to comply
8.0	SPINDLE DRIVE:-				
8.1	DC spindle drive (Siemens/Fanuc/Fuji/ABB/Yasakawa) of suitable rating for the existing spindle motor. The rating of the drive modules selected is such that it should match the torque and speed of existing spindle motor. The type number / model of the drive module selected should be indicated in the offer and the technical leaflet should be enclosed.	01 No.			Vendor to provide details & comply
8.2	The selected DC drive for spindle shall comply with the following specification/requirements: A. 4 Quadrant operation B. Infinitely variable speed control of motor C. Controllable Armature with closed loop control D. Controllable field with closed loop control E. Field weakening operation F. Feedback of speed control shall be with DC Tachogenerator G. Monitoring and display of faults & alarms for various faults related to Fuses, Field, Armature, Tacho, Motor Overload, Overvoltage, Overcurrent, Over speed etc. H. Overload and Short circuit protection I. Jog/Inch facility				Vendor to provide details & comply

	J. Contacts for zero speed, drive ready, drive fault, speed reached etc. K. Regenerative braking L. User friendly parameterization & fault diagnostic. M. Local mode operation: LOCAL/REMOTE switch, speed potentiometer & related controls for LOCAL mode operation of the drive & motor shall be provided in control panel.				
8.3	DC Tacho generator HUBNER MAKE Model- 2DP02LT-7 & Coupling suitable and matching to existing spindle motor.	01 No.			Vendor to comply
9.0	MEASURING SYSTEM:-				
9.1	LB382C scale of 15040 mm Measuring length complete with scanning head AE LB382C(1 Vss output) & Adapter cable of Heidenhain make with +/- 5 micron per meter accuracy grade for X axis .	01 No.			Vendor to provide details & comply
9.2	LB382C scale of 5240 mm Measuring length complete with scanning head AE LB382C(1 Vss output) & Adapter cable of Heidenhain make with +/- 5 micron per meter accuracy grade for Y axis .	01 No.			Vendor to provide details & comply
9.3	ROD486 (2048 pulses) encoder of Heidenhain make for Z axis .	01 No.			Vendor to provide details & comply
9.4	ROD880 (36000 pulses) encoder of Heidenhain make B axis .	01 No.			Vendor to provide details & comply
9.5	LB382C scale of 2240 mm Measuring Length complete with scanning head AE LB382C (1 Vss output) & Adapter cable of Heidenhain make with +/- 5 micron per meter accuracy grade for W axis .	01 No.			Vendor to provide details & comply
9.6	ROD 486 (1024 pulses) encoder of Heidenhain make for spindle position .	01 No.			Vendor to provide details & comply
9.7	Signal cables of required length for all axes & spindle, couplings & all necessary interfaces required to interface the position feedback with the offered CNC controller /Machine. All the measuring systems should be suitable for resolutions of 1µm (0.001mm) for CNC system.	01 Set.			Vendor to provide details & comply
10.0	Electrical cabinets of RITTAL / SCHNEIDER make having sufficient space to mount all the feed drives and spindle drive along with all switch gears of drives, PLC and other accessories. The panel shall be stand-alone floor mounting type. It should be a single unit with multiple doors (The present arrangement can be studied by the vendor). The components should only be mounted on the front side only; rear side of the panel should not have doors/ covers .Cable entry shall be from the bottom. Suitable eye hooks shall be provided for lifting the panel. Lighting with CFL lamps and one 5A, 3pin socket with on/off switch shall be provided in each section of electrical cabinet.	01 Set.			Vendor to comply

11.0	Siemens/ABB/ Schneider Electric make Main circuit breaker with rotary handle of suitable rating as per the new scheme (25% over-rated to maximum load) for switching on the power supply of panel & machine.	01 No.			Vendor to provide details & comply
12.0	Operator Control panel (Rittal / Schneider make) swivel type along with the horizontally extended & swivel type arm (similar to the existing type) incorporating the CNC Controller, MCP and selector switches for other functions as required. Front side should have handles for rotating by hand. The rear door should be on hinges with lock and not on screw mounted. One 220 VAC/ 5 Amp 3-pin service socket and switch. (Operation features as per para A.1.0.1)	01 No.			Vendor to comply
13.0	A hand held unit with selector switches for manual operations of spindle and all axes (jog and all incremental). All other existing operation to be incorporated in it.	01 No.			Vendor to comply
14.0	Complete switchgears of the machine including overloads, relays, contactors, MPCBs etc. for feed drives(X,Y,Z,B &W), Spindle drive, CNC and PLC, all accessories and to cover all other machine functionalities.	01 Set			Vendor to comply
15.0	Portable LED machine lamp with magnetic base operating at 24V DC, 20 Watts or more with 5 meter cable with conduit to be supplied.	02 No.			Vendor to comply
16.0	Machine illumination light (150W metal halide single ended / equivalent (Lumen) LED) mounted at the top of column for the full illumination on the working area of reputed make with well-guarded from chips and coolant.	01 Set.			Vendor to comply
17.0	2 number of Side mounted Air conditioners of ADVANCE make with each 1500 Watts capacity and proper drainage pipes for condensate are to be provided in Electrical Panels (each 1500Watt.) and 1 number AC of sufficient capacity for Operator control panel.	01 Set.			Vendor to provide details & comply
18.0	Mounting brackets, mounting plates ,intermediate flanges ,couplings & all necessary interface for mounting of CNC controller , motors , scales, transducers, external encoders of all axes/ spindle and other items required for ensuring accuracy and repeatability of the feed axes movement & spindle RPM should be included in the offer.	01 Set.			Vendor to comply
19.0	All the Mechanical & Electrical fittings, Flanges, pulleys, belts, Brackets etc. required for the retrofitting work	01Set.			Vendor to comply
20.0	Control cables , Power cables ,signal cables, field wiring and conduits(LAPP/IGUS make) of suitable length, connectors, Lugs, Terminal Blocks, ferrules etc. required to interface the CNC/PLC system with servomotors, Spindle motor , drives and field devices to successfully complete the project.	01Set.			Vendor to comply
21.0	Movable metallic drag chain (IGUS/KABEL SCHLAPP Make) sliding along the bed (X axis) of suitable size & length for cables & hydraulic pipes going to the machine.	01 Set.			Vendor to comply

