

Annexure-A

**SCOPE OF SUPPLY & WORK FOR RETROFITTING OF SERVO DRIVES & MOTORS
ON CNC LATHE STC-25, PLAN NO. 1-226 IN BL-1**

Purpose: Servo Motors and Drives installed on the machine shall be replaced and commissioned with existing CNC controllers as per following scope of supply and work. Existing CNC Controllers and Motor & Drives used on CNC lathe is SINUMERIK System-3 CNC controller, DC Servo feed Drives & Motors and AC Servo Drive & 1FT5 Servo motor for spindle (tool Drive).

| S.No. | Description | Qty. | Compliance | Remarks |
|------------|--|-------|------------|-------------------|
| 1.0 | Drive and Motor Package for CNC Lathe 1-226: | | | Vendor to confirm |
| 1.1 | Servo Motors for Tool Drive and axes Drives. a) Tool Drive: Servo motor, 4.71KW, 22.5Nm, 2000rpm, 1FT7086-5AC71-1DA2-Z, Z=N05. b) X-Axis: Servo motor with brake, Mn=7.6Nm, 3000rpm, 1FT7064-5AF71-1DB1. c) Z-Axis: Servo motor without brake, Mn=16.9NM, 2000RPM, 1FT7084-5AC71-1DA0. | 1 set | | |
| 1.2 | SINAMICS S120, Servo Drive Package of suitable rating with regenerative braking for Spindle, X and Z axes Motors having following components. a) Control Unit CU320 with PROFIBUS Interface, Compact Flash Card & BOP. b) Active Line Module (16KW) along with Filter & Choke modules. c) Single Motor Module (9A) for X Axis motor. d) Single Motor Module (9A) for Z Axis motor. e) Single Motor Module (18A) for tool Drive motor. f) Terminal Module TM31 with digital and analog I/O interfaces for two Motors i.e. X & Z Axes. g) Terminal Module TM41 with digital and analog I/O interface plus incremental encoder (TTL) simulation for tool Drive motor. h) Drive Cliq cables of suitable length for complete Servo Drive package. | 1 set | | |
| 1.3 | Motor power & signal (Drive Cliq) cables, preassembled, 6FX8002 series of following lengths. a) Cable length for tool Drive motor 10.0 Meter . a) Cable length for X Axis motor 10.0 Meter . b) Cable length for Z Axis motor 6.0 Meter . | 1 set | | |
| 1.4 | Sitop DC supply 24VDC, 10 A, for Servo Drive. | 1no. | | |
| 1.5 | Semiconductor fuses with base of suitable rating for Active Line Module. | 1set | | |
| 1.6 | Line Contactor, 16KW/400V, coil voltage 24VDC, for Active Line Module. | 1no. | | |

