

Bharat Heavy Electricals Ltd.,
(A Government of India undertaking)
Electronics Division
PB No.2606, Mysore Road, Bangalore-560026, India

E-TENDER

Quotations are invited under two part bid system for Supply, I&C and Comprehensive AMC of 5 MW Containerised PCUs for NTPC 20MW Solar PV Project at Gandhar, Gujarat through e-procurement route.

RFQ NO and date	RAJBOS0057 dated 04.08.2020 (E-tender)
RFQ due date & time	17.08.2020 up to 13.00 hrs (IST)
Date, Time & Venue of Part-I Bid Opening	17.08.2020 after 13.30 hrs (IST) (E-tender) – Website - https://bhel.abcpurchase.com
Date, Time & Venue of Price Bid opening	Will be intimated later for technically accepted vendors
Address for Communication & Contact Person in BHEL	Mr. Rajesh S (09845634534)/ Mr. Vivek Yadav (09449039232), SC&PV MM Department, BHEL Electronics Division, PB NO 2606, Mysore road, Bangalore-560 026. INDIA Email: s.rajesh@bhel.in vivekyadav@bhel.in Telephone number: +91 80 26989637

RAJBOS0057 - Pre Qualification Criteria

BHEL-EDN is executing Solar PV projects of 20 MW capacity for NTPC on EPC basis.

Below requirement of PCUs is being floated as open tender:

S.No	Item Description	Estimated Quantity
1	5MW PCU Container (1x5MW or 2x2.5MW)	4 Nos

Pre-Qualification Criteria (PQC) is:

- 1) The bidder should be an OEM and should have experience of supply and commissioning of at least 10 nos. of 2.5 MW or higher capacity containerized PCU (1500V system) for solar PV plants in India during the past 3 years with reference to the date of opening of Part-1 bid. As an evidence, vendor shall submit PO copies along with the Commissioning/Performance Certificates from the respective clients.
- 2) The OEM should have a service center in India. As an evidence vendor shall submit the details of service centre in India.
- 3) During technical evaluation, Credentials of vendors will be submitted to end customer (M/s NTPC) for approval. Only the price bids of those vendors, **who are technically qualified and Approved by end customer** (M/s NTPC) before price bid opening, will be considered for further procurement processing.

REQUEST FOR QUOTATION

	BHARAT HEAVY ELECTRICALS LIMITED Electronics Division PB No. 2606, Mysore Road Bangalore - 560026 INDIA	RFQ NUMBER: RAJBOS0057 RFQ DATE : 04.08.2020	Due Date/Day: 17.08.2020 MON Time : 13:00 HRS Tender Box : Reception Area Opening Venue: NEW ENGG. BLDG
MMI:PU:RF:003			
(address for communication) :		(for all correspondence) Purchase Executive : RAJESH SHELMEIDA Phone : 26989637 Fax : 00918028520135 E-mail: s.rajesh@bhel.in	

SI No.	Description	Qty	Unit	Delivery qty	Delivery Date
1	PS0679081062 Supply of 2x 2.5 or 1x 5MW Containerised * HSN/SAC : 8504 Test Certificate Supply of 5 MW, Containerised PCU as per BHEL spec PS-439-1291	4	ST	4	14.10.2020
2	PS0679081070 I & C Support for PCU Container 5 MW * HSN/SAC : 7308 I & C for container PCU 5 MW	4	AU	4	14.10.2020
3	PS0679081089 Supply of Spares for PCU * HSN/SAC : 8504 Test Certificate Supply of Spares as per BHEL spec PS-439-1291	1	ST	1	14.10.2020
4	PS0679086692 Comprehensive AMC for first Year * HSN/SAC : 7308 Comprehensive AMC for first Year (for all PCUs)	1	AU	1	14.10.2020
5	PS0679086706 Comprehensive AMC for Second Year * HSN/SAC : 7308 Comprehensive AMC for Second Year (for all PCUs)	1	AU	1	14.10.2020
6	PS0679086749 Comprehensive AMC for third Year * HSN/SAC : 7308 Comprehensive AMC for third Year (for all PCUs)	1	AU	1	14.10.2020
7	PS0679086757 Comprehensive AMC for fourth Year * HSN/SAC : 7308 Comprehensive AMC for fourth Year (for all PCUs)	1	AU	1	14.10.2020
8	PS0679086765 Comprehensive AMC for fifth Year * HSN/SAC : 7308 Comprehensive AMC for fifth Year (for all PCUs)	1	AU	1	14.10.2020
9	PS0679086773 Comprehensive AMC for sixth Year * HSN/SAC : 7308 Comprehensive AMC for sixth Year (for all PCUs)	1	AU	1	14.10.2020
10	PS0679086781 Comprehensive AMC for seventh Year * HSN/SAC : 7308 Comprehensive AMC for seventh Year (for all PCUs)	1	AU	1	14.10.2020
					14.10.2020

TWO PART BID - SUBMIT TECHNICAL AND PRICE BID IN SEPARATE SEALED COVERS

NOTES:

1. This RFQ is governed by:
 - a) INSTRUCTIONS TO BIDDERS/SELLERS and GENERAL CONDITIONS OF CONTRACT FOR PURCHASE available at <http://edn.bhel.com> (RFQ-PO Terms & Conditions)
 - b) Any other specific Terms and Conditions mentioned.
 2. Bidders / Representatives who would like to be present during opening of offers are required to furnish authorization letter for the same.
- * The HSN/SAC no mentioned against the line items in the RFQ are indicative only.

For and On behalf of BHEL.

RAJESH SHELMEIDA
Semiconductors & Pho

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REQUEST FOR QUOTATION

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MMI:PU:RF:003			
(address for communication) :		(for all correspondence) Purchase Executive : RAJESH SHELMEDEA Phone : 26989637 Fax : 00918028520135 E-mail: s.rajesh@bhel.in	

SI No.	Description	Qty	Unit	Delivery qty	Delivery Date
11	PS0679086790 Comprehensive AMC for eighth Year * HSN/SAC : 7308 Comprehensive AMC for eighth Year (for all PCUs)	1	AU	1	
12	PS0679086803 Comprehensive AMC for ninth Year * HSN/SAC : 7308 Comprehensive AMC for ninth Year (for all PCUs)	1	AU	1	14.10.2020
13	PS0679086811 Comprehensive AMC for tenth Year * HSN/SAC : 7308 Comprehensive AMC for tenth Year (for all PCUs)	1	AU	1	14.10.2020

Total Number of Items - 13

- 1.
- 2.

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			PURCHASE SPECIFICATION FOR 5000 kW CONTAINERISED GRID-CONNECTED POWER CONDITIONING UNITS		PS 439-1335	
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COPY RIGHT AND CONFIDENTIAL The information on this document is the property of Bharat Heavy Electricals Limited. It must not be used directly or indirectly in anyway detrimental to the interest of the company.						
		Technical specification for Supply, installation and commissioning of 3-phase Grid-connected Power conditioning units housed in 1x5 MW Container or 2x2.5MW Container				
		R00 dated 01.07.2020	Approved: Prachi Rao V			
			Prepared Sheetal Prasad	Issued  SC PV-Engg	Date 01.07.2020	

		बीएच ई एल 	PURCHASE SPECIFICATION FOR 5000 kW CONTAINERISED GRID-CONNECTED POWER CONDITIONING UNITS		PS 439-1335
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INTRODUCTION: This technical specification provides details of supply of Containerized solution for 3-phase Grid-connected Power Conditioning Units (PCU). The scope also includes commissioning of the supplied units at the project site for synchronizing the generated ac power with LV side of a transformer that connects to 33kV grid on HV side.					
1.0 Scope of supply					
COPY RIGHT AND CONFIDENTIAL The information on this document is the property of Bharat Heavy Electricals Limited. It must not be used directly or indirectly in anyway detrimental to the interest of the company.	SL No	Item Description	Qty		
	1.1	Supply of : a) 1 x 5MW Container consisting of 3-phase, Grid-connected Power Conditioning Unit (PCU) of 1500V rating and suitable power rating** along with other auxiliary items AC Output from the container : 2 nos. of 2500kW, 3-wire output OR b) 2 x 2.5MW Containers consisting of 3-phase, Grid-connected Power Conditioning Unit (PCU) of 1500V rating and suitable power rating** along with other auxiliary items AC Output from the container : 2500kW, 3-wire output ** PCUs of suitable rating (minimum rating of each PCU housed inside the container shall be 1.25MW, 1500V). However, the output from the container shall be at 2.5MW level. Note: 1 no “PCU” includes Inverter Panel, DC Combiner Panel and AC Combiner Panel	4 sets		
	1.2	Supply of Spares for power conditioning units. List of items with quantity is as follows: Mandatory Spares: 1) Electronic Cards for PCU ** Quantity = 5% of total population of each type 2) Semiconductor Fuses Quantity = 5% of total population of each type 3) AC Fuse of rating more than 10 Amp Quantity = 5% of each rating 4) Complete IGBT Unit for PCU Quantity = 5% of total population 5) MCCBS/MCBs Quantity = 5% of each type O&M SPARES: 1) Surge Protection Device Quantity = 1 set of each type and rating	1 set		