22.0	Motor with gear box, electrical control box and Independent manual hanging pendant for up, down, forward & reverse movement for the existing Jib crane of 750 Kg capacity mounted on the column of the machine.	01 Set.			Vendor to provide details & comply
23.0	Program conversion software. (As per Para A.1.0.2) Vendor should provide program conversion software for automatic conversion of existing programs of the machine ensuring conversion of all basic codes (G,M,F,S,T,H codes etc.), coordinate values, text instructions, subprogram call, block structure and tool nos. of NC program. In case, conversion of any special function/feature/cycle/offset nos. is not possible with supplied software, necessary manual correction of existing programs (500 Nos.) shall be carried out by vendor for acceptance by BHEL. The software shall be installed on BHEL PC (Windows 7 onwards). Testing of software shall be done by converting 5 existing programs using supplied software and checking of converted programs for their correctness & suitability to new system.	01 Set			Vendor to provide details & comply
24.0	Telescopic covers of X-Axis (both left & right side) (Total 1 set as per drawing no. HW200-SP-10) and of Table (both front & back side) (Total 1 set as per drawing no. W200HB-SP-09). Drawings of telescopic covers are attached as Drawing-1 & 2 for both X-axis and Table. (Only Kabelschlepp or Surhenning are acceptable.) The drawings are indicative; vendor must take exact dimensions before ordering.	01 Set			Vendor to comply
24.1	High Pressure High Discharge Multistage Coolant Pump Motor. 3-phase 415vac/50Hz Inverter Grade Motor Mounting = Vertical Immersion Type, Immersion Depth = 750-900 mm, Discharge 140 LPM or more, Head = 30 Meters (Only Brinkmann, Grundfos & Rajamane makes are acceptable)	01 Set			Vendor to comply & provide details.
24.2	Hydraulic Power Pack Unit for Tool Clamp/Unclamp operation. Motor 3 Phase 415 VAC/50Hz, Operating Pressure = 200 Bar, Discharge 1.5 – 2.0 lit/min, Tank Capacity = 20-25 Litres as per attached Drawing 3 (Only Hawe, Rexroth, Parker & Yuken make Pump & Control Valves are acceptable, Only Siemens, ABB, Crompton Greaves make Motor is acceptable) . Vendors are advised to get approve hydraulic circuit diagram from BHEL before submitting their final offer. [Existing Tank dimension is 210mm(H) x 270mm(W) x 500mm (L)].	01 Set			Vendor to comply
24.3	New hose pipe for coolant system. Hose ID= 1 Inch (25.4mm) , Type SAE 100 R1 AT, 30 meter or more with end connections. (Only Parker and Gates make acceptable)	01 Set			Vendor to comply
24.4.1	New hose pipe for pneumatic system. Hose ID = 1/2 Inch (12.7mm), 30 meter or more with end connections. Operating pressure up to 20 Bar. (Only Parker and Gates make acceptable).	01 Set			Vendor to comply

24.4.2	New Coiled type Flexible compressed air hose pipe OD=8MM, 20 meters or more suitable for Operating pressure upto 20 Bar with end connections and manually operated hand gun for cleaning of Job.	01 Set			Vendor to comply
24.5	New Hydraulic hose pipe, ID = ¾ Inch (19mm), 2-wire braided type SAE 100 R2 AT for hydraulic system (Rotary table and Column Hydrostatic). 80 meter or more with end connections. (Only Parker and Gates make acceptable)	01 Set			Vendor to comply
24.6	Variable frequency drive (VFD) of suitable rating and make (Siemens/ABB/Fuji/Yashakawa make) for operation of Coolant pump motor supplied against point no. 24.1.	01 No.			Vendor to comply
24.7	Testing and Measuring instruments for maintenance a) AC/Dc true RMS clamp meter, FLUKE model 325 1 No. b) True RMS Multimeter, FLUKE model 179 1 No. c) Set of Taparia make torx , allen keys and screw drivers. 1 No. each d) Energy (Kwh) meter to be installed on electrical panel. 1 No.	01 Set			Vendor to comply
25.0	SPARES:				
25.1	AC servo drive (Motor module/Servo Amplifier) as offered against the point 7.2 above.	01No. Each			Vendor to comply
25.2	Active Interface module & Active Line module / Power supply module etc. as offered against the point 7.3 above.	01 No. Each			Vendor to comply
25.3	Control unit & Sensor module as offered against the point 7.3 above.	01 No. Each			Vendor to comply
25.4	Scanning Head AE LB382C as offered against the Point No 9.1 above.	02 No.			Vendor to comply

Para A.1.0.1

OPERATIONAL FEATURES:

S. No.	Item:-	Qty.	Accepted (Yes/No)	Deviation	Remarks
1.0	The Operator Control panel (Rittal / Schneider make) swivel type along with the horizontally extended & swivel type arm (similar to the existing type) on the operator platform moving along with the Y axis incorporating the CNC Controller should have the following operational features on the MCP along with existing features of machine control pendant.	01 Set			Vendor to provide details & comply
1.1	Axes selection keys (Separate for each axis.)				Vendor to comply
1.2	Directional keys + & - for axis movement in jog (Separate for each axis)				Vendor to comply
1.3	Rapid traverse key				Vendor to comply
1.4	Emergency stop				Vendor to comply
1.5	Reset key				Vendor to comply
1.6	Single block switch				Vendor to comply
1.7	Dry run switch.(Dry run freely executable during program run in automatic)				Vendor to comply
1.8	Coolant ON / OFF switch/key with regulator to control the flow (Coolant should be switch on/off during Auto/Jog mode irrespective of the definition in the part program)				Vendor to comply
1.9	Spindle continuous/inch selector switch				Vendor to comply
1.10	Spindle CW / CCW selector switch				Vendor to comply
1.11	Spindle orientation switch				Vendor to comply
1.12	Pushbutton / soft key for activating “Delete distance to go”				Vendor to comply
1.13	Chip conveyer forward / reverse push button				Vendor to comply
1.14	Mode selector switch				Vendor to comply
1.15	Feed override switch				Vendor to comply
1.16	Spindle override switch				Vendor to comply
1.17	Spindle gear selector switches with light				Vendor to comply
1.18	Machine illumination switch				Vendor to comply
1.19	Feed release switch				Vendor to comply
1.20	Pre selection of Ram or Spindle or Ram Reference				Vendor to comply
1.21	Green, Yellow & Red lights for machine in operation, failure & failure-stop				Vendor to comply

PROGRAMMING FEATURES:

S. No.	Item:-	Qty.	Accepted (Yes/No)	Deviation	Remarks
2.0	The CNC controller should have following programming features:	01 Set			Vendor to provide details & comply
2.1	ISO code (G&M mode type) programming.				Vendor to comply
2.2	Absolute/incremental programming.				Vendor to comply
2.3	Decimal point programming.				Vendor to comply
2.4	Linear & circular interpolation on both axes.				Vendor to comply
2.5	Programmable dwell.				Vendor to comply
2.6	Scaling, Mirroring, rotation & work offset transformation				Vendor to comply
2.7	Storage of user defined subroutine independent of the main program.				Vendor to comply
2.8	Variable parametric programming with mathematical functions including trigonometric & logic functions.				Vendor to comply
2.9	Programmable software limits.				Vendor to comply
2.10	Arc-programming with radius & end-point.				Vendor to comply
2.11	Conditional & unconditional jump.				Vendor to comply
2.12	Programmable tool offset.				Vendor to comply
2.13	Programmable zero offset.				Vendor to comply
2.14	Two Programmable additive zero offset.				Vendor to comply
2.15	Subroutine nesting up to 3 levels.				Vendor to comply
2.16	Programmable skip.				Vendor to comply
2.17	Facility of inclusion of message in the part programme.				Vendor to comply
2.18	Corner rounding & chamfering. (e.g. RND, CHF and ANG).				Vendor to comply
2.19	Canned cycles for:				
2.19.1	Drilling, deep drilling, Boring and Tapping (both solid and flexible) cycles				Vendor to comply
2.19.2	Pocket milling (rectangular and circular)				Vendor to comply
2.19.3	Thread whirling				Vendor to comply
2.19.4	Thread Milling				Vendor to comply
2.20	Tool nose radius compensation G41, G42				Vendor to comply

