



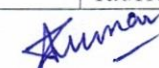
BHARAT HEAVY ELECTRICAL LIMITED
CENTRAL FOUNDRY FORGE PLANT

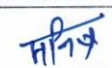
ELECTRIC ARC FURNACE (30T)

Spec. No.: FF:30T EAF:01
Rev.: 01

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Sl. No.		Supplier's Comment
1.0	<u>Introduction</u> This Specification governs Technical requirements of 30T Electric Arc Furnace complete in all respect with Mechanical, Electrical and Peripheral Equipment/System along with state of art Technical Knowhow/backup support for its Operation and Maintenance. The EAF shall be capable of making 30T Liquid Metal (Tap Weight) for primary melting operation of Ferrous, Non Ferrous, Plain Carbon, Alloy Steel, Super critical and AISC grade Heat. All documents and drawings shall be provided in English language only. Any communication with BHEL shall also be done in English Language only.	
2.0	<u>Qualification for bidders</u> Vendors Confirming all the clause of <u>Annexure-A</u> (Separately attached) shall only qualify for bidding of this 30T Electric Arc Furnace.	
3.0	<u>Site visit at CFFP, BHEL</u> The vendors shall visit the site to get a firsthand idea about the location, application and layout of the site. The vendor must ensure that they have clear understanding about the site conditions before participation. The successful vendor is required to measure all necessary dimensions at site before starting of the 30T EAF design / manufacturing.	
4.0	<u>Scope of supply</u>	
4.1	Scope of supply covers Design, Manufacture, Supply, Testing, Erection & Commissioning of one number 30T EAF as per ➤ Technical Parameter (Ref. Clause 7) ➤ Mechanical System and Equipments (Ref. Clause 10) ➤ Electrical System and Equipments (Ref. Clause 11) ➤ Peripheral Equipments (Ref. Clause 8) The 30T EAF plant should be supplied complete in all respects. The items not covered in this specification but considered necessary for completeness of equipment and to attain desired features and performance by the shall be quoted by the vendor separately in attached <u>Annexure 1</u> in his offer and should be the part of scope of supply.	
4.2	The vendor shall study technical specification of each item, the total system, technical data and other details thoroughly regarding the efficiency and workability of the furnace to be supplied and will bear full responsibility for the guaranteed operation in respect of performance, protection and smooth reliable working.	
4.3	All parts of Furnace are to be arranged for convenient operation, inspection, lubrication and ease of replacement with minimum down time.	


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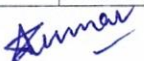
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4.4	All sundry erection materials required for installation and connection of all equipment will be in the scope of supply.	
4.5	Furnace and its components offered shall confirm to BIS or equivalent international specifications to suit Indian standards with various working environment.	
4.6	All the equipment and related activities shall comply with statutory requirements of all applicable regulations at works.	
5.0	<u>Safety Requirements</u> All safety regulations as applicable with Factory Acts, Indian Electricity rules etc. as prevailing in the country shall be taken into consideration and provided for. All the equipment shall be complete with approved safety devices and provision for safe access of personnel to and around equipment for operation and maintenance functions. These shall include not only elements of machinery but also the additional covers, guard, cross overs, stairways, platform, handrails etc.	
6.0	<u>Painting</u> Electric Arc Furnace and its allied/peripheral equipment shall be thoroughly cleaned of dirt and then shall be painted with 2 coats of red oxide primer followed by 1 coat of synthetic enamel paint. The surface preparation procedure shall be done as per IS:1477, Part-I, Clause 6.2.1.2 or equivalent DIN Standard St-3 or as per paint manufacturer's recommendations	
7.0	<u>Technical Parameter</u>	
7.1	Tap weight from EAF	30T
7.2	Shell	Steel constructed, Refractory Lined (No Water cooling)
7.3	Roof	Refractory lined with water cooled Ring
7.4	Bottom	Dished
7.5	Method of Tapping	Launder with Slide Gate
7.6	Method of Charging	From Top using Charging Bucket
7.7	Operation	3 Ph. 50Hz, AC, using 3 Nos. Graphite Electrode
7.8	Electrode Dia.	16"
7.9	Roof Lifting and Slewing arrangement	Oil Hydraulic (Oil to be used: Servo System 32/68 or equivalent)
7.10	Furnace Tilting Arrangement	Oil Hydraulic (Oil to be used: Servo System 32/68 or equivalent)
7.11	Electrode Clamping	Oil Hydraulic (Oil to be used: Servo System 32/68 or equivalent)
7.12	Slag Door	Water Cooled, Hydraulic/Pneumatic operated
	Bumper Block (Front & Rear), for Turret/tilting Platform lock	Hydraulic/Pneumatic operated


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7.13	Power Consumption in Meltdown upto 1550 °C	< 450 KWH/MT	
7.14	Meltdown Time upto 1550 °C	<100 Min	
8.0	<u>Peripheral Equipments:</u>		
8.1	Oxygen Lance Manipulator and carbon injection system	01 No.	
8.2	Mechanized De-slagging Manipulator	01 No.	
8.3	4QC Slide gate system for Launder Pouring	01 No.	
9.0	<u>Facilities provided by BHEL</u>		
9.1	Transformer	12/14.4 MVA, HV-11 KV (Specification & Dimensions at Annexure: 4)	
9.2	Low Voltage for Auxiliary operation	415V +/- 10%, 3 Φ, 50Hz AC	
9.3	Industrial cooling water with cooling tower in closed loop	Water composition at Annexure: 3	
9.4	Compressed Air	6 Kg/cm ²	
10.0	<u>Mechanical System</u>		
10.1	Furnace should be fully equipped with Tilting platform, shell, electrode lifting column & Arm, Roof with Fume Suction Elbow, Hydraulic system, Water cooling system and other allied/necessary mechanical parts and system in order to run the furnace independently with all possible safety measures.		
10.2	<u>Tilting Platform</u> Tilting Platform should be designed as a rigid chassis constructed of heavy steel sections to support furnace shell and back structure (together with the roof lift and slew mechanism and the electrode mast assemblies). The platform should be mounted on rocker or other structural assemblies to enable furnace forward and backward tilt operations with suitable mechanical arrangement to prevent slippage during tilting. The tilting platform, when in working position, should be locked to the main platform by means of hydraulic/pneumatic operated plunges/Bumper block and is interlocked with roof swing. The roof shall not be opened if the Tilting Platform is not locked.		
10.3	<u>Shell</u> Furnace shell shall be cylindrical shaped, split type, rigid structured, designed to avoid distortion due to mechanical or thermal stresses during furnace operation. The diameter of the shell should be selected for optimum refractory performance and efficient melt power utilization. Upper part of Shell should be designed to minimize air inlet with refractory lined roof and the bottom should be designed to prevent metal splash during scrap charging.		
10.4	<u>Electrode lifting Column & Arm</u> Electrode Arm shall be cantilever designed supported by Lifting columns in box type design to provide good physical properties for low vibrations. Lifting Columns shall be as close as geometrically possible to the shell reducing loads to the guide rollers and allow the electrode arms to counterbalance dynamic		

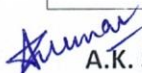
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	loads and further suppress vibrations. Electrode lifting columns and electrode arms shall be of stiff design allowing for fast response electrode position control. Current carrying water cooled bus tube transferring current from water cooled cable to electrode holder shall be well supported by Arm connected through Stainless Steel nonmagnetic fasteners, clamps and insulation suitable to sustain vibration and temperature gradient during furnace operation.	
10.5	<u>Roof with Fume Suction Elbow and Roof Slewing Mechanism</u> Furnace roof shall be water cooled Ring structured, designed for refractory lining and mounting over the upper part of shell to minimize air inlet. Water cooled Elbow of suitable diameter shall be mounted over the roof ring at one end opposite to the Electrode Column/Turret, for effective suction of fumes generated during furnace operation. Elbow shall be designed and fitted in order to take minimum time for replacement and breakdown maintenance. The roof shall be attached with a rigid back structure/turret through a heavy cantilever arrangement. The back structure/turret shall be rotated over a vertical Pivot Pin (mounted on the furnace chassis) and supported on slew rollers/wheel moving on a track concentric with the Pivot pin. The slewing movement of the back structure shall be activated by a double acting hydraulic cylinder designed to swing the back structure within the fixed mechanical stops and electrical limits. The rollers/wheel and the track shall be beveled to avoid roller slipping. When the roof is on the furnace shell, the back structure and gantry arms are secured in position by means of a robust mechanical locking arrangement, which is automatically positioned when the roof comes down on the furnace shell. The mechanical lock shall ensure that the slew platform and back structures are securely attached to and supported by the chassis when the furnace is being titled for tapping. The rollers/wheel and the track should be made of high strength steel with surface hardening at the rolling surface for wear resistance matched to track for optimum performance. Roof lifting shall be done through 2 Nos. double acting hydraulic cylinder connected with roof lifting solid rod, lever and hinge arrangement robust to sustain elevated temperature and prevent run time breakdown. Note: No Chain shall be used for roof lifting. A service platform shall be provided over the furnace roof for access to the electrode clamps and Arm maintenance. The platforms shall have chequered plate at bottom, access ladders, safety railing etc.	
10.6	<u>Hydraulic Equipment</u> There shall be two independent hydraulic systems with details as under: 1. <u>Electrode regulation:</u> Electrode regulating Hydraulic system shall be designed for high speed, fast response electrode position control and to use counter pressure in order to balance out the weight of the column, arm and power cables in order to reduce the possibility of electrode breakage by preventing high load pressing on the electrode in case of	



