Annexure – 'A' to NIT	
SCOPE OF SUPPLY FOR RETROFITTING OF	
CNC GAS/PLASMA CUTTING MACHINE, PLAN NO. 0-339, BLOCK-2	
Presently installed machine description:	
Technical data & specifications:	
Type	Phoenix
Working Width	Track guage-4000mm (for one torch)
Working Length	Length of the track-25000mm
Temperature of the workshop	0-40 deg Celsius
Fuel Gas	Acetylene, propane, etc.
Single torch suspension	
Speed of lifting	20-60mm/sec
Ignition voltage	7000V
Power of lifting motor	25.1W/60W
Thickness of plate to be gas cut (Material - Mild Steel)	6-300mm
Thickness of plate to be plasma cut (Material- Stainless Steel)	5-80mm
Longitudinal direction	
Driving type	Driven on two side
Rapid moving speed	24000mm/min
Transverse direction	
One of the transverse carraige is the driving carraige, the other carraiges can move in the same direction by the driving of the steel belt.	
Range of moving speed	0-24000mm/min
Rapid moving speed	24000mm/min
Total weight of the machine	
About 2 Tonn.	
Other description are as mentioned in the requirements:	

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S. N.	Description		Compliance / Remarks
1	**CNC CONTROL SYSTEM & ACCESSORIES:**	**Qty.**	
1.1	CNC Controller: Industrial PC Windows based, Min. 80 GB Hard Disk , Min.1.5GHz Processor , RS-232C & USB ports for entering the program & taking back up of the program, LCD/TFT colour display (minimum 12" inch) etc. Make: BURNY / MESSER / HYPERTHERM (latest model).	1 set	
1.2	NC Front Panel Key Board.	1 no	
1.3	Switch PCB having sufficient no. of PBs & Switches for controller of two no. Gas and one no. Plasma burners.	1 set	
1.4	PLC Controller having minimum 16 I/16O (inbuilt or with Interface I/O Board).	1 set	
1.5	Motion Control System for 3 Axis (inbuilt or with MCC board).	1 set	
1.6	Switched Mode Power Supply of sufficient rating for the CNC controller.	1 set	
1.7	24 VDC Power Supply of sufficient rating for external I/Os.	1 no	
1.8	Uninterrupted Power Supply (UPS) of sufficient rating (min. 750VA) for the CNC controller.	1 no	
1.9	Software and Communication cable required for commissioning of CNC Controller.	1 set	
2	**FEATURES OF CNC CONTROL IN ADDITION TO ITS STANDARD FEATURES:**		
2.1	Kerf Compensation		
2.2	Automatic Calculation of Cutting Parameters		
2.3	Automatic Reversing from the end point to the start point		
2.4	Nesting and Mirror imaging feature		
2.5	Real Time Simulation and Motion Display for the Programmed piece.		
2.6	Off-part lead-in or Cut recovery feature		
2.7	Repositioning feature		
2.8	Variable and settable Feed rate.		
2.9	Settable Pre-heat and Pierce times.		
2.10	Co-ordinate system rotation and transformation.		
2.11	Automatic Plate alignment in the CNC control by defining end points on the plate.		
2.12	The CNC should be able to access and execute programs in the ESSI format, generated by the existing AutoCAD programming station, without any modification.		
2.13	Chain cutting & grid cutting feature for continuous cutting of different components / shapes without the need of repetitive piercing.		