2.21	Coolant on/off should be programmable				Vendor to comply
2.22	Programming of primary, auxiliary & existing functions through M, S, T codes.				Vendor to comply
2.23	A cycle/program for determining work offset at any rotation of table angle with respect to a defined work offset on the job for machining of angular details on the job				Vendor to comply
2.24	Axis replacement with GEOAX command or equivalent for working with CNC Boring heads.				Vendor to comply
2.25	On screen graphic simulation. (Offline graphic simulation-fast simulation of tool movements without requirement of locking machine axes/independent of machine movements)				Vendor to comply
2.26	Programming with polar coordinates.				Vendor to comply
2.27	CYCLE800 or equivalent for smooth machining at any angle, with existing right angle head.				Vendor to comply
2.28	Any special function/cycle required for smooth functioning of attachments like CNC boring head. Universal milling head or right angle milling head.				Vendor to provide details & comply

Note: 1. CNC controller supplied as per Point 1.0 of SOS (Scope of Supply) must have all the programming / machining features required for milling operation even if not covered in Para A.1.0.1.

2. Complete breakup of all the constituent items with OEM type number for CNC system and drive modules shall be provided.

Para A.1.0.2

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

1.0 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. 1.1 and shall be tested & approved as mentioned at point no. 1.2.

1.1 Requirements:

- a) The conversion software shall be Windows7 based.
- b) 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.
- c) 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.
- d) 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.
- e) 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.
- f) The development of the conversion software shall be done either at site or off-site at the expense and suitability of the vendor.

1.2 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. 1.1 (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. 1.1.

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 point 1.1.c) by graphic simulation feature on the retrofitted CNC system.

2.0 DELIVERABLES:

- Installable CD

B. SCOPE OF WORK

S. No.	Activities	Qty.	Accepted (Yes/No)	Deviation	Remarks
1.0	Dismantling and removal of all drives(X,Y,Z,B,W & Spindle) , switch gears ,CNC, PLC, along with old cabling and wirings, cable trays etc. in the existing Electrical cabinet(s). Dismantling of X, Y, Z, B & W axis feed motors, all linear scales, all encoders and field devices.				Vendor to comply
2.0	Dismantling of old swivel type CNC operator Control panel and Installation of new swivel type CNC operator control panel.				Vendor to comply
3.0	Installation of all drives(X,Y,Z,B,W & Spindle) , PLC, CNC , switch gear , Main Rotary switch etc. in the New electrical cabinet(s) with required new cable trays , rails etc.(Switch gear and electrical system details as per PARA B.2.0.1)				Vendor to comply
4.0	Mounting and installation of feed motors (X, Y, Z, B & W), Incremental linear scales for X, Y, W axis, Incremental encoders for Z, B and spindle. All the linear scales should be provided with proper protecting covers to protect from chips, coolant, dust, oil leakages etc. Design, Modification / re-engineering, manufacturing of pulley, flanges and encoder couplings etc. for feed motors, position feedbacks 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 of the machine routed through the metallic caterpillar/ drag chain is to be replaced with the new cabling. Laying and routing of new conduits, cables from electrical cabinet to machine and CNC operator panel through new conduits/drag chain. Refurbishment and rewiring of all the terminal boards, Junction Boxes as per requirement.				Vendor to comply
6.0	Interfacing of new swivel type CNC operator control panel.				Vendor to comply
7.0	Interfacing of the existing coolant unit, Main hydraulic unit, chip conveyer & hydraulic unit of Table and Manual head with the new scheme.				Vendor to comply
8.0	Installation, Interfacing & commissioning of the CNC, PLC, Position feedback, spindle & Feed drives systems, Machine lights, portable lamps, all air conditioners.				Vendor to comply
9.0	Installation of jib crane motor with gear box, electrical control box and interfacing of manual hanging pendant on the existing beam.				Vendor to comply
10.0	Dismantling of old telescopic cover and installation of new telescopic cover for X axis and table supplied against point A24.0 of SOS. Onsite modification for fitting of telescopic cover as per end connection to be done by vendor.				Vendor to comply
11.0	Dismantling of old coolant pump motor and installation of new coolant pump motor along with drive supplied against point A 24.1of SOS.				Vendor to comply

12.0	Dismantling of old Hydraulic power pack unit and installation of new power pack unit supplied against point 24.2 of SOS. Existing tank dimensions are provided in clause 24.2 of SOS, Vendor to note that new power pack tank should be of nearly similar dimension for easy installation.				Vendor to comply
13.0	Dismantling of old hose pipe for coolant system and installation of new hose pipe supplied against point A 24.3 of SOS. To be fitted onsite as per requirement with end connections by vendor.				Vendor to comply
14.0	Dismantling of old hose pipe for pneumatic system and hydraulic system (Rotary table and Column Hydrostatic) and installation of new hose pipe supplied against point 24.4 and 24.5 of SOS. To be fitted onsite as per requirement in different lengths with end connection by vendor. Installation of coiled flexible compressed air hose pipe (supplied against clause 24.4.2) of SOS. The compressed air connection is to be taken from the existing compressed air point available at the Column using suitable T-Connector.				Vendor to comply
15.0	Modification & rewiring of PLC program as per the new CNC controller and implementation on machine. Existing electrical logic has to be retained in the new PLC Program. In case the vendor perceives that more Inputs/Outputs are required for completion for the work as per their designed and conceived electrical scheme, the same should be included in the scope of supply.				Vendor to comply
16.0	Laser calibration of X, Y, Z, W & B axes and generation of compensation data for pitch error and backlash from a reputed certified agency.				Vendor to comply
17.0	Prove-out of all the main functions (axes & spindle) including M19.				Vendor to comply
18.0	Prove-out of all existing auxiliary functions (Clamping system, Coolant system, hydraulics, lubrication, chip conveyer, Manual head etc.).				Vendor to comply
19.0	Prove-out of the network LAN function (Part program & parameter transfer).				Vendor to comply
20.0	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, Y, Z, W & B axes.				Vendor to comply

21.0	Prove out and demonstration of all existing machine functions and programming features of new CNC System including manual control of the machine. Siemens/Fanuc expert intervention will be ensured by the party wherever party itself is not able to meet the requirement related to application or program.				Vendor to comply
22.0	After successful demonstration of all the operational and programming features of the machine, subsequent to completion of total scope of work, one BHEL component (time cycle 3-4 days) shall be machined by BHEL under the supervision of vendor on the machine using either existing program or new program prepared by BHEL for new retrofitted system. Trouble-free running of the machine & CNC system in compliance to WO requirements during this period shall be taken into consideration for final acceptance.				Vendor to comply
23.0	Machine should have provision to switch from direct position feedback system to indirect position feedback system (built in motor encoder) through PLC/ Custom screen which is required for service purpose only.				Vendor to comply
24.0	a). Customized screen for displaying the status of all the axis unclamp, unbrake, slides lubrication & gear lubrication b). Customized screen for selection of Table On/OFF for both the axis of table (B & W) through soft keys. c). Customized screen for entering the manual feed rate for individual axis & spindle RPM.				Vendor to comply
25.0	Alarms and message should be displayed on CNC along with full remedial description through help guide loaded for system and user defined alarms & messages. PLC alarms & messages should include the device number and/or the operand.				Vendor to comply