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	nonconductive Material present in the furnace. The system shall be interfaced and controlled by the PLC based automation for fast and precise hydraulic controls for the efficient electrode regulation. The system shall be equipped with Tank, thermostats, optical and electric level controllers and thermometer, Hydraulic Pump Motor Assembly (with 1 standby), Servo/ proportional valve, Solenoid controlled DC Valve (suitable for 220V AC only), High pressure accumulator system, Complete piping and tubing with high pressure pipes & hoses etc. 2. <u>Other hydraulic operations (Like: Roof Up/down, Roof In/Out, Furnace tilting forward/reverse, Electrode clamping/declamping etc.):</u> A dedicated hydraulic system shall be provided for actuation of the hydraulic cylinders for the furnace operations such as roof lifting, roof slewing and furnace tilting, clamping etc. The system should be complete with tank, thermostats, optical and electric level controllers, thermometer, Hydraulic pumps complete with motors (with 1 standby), couplings, delivery filter, and electrical and optical clogging filters, Set of valves and instruments, Set of pipes and hoses, Set of piping fittings, connections, supports etc complete with all safety interlocking.	
10.7	<u>Water Cooling System</u> All equipment parts and systems vulnerable to heat & non-refractory lined such as door, roof ring, electrode arm, bustubes, high current carrying cables etc. shall be water cooled. Instruments for monitor the temperature, flow of water & high temperature alarm in different water circuits shall be provided in the control room. Out flow of water from each Arm Bus tubes with electrode holder, set of water cooled cable, Roof Ring, fume suction elbow, Delta tube etc shall be visible separately through the naked eye. The system will be complete with valves, fittings, instruments and interconnecting pipework with supports. Separate inlet water valve for each Arm Bus tubes with electrode holder, set of water cooled cable, Roof Ring, fume suction elbow, Delta tube etc shall be mounted over a valve stand rack manufactured with the concept to be ready-to-use equipment, in order to reduce the time required for the installation, connection and maintenance. Water supply till the main inlet valve (1 No.) of the valve stand will be provided by CFFP. The system shall be designed as per water composition available at CFFP as per Annexure: 3	
11.0	<u>Electrical System</u>	
11.1	Scope of supply covers complete Power & Control System (in accordance to the available facility as per <u>Clause 9.1 & 9.2</u>), set of water cooled power cables, Delta formation by water cooled copper tube at LV side of transformer, PLC based Servo/proportional valve controlled Hydraulic operated Electrode regulation control panel, Cabling, Earthing, equipment illumination etc. for proper operation of the Plant.	


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11.2	Power supply system should be designed for indoor installation and operation.	
11.3	<u>Delta System</u> One set of water cooled tube of suitable current density to be supplied from the transformer riser (LV Bushings) is used to complete the Delta closure. Bus tubes are provided complete with connection plates made of copper for connecting the water-cooled cables and the transformer risers. Connection of Cooper bus tube with the transformer riser should be through suitable flexible copper so as to avoid shifting of vibration to the riser/LV bushing. The bustube should be supported suitably to avoid vibration/unbalanced load and to avoid any mechanical load over transformer bushings/riser. Proper insulation to be provided between the bustube/copper plate and the support structure. The delta closure shall be suitably designed as per dimension of transformer at annexure: 4	
11.4	Current transformers of suitable rating are to be mounted on the secondary side of the furnace transformer for feeding electrode regulation panel and Metering.	
11.5	<u>Water Cooled Cable</u> Insulated water-cooled flexible cables complete with cable lugs and cooling water hoses shall be provided for connection between electrode arm bustubes and the LV water-cooled bustubes. Outer Sheath/Hose of the cable should be heat resistant neoprene based synthetic rubber, carbon fiber with no steel wire reinforcement, electrically insulating, non-reactive with abrasion resistant. Designed for working pressure 10Kg/Cm² and working temperature 100 °C. The design of the cable shall be such that in the event of damage to the outer sheath/hose, it can be removed and replaced by a new one. Copper terminals shall be provided for connecting the cable to the furnace electrode arm and to the transformer delta. Hose should be clamped with copper terminals with Minimum 2 Nos. of Non-magnetic SS Clamp with Non-magnetic SS Bolts. Nr/Urethane/SBR, anti-abrasion bumper rings at equidistant of not more than 300mm, clamped together by jubilee clamp having abrasion resistant 80mm³, 10N confirming to IS 5192. Conducting Cooper to be used of suitable rating shall be 99.90% pure electrolytic copper conductor of ETP Grade as per IS 191.	
11.6	<u>Electrode Holder</u> 3 Nos identical Round shaped electrode holder cast/fabricated with electrolytic copper designed for water cooling system and high electrical conductivity. The holder shall be designed for larger conducting surface contact with graphite electrode. Holder shall be equipped with Electrode cooling water spray ring to reduce oxidation of electrode.	
11.7	<u>Electrode Regulation System</u> Electrode regulation system shall be PLC based Servo/proportional valve controlled Hydraulic operated. Electrode regulation system shall be designed	

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for furnace operation at highest possible power input without creating arc instability.

Quality parameter for electrode regulation shall be as under:

- Increased melting efficiency
- Reduced energy consumption
- Reduced electrode consumption
- Reduced refractory consumption
- High Arc stability
- Shorter Tap to Tap time

PLCs and drive (if used) in electrode regulation control panel should be of Siemens make and should have profibus/Ethernet communication capability. PLC should be Profibus/Profinet enabled Siemens make Simatic S7-400 PLC including CPU, Centralized and Distributed (for devices in field) IO Cards, DI, DO, AI, AO, Power Supply Cards, Relay Cards, Profibus/Profinet Cables. 10% extra I/Os of each type to be provided in PLC.

All hardware to be of same basic type. Hardware with mixed basic types (e.g. CPU S7-400 with I/Os of S7-300/200) will not be accepted.

Separate power supply should be used for CPU and communication cards.

Switchgear items used:

Incomer Switch: MCCB of suitable rating (Min 125% of peak load of panel, 50kA Short Circuit Current) with Thermal/Magnetic over current trip (adjustable overload and fixed short circuit), Ground fault protection, tripping relay and Extended rotary drive. Incoming supply will be 415V, 3- ϕ , 50 Hz.

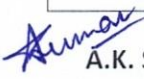
Min Power Contactor rating shall be used one step higher than the current rating required considering 25% overload.

Only Semiconductor Fuses are to be used with semiconductor devices, all other circuits to be protected through MPCBs/MCCBs/MCBs of suitable rating only.

11.8 MCC: MOTOR CONTROL CENTER

The panel should consist of sheet steel enclosure of thickness not less than 2mm, Suitable for three phase four wire system. Painted first with corrosion resistant paint and then with industrial grade grey paint and mounted on a suitable base frame. Down entry space for cables should be provided for outgoing cables and incoming cables in outgoing and incoming sections respectively. The bus bars are to be sleeved with heat shrunk PVC. Power contactors should be selected for at least 150 % of full load current. Aluminum wires should not be used in power and control circuits. A three phase to single phase control transformer must be provided for control supply with tapping for voltage correction. (Should not be less than 2KVA). Motor Control Panels (MCC) should be provided with Voltmeter, ammeter and energy meter.

MCC panel should have Incomer with ACB/MCCB having Over load and short Circuit protection and each outgoing section should have MCCB & MPCB of suitable rating and ammeter with ammeter selection switch and Indications for ON, OFF & TRIP. Incomer and all Outgoing sections should be designed for Operation through extended rotary drive handle.