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| 1.7 | DIN rails, terminal blocks, ferrules, lugs, wires, cables, cable ties, fasteners and other accessories required for mounting and installation of Servo Drive modules in existing electrical cabinet. | 1 set | |
| 1.8 | Mounting Flanges and Timing Pulleys with belt for spindle, X & Z axes Motors as per requirement. | 1set | |
| 1.9 | Heavy Duty Drag chain/cable carrier with detachable cover (TEKNIC/LAPP/IGUS/ SUR-HANNIG make) dimension: Length-1400MM, Width-200MM, Bending Radius-150MM. | 1 no. | |
| 2.0 | Spare Items: | | |
| 2.1 | Control Unit CU320 with PROFIBUS Interface, Compact Flash Card & BOP. | 1set | |
| 2.2 | Active Line Module (16KW). | 1no. | |
| 2.3 | Active Line Module (55KW). | 1no. | |
| 2.4 | Single Motor Module (9A). | 1no. | |
| 2.5 | Single Motor Module (18A). | 1no. | |
| 2.6 | Terminal Modules TM31. | 1no. | |
| 2.7 | Terminal Modules TM41. | 1no. | |
| 2.8 | Sensor Module SMC 20. | 1no. | |
| 2.9 | Drive Cliq cable as per clause 1.2h. | 1no. | |
| 2.10 | Motor power cable (with brake) & signal cable of 10.0 Meter length each. | 1set | |
| 2.11 | Sitop DC supply 24VDC, 10 A. | 1no. | |
| 2.12 | Semiconductor fuses with base of same rating as in clause no. 1.5. | 1set | |
| 3.0 | Documents / Software: | | |
| 3.1 | Commissioning & Diagnostic Manual for Sinamics S120 Servo Drives & Motors, in hard and soft copy. | 2set | |
| 3.2 | Commissioning software on CD/DVD/USB and cable for communication with Sinamics S120. | 1set | |
| 4.0 | Scope of work: | | |
| 4.1 | Dismantling of existing Servo Drives, Motors and cables on the machines. | | |
| 4.2 | Mounting of Servo Motors and cable laying on the machines. Mounting flanges, couplings, timing pulleys & belts shall be designed and supplied by the vendor. | | |
| 4.3 | Mounting and installation of Servo Drives in the existing electrical cabinets on the machines. All accessories required for mounting and installation of Servo Drive modules shall be supplied by the vendor. | | |
| 4.4 | Interfacing of Servo Drive modules with existing CNC controllers. All the accessories required for connection and interfacing of Servo Drives shall be supplied by the vendor. | | |
| 4.5 | Commissioning of Servo Drives and tuning of Motors with the Drives under load conditions. | | |

Vendor to confirm

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| 4.6 | On load running trials of Servo Drives and Motors in manual and automatic mode through existing CNC controllers. | |
| 5.0 | Training: | |
| 5.1 | Vendor shall arrange minimum three days training for two BHEL Engineers in Commissioning & Maintenance of the SINEMICS S120 Servo Drive at the training center of Drive manufacturer. Lodging & boarding shall be borne by BHEL. | |
| 6.0 | Warranty: | |
| 6.1 | Warranty for the supplied material shall be for a period of 18 months from the date of delivery or 12 months from the date of successful commissioning & final acceptance whichever is later. | |
| 7.0 | Final Acceptance: | |
| 7.1 | Final Acceptance shall be at HEEP, BHEL, Haridwar after: a) Completion of the scope of supply and scope of work at BHEL as in clause no. 1-5 above . b) Successful Commissioning & Demonstration of various functions as per scope of supply & work. | |
| 8.0 | Delivery: (if delivery period is not offered/ accepted, offer will not be considered for further processing) | |
| 8.1 | Material: Max. 5 months from the date of award of contract. Early delivery shall be acceptable subject to approval by BHEL. | |
| 8.2 | Work : Within 25 days from the date of release of machine for work. | |
| 9.0 | Late Delivery Penalty (LD) Clause: | |
| 9.1 | Late delivery @ 0.5% per week subject to a maximum of 10% of the material cost including spare parts shall be applicable for delay in deliveries. In case of any change to order value, the LD should be 0.5% of the revised material cost per week of delay or part thereof subject to a maximum of 10% of the revised material cost. | Vendor to confirm |
| 9.2 | In case of delays in commissioning after handing over the machine as per clause 8.2 penalty @ 0.5% per week subject to a max. of 10% of the Commissioning Charges shall be applicable for delay beyond scheduled completion of work for reasons attributed to the party. Net delay for the purpose of calculating late commissioning will be considered as the delay in work completion. | |
| 9.3 | 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, at least 7 days in advance. | |
| 10.0 | Pre-Dispatch Inspection: | |
| 10.1 | Pre-dispatch inspection of all the items covered under Scope of Supply clause 1, 2 & 3 shall be carried out by BHEL at party's works. | |
| 10.2 | Supplier shall invite BHEL for carrying out pre- dispatch inspection. | |
| 10.3 | Before inviting BHEL for pre dispatch inspection vender will submit Bill of material as per Scope of Supply and copy of electrical drawing/ schematic of the machines. | |
| 10.4 | Deputed BHEL persons shall do pre acceptance at vendor works and give dispatch clearance. | |