PARA B. 2.0.1

SWITCH GEAR AND ELECTRICAL SYSTEM:

1. In the new electrical panel(s) all feed drives , spindle drive , PLC, all 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, and Relays etc.) should be of any one of the following makes: **Siemens, Schneider, Telemecanique or ABB.**
3. Operator control Panel should be of **Rittal** make with proper air conditioning and vermin proof.
4. The operator's 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. Long lasting nameplates shall be fixed on each component as well as on the walls of panels etc. to indicate permanent location of the component. 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 and 220 VAC, 5 A plug points on the operator Panel. & 15 A plug point on the operator platform.
8. Vendor should ensure proper earthing for the machine, Auxiliary motors and for supplied panels, equipment & accessories.

C.	<u>DOCUMENTATION:</u>	Qty.	Accepted (Yes/No)	Deviation	Remarks
	<u>Following documents shall be supplied with above supply</u>				
1.	Electrical circuit diagram	03 Set			Vendor to comply
2.	PLC printout in ladder form with symbols & comments in English	03 Set			Vendor to comply
3.	O&M manuals (hard copy) for CNC, PLC, Drives, Measuring systems & BOI.	01 set			Vendor to comply
4.	Programming manual (hard copy) for CNC system.	03 set			Vendor to comply
5.	Machine data (NC, PLC, Setting & Alarm texts), Ghost back up , Drives data , PLC program , Electrical circuit diagram & BOI (soft copy)	01 Set			Vendor to comply
6.	Details of all mechanical modifications & fittings with drawings.	03 Set			Vendor to comply
D.	<u>WARRANTY:</u>				
1.	Party shall stand warranty for all the supplied material and work for a period of one year from the date of successful commissioning of the material and final acceptance (clause –F)				Vendor to comply
E.	<u>TRAINING:</u>				
1.	Party shall impart training to BHEL staff for Application programming (1Person), System and drive maintenance (2 Persons) and operations (6 Persons) of the system at the Vendor / manufacturers works for 1 week in each area. Expenses for boarding & lodging of BHEL personnel during training shall be borne by BHEL.				Vendor to comply
F.	<u>FINAL ACCEPTANCE:</u>				
	<u>Final Acceptance shall be at HEEP, BHEL, Haridwar after:</u>				
1.	Upon completion of the scope of supply and scope of work at BHEL.				Vendor to comply
2.	Final acceptance shall include clearance of all pending issues related to the work contract.				Vendor to comply
3.	Successful Commissioning & Demonstration of various cycles and control functions as envisaged in the technical scope. Party shall demonstrate operation of all parts of the system supplied along with all the features as specified above.				Vendor to comply
4.	After settlement of all pending issues related to work and supply, a certificate for Completion of works in all respect shall be released within 15 days by Production and Maintenance personnel of BHEL which will be the referred document for Final Acceptance and final payment to the vendor.				Vendor to comply

G.	<u>DELIVERY: (IF DELIVERY PERIOD IS NOT OFFERED/ ACCEPTABLE, OFFER WILL NOT BE CONSIDERED FOR FURTHER PROCESSING)</u>				
1.	Material: Max. 6 months from the date of award of contract. Early delivery shall be acceptable subject to approval by BHEL.				Vendor to comply
2.	Work : Within 60 days from the date of release of machine for work.				Vendor to comply
H.	<u>LATE DELIVERY PENALTY (LD) CLAUSE:-</u>				
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				Vendor to comply
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.				Vendor to comply
3.	However total LD on account of clause H1 & H2 will be limited to 10% of work awarded value.				Vendor to comply
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.				Vendor to comply
I.	<u>PRE-DISPATCH INSPECTION</u>				
1.	Pre-dispatch inspection of all the items covered under Scope of Supply at Para (A) shall be carried out by BHEL at party's works.				Vendor to comply
2.	Supplier shall invite BHEL for carrying out pre- inspection of material under scope of supply at PARA (A) with 7 days prior notice				Vendor to comply
3.	Deputed BHEL persons shall do pre acceptance at vendor works and give despatch clearance.				Vendor to comply
4.	Expenses of Boarding and lodging of BHEL personnel during PDI shall be borne by BHEL.				Vendor to comply
J.	<u>SUBMISSION OF BILL OF MATERIAL (BOM)</u>				
1.	Before inviting BHEL for Pre-dispatch inspection, vendor shall submit to BHEL the Bill of				Vendor to comply

	Material (BOM) and proposed electrical drawing/ schematic for scrutiny and approval.				
K.	<u>EARNEST MONEY DEPOSIT (EMD):</u>				
1.	Vendors have to deposit Rs 2,00,000/- as the EMD. EMD may be deposited in cash (as permissible under Income tax Act), through pay order or demand draft in favor of Account officer, HEEP, BHEL, Hardwar payable at Haridwar only.				Vendor to comply
2.	EMD shall be converted to security deposit if the work is awarded.				Vendor to comply
3.	EMD of unsuccessful bidders shall be refunded back normally within fifteen days of acceptance of award of work by the successful bidder.				Vendor to comply
4.	EMD shall not carry any interest.				Vendor to comply
5.	EMD by bidder will be forfeited as per tender document, if				
5.1	After opening the tender, the tenderer revokes his tender within the validity period or increases his earlier quoted rates.				Vendor to comply
5.2	The tenderer does not commence the work within the period as per LOI/contract.				Vendor to comply
6.	Offers without EMD will be rejected and will not be considered for evaluation. However "MSE suppliers can avail the intended benefits only if they submit along with the offer, attested copies of either EM 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 at Annexure -1 where deemed validity of EM II certificate of five years has expired) applicable for the relevant financial year (latest audited). Date to be reckoned for determining the deemed validity will be the date of bid opening (Part 1 in case of two part bid). Non submission of such documents will lead to consideration of their bid at par with other bidders. No benefit shall be applicable for this enquiry if any deficiencies in the above required documents are not submitted before price bid opening. If the tender is to be submitted through e-procurement portal, then the above required documents are to be uploaded on the portal. Documents should be notarized or attested by a Gazetted officer. "				Vendor to comply
L.	<u>SECURITY DEPOSIT (SD):-</u>				
1.	Successful vendor shall deposit security. The rate of security deposit will be as below:				
1.1	For work Up to Rs. 10 Lakhs : <u>10% of work order value</u>				Vendor to comply
1.2	Above Rs. 10 Lakhs upto Rs. 50 Lakhs : <u>Rs.1 Lakh + 7.5% amount exceeding Rs. 10 Lakhs</u>				Vendor to comply