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	All ACB/MCCB used should be Min 125% of rated load. HRC Fuses must not be used.	
11.8.1	All Electrical field instruments, low voltage switching unit, protective switch gear, control desk, MCC Panel and other allied Low voltage control system to be supplied considering available low voltage power supply 415V +/- 10%, 3 Φ , 50Hz AC.	
11.9	<u>Operator Control Desk</u> Complete control desk made of metallic structure – thickness 3 mm or more and painted first with corrosion resistant paint and then with industrial grey paint. The top cover must be metallic and anodized sheet – thickness 3 mm or more. Fully pre-wired for all operational controls through industrial joy sticks/MCS/PCS, foot switches and control interfaces for proper operation. The operator control desk shall be equipped with Control switch for operating the furnace breaker, Emergency push button, Control switch for transformer tap changing, Transformer tap position indicator, Master control switch for the three electrodes, 3-phase control switch for individual electrodes, Electrode current adjusting Potentiometer, Manual/auto changeover switch for electrode movement Push buttons & indication for electrode regulation unit etc.	
11.9.1	The operator's desk should contain one Industrial Grade PC based HMI system for operator control and monitoring. The PC system should have LED monitor of 22 inches or more, CPU will have latest generation core i5 Intel processor or higher, with clock speed 3.0GHz or more, RAM DDR4 8GB or more, 1TB or more SSD, wired key board & wired optical mouse, UPS of 500VA or more. The PC should be pre-loaded with SIEMENS STEP 7 (SEMAC MANAGER) or latest software, SCADA and HMI along with licenses (licensed copy with life time validity), archive software for the tag logging (historical trending, alarms etc.), necessary cables and required hardwares/Adaptors (for Communication with the PLC/Drive system): The PC should be loaded with complete Electrical Schemes, Mechanical Assembly drawings, Hydraulic Circuit Diagrams, Operation and Maintenance Manuals, Machine Alarm list along with Help text wiring diagram, On-Line display of PLC user logic should be available on the note book PC. Procedure of fault diagnostic system and data transfer/PLC logic transfer between PC Notebook & PLC/Drive system should be demonstrated to BHEL during commissioning of the machine. Note: Software License should have RUN time and Editing Writes. Alternate control with electrical switchgear must be provided for the touch screen based control used (if any).	
11.9.2	The following melting parameters and its trends shall be displayed in control desk: Melting current, Melting voltage, Melting power, Total power consumption, water temperatures and flow rates (All individual water cooling parts), HT Amp., HT Voltage, Any abnormality / malfunctioning in the system should be displayed along with alarm.	

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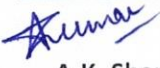
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	The list of parameters mentioned here is only indicative and not exhaustive in nature. Any other parameters not mentioned here but required for successful operation monitoring of furnace shall be included in display of the control desk, suitably.	
11.9.3	3 Nos. of separate control desk for hydraulic operation of Furnace tilting and roof movement. The desks shall be fitted with start/stop buttons for the hydraulic pump motors and pilot for tilting / roof operations & indicating lamps for various interlocks connected. Among 3 Nos. separate control desk, 1 No. is required for operator's room and rest 2 Nos. for local operation.	
11.10	<u>CABLES</u> All wiring for power, control, lighting etc. (Except Melt power supply cable) shall be carried out with 1.1KV grade PVC armored cables except flexible cables where armor shall not be provided. All control cables shall be minimum 2.5mm² Copper and power cable shall be minimum 4 mm². All flexible cables shall be multistranded copper. Single strand cables shall not be used anywhere (Except inside panel wiring). Cables laid on open racks shall be adequately clamped. Cable size should be calculated at temperature 70 Deg C. Conduits and conduit fittings if used shall be of standard design and shall be supplied with complete accessories. Each motor shall be wired through separate conduits. All cables, remaining live in open position of isolator shall be installed separately. Data & Power cables between motors and drives must be provided with connectors compatible with the motor and drive ends respectively.	
12.0	<u>Erection</u> Vendor shall provide packing list of material of EAF and take adequate care for transportation of material that is fragile in nature. Vendor shall depute its representative for unloading of material. Supplier to take full responsibility for carrying out the erection, startup, testing of EAF and its control system. For unloading the consignment, BHEL will provide only EOT crane at plant site free of cost. However, the vendor shall shift all the material from unloading area to the site of erection. Vendor shall be responsible for erection of the plant at site provided by BHEL. Necessary tools & Equipments required for erection shall be brought by the supplier. All sundry erection materials required for installation and connection of electrical equipment with cable lying and fixing accessories should be in the scope of supply.	
13.0	<u>Commissioning</u> EAF shall be considered as commissioned on the date of successful processing of 3 Nos. Heats in 1 day (2 shift operation) as per Clause 4 (Scope of Supply), at CFFP/BHEL by the vendor. 3Nos. of Heats for commissioning shall be taken within 1 week from the date on which the furnace will be ready for trial by the supplier (The Date for	


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	readiness of furnace for Trial shall be communicated in written by supplier to CFFP/BHEL.	
14.0	<u>Acceptance Criteria for date of start of Guarantee/Warranty period</u> Subsequent to successful commissioning, the Guarantee/Warranty of EAF will start from the date of successful processing of 3 Nos. of Heats in 1 day by CFFP/BHEL under the guidance of vendor, within a period of 1 week from the date of commissioning.	
15.0	<u>Drawings, Documents & Manuals (In English Language only, after erection and commissioning)</u>	
15.1	Complete Electrical drawing including layout (Both Single line diagram and 3 phase drawing), wiring diagram, bill of material with details, part number, specification, make, itemized product catalogue and details, interlocks in leather bonded folders. The documents should not be photocopies but good quality print. - Five Sets	
15.2	Complete Mechanical, Hydraulic drawing, layout, product catalogue, bill of material with details, part number, specification, make in leather bonded folders. The documents should not be photocopies but good quality printouts – Five Sets.	
15.3	Operation and Maintenance Manual along with Preventive, Periodic Maintenance schedule in leather bonded folders –Five Sets	
15.4	Alarm list and fault diagnostic Manual-Five Sets	
15.5	A soft copy of above Documents in Flash Drive- Five Sets	
15.6	Copy of PLC Program & HMI Program in Flash Drive.- Five Sets	
15.7	Image /Backup of all software and programs installed/loaded on PLC and PC Based HMI along with Licenses (Using Norton Ghost or other Suitable software) on a (Seagate/WD/Kingston make portable) Portable SSD.- Two Sets	
15.8	List of Standards used for design and manufacturing of EAF.	
16.0	<u>Drawings to be submitted for approval before manufacturing of EAF</u> - Detailed Quality Assurance Plan. - Mechanical, Hydraulic circuit Layout/scheme, piping drawings, calculations, bill of material along with supporting data should be approved by BHEL before manufacturing. - Panel/electrical Layout/scheme, SLD & Three phase drawing, wiring drawings, Cable & Bus bar calculation, calculation sheet for Melt power supply, Auxiliary supply system, switchgear and power processing module, bill of material along with supporting data should be approved by BHEL before manufacturing. - All the technical details, features & model of pump, motor, valves to be submitted with drawing for approval by BHEL before manufacturing. - Drawing and know How for Refractory lining of Roof and Shell. All drawings with complete details and supporting data should be submitted in one lot. Delay on account of incomplete drawing/data or lack of supporting documents will be on vendors account. Time of approval will be six weeks.	

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17.0	<u>Civil Foundation work</u> All civil foundation work will be done by CFFP/BHEL as per Supplier's design and requirement. The drawings should consist of all requirements with respect to complete equipment and all accessories. BHEL should construct complete foundation for the 30T EAF under the guidance of supplier and at supplier's responsibility. Supplier shall provide complete Civil foundation drawing in advance after visiting and assessing the site as early as possible after placement of Purchase Order. Vendor should arrange equipment required for the testing of foundation, if required. The vendor should also indicate detailed specifications of grouting compound and grouting procedure etc. for grouting of foundation bolts of the equipment and requirement of any specific treatment to the foundation. Vendor to provide no. of days (along with tender) required to submit complete drawing and details of Civil foundation from the date of Letter of Intent (LOI)/ Purchase Order (PO) whichever is earlier.	
18.0	<u>Pre-Dispatch Inspection</u> BHEL is authorized to pre inspect the material at vendor's works. The material will be dispatched only after getting clearance from CFFP/BHEL. Indigenous suppliers shall give Pre-Dispatch Inspection (PDI) call at least 15 days in advance and foreign suppliers shall give PDI call at least 45 days in advance. If supplier fails to give pre-inspection call within stipulated time, this will not be considered as a reason for waiver of penalty or delivery extension. Pre-Dispatch Inspection shall be done as per Specification and approved Drawings/documents.	
19.0	<u>Training</u> Minimum one (1) week training shall have to be provided to CFFP/BHEL personnel (3 from operation and 2 from Maintenance) at Manufacturer's training center, to familiarize the personnel with the equipment, maintenance, Automation, trouble shooting and process as well as working procedures. The training shall be provided at the time of pre-dispatch material inspection as per clause 18.0.	
20.0	<u>Performance Guarantee/Warranty</u> The Performance of the EAF as per specification shall be guaranteed for a minimum period of 24 Months from the date of Acceptance of EAF at CFFP/BHEL as per clause 14.0.	
21.0	<u>Mandatory spares</u> Vendor to supply mechanical, hydraulic, electrical and electronic spares used on the machine in sufficient quantity as per recommendation of Vendor for 2 years of trouble free operation on three shifts continuous running basis. The list of the above to be submitted with the offer.	