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COPY RIGHT AND CONFIDENTIAL The information on this document is the property of Bharat Heavy Electricals Limited. It must not be used directly or indirectly in anyway detrimental to the interest of the company.			Notes: (a) "POPULATION" = Total quantity of the item used in the total scope of supply of PCUs against subject tender as per Cl. 1.1 (b) Where % qty is a decimal, same shall be rounded off to the next higher whole no. (c) "1 SET" = Total Quantity of items used in 1 PCU of rating 2.5MW (in case 2 nos of 1.25MW PCUs are used in lieu of 1 no. of 2.5MW PCU, the quantity supplied shall be for 2 nos. PCUs). Similarly for other equivalent ratings. (d) The above spare quantities are for contingency purposes over and above the warranty requirements. (e) Item-wise BOQ and break-up prices shall be provided in the offer. ** (f) Electronic cards refers to all the cards used in the PCU including main microprocessor cards, protection cards, I/O cards, gate driver cards and any other PCBs used in the PCU not specifically indicated above.	
1.3		Commissioning of PCUs along with Training at site. BHEL scope of activities at site for installation and commissioning: (1) Movement and positioning of Containers with PCU panels at the earmarked position on the outdoor RCC platform. (2) Crimping the incoming (DC side) and outgoing (AC side) cables (BHEL supply) using the cable lugs provided by the vendor. (3) Connecting at the respective termination ends of the panels using the cable glands and fastening hardware (nuts, bolts, washers etc) provided by the vendor. Vendor scope of activities at site for commissioning: (1) All the electrical checks that are required to confirm that solar DC parameters (current, voltage) are available at the DC input side of PCUs. (2) Service engineers shall be present at site during installation of PCUs, commissioning of solar power plant, providing all necessary guidance and support to achieve successful synchronization of PCU output with grid and also to trouble-shoot / resolve the technical problems associated with PCU. Commissioning / Service Engineer shall be from OEM. (3) Guidance and support to BHEL team, at the time of installation and commissioning of SCADA, in respect of connection of communication cables to PCUs and technical problems related to receiving data signals at SCADA station from PCUs. (4) Training: Vendor shall provide training at site to BHEL and customer's engineers during commissioning. Training shall cover various technical aspects such as functional/ operational features, trouble-shooting procedures, maintenance schedules, requirements, safety, emergency precautions etc. Both the theory and practical (hands on) training shall be covered. Note: Supply and installation of integrated SCADA system for the overall power plant is within BHEL scope. A single lump-sum price per 5MW PCU (1x5MW or 2x2.5MW) Container basis shall be offered. The lump-sum price shall include all the costs that will be incurred by the vendor towards commissioning including travel, boarding, lodging and any other contingency expenses.	4 sets	

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PURCHASE SPECIFICATION FOR 5000 kW CONTAINERISED GRID-CONNECTED POWER CONDITIONING UNITS

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4.1.3	Maximum Power Point Tracking (MPPT)	MPPT shall be integrated in the power conditioning unit to maximize energy drawn from the solar PV array. The MPPT should be microprocessor based to minimize power losses. In order to maximized the energy collection from solar PV array, the PCU shall have inbuilt maximum power point tracker (MPPT) controller and MPPT shall be able operate the PV array at its maximum power point by adjusting output voltage of PV array system according to atmospheric condition. PCU MPPT controller shall ensure that it operate the PV array system at its global maximum power point and it shall not have rapped into PV array local maximum power point during cloudy atmospheric condition. The PCU shall operate within its MPPT operating input DC voltage range (window). The PCU MPPT operating DC voltage range shall be large enough so that it shall be able to satisfactorily operate the PV modules exposed to the maximum ambient temperature of 50°C. In case the solar PV array operating maximum power point voltage fall below (or above) the PCU MPPT operating voltage range, then the PCU controller shall automatically adjust the PCU input voltage so that PCU shall not enter into sleep mode. If the PV array output power fall below the PCU minimum preset power value, then PCU shall automatically switched to sleep mode. The details of working mechanism of MPPT shall be submitted during the detailed engineering. The operating voltage range of PCU
4.1.4	AC-DC conversion	3-phase Inverter stack
4.1.5	Built-in support systems	PCU shall be provided with protection circuits, monitoring circuits, data logging & storage system, provisions to download data to PC/Laptop, MODBUS communication outputs for SCADA interface etc as per Cl. 4.7 of this specification.
4.1.6	External ducts or heat exchangers	Containers shall be provided with cooling ducts or heat exchangers for the extraction of heat from PCUs. Design shall suit the HVAC requirements of the container. Vendor shall submit HVAC calculations during detailed engineering.
4.1.7	DC input and AC output terminations	Input and output terminations together with cable glands, lugs, hardware shall be provided to match the connections using BHEL cables as specified under related clauses of this specification. Terminals should be shrouded.
4.1.8	Environment protection	All PCB cards shall be provided with suitable coating (epoxy etc) for protection.

4.2 Technical parameters

#	Technical parameter for individual PCU	BHEL specification
4.2.1	Output power rating	Rating of individual PCUs housed inside each container rating can vary depending on vendor design (with minimum rating of 1250kW each) with overall container output 1x5000kW Or 2x2500kW (at 50 deg C ambient) – No derating upto 50degC. However, for each Block of 5MW, 2 nos of 2500kW, 3phase, 3 wire, 50Hz output shall be made available. The continuous combined rating of all PCU shall not be less than Plant capacity (20MW) at unit power factor at ambient temperature of 50 deg C, and 0.95 p.f. at 40 deg C.
4.2.2	AC grid connection	3-phase
4.2.3	Output frequency	50 Hz +/- 5%.

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			The PCU shall be capable of operating in the frequency range of 47.5 Hz to 52 Hz and shall be able to deliver rated output in the frequency range of 49.5 Hz to 50.5 Hz.		
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		4.2.5	Maximum DC input voltage (Max open circuit PV voltage)	1500 V DC	
		4.2.6	MPPT Range of control system	Range to be indicated by vendor.	
		4.2.7	DC side peak power	Vendor shall confirm that PCU is suitable for overloading of DC input power upto 30%.	
		4.2.8	Max DC operating current	Value to be indicated by vendor.	
		4.2.9	Max AC output current	Value to be indicated by vendor corresponding to the rated output power of the PCU.	
		4.2.10	Power factor	Designed operation close to unity PF. Adjustable window 0.9 lead to 0.9 lag	
		4.2.11	Ambient temperature	0 to 50 deg C.	
		4.2.12	Relative Humidity	Upto 95% non-condensing	
		4.2.13	Ingress Protection of Container	IP 54 or higher (Outdoor duty). The container must be suitable to withstand the harsh environmental conditions for complete life of plant.	
		4.2.14	Grid Frequency tolerance	+/- 3 Hz	
		4.2.15	Grid Voltage tolerance	+/- 10%	
		4.2.17	AC output THD limits	Current THD < 4% at nominal load	
		4.2.18	Maximum noise level	Maximum Noise level 75 dBA	
		4.2.19	DC injection (as % of nominal load current)	DC injection shall be limited to 0.5% of the rated current of the inverter.	
		4.2.20	Flicker	Shall be as per IEC 61000	
		4.2.21	Set point pre-selection for active power and VAR control	PCU shall be provided with all necessary features that will enable set point selection through SCADA. For this PCU vendor shall furnish the Modbus mapping for the set points or suggest the possible method for selecting VAR control. Operator shall be able to limit the total power (Active and Reactive) injected in the grid through manual intervention as and when required in view of grid security.	
		4.2.22	Auxiliary power requirement – Auxiliary Transformer, ACDB, UPS	In addition to the PCU, the container shall consist of the following items: (i) Auxiliary Transformer Dry type 3-Ph, 415V output (a) Rating 15KVA along with ACDB Panel – 1 set for each 2500kW container	

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COPY RIGHT AND CONFIDENTIAL The information on this document is the property of Bharat Heavy Electricals Limited. It must not be used directly or indirectly in anyway detrimental to the interest of the company.						- If 5000kW container is provided, 30kVA auxiliary transformer along with ACDB Panel shall be provided. b) All ACDBs shall have 2 incomers (100% rated) fed from 2 different sources – one from the auxiliary transformer located within the container and the second from auxiliary transformer in adjacent container. Suitable provision for 2 such redundant inputs shall be available in the ACDB. c) Output feeders in ACDB shall be tentatively as per the attached Auxiliary SLD (Annexure-B). However, final feeder list shall be provided during detailed engineering. d) In case auxiliary supply of PCU is met internally, then it should have sufficient power backup to meet the LVRT requirement. Vendor shall submit the detailed auxiliary supply arrangement during detailed engineering stage.
						(ii) UPS – 1ph, 50Hz, 230V a) Rating - 2KVA – 1 set for each 2500kW container Each UPS shall consist of 1x100% charger and inverter, 1 x 100% Battery bank for providing 30 minutes backup. Bypass Line static switch, manual bypass switch, 1 x 100% UPSDB, and other necessary Protective devices and accessories. UPSDB shall have two incomers, each fed from two separate 2kVA UPS as mention above. At a time one incoer shall be in service. Suitable auto changeover logic shall be provided. b) If 5000kW container is provided, 2 nos. of 2kVA UPS Systems as detailed above shall be provided. c) All further technical details of UPS are provided in extract of NTPC tender (Annexure-C). All relevant clauses to be adhered to.
						(iii) Cabling scope: a) For connection within PCU container (including supply of cables, cable accessories, hardware etc): Between PCU, Auxiliary Transformer, ACDB Panel & UPS - PCU Vendor's scope. b) For interconnection between ACDB & UPS in PCU container) to external equipment (being supplied by BHEL) - BHEL scope.
						(iv) Auxiliary supply, if required internally for PCU, shall be tapped from within PCU and shall be over and above the above indicated ratings.
						4.2.23