1.3	Above Rs. 50 Lakhs: Rs. 4 Lakhs + 5% amount exceeding Rs. 50 Lakhs				Vendor to comply
2.	The security deposit should be submitted before the start of work in the following forms:				
2.1	Cash (As permissible under the Income Tax Act)				Vendor to comply
2.2	Pay Order, Demand Draft in favour of Account officer, HEEP, BHEL, Hardwar payable at Haridwar				Vendor to comply
2.3	Local cheques of Scheduled Banks, subject to realization.				Vendor to comply
2.4	Bank Guarantee from Scheduled Banks/Public Financial Institution as defined in the companies Act. The Bank guarantee format should have the approval of BHEL.				Vendor to comply
3.	Security Deposit shall not carry any interest.				Vendor to comply
4.	EMD of successful tenderer can be converted and adjusted against the Security Deposit.				Vendor to comply
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				Vendor to comply
M	<u>Performance Bank Guarantee (PBG):</u>				
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.				Vendor to comply
2.	The PBG shall be submitted on a non-judicial stamp paper of value not less than Rs.100/- issued by any one of the nationalised banks.				Vendor to comply
N.	<u>PAYMENT TERMS:</u> (Note: No advance payment shall be made to the vendor.)				
1.	Part payment will be made after completion of following milestones:				
1.1	First payment of 80% of material cost along with 100% taxes & duties (Excise duty, CST/VAT as applicable) shall be payable after receipt of material at HEEP, BHEL, Hardwar. Vendor to ensure that all relevant documents are submitted.				Vendor to comply
1.2	Final payment of balance 20% of material cost, 100% of commissioning cost including service taxes as applicable amount and refund of 100% of the Security Deposit amount will be made after final acceptance, subject to submission of PBG as per Para 'M'				Vendor to comply
2.	All the payments shall be made through e-payment after submission of following documents along with first bill				

2.1	E-payment form duly filled (Form will be provided by BHEL)				Vendor to comply
2.2	Income tax exemption letter (if applicable)				Vendor to comply
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.				Vendor to comply
4.	Timely submission of CENVATABLE invoices along with necessary documents to enable availment of CENVAT (Excise duty, Service Tax & VAT) credit by BHEL. <u>Note: Wherever CENVAT credit cannot be availed within given time limit due to delay in submission of invoices or for any other reasons attributed to vendor, loss of such CENVAT credit will be recovered from such vendor.</u>				Vendor to comply
O	<u>Risk Purchase Clause:-</u>				
1.	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. If 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 comply
P.	<u>COMMERCIAL TERMS :-</u>				
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, transit insurance & Transportation charges etc. Applicable % of ED & Sales Tax, Installation & Commissioning Charges & service tax should be clearly indicated in attached Price bid format as per “ Annexure-B ”				Vendor to comply
2.	Validity of offer shall be for a minimum period of 120 days from the date of Tender Opening				Vendor to comply
3.	The material will be dispatched to Central Plant Stores, HEEP, BHEL, Haridwar with instructions to forward the same to Engineer (WEX/CNC-NTS), HEEP, BHEL, Haridwar-249403				Vendor to comply

Q.	<u>QUALIFYING CRITERIA:- Offer only from the vendors meeting the following conditions will be processed further.</u>				
1.	The average annual turnover during the last three Financial years ending March 31st 2015 should be at least Rs. 40.06 Lac. Audited balance sheets for the last three years should be submitted.				Vendor to comply
2.	In last 7 years upto 31-01-2016 party has been carried out: The Vendor must have successfully completed the similar projects during last seven years ending 31-01-2016 and these projects should fulfill either of the following: a. Three similar projects with each project costing not less than Rs. 53.41 Lacs. (Excluding of taxes & duties) or b. Two similar projects with each project costing not less than Rs. 66.77 Lacs. (Excluding of taxes & duties) or c. One similar project with project costing not less than Rs. 106.83 Lacs. (Excluding of taxes & duties) Similar project means retrofitting/reconditioning of a CNC Horizontal Borer / HMC with Siemens/Fanuc CNC control system and servo drives.				Vendor to comply
3.	The above retrofitted machines should be running satisfactorily for at least 6 months prior to 31-01-2016. Vendor to provide P.O. / W.O copies and commissioning / performance certificates / relevant MOM for satisfactory operation of the above retrofitted systems along with name, address & contact details of their customer. BHEL reserves the right to verify the information provided.				Vendor to comply
4.	In case bidder is the OEM of the machine (M/s. Skoda Machine tools, Czech Republic) then they will be considered qualified against clause Q without the need for submission of any documents related to clause Q.1 to Q.3				Vendor to comply
R.	<u>BHEL'S OBLIGATION:</u>				
1.	Existing electrical schematic of the machine shall be provided by BHEL to the vendor.				Vendor to comply

2.	Crane facility and lifting tackles like slings, rope, D-Shackles shall be made available while working in BHEL premises only.				Vendor to comply
3.	Facilities of minor welding, brazing, minor machining facility required for rectification/fitting of supplied material, subject to the extent available in BHEL, shall be provided in BHEL premises only.				Vendor to comply
4.	Any civil work required for the erection of panel shall be done by BHEL.				Vendor to comply
5.	Electricity, water & air shall be provided by BHEL at one point only.				Vendor to comply
6.	Consumables like lubricants, kerosene oil, cotton waste etc. will be supplied free of cost by BHEL during execution of works inside BHEL premises.				Vendor to comply
7.	The above requirements should be informed by the vendor in advance.				Vendor to comply
S.	<u>VENDORS OBLIGATION :-</u>				
1.	The vendor shall bring all types of hand tools including pneumatic/electrical drill machines, Laser equipment's, and grinders along with general purpose measuring instruments and testing equipment with them for successful commissioning of the machine & supplied system.				Vendor to comply
T.	<u>GENERAL CONDITIONS:-</u>				
1.	A point wise compliance statement shall be submitted by the party with reference to the above scope of supply against each clause/ sub-clause with relevant details & comments. Non-compliance to any of the clauses & quoting inadequate quantity can lead to dis-qualification of the offer.				Vendor to comply
2.	The Vendor is advised to inspect the machine prior to quoting to ascertain all the relevant details required for successful completion of the work.				Vendor to comply
3.	Complete specifications such as part no./Model/Type, power, torque, Rated and maximum RPMs, Rated and maximum currents of the motor and drive controllers shall be stated in the offer by the party. Ordering brochure/catalogue should be attached.				Vendor to comply
4.	Material to be used should be of reputed make or as per IS standards.				Vendor to comply
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 comply