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Spec. No.: FF:30T EAF:01
Rev.: 01

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Annexure 1

**ITEMS NOT COVERED IN THIS SPECIFICATION BUT CONSIDERED NECESSARY
FOR COMPLETENESS OF EQUIPMENT AND TO ATTAIN DESIRED FEATURES AND
PERFORMANCE**

To be filled by vendor along with Technical Offer

A.K. Sharma
Manager, SMS

M.K. Rajak
Sr Manager, SMS

K.S. Rana
AGM, SMS & SC



BHARAT HEAVY ELECTRICAL LIMITED
CENTRAL FOUNDRY FORGE PLANT

ELECTRIC ARC FURNACE (30T)

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Annexure 2

DETAILS TO BE FURNISHED BY THE SUPPLIER

SN	Description	Details to be filled by the Bidder
1	Shell internal diameter	
2	Maximum Forward tilt angle (tapping) (in Degree)	
3	Maximum Backward tilt angle (deslagging) (in Degree)	
4	Tilting forward speed (deslagging) (°/sec)	
5	Tilting backward speed (tapping) (°/sec)	
6	Maximum angle of Roof opening (in Degree)	
7	Roof rotation speed (°/sec)	
8	Roof lifting (mm/sec)	
9	Roof lowering (mm/sec)	
10	Total Energy consumption in melting up to 1550°C	
11	Melt down time up to 1550°C	
12	Peak current (LV)/Per phase	
13	Peak current (HV)/Per phase	
14	Water flow required at common inlet point	
15	Water Pressure required at common inlet point	
16	Water Temperature required at common inlet Point	
17	Max. safe Outlet water temperature	
18	Maximum Air Pressure required	
19	Maximum Oxygen pressure required	
20	Maximum oxygen flow required	

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Annexure 3

Water Composition available at CFFP

Sr.No.	Parameter	Unit	OBTAINED VALUE (PCRI BHEL HARIDWAR)
1	Alkalinity	mg/L	220
2	Aluminium (as Al)	mg/L	0.01
3	Ammonia (as Total Ammonia -N)	mg/L	ND
4	Arsenic (as As)	mg/L	ND
5	Boron (as B)	mg/L	ND
6	Cadmium (as Cd)	mg/L	ND
7	Calcium (as Cl)	mg/L	85
8	Chloride (as Cl)	mg/L	26
9	Chromium Total (as Cr)	mg/L	ND
10	Colour	Hazen	<5
11	Copper (as Cu)	mg/L	0.01
12	Cyanide (as CN)	mg/L	ND
13	E.Coli	MPN/100 mL	Absent
14	Fecal Coliform	MPN/100 mL	Absent
15	Flouride (as F)	mg/L	0.84
16	Hardness (as CaCO ₃)	mg/L	362
17	Iron (as Fe)	mg/L	0.09
18	Lead (as Pb)	mg/L	0.05
19	Magnesium (as Mg)	mg/L	17.4
20	Manganese(as Mn)	mg/L	0.1
21	Mercury (as Hg)	mg/L	ND
22	Mineral Oil	mg/L	ND
23	Nickel (as Ni)	mg/L	0.02
24	Nitrate (as NO ₃)	mg/L	1.26
25	Odour		Agreeable
26	pH		7.9
27	Phenolic Compounds as (C ₆ H ₅ OH)	mg/L	ND
28	Selenium (as Se)	mg/L	ND
29	Silver (as Ag)	mg/L	ND
30	Sulphate (as SO ₄)	mg/L	30.65
31	Sulphide (as S)	mg/L	0.6
32	Taste		Agreeable
33	Total Coliform	MPN/100 mL	5
34	Total Dissolved Solids	mg/L	416
35	Total Residual Chlorine	mg/L	ND
36	Turbidity	NTU	4.25
37	Zinc (as Zn)	mg/L	0.02

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Annexure 4 (Page1 of 3)

Transformer details available at CFFP

Sl. No.	Description	
1.	Name of manufacturer	BHEL, Jhansi
2.	Country of manufacture	INDIA
3.	Governing standard	Generally to IS -2026
4.	Insulation class	A
5.	Type of cooling	OFWF (Cooler)
6.	No. of phases	3
7.	Rated frequency	50 Hz
8.	Rated primary KVA	12000/14000
9.	Rated secondary KVA	12000/14000 KVA
10.	Rated HV voltage(Line)	11000 volts
11.	Rated LV voltage (Line)	120-325 volts
12.	Winding connection	Primary - Delta Secondary - Open Delta
13.	Vector group	Non- Std
14.	Tapping	: (On load circuit Taps are provided on HV winding for LV voltage variation from 120V to 325 volts as follows:-

Tap Position	HV Volts	LV Volts	LV CURRENT Amps
1	11000	120	23566
2	11000	129	23566
3	11000	139	23566
4	11000	151	23566
5	11000	165.5	23566
6	11000	175.5	23566
7	11000	186.5	23566
8	11000	189.5	23566
9	11000	214	23566
10	11000	225.5	23566
11	11000	238.5	23566
12	11000	253	23566
13	11000	269	23566
14	11000	281	23566
15	11000	294	23566
16	11000	309	22422
17	11000	325	21318


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Sr Manager, SMS


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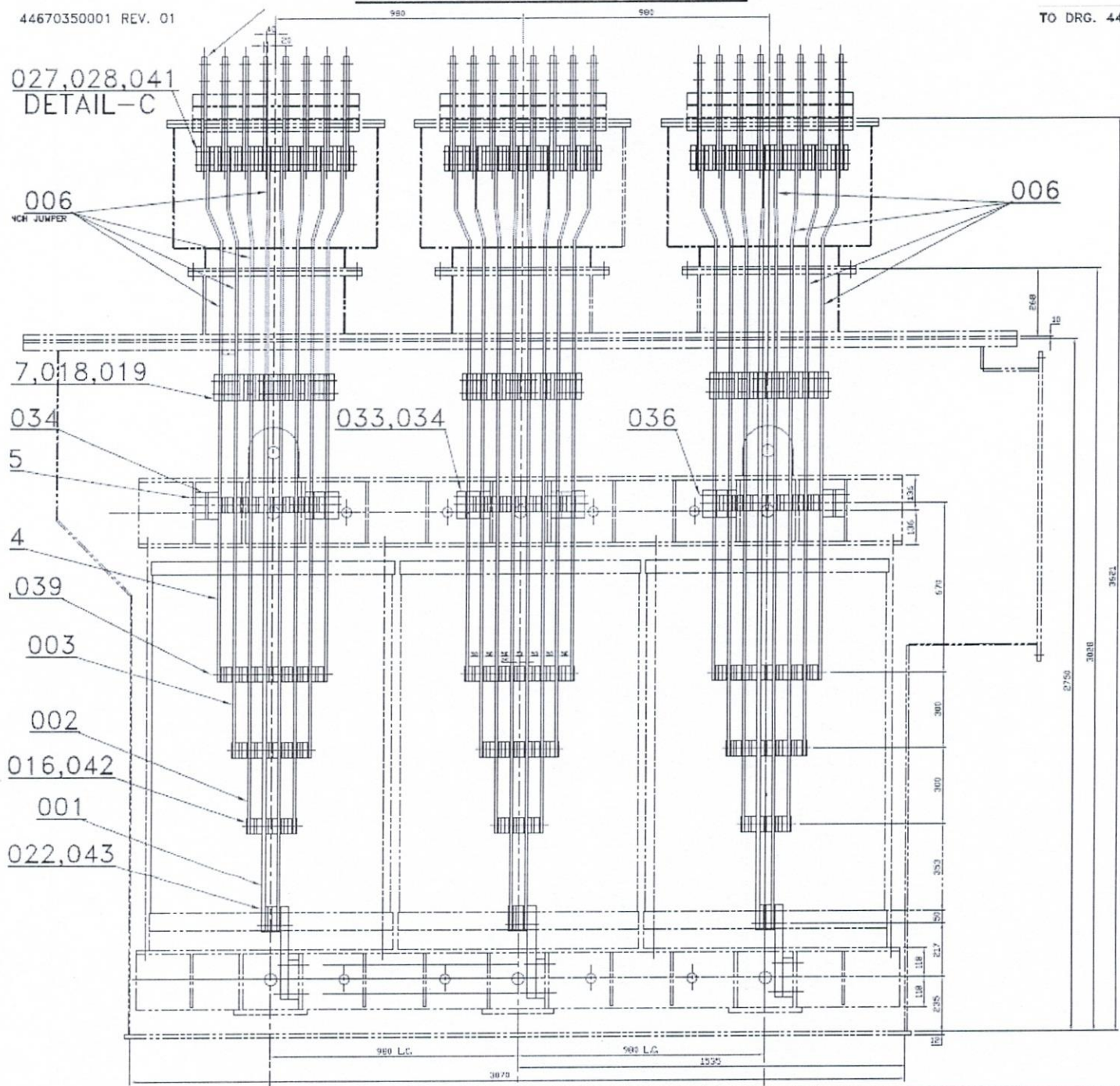
ELECTRIC ARC FURNACE (30T)

Annexure 4 (Page 2 of 3)