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S. N.	Description		Compliance / Remarks
2.14	Manual mode operation for Jogging of the axes and other manual machine functions.		
2.15	EMI / RFI suppression to protect the control from electrical noise emanating from Welding & Plasma cutting.		
2.16	The CNC control should have in-built diagnostic facility having Alarm Text & Help for trouble-shooting and Status display of all PLC Inputs / Outputs and Axis service.		
2.17	Cutting speed required: 100mm/min for maximum sheet thickness 300 mm, 800 mm/min for 4 mm sheet thickness. Direct Piercing should be possible upto 100 mm. Available maximum Gas pressures are as following: i) Cutting Oxygen pressure : 7.0 bar ii) Heat Oxygen pressure : 2.5 bar iii) Acetylene pressure : 0.3 bar.		
3	**MOTORS, DRIVES, CABLES & OTHER ACCESSORIES:**	**QTY**	
3.1	AC Servomotor minimum 1.5KW, 4Nm/3000 rpm, SIEMENS / FAGOR / BALDOR / YASKAWA make for X, Y1 & Y2 Axes to replace existing BALDOR make motors BSM80B-175AA.	3 no	
3.2	AC Servo Drives of sufficient ratings, SIEMENS / FAGOR / BALDOR / YASKAWA make, including power and controller modules for X, Y1 & Y2 Axes. Y1 & Y2 axes are to be configured as Gantry axes.	1 set	
3.3	Power and Signal Cables of sufficient length (Minimum 10 meters) for all the motors.	1 set	
3.4	Software and Communication cable required for commissioning of Servo Drives.	1 set	
3.5	Electrical switch gear such as main disconnect switch, fuses, contactors, relays, MCBs, transformers and other accessories of suitable rating and reputed make required for retrofitting the machine.	1 set	
3.6	Limit Switches, Proximity Switches and other sensors of reputed make required for axes over travel & other safety interlocks.	1 set	
4	**MECHANICAL ITEMS:**		
4.1	Gear Boxes (NEUGART make or any other reputed make), Mounting Flanges, Couplings and Driving pinions of reputed make for all the motors.	1 set	
4.2	Roller Guides & Bearings of reputed make as per DIN standards to replace the existing roller guides of all Axes.	1 set	
4.3	Guiding Rod & Linear Bearing for slide of Transverse Axis and Steel Band & Locking arrangement for Burners.	1 set	

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S. N.	Description		Compliance / Remarks
5	**TORCH HEIGHT CONTROL, TORCHES & ASSOCIATED PARTS:**	QTY	
5.1	Torch Lifter Assembly (BURNEY/MESSER/HYPERTHERM make) for Oxy fuel Torch, consisting of Torch Suspension & Height Control unit, with Capacitive height sensing and motor/drive for up/down movement (300 mm Lift).	2 no	
5.2	Torch Lifter (BURNEY/MESSER/HYPERTHERM make) for Plasma Torch, consisting of Torch Suspension & Height Control unit, Initial height sensing unit with Anti-collision protection and motor/drive for up/down (200 mm Lift).	1 no	
5.3	Single Torch Burner Assembly (BURNEY/MESSER/TANAKA make) with non-return valve/flash back arrestors suitable for cutting of 6 -300 mm thick plates with DA/BMCG/CNG having auto ignition system & manual regulators for individual gases. The torch should be able to provide best finish at required speed & other cutting parameters.	2 set	
5.4	Gas Manifold with Solenoid valves of REXROTH/FESTO/AVCON/MESSER make (having 24 VAC/DC actuation) with associated elements like non-return valves / flash back arrestors etc., for Fuel Gas, Heating and Cutting Oxygen for two nos. Oxy fuel Torches.	1 set	
5.5	Manual Pressure Regulator Valves and Pressure Dial Indicators of reputed make for Fuel Gas, Heating and Cutting Oxygen as per DIN/IS Standards.	1 set	
5.6	Fire Proof Gas Hoses & Pipes of Sufficient Length (40 meters approx.) of MESSER/ GENERICO/ ESAB/ GATES make for Fuel Gas, Heating and Cutting Oxygen as per DIN 8541 Standards.	1 set	
6	**OPERATOR PANEL, CABLES & OTHER ACCESSORIES:**	**QTY**	
6.1	Operator panel of reputed make and appropriate size to accommodate CNC Control, LCD Display, I/O Board, Motion Control Board, Power Supply, NC Front Panel Key Board, Switches / PBs and other operator components.	1 no	
6.2	Electrical Cabinet of reputed make and appropriate size to accommodate all Switchgear such as Contactors, Relays, Mains ON/OFF Switch, MCS/Overloads, Fuses, Control Transformers, drives and all other elements.	1 no	
6.3	The electrical cabinet should be fitted with suitable cooling fan, light & 220 VAC/5A socket.	1 set	
6.4	Air conditioner of sufficient rating, RITTAL/ADVANCE/CHILTON make for Operator Panel.	1 no	
6.5	Suitable interface cables, conduits, connectors for the machine. Cables of flexible type (LAPP/SAB/IGUS make), conduits to be fire resistant and of reputed make. Mating Connectors, Cable Terminations and cable accessories with Identification Tags / nos. clearly mentioned for all the items.	1set	
6.6	Heavy duty drag chain system (moulded non metallic with end brackets) of TEKNIC/LAPP/IGUS/SUR-HENNIG make for hoses and cables for longitudinal movement. Approximate Size: 15000x155x70mm.	1 no.	