6.	Vendor must compulsorily quote the quantity exactly as per the Scope of supply. No reduction in quantity as per the above Scope of supply is permissible.				Vendor to comply
7.	Vendor must quote the Spare parts separately along with the offer otherwise the offer will be rejected.				Vendor to comply
8.	If required, the vendor will have to come at BHEL, Haridwar for technical discussion for finalization of the tender.				Vendor to comply
9.	The offers of the bidders who are on the banned list as also the offer of the bidders, 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 comply
10.	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 be forwarded along with income tax clearance.				Vendor to comply
11.	The award of work will be made on basis of the total of Material cost, Spare Parts 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 comply
12.	Check List as per Annexure 'C' must be enclosed with techno-commercial bid				Vendor to comply
13.	The risk of delay/loss by post/courier rest with the bidder.				Vendor to comply
14.	Conditional tender is likely to be rejected.				Vendor to comply
15.	BHEL reserves the right to reject the lowest or any tender or accept any tender in full or in part without assigning any reasons whatsoever.				Vendor to comply
16.	If any information/documents submitted by the contractor are found false/fake at any stage, the tender will be cancelled and earnest money deposited shall be forfeited debarring from the future participation in tenders.				Vendor to comply
17.	In case more than one contractor quotes equal L-1 rates, lottery shall be drawn among L-1 parties to decide one L-1 party.				Vendor to comply
18.	Vendor must note that all the retrofitting and minor mechanical work in the scope of this tender, has to be carried out at BHEL works only. In any case, vendor will not be allowed to transport the complete machine or major assemblies outside BHEL works. Therefore, vendor is advised to inspect the machine before bidding to collect & ascertain all the relevant details required for successful completion of work.				Vendor to comply

U.	<u>PACKING :</u>				
1.	Supplier shall arrange for adequate protection and packing of the consignment so as to avoid loss and damage during transit and also take appropriate measures to prevent metal parts from rusting and corrosion during transit. Handling instructions shall be clearly printed /painted on the packages. Each package should carry a detailed packing slip. Supplier shall be responsible for any loss/damage during transit due to defective/inadequate packing				Vendor to comply
V.	<u>OFFER :-</u> The offer should be submitted in two parts and in following manner.				
1.	<u>Techno-commercial Bid :</u>				
1.1	The envelop shall contain the Techno-commercial Bid (ANNEXURE 'A') with technical details and commercial terms & conditions along with Unpriced priced bid as per ANNEXURE 'B' with clear undertaking that no deviation from BHEL's price bid format , 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, Tender fees, EMD, Check list as per ANNEXURE 'C' and all the documents related to clause Q (Demand draft for tender document cost shall also be accompanied in case tender documents are down loaded from BHEL website. Offers without the EMD and Tender Fee will not be considered except having valid NSIC certificate).				Vendor to comply
1.2	The envelop shall be super scribed with "Techno-Commercial Bid", Name of work & NIT No. and Date of opening				Vendor to comply
1.3	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.				Vendor to comply
1.4	The vendor must note that no prices are to be quoted / mentioned in the techno-commercial offer.				Vendor to comply
2.	<u>Price Bid :</u>				
2.1	The second envelope shall contain only the price bid with separate price for material & work on Price Bid Format as per <u>ANNEXURE 'B'</u> .				Vendor to comply
2.2	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 & stamped by the bidder at the bottom of each page.				Vendor to comply

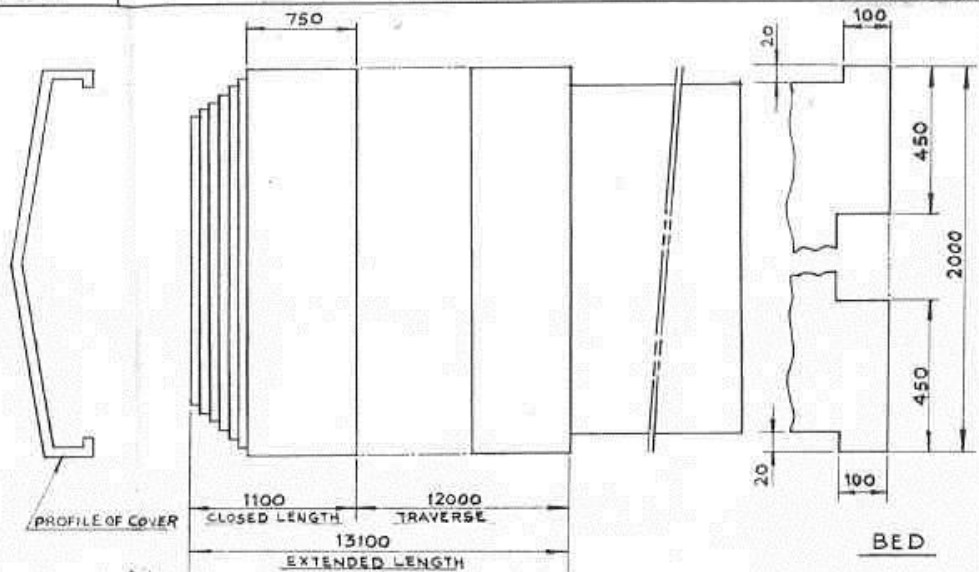
2.3	The envelope shall be sealed and super scribed with “Price Bid”, Name of work & NIT No.				Vendor to comply
2.4	Price bids of only techno commercially accepted vendors shall be opened.(In presence of available vendors at the time of opening)				Vendor to comply
2.5	Vendor should submit their best 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.				Information to Vendor
2.6	In case the date of tender opening happens to be a BHEL declared holiday, tenders shall be opened on the next working day.				Information to Vendor
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 HEEP, BHEL, Haridwar -249403 and it should also contain vender’s name & contact details.				Vendor to comply

DRAWING 01

FIRST ANGLE PROJECTION

(ALL DIMENSIONS ARE IN mm)

- 1- NO. OF COVERS - 18
- 2- CLOSED LENGTH - 1100
- 3- TRAVERSERS - 12000
- 4- EXTENDED LENGTH - 13100
- 5- MAX. WIDTH OF COVER NOT TO EXCEED - 750 mm.
- 6- MAX. TRAVERSING SPEED - 5-8 METER/min.
- 7- ALL TELESCOPIC COVERS SHOULD BE PROVIDED WITH POLYURETHANE WIPERS. THESE WIPERS SHOULD BE TEMPERATURE RESISTANT FROM 0°C TO 100°C AND SHOULD BE RESISTANT TO OIL, WATER AND COOLANT.
- 8- COVER SHOULD BE MADE OF 3 mm THICK OR 11 GAUGE (C.R.C.A) ANTI-RUST STEEL PLATES HAVING ZINC COATING.
- 9- COVERS SHOULD BE OF WALK ON TYPE
- 10- THE PROFILE OF COVER SHOULD BE AS PER DRG.
- 11- WORKING CONDITION OF M/C INVOLVES WATER, COOLANT AND OIL SPILLAGE ON THE COVERS. THE SEALING OF COVERS BETWEEN SLIDING MOVEMENT SHOULD BE ENSURED SUCH THAT THERE IS NO SPILLAGE OF ANY FOREIGN MATERIAL.
- 12- THE COVERS SHOULD BE SUFFICIENT RIGID AND SLIDABLE AND SHOULD HAVE ROLLERS WITH BALL BEARING/NEEDLE BEARINGS ETC FOR SMOOTH RUNNING.
- 13- ALL THE DIMENSIONS OF THE DRG. ARE APPROX. DIMENSIONS. THE SUPPLIER SHOULD NOTE DOWN THE FINAL DIMENSIONS FROM THE M/C ITSELF FOR PROPER FITTING ON THE M/C AND TO AVOID FITMENT AND RUNNING PROBLEM OF THE SITE FOR TROUBLE FREE RUN.
- 14- THE SUPPLIER SHALL ARRANGE TO FIT THE TELESCOPIC COVERS ON THE M/C WITHIN TWO WEEKS TIME.
- 15- PROFILE OF THE COVERS SHOULD BE PREFERABLY MANUFACTURED ON PROFILE FORMING M/C IF POSSIBLE. PL. CONFIRM.
- 16- THE TELESCOPIC COVERS OF LEFT SIDE AND RIGHT SIDE OF M/C ARE DIFFERENT DUE TO FITTING CONDITIONS.