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COPY RIGHT AND CONFIDENTIAL The information on this document is the property of Bharat Heavy Electricals Limited. It must not be used directly or indirectly in anyway detrimental to the interest of the company.	4.2.24	European Efficiency	Minimum Euro Efficiency shall be 97% Vendor shall specify the conversion efficiency values at 25%, 50%, 75% and 100% of rated load during detailed engineering, which shall be confirmed by type test reports.		
	4.2.25	PCU availability	The up-time of Inverters should be of 99% in a year, in case of failing to achieve this due to failure of any component of inverter the vendor shall either replace the inverter or the component at their own cost		
	4.2.26	No load loss	No load loss shall be < 1% of rated power and maximum loss in sleep mode shall be less than 0.05%.		
	4.2.27	Voltage Ride Through	The PCU shall remain connected to the grid during temporary dip or rise in grid voltage as per the LVRT and HVRT requirements of CEA Technical Standards for Connectivity to the Grid Regulations. The PCU shall also be able to inject reactive power during the period of voltage dip.		
	4.2.28	Active power regulation	The PCU shall be able to limit the active power exported to the grid based on the set point provided through PCU front control panel. The PCU shall also be able to automatically the limit the active power after an increase in grid frequency above a pre-set value. The ramp rate shall be adjustable during operation and start-up after fault. The applicability of the requirement shall be as per CEA regulation and compliance.		
	4.2.29	Reactive power control	The PCU shall be able to inject /absorb reactive power to/ from the grid based on the set point provided through PCU front control panel. The same shall be performed automatically with adjustable ramp rate based on dynamic changes in grid voltage or reactive power reference		
	4.2.30	Night time VAR Compensation	PCU shall be capable of providing night time reactive power compensation. Suitable circuitry shall be provided for the same.		
4.3 Protection systems					
	4.3.1	Protection systems for current, voltage, temperature, surges, ground faults, fan failure etc.	AC & DC over current, under and overvoltage, under and over frequency protection		
	4.3.2		AC & DC short circuit		
	4.3.3		DC reverse polarity		
	4.3.4		Over temperature protection: Heat sink, Cabinet		
	4.3.5		Synchronization loss		
	4.3.6		Anti-islanding & LVRT protection		
	4.3.7		EMI and RFI		
	4.3.8		Grid monitoring Protection against any sustained fault (lightning effect etc) in grid / feeder line.		
	4.3.9	PV array-Ground fault monitoring & detection, insulation monitoring			

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COPY RIGHT AND CONFIDENTIAL The information on this document is the property of Bharat Heavy Electricals Limited. It must not be used directly or indirectly in anyway detrimental to the interest of the company.		4.3.10		Power regulation in the event of thermal overloading	
		4.3.11		Internal Surge Protection Device (SPD) shall be provided in the PCU on DC and AC side. It shall consist of Metal Oxide Varistor (MOV) type arrestors. The discharge capability of the SPD shall be at least 12.5kA at 8/20 micro second wave as per IEC 61643-12.	
		4.3.12		PCU shall have active power limit control, reactive power and power factor control feature. Plant operator shall be able to provide (manual intervention) active power, reactive power and power factor control/limit set point through SCADA HMI and local control display unit (or Laptop computer). PCU shall be provided with remote start and stop facility from SCADA HMI. All required hardware and software required for this purpose shall be provided by vendor.	
		4.3.13		PCU shall have thermal overloading protection to prevent failure of switching devices (i.e. IGBT) and other components of Inverter. PCU controller shall automatically regulate/limit the power output in order to reduce the PCU cabinet and switching devices temperature. Bidder to submit the PCU power vs ambient temperature curve during details engineering stage. PCU shall be able to provide inverter inside cabinet and IGBT's (switching device) temperature (in soft analog value) to SCADA system for remote monitoring, storing and report generation purpose.	
		4.3.14		Fan failure – Alarm contact shall be provided for air flow loss / rise of temperature of cooling fan. If any other cooling methodology is used (air-water heat exchangers etc, similar alarm annunciation shall be made available).	
4.4 DC, AC side load break disconnecting switch / breaker provisions					
4.4.1	DC side	DC Switch Disconnecter. Clause to be read in conjunction with Cl. 4.8.2.			
4.4.2	AC side	(a) ACBs shall be provided on the AC output side. (b) Remote operating and controlling facility for PCU from the Main Control Room shall be provided. (c) Aux contacts (ON/OFF feedback) from both ACB and DC Switch Disconnecter shall be made available at TB terminals to enable external wiring for SCADA monitoring purpose. (d) Surge protection device (3P) with suitable rating shall be provided at the input of the ACB. (e) Indication for grid side supply ON / OFF status shall be available on the Door Interface. (f) Interconnection between the ACB Panel and PCU supply/provision of cables / busbars as applicable shall be in the scope of the vendor.			



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4.5 Front panel display and control

4.5.1	Front panel screen (LCD display, etc) with browsing / navigation provisions to	Instantaneous DC power input DC input voltage DC Current
4.5.2	1) select display parameters 2) provide settings for various parameters	Instantaneous active AC power output Instantaneous reactive AC power output AC voltage (all the 3 phases and line) AC current (all the 3 phases and line) Frequency Power Factor Energy (kWh) produced during entire day Total Energy (kWh) produced during its life
4.5.3		Faults
4.5.4		Other event logs
4.5.5		Other features as may be necessary for supervisory control and operation of the PCUs shall be provided.
4.5.6		PCU shall be provided with Mobile user interface facility for monitoring of inverter

4.6 Data logging, storage, retrieval, downloading, uploading

4.6.1	Provision of built-in systems for data logging, storage, retrieval, downloading, uploading etc.	Date-cum-time stamped logging of DC and AC side parameters (current, voltage, frequency, phase, power factor, power, export energy etc), faults and other events.
4.6.2		Data storage with retrieval features.
4.6.3		Provision of all necessary built-in systems, ports etc for downloading the data into a PC / Laptop etc that will be required for reporting, data analysis and trouble-shooting purposes.
4.6.4		Provision of all necessary built-in systems, ports etc for uploading of software etc that will be required for replacing, revising, upgrading the system.
4.6.5	LAPTOP for PCU	One number of laptop PC shall be supplied for PCU configuration and troubleshooting purpose. Laptop shall be supplied with complete set of hardware & software accessories. Laptop detailed configuration must ensure suitability for the required applications. Supplied Laptop shall be protected with the latest anti-virus software and shall be provided 3 Years onsite warranty including its battery. At least two sets of communication cable for Laptop to PCU communication shall be provided.

4.7 Provisions for interface with SCADA & POWER PLANT CONTROLLER

4.7.1	SCADA - Interface requirement	Solar PV power plant will have an integrated SCADA, which is within BHEL scope, whereby all the PCUs will be integrated with other data systems such as solar array string monitoring,
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				weather monitoring, HT side transformers / breakers monitoring, etc. Accordingly, PCU shall have necessary communication protocol and output ports to facilitate SCADA interface as per Clause 4.7.2. SCADA shall be OPC server based.	
4.7.2	SCADA - Communication protocol			Dedicated MODBUS TCP/IP on Ethernet Interface for networking with SCADA.	
4.7.3	SCADA - Parameters			All DC and AC parameters (current, voltage, frequency, phase, power factor, power, export energy etc), grid data, temperature, faults, other event logs, date/time logs etc from each PCU will be required at SCADA control desk. PCU shall provide for this requirement.	
4.7.4	SCADA - Remote monitoring features			PCU shall have features to facilitate remote monitoring via telephone modem or mini web server.	
4.7.5	POWER PLANT CONTROLLER (PPC)			As per latest CEA 2019 grid connectivity standards, for the Solar PV power plant, Integrated Power Plant Controller (PPC) shall be provided along with the SCADA system by BHEL. The PPC along with its control software shall be capable of controlling the individual PCUs through SCADA including ON/OFF operations, Control of Active power, reactive power, Frequency, power factor, Ramp up/Down, Voltage regulation etc. PCU shall be provided with suitable provisions.	
Details given for DC and AC Inputs and termination in the Clauses below refer to 2500 kW PCU. Depending on the individual PCU ratings being offered by bidders, the relevant clauses shall be interpreted in accordance with the ratings being offered by the bidder.					
4.8 DC Inputs and termination details for 2500 kW PCU. For 2x2500kW Container or 1x5000kW Container, the quantity shall be in multiples thereof					
Vendor shall supply the PCU with the termination features on DC side as tabulated below. Detailed drawings of termination arrangements with bus bar particulars such as positions, dimensions, hole sizes, spacing between holes, support to bus bar, etc shall be submitted for BHEL approval.					
4.8.1	DC input terminals			2500kW PCU (28 inputs minimum): (13+1spare for DC +ve and 13+1 spare for DC -ve)	
4.8.2	Fuses / DC Ckt Breaker on DC input side			(a) Fuse current rating 450A (min) shall be provided at the positive DC input terminal. Fuse requirement at the negative side of incoming DC cable shall be as per inverter manufacturer's recommendation. (b) Alternately, DC circuit breaker 315A (min) can also be provided as per design. If DC Breaker is provided for each input, then DC Switch Disconnecter as per Cl. 4.4.1 is not mandatory.	
4.8.3	Max DC input current rating of PCU			Vendor shall indicate the rating. In addition, max rating of each individual DC input shall be indicated	
4.8.4	DC cable entry into panel			Bottom entry. Cable supply is within BHEL scope.	