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S. N.	Description		Compliance / Remarks
7	**SPARE PARTS:(To be quoted separately)**	**QTY**	
7.1	Complete CNC Control with Mother Board, CPU, RAM & SMPS, Hard Drive, Motion Control Board, Interface I/O Board, Display, NC Key Board and Switch PCB complete with Push Buttons & Switches.	1 set	
7.2	24 VDC Power Supply for external I/Os	1 set	
7.3	External I/O Modules, one no. of each type	1 set	
7.4	Servo Drive Modules, one no. of each type	1 set	
7.5	Servo Motor one no. of each type	1 set	
7.6	Pre assembled Power & Encoder feedback cable from Servo Drive to Motor	1 set	
7.7	Torch Lifter including height control and up/down motor for Oxy fuel Torch as 5.1 above.	1 set	
7.8	Torch Lifter including height control and up/down motor for Plasma Torch as 5.2 above.	1 set	
7.9	Solenoid valves 2 nos. of each type	1 set	
7.10	Non return valves / Flash back arresters two nos. of each type.	1 set	
7.11	Driving pinions for all the three motors.	1 set	
8	**MANUALS & DOCUMENTS:**	**QTY**	
8.1	Operation manual of CNC Control.	3 no.	
8.2	Maintenance & Service Manual of CNC Control.	3 no.	
8.3	Maintenance & Service manual of Servo Drives.	3 no.	
8.4	Electrical schematic and wiring diagram of the machine with proper identification and cross reference of all the elements.	3 no.	
8.5	List of Inputs, Outputs, Alarms/Messages showing detailed cause and remedy.	3 no.	
8.6	Drawings of all mechanical modifications, mountings, flanges & couplings.	3 no.	
8.7	Service catalogues of all bought-out items.	3 no.	
8.8	Set of all the above documentation on CD/DVD ROM.	3 no.	
8.9	Recovery/installation CD/DVD/Complete back-up of CNC Control on Hard Disk.	1 no	

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S. N.	Description	Compliance / Remarks
9	**SCOPE OF WORK, COMMISSIONING & PROVE OUT:**	
9.1	Dismantling of existing CNC control, Drives, Motors, cables and other elements.	
9.2	Mounting & installation of new Operator Panel along with CNC System, Keyboard and other Operator Controls.	
9.3	Modification and manufacturing of couplings and flanges and mounting & installation of all the Motors.	
9.4	Installation and commissioning of new CNC Controller, Motors, drives and complete material as per scope of supply in the existing electrical Cabinet.	
9.5	The design, modification and supply of the Driving Pinion as required shall be in the scope of the Vendor.	
9.6	Rail and Rack levelling and alignment for X, Y1 and Y2-axis shall be in the scope of the Vendor.	
9.7	Refurbishment and rewiring of connectors & Junction Boxes as per requirement.	
9.8	Start-up and commissioning of new CNC system, Drives and Motors.	
9.9	Interfacing of existing Plasma Cutting System with the machine control and its prove out with Plasma Cutting.	
9.10	Positional Accuracies, repeatability and prove out of all machine functions as per BHEL / National / DIN Standards.	
9.11	Trial of the machine with cutting of different type of shapes & programs, Job Prove out and handing over.	
10	**TRAINING:**	
10.1	One week training for one BHEL Engineer in the field of maintenance of CNC Control & Drives at Manufacturer/supplier's works. Expenses of Boarding and lodging shall be borne by BHEL.	
10.2	Training of BHEL personnel in the area of Maintenance and Operation, after retrofitting and commissioning of the machine at BHEL works.	
11	**GUARANTEE:**	
11.1	All the material supplied and work done shall be under guarantee for a period of 12 months from the date of commissioning and acceptance of the machine.	
12	**VENDOR'S OBLIGATION:**	
12.1	The vendor shall bring all tools and testing equipment with them for retrofitting, commissioning and prove out of supplied system.	