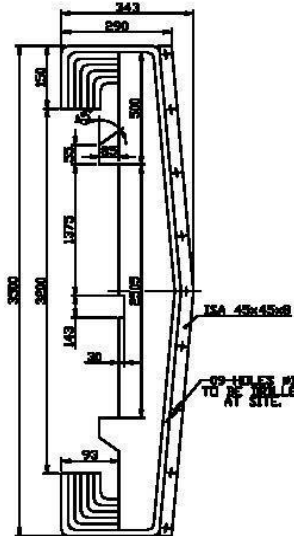
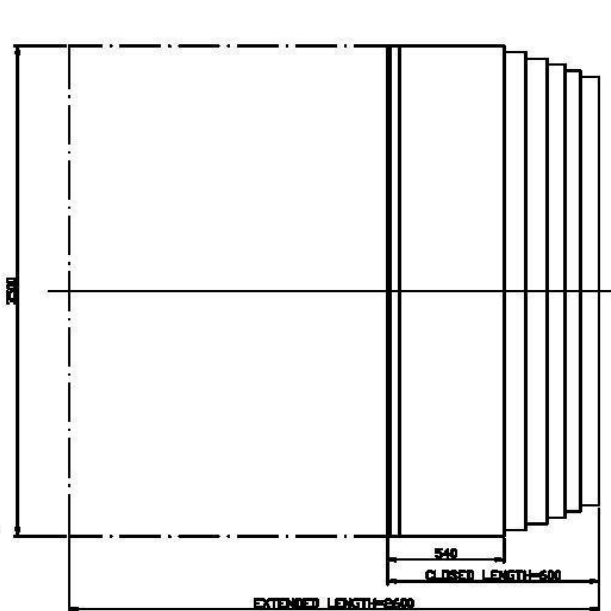


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 OR INDIRECTLY IN ANY WAY DETRIMENTAL TO THE INTEREST OF THE COMPANY.

REF. DRG NO. SIGN & DATE 557 00-07-003	GMS NO./GR. SP. NO. M/CG- V/C/M/F AA 0230208 WELDING-A/B/C/D-AA621104 GAS CUTTING--T3'AA0621101	STATUS OF DRG. NAME SIGN DATE	TYPE OF PRODUCT HORIZONTAL BORING M/C OR NAME OF CUSTOMER/ PROJECT Block - III	PLAN - 1-118 Block - III	MATERIAL CODE UNIT WEIGHT MATERIAL SPECN UNIT
DEPT. WEX CODE DESIGN		SCALE WEIGHT (Kg.)		REF. TO ASSY. DRG. DRAWING NO.	
TITLE TELESCOPIC COVER (LONGITUDINAL)		SHEET NO.		NO. OF SHEETS	

SIZE A3

DRAWING 02



1. NO. OF COVERS. - 08
2. CLOSED LENGTH. - 600
3. TRAVERSE. - 2000
4. BED WIDTH - 2500.
5. EXTENDED LENGTH. - 2600
6. MAX. TRAVERSING SPEED. -05M/MIN
7. ALL TELESCOPIC COVERS SHOULD BE PROVIDED WITH POLYURETHANE WIPERS. THESE WIPERS SHOULD BE TEMPERATURE RESISTANT FROM 0°C TO 100°C AND SHOULD BE RESISTANT TO OIL, WATER AND COOLANT.
8. COVERS SHOULD BE MADE OF 3 MM THICK OR GAUGE 11 ANTI-RUST STEEL PLATES HAVING ZINC COATING OF 0.5 MM MINIMUM.
9. COVERS SHOULD BE OF WALK ON TYPE.
10. THE COVERS SHOULD BE SUFFICIENT RIGID AND SLIDABLE AND SHOULD HAVE ROLLERS WITH BALL/NEEDLE BEARINGS ETC. FOR SMOOTH RUNNING.
11. THE PROFILE OF THE COVER SHOULD BE AS PER DRG.
12. THE WIPER LIPS SHOULD HAVE STEEL COVERING FOR PROTECTION AGAINST HOT CHIPS. THIS WIPER PROTECTION COVERING SHOULD BE FITTED BY SPOT WELDING TECHNIQUE. PLEASE CONFIRM.
13. WORKING CONDITION OF M/C INVOLVES WATER, COOLANT AND OIL SPILLAGE ON THE COVERS. THE SEALING OF COVERS BETWEEN SLIDING MOVEMENT SHOULD BE ENSURED SUCH THAT THERE IS NO SPILLAGE OF ANY FOREIGN MATERIAL.
14. ALL THE DIMENSIONS OF THE DRG. ARE APPROX. DIMENSIONS. THE SUPPLIER SHOULD NOTE DOWN THE FINAL DIMENSIONS FROM THE M/C HIMSELF FOR PROPER FITTING ON THE M/C AND TO AVOID FITMENT AND RUNNING PROBLEM OF THE SITE FOR TROUBLE FREE RUN.
15. THE SUPPLIER SHALL ARRANGE TO FIT THE TELESCOPIC COVERS ON THE M/C WITHIN TWO WEEKS TIME.
16. PROFILE OF THE COVERS SHOULD BE PREFERABLY MANUFACTURED ON PROFILE FORMING M/C IF POSSIBLE. PLEASE CONFIRM.
17. THE PROFILE OF THE FIRST COVER OF TELESCOPIC COVERS OF LEFT SIDE OF M/C AND RIGHT SIDE OF M/C ARE DIFFERENT DUE TO TYPICAL PROFILE OF DIFFERENT SUB-ASSEMBLIES FITTED ON THE M/C.