Transformer's Dimensions details

44670350001 REV. 01

TO DRG. 446



Amma

A.K. Sharma
Manager, SMS

HI 74

M.K. Rajak
Sr Manager, SMS

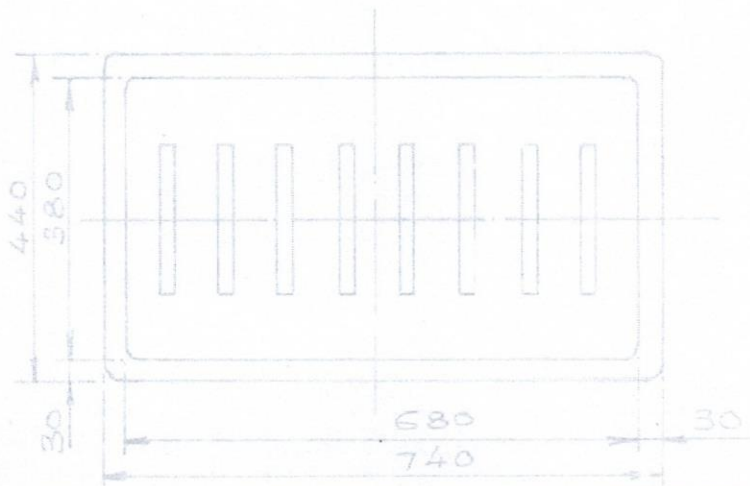
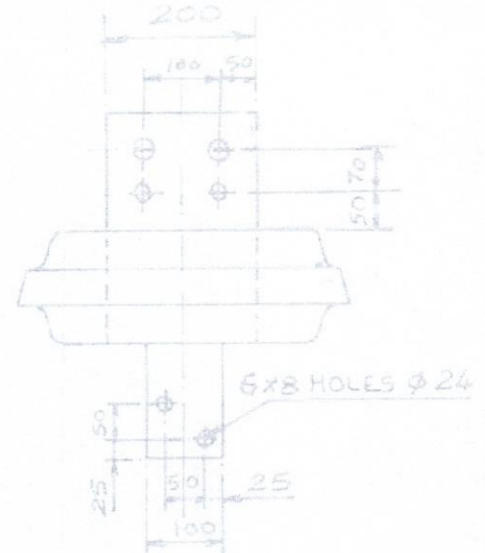
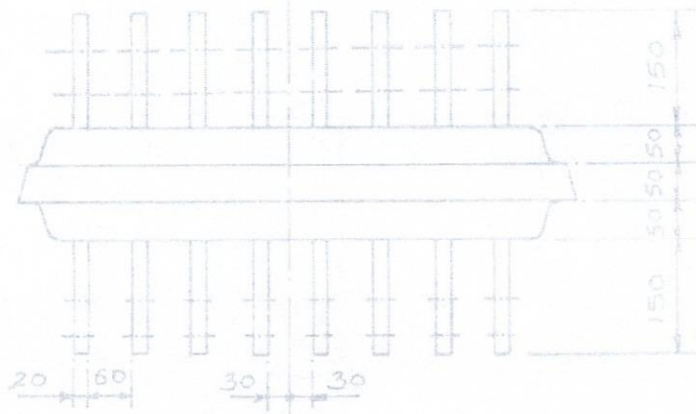
2023

K.S. Rana
AGM, SMS & SC



Annexure 4 (Page 3 of 3)

Transformer Bushing/Riser Dimension for Delta making



A.K. Sharma

A.K. Sharma
Manager, SMS

M.K. Rajak

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Sr Manager, SMS

K.S. Rana

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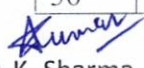


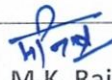
Annexure 5

LIST OF MANDATORY SPARES FOR TWO YEARS OF TROUBLE FREE OPERATION

Following mandatory spares shall be supplied along with the Furnace:

S.No.	ITEM	QUANTITY (NO.)	Remarks
<u>Electronic/CNC</u>			
1.	CPU	01	Of each type
2	AI,DI,AO,DO	04	Of each type
3	Communication Cards	02	Of each type
4	Power Supply Module	02	Of each type
5	Interface Module	02	Of each type and size
6	MMC Module/card	02	Of each type and size
7	NCU module with NCU card	02	Of each type and size
8	Relays	10	Of each type
9	Amplifier card	02	Of each type
10	Encoder	02	Of each type
11	Communication cable for plc &/or drive	02	Of each type and size
12	Connector for communication cable of plc &/or drive	05	Of each type
13	Power Cable with end connectors- 2 nos. of	02	maximum length used of each type
14	Signal Cable with end connectors	02	maximum length used of each type
15	Hand Held Unit	01	Of each type
16	Line Modules (rectifier section)	02	Of each type and size
17	Interface Modules (reactor & filter)	02	Of each type and size
18	Motor Modules (inverter section)	02	Of each type and size
19	Control units for drives	02	Of each type and size
22	Encoders	02	Of each type
<u>Electrical</u>			
25	Proximity Switch	10	Of each type
26	Pressure Sensor	5	Of each type
27	Temperature Sensor	5	Of each type
28	Led Indicator	50	Of each color & type
29	Push Button	20	Of each color & type
30	Selection switch/any other switch	05	Of each type
31	Variable Resistances/Potentiometers	05	Of each type
32	Joy sticks	03	Of each type
33	Any other electronic card	02	Of each type
34	Limit Switch	10	Of each type
35	Hydraulic control valve	02	Of each type
36	Motors	02	Of each type & rating


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37	Hydraulic pump	01	Of each type
38	Hydraulic motor	01	Of each type
39	Filter elements	05	Of each type
40	Terminal blocks	200	Of each type and size
41	Lugs/Thimbles	200	Of each type and size
42	Marking legends/ferule	10 set	Of each type and size
43	Semi-Conductor Fuses for various Drives	10	Of each type and size
44	Auxiliary Contactors	05	Of each type and size
45	Power Contactors	02	Of each type and size
46	MCB & MPCB	02	Of each type and size
<u>Mechanical Spares</u>			
46	Pumps with motor –	01	Of each type
47	All seals, supports, fasteners, anchors, pressure switch, flow switches, pressure gauges, sensors, regulators – 10% of all types supplied as per BOM	01 (Min.)	Of each type
48	Valves of all types – 10% of each type	02 (Min.)	Of each type
49	Coupling	2 Nos.	Of each type
50	Hydraulic Cylinder	1 No.	Of each type

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CENTRAL FOUNDRY FORGE PLANT

ELECTRIC ARC FURNACE (30T)

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Annexure 6

MANDATORY SPARES NOT COVERED IN THE ANNEXURE 5 BUT CONSIDERED NECESSARY TO RUN THE PLANT SUCCESSFULLY FOR 2 YEARS OF TROUBLE FREE OPERATION

To be filled by vendor along with Technical Offer

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Manager, SMS

M.K. Rajak
Sr Manager, SMS

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BHARAT HEAVY ELECTRICAL LIMITED
CENTRAL FOUNDRY FORGE PLANT

ELECTRIC ARC FURNACE (30T)

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Annexure 7

MAKES OF BOUGHT OUT ITEMS SHALL BE AS PER THE LIST GIVEN BELOW

S/N	Item	Make	Remarks	Confirmation by vendor
1	PLC	Siemens, Europe	Preferably Germany	
2	Drive	Siemens, Europe	Preferably Germany	
3	Servo Motor	Siemens, Europe	Preferably Germany	
4	Relays	Phoenix		
5	Cables, Wires	Siemens, Lapp, Igus, Nexans	Only Copper Core, tinned	
6	Connectors, Terminal blocks	Phoenix, Wago		
7	Pressure Sensors	HYDAC		
8	Temperature Sensors	HYDAC		
9	Limit Switches	Siemens, BCH		
10	Encoders	TWK, Siemens		
11	Switches, Push Buttons	Siemens, Schneider		
12	LED indicators	Siemens, Schneider		
13	Joy stick	Spohn & Burkhardt		
14	Potentiometer	Siemens		
15	MCB, MCCB	Siemens, Schneider		
16	Contractors	Siemens		
17	Fuse Base and Fuse	Siemens		
18	Selector switch	Siemens,		
19	Profibus	Siemens		
21	Conduits	Reputed	Metallic SS/flexible Stainless steel wire braided	
22	Panel	Reputed		
23	Proximity Switches	Reputed		
24	UPS	APC/ Schneider		
25	Computer	DELL/HP/Siemens/IBM	Industrial grade	
26	Motors	Siemens, ABB, Marathon, Crompton greaves		
27	Hydraulic Pump	Rexroth, Etone, Parker, Vickers, W. Phanke, Veljan		
28	Solenoid valve	Rexroth, Etone, Parker, Vickers, W. Phanke, Veljan		
29	Proportional/servo valve	Rexroth, Etone, Parker, Vickers, W. Phanke, Veljan		
30	Manifolds, check valves, relief valves etc	Rexroth, Etone, Parker, Vickers, W. Phanke, Veljan		
31	Accumulator	Rexroth, Hydec		
32	Hose pipes	Reputed		
33	Drag chain	Igus	Fiber	

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BHARAT HEAVY ELECTRICAL LIMITED
CENTRAL FOUNDRY FORGE PLANT

ELECTRIC ARC FURNACE (30T)