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					1C x 400 sq-mm, 3.3Kv grade Aluminium, multi-strand, armoured, XLPE insulation, PVC sheath cable will be used for each DC input. Exact size shall be provided during detailed engg. DC termination shall be suitable for the above cable.
COPY RIGHT AND CONFIDENTIAL The information on this document is the property of Bharat Heavy Electricals Limited. It must not be used directly or indirectly in anyway detrimental to the interest of the company.	4.8.5	Gland plates	Drilled Gland plates shall be provided with holes to accommodate the cable glands.		
	4.8.6	Cable glands	Nickel plated brass, double compression type cable glands of reputed make (Make: Comet or any other reputed make) shall be provided by the vendor. To enable right selection of glands, final cable O.D will be provided by BHEL at the time of manufacturing. Approval of make and type/size shall be taken from BHEL before procurement of glands. Part no. and qty shall be indicated in the BOM. PCUs shall be supplied with all the glands fixed on the gland plates.		
	4.8.7	Cable lugs, plain washers, spring washers, bolts and nuts	Similarly, cable lugs, bolts, nuts & plain washers, Zinc coated spring washers shall be provided by the vendor. Make for lugs: Dowells or any other reputed make with CE/VDE/UL/CSA/BIS. Approval of make and type/size shall be taken from BHEL before procurement of lugs. Part no. and qty shall be indicated in the BOM. PCUs shall be supplied with all these items fixed on the bus bars at their respective positions. DC Cables in BHEL scope shall be Aluminium type. Suitable cable lugs in PCU vendor scope shall be based on the type of busbars being used in PCU: a) If Aluminium busbars used, aluminium lugs to be provided. c) If Copper busbars used, Al-Cu Bi-metallic lugs or Aluminium Lugs with Bi-metallic strips/washers to be provided.		
	4.8.8	Bus bar design	Tinned Copper or Aluminium Busbars shall be provided.		
	4.8.9	In case of separate DC termination panel	(a) In case the DC terminations are not within the main PCU panel with the vendor design featuring a separate panel, the add-on panel shall also be included in the offer. (b) General arrangement showing views and details of termination panel, with cable entry particulars, shall be submitted as part of technical bid. (c) Interconnecting the add-on DC termination panel with the main panel, including supply of cables for this purpose, shall be within the scope of vendor.		
	4.8.10	DC Side Negative Grounding	DC side negative grounding system shall be provided for the PCU.		

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				The same shall be indicated in the GA/SLD/Schematics and BOM.	
COPY RIGHT AND CONFIDENTIAL The information on this document is the property of Bharat Heavy Electricals Limited. It must not be used directly or indirectly in anyway detrimental to the interest of the company.		4.9 AC Output and termination details for for 2500 kW PCU. For 2x2500kW Container or 1x5000kW Container, the quantity shall be in multiples thereof			
		Vendor shall supply the PCU with the termination requirements on AC side as tabulated below. General arrangement showing views of termination shall be submitted as part of technical bid. Detailed drawings of termination arrangements with bus bar particulars such as positions, dimensions, hole sizes, spacing between holes, support to bus bar, etc shall be submitted within seven days after receipt of purchase order for BHEL approval.			
		4.9.1	Number of AC outputs	Three phases: R, Y, B terminals	
		4.9.2	AC cable entry into panel	Top / Bottom entry. Cable supply is within BHEL scope. Vendor to confirm methodology used. For each phase, 6 runs of 1Cx400 sq.mm,1.1kV Grade aluminium, multi-strand, armoured, XLPE insulation, PVC sheath cable will be used. Final cable selected and cable O.D shall be informed to vendor during detailed engineering for selecting suitable cable lugs, glands and termination.	
		4.9.3	Gland plates	Drilled Gland plates shall be provided with holes to accommodate the cable glands.	
		4.9.4	Cable glands	Nickel plated brass, double compression type cable glands of reputed make (Make: Comet or any other reputed make) shall be provided by the vendor. Approval of make and type shall be taken from BHEL before procurement of glands. PCUs shall be supplied with all glands fixed on the gland plates.	
		4.9.5	Cable lugs, plain washers, spring washers, bolts and nuts	Similarly, cable lugs, bolts, nuts & plain washers, Zinc coated spring washers shall be provided by the vendor. AC Cables in BHEL scope shall be Aluminium type. Suitable cable lugs in PCU vendor scope shall be based on the type of busbars being used in PCU: a) If Copper busbars used, Al-Cu-bimetallic lugs or Aluminium lugs with Bi-metallic strips/washers to be provided. b) If Aluminium busbars used, Al lugs to be provided Make for lugs: Dowells or any other reputed make with CE/VDE/UL/CSA/BIS. Approval of make and type shall be taken from BHEL before procurement of these items. Part no. and qty shall be indicated in the BOM. PCUs shall be supplied with all these items fixed on the bus bars at their respective positions.	
		4.9.6	Bus bar design	Tinned Copper or Aluminium busbars shall be provided.	

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COPY RIGHT AND CONFIDENTIAL The information on this document is the property of Bharat Heavy Electricals Limited. It must not be used directly or indirectly in anyway detrimental to the interest of the company.	4.9.7	In case of separate AC termination panel	In case the AC output terminations are not within the main PCU panel with the vendor design featuring a separate panel, the add-on panel shall also be included in the offer. General arrangement showing views and details of termination panel, with cable entry particulars, shall be submitted as part of technical bid. Interconnecting the add-on AC termination panel with the main panel, including supply of cables for this purpose, shall be within the scope of vendor.		
	4.10 Panel related parameters				
	4.10.1	Structure sheets	Doors and frames - Type of enclosure and size/thickness details of the doors and frames shall be indicated by vendor Gland plate: Minimum 3mm thk min sheet steel or 4 mm thk non-magnetic material		
	4.10.2	Bus bars	Busbars shall be of appropriate size to match current rating, based on vertical / horizontal layouts and bus bar orientations. Insulation sleeves (PVC etc.) shall be used wherever necessary. Bus bars (both AC and DC) shall be suitably colour coded.		
	4.10.3	Internal power cables	Insulated (PVC etc.) copper cable with appropriate cross section to match current rating.		
	4.10.4	Control wiring	Insulated (PVC etc.) copper cable of appropriate cross-section.		
	4.10.5	Base channel	ISMC channel of appropriate size to withstand the weight of the panel; suitable anti-corrosive finish (powder coated finish etc). Single rectangular ISMC base frame shall be provided for the complete panel.		
	4.10.6	Fixing of PCU	PCU shall be suitable for fixing on the cable trench channels by the means of tack welding.		
	4.10.7	Earthing terminals as per relevant standards	Earthing terminals shall be provided using tinned copper / aluminium bars of suitable cross section. Terminals shall be brought out to facilitate external connections.		
	4.10.8	Insulation clearances	AC side: Phase to Phase / neutral: As per relevant standards DC side: As per relevant standards.		
	4.10.9	Container Enclosure /Painting	The PCU enclosure protection class shall be IP 54 or better protection. The container shall have projection of at least 50cm wherever on opening the inverter door exposes the inverter component to outside environment. Alternatively, vendor can also provide integrated protection to the inverter enclosure through suitable other arrangement (s) subjected to NTPC approval. The enclosure must be suitable to withstand the harsh environmental conditions for complete life of plant. All equipment shall be protected from external corrosion by providing suitable paint. Paint shade shall be informed during detailed engineering.		