CONTRACT AND COMPANY
IT MUST BE THE RESPONSIBILITY OF THE SUPPLIER TO CHECK THE DIMENSIONS OF THE M/C AT THE SITE

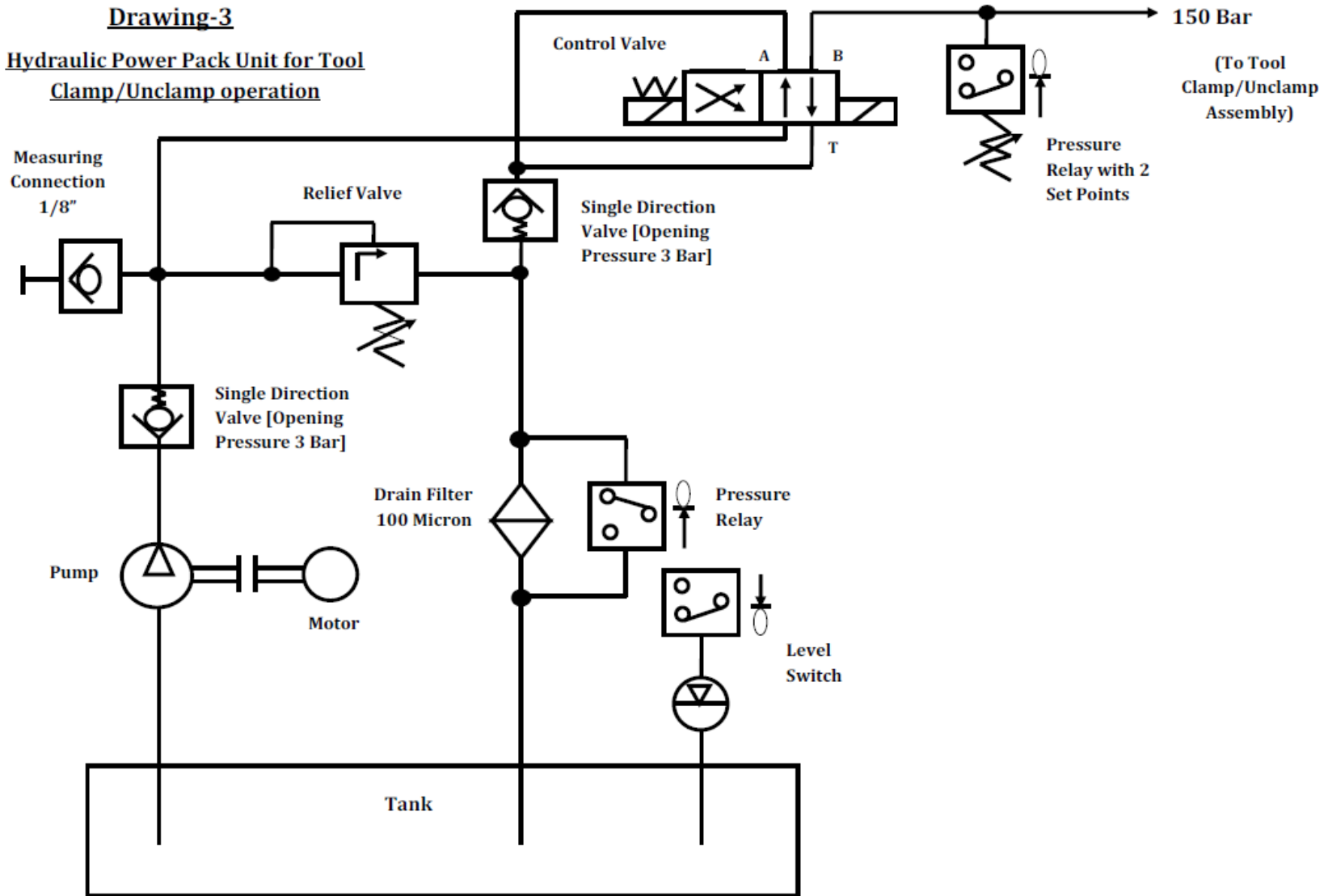
SAMPLE
REF. DRG. NO.

LA-01-01/573
ISSUE NO.

DRAWING 02

CSOM NO.		TYPE OF PRODUCT		HORZ. BORING M/C.		PLAN NO.-2-473	
NAME		NAME OF CUSTOMER/ PROJECT		BLICK-III		NAME	
SIGN		SIGN		SIGN		DATE	
DATE		DATE		DATE		DATE	
GRADE OF UNTOL DML:-				M/C - X/P/M/AA 0230208			
WELDING - A/B/C/D - AA821104				GAS CUTTING - T3/AA0821101			
REX DATE		ALTERED CHECKED		REX DATE		ALTERED CHECKED	
TITLE		SCALE		WEIGHT(Kg)		REF. TO ASSY. DRG.	
TELESCOPIC COVER		N.T.S.		-		-	
(FRONT TABLE)						00	
						SHEET NO. 01 INCL. OF SHEETS 01	
						SIZE A2	

Drawing-3
Hydraulic Power Pack Unit for Tool
Clamp/Unclamp operation



Existing Tank Dimensions are

H=210mm , W=270mm , L=500mm

ANNEXURE-'1'

Certificate by Chartered Accountant on Letter Head

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 Books of account that the investment of the company as per the latest audited financial year..... 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 Ministry of small scale Industries vide its notification No. S.O. 1722(E) Dtd. October 5 , 2006):
Rs. Lacs
- 2. For Service Enterprises:** Investment in equipments (i.e. 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 MSMED Act, 2006):
Rs. Lacs

(Strike off whichever is not applicable)

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

Or

The company has graduated from its original capacity (Micro/ small) (Strike off whichever is not applicable) and date of graduation of such enterprise from its original capacity is..... (dd/mm/yy) which is within the period of 3 years from the date of graduation of such enterprise from its original category as notified vide S. O. No. 3322 (E) dated 01.11.2013 published in the gazette notification dated 04.11.2013 by ministry if MSME.

Date:
(Signature)
Name-
Membership No.-
Seal of Chartered accountant

Vendor's Signature & Seal

ANNEXURE 'B'

PRICE BID FORMAT

Name of Work: RETROFITTING OF SKODA CNC HORIZONTAL RAM BORER PLAN No. 1-119, Block-3

NIT NO.: 20150059/WEX/CNC/WC/1-119

DATE: 01/03/2016

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	Set	01		%	%	%	Rs.	
2.	Spares	Set	01		%	%	%	Rs.	
3	Installation & Commissioning	Set	01				%	Rs.	
	TOTAL COST								Rs.

Note: Bidder may please note that all relevant columns should be duly filled up and in case any column is left blank it will be considered as inclusive in the prices quoted. All pages to be duly signed and stamped by authorised signatory.

Signature & Seal of Vendor

ANNEXURE 'C'**CHECK LIST FOR TENDER****NIT No.: 20150059/WEX/CNC/WC/1-119****Date:01/03/2016**

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

Sl. No.	Particulars	Yes/No	Remarks
1.	Sealed (Techno-commercial Bid+ Unpriced price bid) as per clause V-1-i of Annexure 'A' of NIT		
2.	Sealed Price Bid as per Annexure 'B' of NIT		
3.	Compliance to all the points of the Annexure 'A' of NIT		
4.	Audited balance sheets for the last three Financial years ending March 31st 2015 should be submitted required as per Clause Q-1 of Annexure 'A' of NIT.		
5.	P.O./ W.O copies and commissioning / performance certificates / relevant MOM required as per Clause Q-3 of Annexure 'A' of NIT		
6.	Name, address & contact details of their customer required as per Clause Q-3 of Annexure 'A' of NIT		
7.	Tender Fee enclosed.		
8.	Earnest Money Deposit (EMD) required as per Clause K of Annexure 'A' of NIT		
9.	Complete specifications such as part no. / Model / type of Siemens /Fanuc system, drive and servo motors, power, torque, rated and max RPMs, Rated and max. Currents of servo motors. Ordering brochure/catalogue should be attached required as per Clause T-4 of Annexure 'A' of NIT.		

(Signature & Seal of Vendor)