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| 10.5 | Expenses of Boarding and lodging of BHEL personnel during PDI shall be borne by BHEL. | |
| 11.0 | Earnest Money Deposit (EMD): | |
| 11.1 | Vendors have to deposit Rs 60,000/- 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, Haridwar payable at Haridwar only. | |
| 11.2 | EMD shall be converted to security deposit if the work is awarded. | |
| 11.3 | EMD of unsuccessful venders shall be refunded back normally within fifteen days of acceptance of award of work by the successful vender. | |
| 11.4 | EMD shall not carry any interest. | |
| 11.5 | EMD by vender will be forfeited as per tender document, if a) After opening the tender, the tenderer revokes his tender within the validity period or increases his quoted rates. b) The tenderer does not commence the work within the period as per LOI/contract. | |
| 11.6 | Offers without EMD will be rejected and will not be considered for evaluation. However valid NSIC certificate may be considered subject to receipt of notarized copy / copy attested by gazetted officer & verification. | |
| 12.0 | Security Deposit (SD): | |
| 12.1 | 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. | |
| 12.2 | The security deposit should be submitted before the start of work in the following forms: i) Cash (As permissible under the Income Tax Act) ii) Pay Order / Demand Draft in favour of Account officer, HEEP, BHEL, Haridwar payable at Haridwar iii) Local cheques of Scheduled Banks, subject to realization. iv) 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 confirm |
| 12.3 | Security Deposit shall not carry any interest. | |
| 12.4 | EMD of successful tenderer can be converted and adjusted against the Security Deposit. | |
| 12.5 | 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. | |
| 13.0 | Performance Bank Guarantee (PBG): | |
| 13.1 | Vendor shall be required to submit a performance bank guarantee (PBG) for 10% of the total work order value which shall be valid for total warranty period as per clause no. 6.1 after final acceptance of machines. | |
| 13.2 | 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. | |

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| 14.0 | Payment Terms: (Note: No advance payment shall be made to the vendor.) | |
| 14.1 | Part payment will be made after completion of following milestones: i) 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, Haridwar and inspection (in presence of vendor) & acceptance of material. Vendor has to ensure that all relevant documents are submitted. ii) Final payment of balance 20% of material cost, 100% of commissioning cost including service taxes as applicable and refund of 100% of the Security Deposit amount will be made after final acceptance, subject to submission of PBG as per clause no. 13.0 above. | |
| 14.2 | 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). | |
| 14.3 | 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. | |
| 14.4 | Timely submission of CENVATABLE invoices along with necessary documents for availing CENVAT (Excise duty, Service Tax & VAT) credit by BHEL. 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. | |
| 15.0 | Risk Purchase Clause : | |
| 15.1 | 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. | |
| 15.2 | 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. | |
| 16.0 | Vendor's Obligation: | |
| 16.1 | 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. | |
| 17.0 | Commercial Terms: | |
| 17.1 | 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, freight & insurance. Installation & Commissioning Charges, applicable % of ED, VAT, Sales Tax, and Service tax should be clearly indicated in attached price bid format as per annexure-B. | |
| 17.2 | Validity of offer shall be for a minimum period of 120 days from the date of Tender Opening. | |