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				Vendor shall submit temperature endurance test report of complete assembly during detailed engineering stage.			
		4.10.10	Overall dimensions	Width x Depth x Height in mm shall be indicated in the offer.			
		4.10.11	Weight	Panel weight shall be indicated in the offer.			
COPY RIGHT AND CONFIDENTIAL The information on this document is the property of Bharat Heavy Electricals Limited. It must not be used directly or indirectly in anyway detrimental to the interest of the company.		4.10.12	Cooling and ventilation Air Flow Requirement (m3/hr)	To be indicated by vendor for each PCU. - HVAC calculations shall be provided by vendor during detailed engg - Alternatively, if liquid cooling is recommended, vendor shall provide all the details along with thermal design calculations.			
		5.0 Testing and inspection					
		5.1	ROUTINE AND ACCEPTANCE TESTS: as per relevant standards (IEC etc), shall be carried out on the PCUs and shall be witnessed by BHEL & Customer/ Customer authorized third party inspection agency). Vendor shall submit Manufacturing Quality Plan (MQP) and detailed Test Procedure along with drawings for formal approval by customer prior to inspection. Routine tests shall be carried out by vendor on all the PCUs as per customer approved MQP. Following are the minimum tests to be conducted but not limited to: (a) HV and IR tests on 100% PCUs. (b) Functional tests (c) Load testing of inverter on 1No. PCU: - Verification of inverter performance in its stand-alone operational mode with a defined power (up to 100% rated full load power) and DC input voltage (up to max value). All parameters: DC voltage, current, power, grid voltage / current of R,Y,B lines, line frequency, ac output power, ac output energy, power factor, line current, efficiency, THD, etc. to be measured at 25%, 50%, 75% and 100% of the rated nominal power and checked against specified acceptance norms. (d) Heat Run Test at rated full load on 1 no. panel (e) Protection tests (by direct method or simulation method) - Verification of automatic disconnecting and reconnecting of Inverter to the grid, based on rise and fall of heat sink and cabinet temperature with reference to set points. - DC Reverse Polarity protection test - DC Ground Fault - AC and DC Overvoltage - Abnormal voltage and frequency Test reports shall be submitted prior to dispatch of the system to the site.				
		5.2	Integrated Functional Testing on the PCU Container as per the approved MQP				
		6.0 Documents to be submitted after receipt of purchase order					

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6.1	Following documents shall be submitted for approval within seven days from date of purchase order. 1. GTP/Datasheet 2. General Arrangement of PCU Container along with PCUs and other auxiliary equipment, lighting, HVAC details, Fire alarm system etc 3. BOM for complete PCU including all major components of PCU, AC and DC Combiner Panels 4. BOM of Auxiliary Transformer 5. BOM of ACDB 6. BOM of UPS System 7. Cable Schedule 8. Type test reports (the type tests should have been conducted within ten years from the date of bid opening) 9. Spares List 10. Civil Foundation drgs for PCU outdoor installation on RCC platform 11. Manufacturing Quality Plan (MQP) Vendor shall proceed with Manufacturing only after final approval of all the listed documents.
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7.0 Documents to be submitted along with consignment

7.1	Following documents shall be submitted at the time of dispatch: a. Test reports on individual PCUs b. Technical manual with system specifications, installation guidelines, commissioning guidelines, schematic drawings, circuit board overlays, system set points, calibration settings, hardware settings, cable schedule, general arrangement drawings, panel details. c. Operation and Maintenance manual including final As Built and tested drgs and datasheet, test reports, catalogs of individual components, schematic drgs shall be provided (segregated section wise) in both hard copy and soft copy.
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ACDB SCHEME-

ACDB will include individual feeders for each of the following-

1. UPS
2. Module washing Pump
3. Borewell
4. Internal Lighting
5. Inverter Station Lighting
6. Peripheral Lighting
7. SCADA
8. HT Panel Input 1
9. HT panel Input 2
10. Inverter Transformer
11. Spare feeders as per customer requirement

UPS DB will have feeders for the following-

1. Fire alarm system
2. AC to DC Converter
3. Emergency Lighting
4. SCADA
5. Inverter
6. Spare feeders as per customer requirement

1 UNINTERRUPTIBLE POWER SUPPLY (UPS) SYSTEM

The minimum capacity of the UPS at load factor of 0.8 lagging inclusive of 10% design margin at 50 deg C. The UPS shall have an overload capacity of 125 % rated capacity for 10 minutes and 150 % rated capacity for 10 seconds. The overall efficiency of UPS shall be at least 80% on full load.

The UPS system shall be capable of operating without D.C. battery in circuit under all conditions of load and the performance of various components of UPS like inverter, charger, static switch etc. shall be guaranteed without the battery in circuit.

For UPS capacity 5 kVA or more, in addition to indications/display on UPS panel, important alarms along with important analog signal shall also be provided for use in SCADA. For UPS capacity less than 5 kVA bidder shall provide status, common alarm and trip DI (soft or hard) signal to SCADA

The UPS chargers shall be self-regulating, solid state silicon controlled, full-wave rectifier type designed for single and parallel operation with battery and shall have automatic voltage regulators for close voltage stability even when AC supply voltage fluctuates. The charger should be capable to fully charge the required batteries as well as supply the full rated load through inverter. The charger shall be able to re-charge the fully discharge battery within 8 hours. The charger shall be design for input supply variation of $\pm 10\%$ and frequency variation of $\pm 5\%$. Charger design shall ensure that there is no component failure due to fluctuations of input supply or loss of supply and restoration. The detailed specification for the battery charger for UPS rating of 5kVA and above has been mentioned in the battery charger section below in this specification.

The UPS inverter shall be of continuous duty, solid state type using proven Pulse Width Modulation (PWM)/Quasi square wave/step wave technique. Ferro-resonant types Inverters are not acceptable. The nominal voltage output shall be 230 Volts single phase ,50 Hz. The inverter equipment shall include all necessary circuitry and devices to conform to requirements like voltage regulation, current limiting, wave shaping, transient recovery, etc. The total harmonic content shall be 5% maximum and content of any single harmonic shall be 3% maximum.

The static switch shall be provided to perform the function of transferring UPS loads automatically without any break from faulty inverter to standby AC source. Manual bypass switch shall be employed for isolating the UPS during maintenance.

Contractor has the option of supplying either Nickel Cadmium type batteries or Lead Acid Plante type batteries. The detailed specification for the batteries has been mentioned in the battery and charger section below in this specification.

Equipment enclosures shall match and line up in assemblies of freestanding floor mounted cabinets designed for indoor service.

Individual enclosure shall be ventilated switchboard type fabricated from not less than 1.6-mm thick sheet steel. Enclosures shall be furnished with concealed hinges. Front and rear doors shall be designed to permit easy access to all components for maintenance or replacement. The enclosures shall be reinforced with formed steel members as required to form a rigid self-supporting structure. Doors shall have three point latches.

Adequate ventilating louvers and enclosure top panels shall be included. All vent openings shall be covered with corrosion resistant fine screen coverings.

The cabinets shall be IP-42 protection class for indoor application and IP65 for outdoor application.

The temperature rise inside all the cabinets/enclosures shall not exceed 10 deg.C above ambient temperature.

The Contractor shall also carry out the site tests on UPS as required to be conducted as a standard practice of the UPS manufacture or deemed necessary by the Employer and mutually agreed between the Contractor and the Employer.

One set of tool shall be provided for maintenance and testing purposes.

Battery shall be either Nickle Cadmium battery or Lead Acid Plante Battery. Specifications are as mentioned below-

2. BATTERY : NICKEL-CADMIUM BATTERY

BATTERY PARAMETER

- a) Battery Voltage- To be decide during Detail Engineering
- b) No. of Cells- To be decide during Detail Engineering
- c) Battery type- Nickel-Cadmium
- d) Nominal discharge voltage per Cell- 1.2
- e) Float voltage- 1.42V/Cell

Batteries should be suitable for continuous operation for the maximum ambient temperature as defined in technical parameters.

CODES AND STANDARDS

All standards, specifications and codes of practice referred to herein, shall be the latest editions including all applicable official amendments and revisions as on date of opening of techno-commercial bid. In case of conflict between this specification and those (IS codes, Standards etc.) referred to herein, the former shall prevail. All works shall be carried out as per the following standards and codes:

IEC 60623/ IS 10918 Specification for vented type Nickel Cadmium Batteries.

IS 106 Quality tolerances for water for storage batteries

IEC 60993 Electrolyte for vented Nickel-Cadmium cells

Indian electricity rules

Indian electricity acts

Equipment complying with other internationally accepted standards such as IEC., BS, VDE etc. will also be considered if they ensure performance and constructional features equivalent or superior to standards listed above. In such a case, the Bidder shall clearly indicate the standard(s) adopted, furnish a copy in English of the latest revision of the standards alongwith copies of all official amendments and revisions in force as on date of opening of techno-commercial bid and shall clearly bring out the salient features for comparison.

DC Batteries shall be stationary Nickel Cadmium Pocket plate type conforming to IS:10918. The batteries shall be high/medium discharge performance type suitable for the backup time as specified. For the purpose of design an ambient temperature of 50 degree centigrade and relative humidity of 85% shall be considered.

DC batteries shall be suitable for standby duty. The batteries shall normally be permanently connected to the load in parallel with a charger and shall supply the load during emergency conditions when AC supplies are lost. Batteries shall be suitable for a long life under continuous float operations and occasional discharges. The batteries shall be boost charged at about 1.54 to 1.7 volts per cell maximum and float charged at about 1.42 V/cell.