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Annexure 8

TOOLS & TACKLES & COMMISSIONING SPARES TO BE PROVIDED BY THE VENDOR

Sl. No.	Item Description	Qty.
	Tools & Tackles	
1	Digital Insulation Tester 5000 V	01 No.
2	Low Resistance measuring device	01 No.
3	Multimeter with AC & DC	03 Nos.
4	Clampmeter with AC & DC	02 Nos.
5	Set of screwdrivers	05 Sets
6	Set of allen keys	05 Sets
7	Set of Spanners	05 Sets
8	Crimping Tools for power, control & communication cables	02 Sets
9	Pliers set	05 Nos.
10	Any special tool required for operation or maintenance of Furnace	02 Sets
11	Tap sets applicable for Furnace	02 Nos.
12	Hydraulic Jacks – 100 T, 150 T (suitable strokes)	02 Sets
13	Grease Pump	02 Nos.
14	Hydraulic Torque Wrench	01 No.
15	Pressure measuring kits	02 Nos.
16	Digital Vernier Caliper	03 Nos.
17	Feeler gauge	03 Nos.
18	Micrometer	03 Nos.
19	Optical Pyrometer (Upto 1700 Deg C)	02 Nos.
	Commissioning Spares	
20	All commissioning spares shall be provided by the vendor	01 Set

A.K. Sharma
Manager, SMS

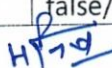
M.K. Rajak
Sr Manager, SMS

K.S. Rana
AGM, SMS & SC

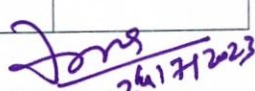
PRE-QUALIFICATION CRITERIA for 30T EAF

The BIDDER has to compulsorily meet the following requirements to get qualified for considering the technical offer:

Sl. No.	Qualifying Condition	Requirement from Vendor	Vendor's Response Yes (OK) /No
1	Vendor must be a manufacturer of Electric Arc Furnace.	Enclose supporting documents	
2	Average Turnover of last 3 financial years should not be less than INR 3 crores.	Vendor to submit balance sheet & Profit loss statement of last 3 years i.e. 2020-21, 2021-22 & 2022-23.	
3	Vendor must have supplied, erected and commissioned at least one Electric Arc Furnace (EAF) of capacity 30 Ton or more in the past 10 years (from the date of opening of Tender). Date of Successful commissioning will be considered for time period.	Enclose Purchase order copy, Invoice copy & Commissioning report mentioning furnace capacity.	
4	The following information is to be submitted by the vendor where referred Electric Arc Furnace as per point no 3, has been supplied: (a) Name of the customer/company where referred Arc Furnace is installed (b) Complete postal address of the customer (c) Month & Year of Commissioning (d) Details of Arc furnace(s) (capacity and application). (e) Name and designation of the contact person of the customer. (f) Phone, FAX no. and email address of the contact person of the customer. (g) Copy of Performance certificate from their customers regarding satisfactory performance of Electric Arc furnace for a period of minimum one year after commissioning (This period of one year should be completed before tender opening (Part-1) bid).	Enclose relevant details, documents and performance certificate of the referred supply.	
5	BHEL reserve the right to verify the information provided by the vendor for the referred Electric Arc Furnace at their customer's works. Requisite permissions regarding visit of BHEL personnel at their customer's works (if required) is to be arranged by vendor.	Vendor to take note and confirm.	
6	BHEL reserves the right to accept or reject the offer based on the assessment of the technical and financial capability of the vendor. In case any information provided by vendor is found to be false/incorrect, the offer shall be rejected.	Vendor to take note and confirm	


M.K. Rajak
Sr Mgr, SMS


K. Chakraborty
SDGM, QM


K.S. Rana
AGM, SMS & SC

Note: For Start-ups / MSE vendors:

New 30T EAF is expected to be shouldering the lead responsibility of meeting the liquid metal demand for producing castings and forgings for CFFP (Almost 90% of the liquid metal production at SMS-CFFP is met with 30T EAF only). Reliability and safety of equipment as well as of workmen are the main concerns, as the equipment is handling liquid metal having temperature in the range of 1700 degree Celsius. The furnace is subject to high temperature & vibration while Liquid metal handling operation. Any failure to this furnace shall lead to stoppage of complete production activity at CFFP.

Also, process of liquid metal melting & handling operation is quite critical. Any failure/ leakage of Liquid metal from Furnace will lead to damage of equipment, Loss of production & shall cause catastrophic failure like fatal injuries to workmen in proximity to furnace.

Thus to ensure reliability & safety of operation relaxation in clause no. 1, 3 & 4 (regarding Prior Experience) is not permitted for Start-ups / MSE vendors.

However, requirement of Prior Turn-over as per point no.2 of above mentioned pre-qualification criteria conditions can be waived-off for Start-ups / MSE vendors (after submission of valid MSME certificate).



M.K. Rajak
Sr Mgr, SMS



K. Chakraborty
SDGM, QM



K.S. Rana
AGM, SMS & SC

BANK GUARANTEE FOR PERFORMANCE SECURITY

Bank Guarantee No:

Date:

To

NAME

& ADDRESSES OF THE BENEFICIARY

Dear Sirs,

In consideration of Bharat Heavy Electricals Limited (hereinafter referred to as the 'Employer' which expression shall unless repugnant to the context or meaning thereof, include its successors and permitted assigns) incorporated under the Companies Act, 1956 and having its registered office at _____¹ through its Unit at.....(name of the Unit) having awarded to (Name of the Vendor / Contractor / Supplier) with its registered office at _____² hereinafter referred to as the 'Vendor / Contractor / Supplier ', which expression shall unless repugnant to the context or meaning thereof, include its successors and permitted assigns), a contract Ref No.....dated³ valued at Rs.....⁴ (Rupees -----)/FC.....(in words.....) for⁵ (hereinafter called the 'Contract') and the Vendor / Contractor / Supplier having agreed to provide a Contract Performance Bank Guarantee, equivalent to% (.... Percent) of the said value of the Contract to the Employer for the faithful performance of the Contract,

we,, (hereinafter referred to as the Bank), having registered/Head office at and inter alia a branch at being the Guarantor under this Guarantee, hereby, irrevocably and unconditionally undertake to forthwith and immediately pay to the Employer any sum or sums upto a maximum amount of Rs --⁶ (Rupees -----) without any demur, immediately on first demand from the Employer and without any reservation, protest, and recourse and without the Employer needing to prove or demonstrate reasons for its such demand.

Any such demand made on the Bank shall be conclusive as regards the amount due and payable by the Bank under this guarantee. However, our liability under this guarantee shall be restricted to an amount not exceeding Rs. _____.

We undertake to pay to the Employer any money so demanded notwithstanding any dispute or disputes raised by the Vendor / Contractor / Supplier in any suit or proceeding pending before any Court or Tribunal, Arbitrator or any other authority, our liability under this present being absolute and unequivocal.

The payment so made by us under this Guarantee shall be a valid discharge of our liability for payment thereunder and the Vendor / Contractor / Supplier shall have no claim against us for making such payment.

We thebank further agree that the guarantee herein contained shall remain in full force and effect during the period that would be taken for the performance of the said Contract/satisfactory completion of the performance guarantee period as per the terms of the Contract and that it shall continue to be enforceable till

all the dues of the Employer under or by virtue of the said Contract have been fully paid and its claims satisfied or discharged.

WeBANK further agree with the Employer that the Employer shall have the fullest liberty without our consent and without affecting in any manner our obligations hereunder to vary any of the terms and conditions of the said Contract or to extend time of performance by the said Vendor / Contractor / Supplier from time to time or to postpone for any time or from time to time any of the powers exercisable by the Employer against the said Vendor / Contractor / Supplier and to forbear or enforce any of the terms and conditions relating to the said Contract and we shall not be relieved from our liability by reason of any such variation, or extension being granted to the said Vendor / Contractor / Supplier or for any forbearance, act or omission on the part of the Employer or any indulgence by the Employer to the said Vendor / Contractor / Supplier or by any such matter or thing whatsoever which under the law relating to sureties would but for this provision have effect of so relieving us.

The Bank also agrees that the Employer at its option shall be entitled to enforce this Guarantee against the Bank as a principal debtor, in the first instance without proceeding against the Vendor / Contractor / Supplier and notwithstanding any security or other guarantee that the Employer may have in relation to the Vendor / Contractor / Supplier 's liabilities.

This Guarantee shall remain in force upto and including.....⁷ and shall be extended from time to time for such period as may be desired by Employer.

This Guarantee shall not be determined or affected by liquidation or winding up, dissolution or change of constitution or insolvency of the Vendor / Contractor / Supplier but shall in all respects and for all purposes be binding and operative until payment of all money payable to the Employer in terms thereof.

Unless a demand or claim under this guarantee is made on us in writing on or before the⁸we shall be discharged from all liabilities under this guarantee thereafter.

We, BANK lastly undertake not to revoke this guarantee during its currency except with the previous consent of the Employer in writing.

Notwithstanding anything to the contrary contained hereinabove:

- a) The liability of the Bank under this Guarantee shall not exceed.....⁶
- b) This Guarantee shall be valid up to⁷
- c) Unless the Bank is served a written claim or demand on or before⁸ all rights under this guarantee shall be forfeited and the Bank shall be relieved and discharged from all liabilities under this guarantee irrespective of whether or not the original bank guarantee is returned to the Bank.