Vendor
to
confirm

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| 17.3 | The material will be dispatched to Central Plant Stores, HEEP, BHEL, Haridwar, with instructions to forward the same to Sr. Engineer (WEX-CNC- Bl. 1), HEEP, BHEL, Haridwar. | |
| 18.0 | BHEL's Obligation: | |
| 18.1 | Existing electrical schematic of the machine shall be provided by BHEL to the vendor. | |
| 18.2 | Crane facility and lifting tackles like slings, D-Shackles shall be made available while working in BHEL premises only. | |
| 18.3 | 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. | |
| 18.4 | Any civil work required for the erection of panel shall be done by BHEL. | |
| 18.5 | Electricity, water & air shall be provided by BHEL at one point only. | |
| 18.6 | The above requirements should be informed by the vendor in advance. | |
| 18.7 | Consumables like lubricants, kerosene oil, cotton waste etc. will be provided by BHEL during execution of works inside BHEL premises only. | |
| 19.0 | General Conditions: | |
| 19.1 | 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. | |
| 19.2 | The Vendor is advised to inspect the machine prior to quoting to ascertain all the relevant details required for successful completion of the work. Any part not mentioned above but required for retrofitting and running of the machine shall be in the scope of the vendor. | |
| 19.3 | 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 confirm |
| 19.4 | The award of work will be made on basis of the total of Material cost (including spares), Commissioning charges, P & F, freight and insurance i.e. " Cost to BHEL ". | |
| 19.5 | 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. | |
| 19.6 | RULES AND REGULATIONS OF THE CENTRAL/STATE GOVERNMENT: In the event of award of 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. | |
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| 19.7 | BHEL reserves the right to cancel the tender at any stage of tendering till signing of agreement without assigning any reason(s). The tender cost in that event shall not be refunded. | | |
| 19.8 | If any information/documents submitted by the vender are found false/fake at any stage, the tender submitted by the vender will be cancelled and earnest money deposited shall be forfeited debarring from the future participation in tenders. | | |
| 19.9 | In case more than one party quotes equal L-1 rates, lottery shall be drawn among L-1 parties to decide one L-1 party. | | |
| 19.10 | Conditional tender is likely to be rejected. | | |
| 19.11 | The risk of delay/loss of tender documents by post/courier rest with the bidder. | | |
| 19.12 | 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. | | |
| 20.0 | Offer: The offer should be submitted in two parts and in following manner. | | |
| 20.1 | Techno-commercial Bid : i) The first 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 and all the documents related to clause 22 (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).ii) The envelop shall be super scribed with "Techno-Commercial Bid", Name of work, NIT No. and Date of opening.iii) The vendor must note that no prices are to be quoted/ mentioned in the techno-commercial offer. | | Vendor to confirm |
| 20.2 | Price Bid : i) The second envelope shall contain only the price bid with separate price for material, spare, Installation & Commissioning & applicable taxes & duties on Price Bid Format only as per ANNEXURE 'B'. 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 & stamped by the bidder at the bottom of the page. iii) The envelope shall be sealed and super scribed with "Price Bid", Name of work & NIT No. | | |
| 20.3 | Price bids of techno commercially accepted vendors shall be opened in presence of available vendors. Date and time will be intimated to the qualified vendors. | | |
| 20.4 | Both the envelopes shall be kept in another sealed cover. The cover shall be super-scribed with "Tender for (name of work), NIT No. & due date" and shall be submitted in the "Tender Box, placed at Tender Room, at IVth Floor, Main Administrative Building, HEEP, BHEL, Haridwar -249403 Uttarakhand". It should also have the Bidder's name and contact address. | | |
| 21.0 | Packing: | | |

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| 21.1 | 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. | | |
| 21.2 | Supplier shall be responsible for any loss/damage during transit due to defective/inadequate packing. | | |
| 22.0 | Pre-Qualifying Conditions: (Offer only from the venders meeting the following conditions will be processed further.) | | |
| 22.1 | Average Annual financial turnover during the last 3 years, ending 31st March 2015, should be at least Rs. 7.0 Lacs. Vendor should submit Audited balance sheets for the last three years. | | |
| 22.2 | The Vendor must have successfully completed the similar projects during last seven years ending 31st March 2015 and these projects should fulfill either of the following:a) Three similar projects with each project costing not less than Rs. 8.5 Lacs. orb) Two similar projects with each project costing not less than Rs. 10.5 Lacs.orc) One similar project with project costing not less than Rs. 17.0 Lacs.Definition of Similar project: Retrofitting of a CNC machine with Sinamics S120 Servo Drives and 1FT/1PH Motors. | | Vendor to confirm |
| 22.3 | The above retrofitted machines should be running satisfactorily for at least 6 months prior to NIT date. 6 Month period will be calculated on the basis of commissioning certificate/MOM. 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. | | |