Construction Features:-

a) Containers

Containers shall be made of polypropylene plastic material. Containers shall be robust, heat resistance, leak proof, non absorbent, alkali resistant, nonbulging type and free from flaws, such as wrinkles, cracks, blisters, pin holes etc. Electrolyte level lines shall be marked on container in case of translucent containers.

b) Vent Plugs

Vent plugs shall be provided in each cells. They shall be antisplash type, having more than one exit hole shall allow the gases to escape freely but shall prevent alkali from coming out. The design shall be such that the water loss due to evaporation is kept to minimum. In addition the ventilator shall be easily removed for topping up the cells and of such dimensions that the syringe type hydrometer can be inserted into the vent to take electrolyte samples.

c) Plates

The plates shall be designed for maximum durability during all service conditions including high rate of discharge and rapid fluctuations of load. The construction of plates shall conform to latest revisions of IS:10918. The separators shall maintain the electrical insulation between the plates and shall allow the electrolyte to flow freely. Separators should be suitable for continuous immersion in the electrolyte without distortion. The positive and negative terminal posts shall be clearly marked.

d) Sediment Space

Sufficient sediment space shall be provided so that cells will not have to be cleaned during normal life and prevent shorts within the cells.

e) Electrolyte

The electrolyte shall be prepared from battery grade potassium hydroxide conforming to IEC 60993. The cells can be shipped either in charged condition or in dry condition. Necessary electrolyte for make-up shall be supplied separately.

f) Connectors and Fasteners

Nickel plated copper connectors shall be used for connecting adjacent cells and PVC insulated flexible copper cables shall be used for inter-row / intertier / inter-bank connections. Bolts, nuts and washers shall be Stainless Steel / Nickel coated steel to prevent corrosion. The thickness of Nickel coating of connectors should be not less than 0.02 mm. All the terminals and cells inter-connectors shall be fully insulated or have insulation shrouds.

g) Battery racks

Mild steel racks for all the batteries shall be provided. They shall be free standing type mounted on porcelain/hard rubber/PVC pads insulators/High impact plastic insulators. Batteries shall preferably be located in the single tier arrangement. However, batteries having a complete cell weight of lower than 50 Kg could be located in the double tier arrangement. The batteries racks and supports for cable termination shall be coated with three (3) coats of anti-alkali paint of approved shade. Name plates, resistant to alkali, for each cell shall be attached on to the necessary racks. The bottom tier of the stand shall not be less than 150 mm above the floor.

Testing

The Contractor shall submit for Owner's approval the reports of all the type tests carried out as per latest IS-1146(for all applicable tests for containers) / IS-10918 (for NI-CD batteries).The complete type test reports shall be for any rating of battery in a particular group, based on plate dimensions being manufactured by supplier. Routine and Acceptance tests shall be as per Quality Assurance & Inspection table of battery.

3. BATTERY : LEAD –ACID PLANTE BATTERY

BATTERY PARAMETER

- a) Battery Voltage- To be decide during Detail Engineering
- b) No. of Cells- To be decide during Detail Engineering
- c) Battery type- Stationary Lead Acid Plante
- d) Nominal discharge voltage per cell- 2.0V
- e) Float Voltage 2.25V/Cell

CODES AND STANDARDS

IEC 60896 Stationary Lead-Acid Batteries

IS : 266 Specification for sulphuric acid

IS : 1069 Specification for water for storage batteries

IS : 1146 Specification for rubber & plastic containers for lead acid storage batteries.

IS : 1652 Specification for stationary cells and batteries, lead acid type (with plante positive plates).

IS : 3116 Specification for sealing compound for lead acid batteries.

IS : 8320 General requirements and methods of tests for lead acid storage batteries.

IS : 6071 Specification for synthetic separators for lead acid batteries.

Indian Electricity Rules

Indian Electricity Acts

Equipment complying with other internationally accepted standards such as IEC, BS, VDE etc. will also be considered if they ensure performance and constructional features equivalent or superior to standards listed above. In such a case, the Bidder shall clearly indicate the standard(s) adopted, furnish a copy in English of the latest revision of the standards alongwith copies of all official amendments and revisions in force as on date of opening of techno-commercial bid and shall clearly bring out the salient features for comparison.

DC Batteries shall be stationary lead acid Plante positive plate type conforming to IS:1652. The batteries shall be high/medium discharge performance type suitable for the backup time as specified. For the purpose of design an ambient temperature of 50 degree centigrade and relative humidity of 85% shall be considered.

DC Batteries shall be suitable for standby duty. The Batteries shall normally be permanently connected to the load in parallel with a charger and shall supply the load during emergency conditions when AC supplies are lost. Batteries shall be suitable for a long life under continuous float operations and occasional discharges. The batteries shall be boost charged at about 2.7 volts per cell maximum and float charged at about 2.25 V/cell.

Construction Features:-

a) Containers

Containers shall be made of transparent glass, hard rubber, suitable robust, heat resistance, leak proof, non absorbent, acid resistant, non-bulging type and free from flaws, such as wrinkles, cracks, blisters, pin holes etc. Electrolyte level lines shall be marked on container in case of transparent containers. Float type level indicator shall be provided in case of opaque containers. The stem portion of the float should be long enough to prevent falling of the float inside the container even if there is no electrolyte in the container. The marking for the electrolyte level should be for the upper and lower limits. The material of level indicator shall be acid proof and oxidation proof. Container shall be closed/sealed lid type. Lid and sealing compound shall be non-cracking type. The container made of hard rubber and plastics shall be type tested as per IS : 1146. All type tests shall be carried out for sealing compound as per IS:3116. The pole sealing arrangement should be such that no acid particle get entrapped due to acid creep as a result of capillary action and it should be

possible to remove and refix the sealing to carry out the maintenance.

b) Vent Plugs

Vent plugs shall be provided in each cells. They shall be antisplash type, having more than one exit hole shall allow the gases to escape freely but shall prevent acid from coming out. The design shall be such that the water loss due to evaporation is kept to minimum. In addition the ventilator shall be easily removed for topping up the cells and of such dimensions that the syringe type hydrometer can be inserted into the vent to take electrolyte sample.

c) Plates

The plates shall be designed for maximum durability during all service conditions including high rate of discharge and rapid fluctuations of load. The construction of plates shall conform to latest revisions of IS : 1652 as applicable. The separators shall maintain the electrical insulation between the plates and shall allow the electrolyte to flow freely. Separators should be suitable for continuous immersion in the electrolyte without distortion. The positive and negative post shall be clearly marked.

d) Sediment Space

Sufficient sediment space shall be provided so that cells will not have to be cleaned during normal life and prevent shorts within the cells.

e) Cell Insulator

Each cell shall be separately supported on PVC/porcelain/hard rubber insulators fixed on the racks with adequate clearance between adjacent cells. Minimum distance between adjacent cells shall be more than the bulge allowed for two cells in accordance with IS:1146.

f) Electrolyte

The electrolyte shall be prepared from battery grade sulphuric acid conforming to IS:266 and distilled water conforming to IS:1069. The cells shall be shipped dry uncharged. The electrolyte shall be supplied separately.

g) Connectors and Fasteners

Lead or Lead coated copper connectors shall be used for connecting up adjacent cells and rows. Bolts, nuts and washers shall be effectively lead coated to prevent corrosion. The thickness of lead-coating of connectors should not be less than 0.025 mm. The lead coating thickness shall be measured in accordance with APPENDIX F of IS:6848 (latest edition). All the terminals and cells inter-connectors shall be fully insulated or have insulation shrouds. End take off connections from positive and negative poles of batteries shall be made by single core cables having stranded copper conductors and PVC insulation. Necessary supports and lugs for termination of these cables on batteries shall also be supplied by the contractor.

h) Battery racks

Wooden racks for all the batteries shall be provided. These racks shall be made of good quality first class seasoned teak wood in line with CPWD specification. They shall be free standing type mounted on porcelain/hard rubber/PVC pads insulators/High impact plastic insulators. Batteries shall preferably be located in the single tier arrangement. However, batteries having a complete cell weight of lower than 50 Kg could be located in the double tier arrangement. The batteries rack and wooden support for cable termination shall be coated with three (3) coats of anti-acid paint of approved shade. Numbering tags, resistant to acid, for each cell shall be attached on to the necessary racks. The bottom tier of the stand shall not be less than 150 mm above the floor. Wherever racks are transported in dismantled condition, suitable match markings shall be provided to facilitate easy assembly.

i) Testing

The Contractor shall submit for Owner's approval the reports of all the type tests carried out as per latest IS-1146 (for rubber & plastic containers for lead-acid storage batteries)/IS 1652 (for lead-acid plante batteries). The complete type test reports shall be for any rating of battery in a particular group, based on plate dimensions being manufactured by supplier. Routine and Acceptance tests shall be as per Quality Assurance & Inspection table of battery.

4. AUXILIARY EQUIPMENTS

Manual discharge resistance bank suitable for each type of battery bank of UPS/Battery Charger has to be provided by contractor.

Following shall be provide (as per applicability) for maintenance purpose

- a Hydrometer 2 Nos.
- b Set of hydrometer syringes suitable for the vent holes in different cells 2 Nos.
- c Thermometer for measuring electrolyte temperature 2 Nos.
- d Specific gravity correction chart 2 Nos.
- e Wall mounting type holder made of teak wood for hydrometer & thermometer 2 Nos.
- f Cell testing voltmeter (3-0-3 V) 2 Nos.
- g Alkali mixing jar 2 Nos.
- h Rubber aprons 5 Nos.
- i Pair of rubber gloves
- j Set of spanners 5 Nos.
- k No smoking notice for each battery room 2 Nos.
- l Goggles (industrial) 2 Nos.
- m Instruction card 2 Nos.
- n Temperature indicator 1 No. per room
- o Cell lifting facility 1 Set per room

5. SITE TESTS

The contractor shall carry out the following site tests as applicable on UPS, Battery Charger and Battery system. However, any other site test is required to be conducted as a standard practice of the OEM or deemed necessary by the employer and mutually agreed between the contractor and the employer, the same shall also be carried out.

Light Load Test

This test is carried out to verify that the UPS/Battery Charger is correctly connected and all functions operate properly. The load applied is limited to some percent of rated value. The following points should be checked:

- a) Output voltage, frequency and the correct operation of meters;
- b) Operation of all control switches and other means to put units into operation.
- c) Functioning of protective and warning devices.