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S. N.	Description	Compliance / Remarks
13	**QUALIFYING CONDITIONS: Offer of the vendors meeting following criteria would only be considered.**	
13.1	The Vendor must be a reputed machine tool manufacturer or retrofitter of heavy & super heavy machine tools with min. 5 years experience, from the date of tender notice, in this field. List of the customers along with respective contacting executive officers addresses (including phone No. / E-mail ID) for whom machines were retrofitted shall be enclosed with the offer.	
13.2	The average annual turnover during the last three years ending March 31st 2011 should be at least **₹ 50 Lac.** Audited balance sheets for the last three years should be submitted.	
13.3	Banker's Solvency from any nationalized / scheduled bank valid on the date of opening of tender.	
13.4	Experience of Manufacturing or Retrofitting of similar CNC gas cutting machine with BURNEY, MESSER or HYPERTHERM control in last five years. The machine should be running satisfactorily for at least one year. 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.	
14	**LATE DELIVERY PENALTY (LDP) CLAUSE:**	
14.1	LDP @ ½% per week subject to a max. of 5% of the order value shall be applicable for delay in deliveries.	
14.2	Late delivery 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.	
15	**PRE-DISPATCH INSPECTION:**	
15.1	Pre-dispatch inspection of all the items covered under Scope of Supply (from para 1 to 8) shall be carried out by BHEL at party's works.	
15.2	Supplier shall invite BHEL for carrying out pre-dispatch inspection.	
15.3	Deputed BHEL persons shall do pre-dispatch acceptance at vendor works and give despatch clearance.	
15.4	Expenses of Boarding and lodging of BHEL personnel during PDI shall be borne by BHEL.	
15.5	Before inviting BHEL for Pre-dispatch inspection, vendor shall submit to BHEL the Bill of Material (BOM) for scrutiny.	

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S. N.	Description	Compliance / Remarks
16	**EARNEST MONEY DEPOSIT (EMD):**	
16.1	Vendors have to deposit the EMD of Rs 1,50,000/- . EMD may be deposited in cash, through pay order in favour of BHEL, Hardwar or through demand draft only.	
16.2	EMD of successful bidder shall be converted to security deposit.	
16.3	EMD of unsuccessful bidders shall be refunded back normally within fifteen days of acceptance of award of work by the successful bidder.	
16.4	EMD shall not carry any interest.	
16.5	EMD by bidder will be forfeited as per tender document, if	
16.5.1	After opening the tender, the tenderer revokes his tender within the validity period or increases his earlier quoted rates	
16.5.2	The tenderer does not commence the work within the period as per LOI/contract.	
17	**SECURITY DEPOSIT (SD):**	
17.1	Successful vendor shall deposit security. The rate of security deposit will be as below:	
17.1.1	• For work Up to ₹ 10 Lakhs : 10% of work order value	
17.1.2	• Above ₹ 10 Lakhs upto ₹ 50 Lakhs : ₹ 1 Lakh + 7.5% amount exceeding ₹ 10 Lakhs	
17.1.3	• Above ₹ 50 Lakhs: ₹ 4 Lakhs + 5% amount exceeding ₹ 50 Lakhs	
17.2	The security deposit should be submitted before the start of work in the following forms:	
17.2.1	i) Cash (As permissible under the Income Tax Act)	
17.2.2	ii) Pay Order, Demand Draft in favour of BHEL, Hardwar	
17.2.3	iii) Local cheques of Scheduled Banks, subject to realization.	
17.2.4	iv) Bank Guarantee from Scheduled Banks/Public Financial Institution as defined in the companies Act.	
17.3	Security Deposit shall not carry any interest.	
17.4	EMD of successful tenderer can be converted and adjusted against the Security Deposit.	
17.5	100% of the Security Deposit amount shall be refunded to the vendor after post commissioning successful running of the machine for one month. **SD shall be released after the submission of Performance Bank Guarantee (PBG) by the vendor**	

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S. N.	Description	Compliance / Remarks
18	**PAYMENT TERMS:**	
18.1	No advance payment shall be made to the vendor.	
18.2	Part payment will be made after completion of following milestones	
18.2.1	80% of material cost along with 100% taxes & duties shall be payable after acceptance of material at BHEL	
18.2.2	Balance 20% of material cost, 100% of commissioning cost and refund of 100% of the Security Deposit amount will be made after post commissioning successful running of the machine for one month, subjected to submission of PBG as per **"Para 19".**	
18.3	All the payments shall be made through e-payment after submission of following documents along with first bill.	
18.3.1	E-payment form duly filled (Form will be provided by BHEL)	
18.3.2	Income tax exemption letter(if applicable)	
18.3.3	Excise duty & CST/VAT, Packing & Forwarding, Freight & Insurance 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.	
19	**PERFORMANCE BANK GUARANTY (PBG):**	
19.1	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 commissioning.	
19.2	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.	
20	**GENERAL CONDITIONS:**	
20.1	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.	
20.2	The Vendor is advised to inspect system & site to ascertain all the relevant details required for successful completion of the work.	
20.3	The proposed electrical schematic for the machine shall be provided by the vendor before start of work.	
20.4	Complete specifications such as part no., Model, Type etc of drive controllers shall be stated in the offer by the party. Ordering brochure/catalogue should be attached.	