ANNEXURE 'B'
PRICE BID FORMAT

Name of Work : RETROFITTING OF SERVO DRIVES & MOTORS ON CNC LATHE STC-25, PLAN NO. 1-226 IN BL. 1
 NIT No. & Date : 20150003/WEX/CNC/RETRO/NIT/1-226 Dt. 02/06/2015
 Bidder's Offer No. & Date :

| Sl. No. | Description of item | Unit | Qty | Basic Rate (in ₹) | Excise Duty (in %) | VAT/CST (In %) (VAT with FORM-17 or CST with C-FORM) | Service Tax (In %) | Value (in ₹) | |
|---------|--|------|-----|-------------------|--------------------|--|--------------------|--------------|----------|
| 1a | Material | Set | 01 | ₹ | % | % | | ₹ | |
| 1b | Spares | Set | 01 | ₹ | % | % | | ₹ | |
| 2 | Installation & Commissioning | Set | 01 | | | | % | ₹ | |
| | Packing & Forwarding charges in both % and Lamp sum (in ₹) | | | | | | | % | ₹ |
| | Transportation Charges F.O.R. BHEL, Haridwar (in ₹) | | | | | | | | ₹ |
| | Transit insurance charges, in both percentage and Lamp sum (in ₹) from Dispatching station to BHEL, Haridwar | | | | | | | % | ₹ |
| | TOTAL COST (| | | | | | |) | ₹ |

Signature & Seal of Vendor

ANNEXURE 'C'

CHECK LIST FOR TENDER

NIT No. & Date: 20150003/WEX/CNC/RETRO/NIT/1-226 Dt. 02/06/2015

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 as per clause 20.1 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 years should be submitted required as per Clause 22.1 of Annexure 'A' of NIT. | | |
| 5. | P.O. copies and commissioning/ Performance certificates required as per Clause 22.3 of Annexure 'A' of NIT | | |
| 6. | Name, address & contact details of their customer required as per Clause 22.3 of Annexure 'A' of NIT | | |
| 7. | Tender Fee enclosed. | | |
| 8. | Earnest Money Deposit (EMD) required as per Clause 11 of Annexure 'A' of NIT | | |
| 9. | Un-priced price bid obtained with technical bid without any deviation from BHEL's price bid format. | | |

(Signature & Seal of Vendor)

Details of Existing Servo drive System of STC-25

The existing system details are as follows

1. System Siemens Sinumerik 3T
2. Motors:
 - a) Feed X: Siemens 1HU3074-0AC01-Z, 167V, 2000rpm, 12.5A, 1.8 Kw,
Mo= 7 Nm, 9.7A; Mmax.=8Nm, 11A, with brake, Tacho 1HU1053 20MV/min; Load 13kOhm, Brake- EBD 2.0B, 24 V , 23W
1 Nos.
 - b) Feed Z: Siemens 1HU3078-0AC01, 183V, 2000rpm, 11.5A, 1.8 Kw,
Mo= 14 Nm, 17A; Mmax.=15.5Nm, 19A; Tacho 1HU1053 20MV/min; Load 13kOhm,
1 Nos.
 - c) Tool Drive Motor 1FT5076-0AF01-Z, Mo- 20Nm, Io- 42.5 A, 4.4 KW, 26A, 3000rpm, Ui- 150 Star, Tacho- 1FU1050-6AF 13.3 MVmin. ,
ROD 320B, 2500rpm
3. Drives : Siemens 6RB2030-2E600
4. Both the axes are belt driven.
5. Signals from CNC Control to drive:
 - a) Axis enable common for both axes
 - b) Individual Drive enable for X & Z
 - c) Analog reference +/- 10VDC to both the Axes.
6. Signals from drive to CNC/PLC:
 - a) Drive ready O/P going to NC, PLC & brake release coil.