A. C. Input Failure Test

The test is performed in UPS/Battery Charger with a fully charged battery and is carried out by tripping input supply feeder or may be simulated by switching off all rectifiers and bypass feeder as at the same time. Output voltage variations are to be checked for specified limits with an oscilloscope/Recorder.

A. C Input Return Test

AC input return test is performed in UPS/Battery Charger by closing AC input supply feeder, or is simulated by energizing rectifiers. Proper operation of rectifier starting and voltage and frequency variations are to be observed. This test is normally performed with a fully or partially charged battery.

Auto changeover Test

This test shall be carried out in UPS ACDB fed from two separate UPS system. Auto changeover of one UPS source to standby UPS to be check by tripping the active UPS manually or by simulation condition. This test shall be check as per approved auto changeover logic.

Transfer Test (for UPS)

This test is applicable for UPS with bypass, particularly in the case of an electronic bypass switch. Transients shall be measured during load transfer to bypass caused by a simulated fault and load retransfer after clearing of the fault.

Full load test

Load tests are performed by connecting the actual load to the UPS/Charger output. Load tests are necessary for testing output voltage and frequency, rated stored energy, recharge time, ventilation, and temperature.

Rated Stored Energy Time (Battery test)

This test is a load test to prove the actual possible time of battery operation. If rated load is not available in the case of large UPS/Battery charger, it is possible to apply a partial load to check the actual battery discharge characteristics and compare these with characteristics specified by the battery manufacturer. Discharge time with rated load shall then be calculated. The test shall be performed with a fully charged battery and also may be done under other battery conditions to be specified, if so agreed. Active power output of the UPS/Battery Charger and the battery voltage shall be recorded during the test. Since new batteries often do not provide full capacity during a starting up period, the discharge test may be repeated after a reasonable recharge time if the original test has failed.

Rated Restored Energy Time

Restored energy depends on the charging capacity of the rectifiers and the battery characteristics. If a certain recharging rate is specified, it shall be provided by repeating the discharge test after the specified charging period.

Battery Ripple Current

If battery ripple currents are specified, then the ripple current which depends on UPS operation shall be checked under normal operating conditions. Rough measuring methods are sufficient.

		ITEM : Solar Power Conditioning Unit (Solar Inverter)		STANDARD QUALITY PLAN					QP.NO:0000-999-QOE-S-59		REVIEWED BY		APPROVED BY	
				CONFORMING TO CODE IS / IEC / NTPC TECHNICAL SPECIFICATION					Rev No.: 0		D.K. Dixit		V. Talwar	
									Date: 16.01.2015		V. Talwar		Raksha Singh	
									VALID UPTO: 15.01.2018					
SI No	COMPONENT & OPERATIONS	CHARACTERISTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK		REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORD				REMARKS	
					6 M	6 C/N				M	C	N		
1	2	3	4	5	6		7	8	9	10	11	12	13	
1.00 Raw Material / Bought out Item-														
1.01	Busbar (Aluminum / Copper)	a	Dimensions	Major	Meas	Mnfr Std.	same as 6 M	Manufacturere standard/ Approved Drawing	Manufacturere standard/ Approved Drawing	Inspection report	P	V	-	
		b	Surface defects	Major	Visual	Mnfr Std.	same as 6 M	IS 5082/IS 613	IS 5082/IS 613	Inspection report	P	V	-	
		c	Hardness	Major	Mechanical	Mnfr Std.	same as 6 M	IS 5082/IS 613 / NTPC appd drg / datasheet	IS 5082/IS 613 / NTPC appd drg / datasheet	Supplier TC	P	V	-	
		d	Conductivity	Major	Electrical	Mnfr Std.	same as 6 M	IS 5082/IS 613 / NTPC appd drg / datasheet	IS 5082/IS 613 / NTPC appd drg / datasheet	Supplier TC	P	V	V	
1.02	Insulators	a	Dimensions	Major	Meas	Mnfr Std.	same as 6 M	Manufacturere standard/ drg. / NTPC Approved Drawing	Manufacturere standard/ drg. / NTPC Approved Drawing	Inspection report	P	V	-	
		b	Surface Finish & batch marking	Major	Visual	Mnfr Std.	same as 6 M	Manufacturere standard/ drg.	Manufacturere standard/ drg.	Inspection report	P	V	-	
		c	Cantilever Strength	Major	Mechanical	Mnfr Std.	same as 6 M	Manufacturere standard/ drg. / IS 9431	Manufacturere standard/ drg. / IS 9431	Supplier TC	P	V	V	
		d	HV Withstand	Major	Electrical	Mnfr Std.	same as 6 M	-do-	-do-	Supplier TC	P	V	V	
		e	Comparative Tracking Index	Major	Electrical	Mnfr Std.	same as 6 M	IS 2824 / IEC 60112	> 600 V	Supplier TC	P	V	V	
1.03	Reactor/Capacitor	a	Make Check	Major	Visual	100%	same as 6 M	Approved MQP	Approved MQP	Inspection report	P	V	-	
		b	Rating plate Check	Major	Visual	100%	same as 6 M	Manufacturere standard/ drg. / NTPC Approved Drawing	Manufacturere standard/ drg. / NTPC Approved Drawing	Inspection report	P	V	-	

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				CONFORMING TO CODE IS / IEC / NTPC TECHNICAL SPECIFICATION				Rev No.: 0		D.K. Dixit				
								Date: 16.01.2015		V. Talwar				
								VALID UPTO: 15.01.2018		Raksha Singh				
Sl No	COMPONENT & OPERATIONS	CHARACTERISTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK		REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORD				REMARKS	
					6 M	6 C/N				D*	**	10		
1	2	3	4	5	6 M	6 C/N	7	8	9	D*	**	10	11	
		c Routine Tests as per relevant standard	Major	Electrical	100%	same as 6 M	-do- IS 5553 / IEC 60289 for reactors and IS 15395 / IEC 61642 for capacitors	-do- IS 5553 / IEC 60289 for reactors and IS 15395 / IEC 61642 for capacitors	Supplier TC	✓	P	V	V	
1.04	Air Break switches/Switch Fuse unit / Indicating Lamps /AC/ DC Power & Auxiliary contactors	a Rating, Make, type check	Major	Visual	100%	same as 6 M	Manufacturer standard/ drg. / NTPC Approved Drawing /Appd MQP	Manufacturer standard/ drg. / NTPC Approved Drawing /Appd MQP	Inspection report	P	V	-		
1.05	Gasket	a Dimensions / profile & material	Major	Visual	Mnfr Std.	same as 6 M	Manufacturer drg / type test reports	Manufacturer drg / type test reports	Inspection report	P	V	-		
		b Shore Hardness	Major	Mechanical	Mnfr Std.	same as 6 M	Mnfr std / drg / IS 11149	Mnfr std / drg / IS 11150	Supplier TC	P	V	-		
		c Ozone Resistivity	Major	Chemical	Mnfr Std.	same as 6 M	Mnfr std / drg / IS 11149	Mnfr std / drg / IS 11150	Supplier TC	P	V	-		
1.06	Enclosure	a Dimensional check	Major	Meas	Mnfr Std.	same as 6 M	Appd GA Drgs	Appd GA Drgs	Inspection report	P	V	-		
		b Paint Shade	Major	Visual	Mnfr Std.	same as 6 M	Approved drawing/ NTPC Specification / IS 5 / RAL std.	Approved drawing/ NTPC Specification / IS 5 / RAL std.	Inspection report	P	V	-		
		c Paint Adhesion	Major	Meas	At random	same as 6 M	Approved drawing/ NTPC Specification	Approved drawing/ NTPC Specification	Inspection report	P	V	-		
		d Paint Thickness	Major	Meas	At random	same as 6 M	Approved drawing/ NTPC Specification	Approved drawing/ NTPC Specification	Inspection report	P	V	-		

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				CONFORMING TO CODE IS / IEC / NTPC TECHNICAL SPECIFICATION					Rev No.: 0		Date: 16.01.2015		D.K. Dishi		31/01/2015	
									Valid Upto: 15.01.2018		V. Talwar		Raksha Singh		S. Jain	
Sl No	COMPONENT & OPERATIONS	CHARACTERISTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK		REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORD							
					6 M	6 C/N				D*	**	10	N			
1	2	3	4	5	6 M	6 C/N	7	8	9	D*	**	10	N	11		
1.07	Electronic cards	a Internal Quality checks by manufacturer	Major	Electrical	Mnfr Std.	same as 6 M	Manufacturer's procedure for testing of electronic cards	Manufacturer's procedure for testing of electronic cards	Inspection report	P	V	V				
1.08	PCU Power Module	a Quality checks	Major	Electrical	100%	same as 6 M	Manufacturer's procedure for testing of power module	Manufacturer's procedure for testing of power module / NTPC Specification / Approved data sheet	Supplier's TC	√	P	V	V			
2.00 In Process Checks																
2.01	Equipment Mounting	a Verification of rating & make of all components as per BOM	Major	visual	100%	same as 6 M	Appd BOM drg/ document	Appd BOM drg/ document	Production Inspection report	P	V	-				
2.02	Busbar Support Insulator Fixing	a Checking of air gaps (clearances) and creepage distances	major	meas	100%	same as 6 M	Approved Drawing / Manufacturer standard	Approved Drawing / Manufacturer standard	-do-	P	V	-				
2.03	Busbar Fixing	a Checking of busbars/ Nut bolt tightness	major	Torque wrench	100%	same as 6 M	-do-	-do-	-do-	P	V	-		Torque values to be furnished by the manufacturer		
2.04	Cable Termination	a Checking of Power cabling and control /Logic wiring termination by pull check	major	mechanical	100%	same as 6 M	-do-	-do-	-do-	P	V	-				