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S. N.	Description	Compliance / Remarks
20.5	Vendor must quote the quantity exactly as per the Scope of supply. No reduction in quantity as per the above Scope of supply is permissible.	
20.6	Vendor must quote the Spare parts individually priced along with the offer.	
20.7	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	
20.8	The award of works will be made on the basis of the total of material cost (including spare parts) & commissioning charges.	
20.9	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.	
20.10	Check List as per **Annexure 'C'** must be enclosed with techno-commercial bid.	
21	**BHEL'S OBLIGATION:**	
21.1	Existing electrical schematic of the machine shall be provided by BHEL to the vendor.	
21.2	Crane facility and lifting tackles like slings, rope, D-Shackles shall be provided.	
21.3	Any machining facility required for rectification/fitting of supplied material, subject to the extent available in BHEL, shall be provided.	
21.4	Any civil work required for the erection of panel shall be done by BHEL.	
21.5	Electricity, water, fasteners, welding sets, Gas cutting equipment, general purpose welding rods and holders required during commissioning shall be provided.	
22	**OFFER : The offer should be submitted in two parts and in following manner.**	
22.1	**Techno-commercial Bid** :	
22.1.1	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 Regn. No., TIN No., CST No., Experience Certificates, Audited Balance Sheet of last 3 years, **EMD** and Check List as per **ANNEXURE 'C'**	
22.1.2	The envelop shall be super scribed with "Techno-Commercial Bid", Name of work & NIT No.	
22.1.3	Point-wise compliance of this scope of supply and work is to be given by vendors while submitting their techno-commercial offer.	

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S. N.	Description	Compliance / Remarks
22.2	**Price Bid :**	
22.2.1	The second envelope shall contain only the price bid with separate price for material & work on Price Bid Format as per **ANNEXURE 'B'**.	
22.2.2	Any other information in the price bid shall not be considered and the quotation is likely to be rejected. Price bid document shall be signed by the bidder at the bottom of the page.	
22.2.3	The envelope shall be sealed and super scribed with "Price Bid", Name of work & NIT No.	
22.2.4	Price bids of techno commercially accepted vendors shall be opened.	
22.3	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 addressed to **Prafulla Chandra Sinha, Sr. Engineer (WEX-MCR), Block-6 Annexe, HEEP, BHEL, Haridwar-249403 and it should also contain Bidder address.**	
23	**COMMERCIAL TERMS:**	
23.1	Prices shall be quoted on "Firm Price" basis only. The prices should be on F.O.R BHEL, Haridwar basis inclusive of Packing & Forwarding, transit insurance & Transportation charges. Applicable % of ED & Sales Tax, Installation/ Commissioning Charges & Service Tax should be clearly indicated in attached Price bid format as per **"Annexure B"**	
23.2	Validity of offer shall be for a minimum period of 120 days from the date of Tender Opening.	
23.3	Freight & transit insurance charges from Dispatching station to BHEL, Haridwar shall be borne by the party.	
23.4	The material will be dispatched to Central Plant Stores, HEEP, BHEL, Haridwar with instructions to forward the same to **Sr.Engr. (WEX-MCR), Block-6 Annexe, HEEP, BHEL, Haridwar-249403**	
24	**PACKING:**	
24.1	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.	
24.2	Supplier shall be responsible for any loss/damage during transit due to defective/inadequate packing.	

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S. N.	Description	Compliance / Remarks
25	**ACCEPTANCE:**	
25.1	Party shall demonstrate operation of all parts of the system supplied along with all the features as specified above. Final Acceptance shall be at BHEL, Hardwar after successful commissioning, testing of the supplied system for all operations.	
26	**DELIVERY:**	
26.1	**Material :** Max. 5 months from the date of award of contract. Early delivery shall be acceptable.	
26.2	**Work : ** Within **30** days from the date of release of machine for work.	

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