We, _____ Bank, have power to issue this Guarantee under law and the undersigned as a duly authorized person has full powers to sign this Guarantee on behalf of the Bank.

For and on behalf of
(Name of the Bank)

Dated.....

Place of Issue.....

1 NAME AND ADDRESS OF EMPLOYER I.e. Bharat Heavy Electricals Limited

2 NAME AND ADDRESS OF THE VENDOR /CONTRACTOR / SUPPLIER.

3 DETAILS ABOUT THE NOTICE OF AWARD/CONTRACT REFERENCE

4 CONTRACT VALUE

5 PROJECT/SUPPLY DETAILS

6 BG AMOUNT IN FIGURES AND WORDS

7 VALIDITY DATE

8 DATE OF EXPIRY OF CLAIM PERIOD

List of BHEL Consortium Bank

Sl.	Name of the bank	
1	State Bank of India	
2	Canara Bank	
3	Axis Bank	
4	Bank of Baroda	
5	Central Bank	
6	Citi Bank N.A.	
7	Deutsche Bank **	
8	Exim Bank	
9	Federal Bank Limited	
10	HDFC Bank Limited	
11	Hongkong and Shanghai Banking Corporation Ltd	
12	Indian Bank	
13	ICICI Bank Limited	
14	IDBI Bank Limited	
15	IndusInd Bank Limited	
16	Indian Overseas Bank	
17	Kotak Mahindra Bank Limited	
18	Punjab National Bank	
19	RBL Bank Ltd.	
20	Standard Chartered Bank	
21	Union Bank of India	
22	Yes Bank Limited	
	TOTAL	

Note: Any changes on above list shall be intimated before executing LC / BG.

AUTHORISATION LETTER
FOR E-PAYMENT/ELECTRONIC FUNDS TRANSFER (EFT/RTGS)
PLEASE FILL UP THE FORM IN CAPITAL LETTERS ONLY

ANNEXURE-D
Page 1 of 1

TYPE OF REQUEST (Tick One) ☐ CREATE ☐ CHANGE

BHEL Vendor/ Supplier Code

Company's Name

Address

City

Pincode

State

Contact Person(S)

Telephone NO.

FAX. No.

e-mail id

1. Bank Name

2. Bank Address

3. Bank Telephone No.

4. Bank Account No.

5. Account Type.

6. Bank's Branch Code

7. Bank Swift Code

(aplicable to EFT only)

8. Enclose blank cancelled cheque

DECLARATION

1. I as representative/Owner of the above named company, hereby authorize BHEL CFFP, Ranipur, Haridwar to electronically make payments to the designated bank account. I hereby certify that the particulars given above are true, complete and correct.

(2) If the transsation is delayed or not effected at all for reasons of incomplete or incorrect information, I would not hold BHEL/transfereing Bank responsible.

3. This authority remains in full force untill BHEL, CFFP, Ranipur, Haridwar receives & acknowledge written notification requesting a change or cancellation.

4. I have read the contents of the covering letter and agree to discharge the responsibilty expected of me as a participant under E-payment/EFT/RTGS.

Date:

Authorized Signatory

Designation

Company Seal

Verification By Bank

Annexure-1

INTEGRITY PACT**Between**

Bharat Heavy Electricals Ltd. (BHEL), a company registered under the Companies Act 1956 and having its registered office at "BHEL House", Siri Fort, New Delhi - 110049 (India) hereinafter referred to as "The Principal", which expression unless repugnant to the context or meaning hereof shall include its successors or assigns of the ONE PART

and

_____, (description of the party along with address), hereinafter referred to as "The Bidder/ Contractor" which expression unless repugnant to the context or meaning hereof shall include its successors or assigns of the OTHER PART

Preamble

The Principal intends to award, under laid-down organizational procedures, contract/s for 30T EAF Electric Arc furnace (T.E. No. 202301841)

_____ (hereinafter referred to as "Contract"). The Principal values full compliance with all relevant laws of the land, rules and regulations, and the principles of economic use of resources, and of fairness and transparency in its relations with its Bidder(s)/ Contractor(s).

In order to achieve these goals, the Principal will appoint panel of Independent External Monitor(s) (IEMs), who will monitor the tender process and the execution of the contract for compliance with the principles mentioned above.

Section 1- Commitments of the Principal

- 1.1 The Principal commits itself to take all measures necessary to prevent corruption and to observe the following principles: -
 - 1.1.1 No employee of the Principal, personally or through family members, will in connection with the tender for, or the execution of a contract, demand, take a promise for or accept, for self or third person, any material or immaterial benefit which the person is not legally entitled to.
 - 1.1.2 The Principal will, during the tender process treat all Bidder(s) with equity and reason. The Principal will in particular, before and during the tender process, provide to all Bidder(s) the same information and will not provide to any Bidder(s) confidential/ additional information through which the Bidder(s) could obtain an advantage in relation to the tender process or the contract execution.
 - 1.1.3 The Principal will exclude from the process all known prejudiced persons.
- 1.2 If the Principal obtains information on the conduct of any of its employees which is a penal offence under the Indian Penal Code 1860 and Prevention of Corruption Act 1988 or any other statutory penal enactment, or if there be a substantive suspicion in this regard, the Principal will inform its Vigilance Office and in addition can initiate disciplinary actions.

Section 2 - Commitments of the Bidder(s)/ Contractor(s)

- 2.1 The Bidder(s)/ Contractor(s) commit himself to take all measures necessary to prevent corruption. The Bidder(s)/ Contractor(s) commits himself to observe the following principles during participation in the tender process and during the contract execution.

- 2.1.1 The Bidder(s)/ Contractor(s) will not, directly or through any other person or firm, offer, promise or give to the Principal or to any of the Principal's employees involved in the tender process or the execution of the contract or to any third person any material, immaterial or any other benefit which he/ she is not legally entitled to, in order to obtain in exchange any advantage of any kind whatsoever during the tender process or during the execution of the contract.
- 2.1.2 The Bidder(s)/ Contractor(s) will not enter with other Bidder(s) into any illegal or undisclosed agreement or understanding, whether formal or informal. This applies in particular to prices, specifications, certifications, subsidiary contracts, submission or non-submission of bids or any other actions to restrict competitiveness or to introduce cartelization in the bidding process.
- 2.1.3 The Bidder(s)/ Contractor(s) will not commit any penal offence under the relevant Indian Penal Code (IPC) and Prevention of Corruption Act; further the Bidder(s)/ Contractor(s) will not use improperly, for purposes of competition or personal gain, or pass on to others, any information or document provided by the Principal as part of the business relationship, regarding plans, technical proposals and business details, including information contained or transmitted electronically.
- 2.1.4 Foreign Bidder(s)/ Contractor(s) shall disclose the name and address of agents and representatives in India and Indian Bidder(s)/ Contractor(s) to disclose their foreign principals or associates. The Bidder(s)/ Contractor(s) will, when presenting his bid, disclose any and all payments he has made, and is committed to or intends to make to agents, brokers or any other intermediaries in connection with the award of the contract.
- 2.2 The Bidder(s)/ Contractor(s) will not instigate third persons to commit offences outlined above or be an accessory to such offences.
- 2.3 The Bidder(s)/ Contractor(s) shall not approach the Courts while representing the matters to IEMs and shall await their decision in the matter.

Section 3 - Disqualification from tender process and exclusion from future contracts

If the Bidder(s)/ Contractor(s), before award or during execution has committed a transgression through a violation of Section 2 above, or acts in any other manner such as to put his reliability or credibility in question, the Principal is entitled to disqualify the Bidder(s)/ Contractor(s) from the tender process, terminate the contract, if already awarded, exclude from future business dealings and/ or take action as per the separate "Guidelines on Banning of Business dealings with Suppliers/ Contractors", framed by the Principal.

Section 4 - Compensation for Damages

- 4.1 If the Principal has disqualified the Bidder (s) from the tender process before award / order acceptance according to Section 3, the Principal is entitled to demand and recover the damages equivalent to Earnest Money Deposit/ Bid Security.
- 4.2 If the Principal is entitled to terminate the Contract according to Section 3, or terminates the Contract in application of Section 3 above, the Bidder(s)/ Contractor (s) transgression through a violation of Section 2 above shall be construed breach of contract and the Principal shall be entitled to demand and recover from the Contractor an amount equal to 5% of the contract value or the amount equivalent to Security Deposit/ Performance Bank Guarantee, whichever is higher, as damages, in addition to and without prejudice to its right to demand and recover compensation for any other loss or damages specified elsewhere in the contract.

Section 5 - Previous Transgression

- 5.1 The Bidder declares that no previous transgressions occurred in the last 3 (three) years with any other company in any country conforming to the anti-corruption approach or with any other Public Sector Enterprise in India that could justify his exclusion from the tender process.
- 5.2 If the Bidder makes incorrect statement on this subject, he can be disqualified from the tender process or the contract, if already awarded, can be terminated for such reason or action can be taken as per the separate "Guidelines on Banning of Business dealings with Suppliers/ Contractors", framed by the Principal.

Section 6 - Equal treatment of all Bidder (s)/ Contractor (s) / Sub-contractor (s)

- 6.1 The Principal will enter into Integrity Pacts with identical conditions as this Integrity Pact with all Bidders and Contractors.
- 6.2 In case of Sub-contracting, the Principal Contractor shall take the responsibility of the adoption of Integrity Pact by the Sub-contractor(s) and ensure that all Sub-contractors also sign the Integrity Pact.
- 6.3 The Principal will disqualify from the tender process all Bidders who do not sign this Integrity Pact or violate its provisions.

Section 7 - Criminal Charges against violating Bidders/ Contractors /Subcontractors

If the Principal obtains knowledge of conduct of a Bidder, Contractor or Subcontractor, or of an employee or a representative or an associate of a Bidder, Contractor or Subcontractor which constitutes corruption, or if the Principal has substantive suspicion in this regard, the Principal will inform the Vigilance Office.

Section 8 -Independent External Monitor(s)

- 8.1 The Principal appoints competent and credible panel of Independent External Monitor (s) (IEMs) for this Integrity Pact. The task of the IEMs is to review independently and objectively, whether and to what extent the parties comply with the obligations under this Integrity Pact.
- 8.2 The IEMs are not subject to instructions by the representatives of the parties and performs his functions neutrally and independently. He reports to the CMD, BHEL.
- 8.3 The IEMs shall be provided access to all documents/ records pertaining to the Contract, for which a complaint or issue is raised before them as and when warranted. However, the documents/records/information having National Security implications and those documents which have been classified as Secret/Top Secret are not to be disclosed.
- 8.4 The Principal will provide to the IEMs sufficient information about all meetings among the parties related to the Contract provided such meetings could have an impact on the contractual relations between the Principal and the Contractor. The parties offer to the IEMs the option to participate in such meetings.

- 8.5 The advisory role of IEMs is envisaged as that of a friend, philosopher and guide. The advice of IEMs would not be legally binding and it is restricted to resolving issues raised by a Bidder regarding any aspect of the tender which allegedly restricts competition or bias towards some Bidders. At the same time, it must be understood that IEMs are not consultants to the Management. Their role is independent in nature and the advice once tendered would not be subject to review at the request of the organization.
- 8.6 For ensuring the desired transparency and objectivity in dealing with the complaints arising out of any tendering process or during execution of Contract, the matter should be examined by the full panel of IEMs jointly, who would look into the records, conduct an investigation, and submit their joint recommendations to the Management.
- 8.7 The IEMs would examine all complaints received by them and give their recommendations/ views to the CMD, BHEL at the earliest. They may also send their report directly to the CVO, in case of suspicion of serious irregularities requiring legal/ administrative action. Only in case of very serious issue having a specific, verifiable Vigilance angle, the matter should be reported directly to the Commission. IEMs will tender their advice on the complaints within 30 days.
- 8.8 The CMD, BHEL shall decide the compensation to be paid to the IEMs and its terms and conditions.
- 8.9 IEMs should examine the process integrity, they are not expected to concern themselves with fixing of responsibility of officers. Complaints alleging mala fide on the part of any officer of the Principal should be looked into by the CVO of the Principal.
- 8.10 If the IEMs have reported to the CMD, BHEL, a substantiated suspicion of an offence under relevant Indian Penal Code / Prevention of Corruption Act, and the CMD, BHEL has not, within reasonable time, taken visible action to proceed against such offence or reported it to the Vigilance Office, the IEMs may also transmit this information directly to the Central Vigilance Commissioner, Government of India.
- 8.11 After award of work, the IEMs shall look into any issue relating to execution of Contract, if specifically raised before them. As an illustrative example, if a Contractor who has been awarded the Contract, during the execution of Contract, raises issue of delayed payment etc. before the IEMs, the same shall be examined by the panel of IEMs. Issues like warranty/ guarantee etc. shall be outside the purview of IEMs.
- 8.12 However, the IEMs may suggest systemic improvements to the management of the Principal, if considered necessary, to bring about transparency, equity and fairness in the system of procurement.
- 8.13 The word 'Monitor' would include both singular and plural.

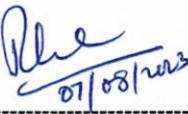
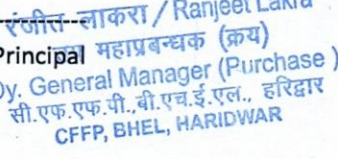
Section 9 - Pact Duration

- 9.1 This Integrity Pact shall be operative from the date this Integrity Pact is signed by both the parties till the final completion of contract for successful Bidder, and for all other Bidders 6 months after the Contract has been awarded. Any violation of the same would entail disqualification of the bidders and exclusion from future business dealings.
- 9.2 If any claim is made/ lodged during currency of this Integrity Pact, the same shall be binding and continue to be valid despite the lapse of this Pact as specified above, unless it is discharged/ determined by the CMD, BHEL.

BHEL-IP

Section 10 - Other Provisions

- 10.1 This Integrity Pact is subject to Indian Laws and exclusive jurisdiction shall be of the competent Courts as indicated in the Tender or Contract, as the case may be.
- 10.2 Changes and supplements as well as termination notices need to be made in writing.
- 10.3 If the Bidder(s)/ Contractor(s) is a partnership or a consortium or a joint venture, this Integrity Pact shall be signed by all partners of the partnership or joint venture or all consortium members.
- 10.4 Should one or several provisions of this Integrity Pact turn out to be invalid, the remainder of this Integrity Pact remains valid. In this case, the parties will strive to come to an agreement to their original intentions.
- 10.5 Only those bidders / contractors who have entered into this Integrity Pact with the Principal would be competent to participate in the bidding. In other words, entering into this Integrity Pact would be a preliminary qualification.
- 10.6 In the event of any dispute between the Principal and Bidder(s)/ Contractor(s) relating to the Contract, in case, both the parties are agreeable, they may try to settle dispute through Mediation before the panel of IEMs in a time bound manner. In case, the dispute remains unresolved even after mediation by the panel of IEMs, either party may take further action as the terms & conditions of the Contract. The fees/expenses on dispute resolution through mediation shall be shared by both the parties. Further, the mediation proceedings shall be confidential in nature and the parties shall keep confidential all matters relating to the mediation proceedings including any settlement agreement arrived at between the parties as outcome of mediation. Any views expressed, suggestions, admissions or proposals etc. made by either party in the course of mediation shall not be relied upon or introduced as evidence in any further arbitral or judicial proceedings, whether or not such proceedings relate to the dispute that is the subject of mediation proceedings. Neither of the parties shall present IEMs as witness in any Alternative Dispute Resolution or judicial proceedings in respect of the dispute that was subject of mediation.


 07/08/2023
 For & On behalf of the Principal 
 (Office Seal) Dy. General Manager (Purchase)
 सी.एफ.एफ.पी.बी.एच.ई.एल., हरिद्वार
 CFFP, BHEL, HARIDWAR
 Place Haridwar
 Date 07-08-2023

Witness: 
 (Name & Address) Manoj Kr. Yadava
Purchase - CFFP, BHEL Haridwar

For & On behalf of the Bidder/ Contractor
 (Office Seal)

Witness: _____
 (Name & Address) _____

Clause on IP in the tender

Integrity Pact (IP)

- (a) IP is a tool to ensure that activities and transactions between the Company and its Bidders/ Contractors are handled in a fair, transparent and corruption free manner. Following Independent External Monitors (IEMs) on the present panel have been appointed by BHEL with the approval of CVC to oversee implementation of IP in BHEL.

SI	IEM	Email
1.	Shri Otem Dai, IAS (Retd.)	iem1@bhel.in
2.	Shri Bishwamitra Pandey, IRAS (Retd.)	iem2@bhel.in
3.	Shri Mukesh Mittal, IRS (Retd.)	iem3@bhel.in

- (b) The IP as enclosed with the tender is to be submitted (duly signed by authorized signatory) along with techno-commercial bid (Part-I, in case of two/ three part bid). Only those bidders who have entered into such an IP with BHEL would be competent to participate in the bidding. In other words, entering into this Pact would be a preliminary qualification.
- (c) Please refer Section-8 of IP for Role and Responsibilities of IEMs. In case of any complaint arising out of the tendering process, the matter may be referred to any of the above IEM(s). All correspondence with the IEMs shall be done through email only.

Note:

No routine correspondence shall be addressed to the IEM (phone/ post/ email) regarding the clarifications, time extensions or any other administrative queries, etc on the tender issued. All such clarification/ issues shall be addressed directly to the tender issuing (procurement) department's officials whose contact details are provided below:

Details of contact person(s):

(1)
Name: Manoj Kr. Yadava
Deptt: Purchase & SDE
Address: BHEL / CCPP / Haridwar
Phone: (Landline/ Mobile) 01334-281724
Email: manoj26@bhel.in
Fax: _____

(2)
Name: Ranjeet Lakra
Deptt: Purchase & Stores
Address: BHEL / CCPP / Haridwar
Phone: (Landline/ Mobile) 01334-284044
Email: rlakra@bhel.in
Fax: _____