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				CONFORMING TO CODE IS / IEC / NTPC TECHNICAL SPECIFICATION						Rev No.: 0		D.K. Dixit	
										Date: 16.01.2015		V. Talwar	
										VALID UPTO: 15.01.2018		Raksha Singh	
Sl No	COMPONENT & OPERATIONS	CHARACTERISTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK		REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORD				REMARKS
					% M	% C/N				D*	M	C	
1	2	3	4	5	6	7	8	9	10	11	12	13	14
2.05	Final Assembly	a Checking of labels and Markings (Legends)	major	visual	100%	same as 6 M	-do-	-do-	-do-	P	V	-	
		b Checking of doors & handle alignment	major	visual	100%	same as 6 M	-do-	-do-	-do-	P	V	-	
		c Check degree of protection check including gasket material & profile	major	visual	at random	same as 6 M	-do-	Gasket material & profile as per type test reports	-do-	P	V	-	
		d Functional checking of PCU	major	Electrical	100%	same as 6 M	Approved Drawing / Manufacturer standard	Approved Drawing / Manufacturer standard	-do-	P	V	-	
		e Uploading of Software to control board and checking of general parameter setting including protection settings	major	visual	100%	100%	Appd datasheet for software version / Appd drg / Mnfr standard	Appd datasheet for software version / Appd drg / Mnfr standard	Inspection report	P	W	V	
Type Test Clearance from NTPC Engineering as per specification requirements to be verified during inspection													
3.00	Final Test	a Dimesional check on Enclosure	Major	Meas	100%	5%	Appd GA Drgs	Appd GA Drgs	Inspection report	P	W	W	

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				CONFORMING TO CODE IS / IEC / NTPC TECHNICAL SPECIFICATION				Rev No.: 0		Date: 16.01.2015		V. Talwar	
								VALID UPTO: 15.01.2018		Rakesha Singh		K.M. Jaiswal	
Sl No	COMPONENT & OPERATIONS	CHARACTERISTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK		REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORD				REMARKS
					6 M	6 C/N				D*	M	C	
1	2	3	4	5	6	7	8	9	10	11	12	13	14
		a Paint Shade, Paint Adhesion & Thickness Check	Major	Meas	At random	At random	Appd GA Drgs	Appd GA Drgs	Inspection report		P	W	W
		b Verification of rating & make of all components as per BOM	Major	visual	100%	5%	Appd BOM drg/ MQP	Appd BOM drg/ MQP	Production Inspection report		P	W	W
		c Check degree of protection check including gasket material & profile	major	visual	at random	at random	Appd datasheet	Gasket material & profile as per type test reports	-do-	√	P	W	W
		d Checking of doors, its handle alignment	major	visual	100%	at random	Manufacturer drg / standard	smooth operation of doors	-do-		P	W	W
		e Uploading of Software to control board and checking of general parameter setting including protection settings	major	visual	100%	1 panel	Appd datasheet for software version / Appd drg / Mnfr standard	Appd datasheet for software version / Appd drg / Mnfr standard	Inspection report		P	W	W

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									Date: 16.01.2015		V. Talwar 		
									VALID UPTO: 15.01.2018		Raksha Singh 		
Sl No	COMPONENT & OPERATIONS	CHARACTERISTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK		REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORD				REMARKS
					6 M	6 C/N				M	C	N	
1	2	3	4	5			7	8	9	D*	**	10	11
		f Control circuit functional check including operation of contactors, relays & circuit breaker	major	testing	100%	1 panel	NTPC approved procedure	NTPC approved procedure	Inspection report		P	W	W
		g Display panel functionality including Digital input / Digital Output check	major	visual	100%	100%	NTPC approved procedure	NTPC approved procedure	Inspection report		P	W /	W
		h Checking direction of rotation & ON-OFF Control of the fans	major	testing	100%	100%	NTPC approved procedure	NTPC approved procedure	Inspection report		P	W	W
		i Protection functions check (by simulation or direct method) abnormal voltage & frequency, DC ground fault, DC reverse polarity, AC & DC overvoltage	major	testing	100%	100%	NTPC approved procedure	NTPC approved procedure	Inspection report		P	W	W
		j Calibration test (DC voltage, Ac voltage & frequency)	major	testing	100%	100%	NTPC approved procedure	NTPC approved procedure	Inspection report	✓	P	W	W

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Date: 16.01.2015		VALID UPTO: 15.01.2018		Raksha Singh		REMARKS								
Sl No	COMPONENT & OPERATIONS	CHARACTERISTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK		REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORD	M	C	N		
1	2	3	4	5	6 M	6 C/N	7	8	9	10	11	12	13	
		k Testing of wake-up/auto start & stop with grid connectivity	major	testing	100%	100%	NTPC approved procedure	NTPC approved procedure	Inspection report	✓	P	W	W	
		l Manual ON/OFF from PCU MMI with grid connectivity	major	testing	100%	100%	NTPC approved procedure	NTPC approved procedure	Inspection report	✓	P	W	W	
		m Maximum power Point tracking test	Critical	Electrical test	1 panel	1 panel	NTPC approved procedure	NTPC approved procedure	Inspection report	✓	P	W	W	
		n Heat run test along with Efficiency test including VDC, VAC, IAC, KWhr, KW, KVAR, KVARhr & harmonic content measurement at four points (25%, 50%, 75%, 100%)	Critical	Electrical test	1 panel	1 panel	NTPC approved procedure	NTPC approved procedure	Inspection report	✓	P	W	W	
		o IR test on main & control circuit	major	Electrical	100%	100%	NTPC approved procedure (mnfr to indicate the test voltage & duration)	NTPC approved procedure (mnfr to indicate the acceptance values)	Inspection report	✓	P	W	W	

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								Date: 16.01.2015 VALID UPTO: 15.01.2018		Raksha Singh  K.M. Jha			
Sl No	COMPONENT & OPERATIONS	CHARACTERISTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK		REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORD				REMARKS
					6 M	6 C/N				M	C	N	
1	2	3	4	5	6 M	6 C/N	7	8	9	10*	**	10	11
		p HV test on main & control circuit	major	Electrical	100%	100%	NTPC approved procedure (mnfr to indicate the test voltage & duration)	NTPC approved procedure (mnfr to indicate the acceptance values)	Inspection report	√	P	W	W
4.00	Packing-												
4.01		a Corrugated box packing	minor		100%		Manufacturer drg / standard	Manufacturer drg / standard		P			

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	CORPORATE QUALITY ASSURANCE SUB-VENDOR QUESTIONNAIRE
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i.	Item/Scope of Sub-contracting			
ii.	Address of the registered office 	Details of Contact Person <i>(Name, Designation, Mobile, Email)</i> 		
iii.	Name and Address of the proposed Sub-vendor's works where item is being manufactured 	Details of Contact Person: <i>(Name, Designation, Mobile, Email)</i> 		
iv.	Annual Production Capacity for proposed item/scope of sub-contracting			
v.	Annual production for last 3 years for proposed item/scope of sub-contracting			
vi.	Details of proposed works			
1.	Year of establishment of present works			
2.	Year of commencement of manufacturing at above works			
3.	Details of change in Works address in past (if any)			
4.	Total Area			
	Covered Area			
5.	Factory Registration Certificate	Details attached at Annexure – F2.1		
6.	Design/ Research & development set-up <i>(No. of manpower, their qualification, machines & tools employed etc.)</i>	Applicable / Not applicable if manufacturing is as per Main Contractor/purchaser design) Details attached at Annexure – F2.2 (if applicable)		
7.	Overall organization Chart with Manpower Details <i>(Design/Manufacturing/Quality etc)</i>	Details attached at Annexure – F2.3		
8.	After sales service set up in India, in case of foreign sub-vendor <i>(Location, Contact Person, Contact details etc.)</i>	Applicable / Not applicable Details attached at Annexure – F2.4		
9.	Manufacturing process execution plan with flow chart indicating various stages of manufacturing from raw material to finished product including outsourced process, if any	Details attached at Annexure – F2.5		
10.	Sources of Raw Material/Major Bought Out Item	Details attached at Annexure – F2.6		
11.	Quality Control exercised during receipt of raw material/BOI, in-process , Final Testing, packing	Details attached at Annexure – F2.7		

	CORPORATE QUALITY ASSURANCE SUB-VENDOR QUESTIONNAIRE
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12.	Manufacturing facilities <i>(List of machines, special process facilities, material handling etc.)</i>	Details attached at Annexure – F2.8			
13.	Testing facilities <i>(List of testing equipment)</i>	Details attached at Annexure – F2.9			
14.	If manufacturing process involves fabrication then- List of qualified Welders List of qualified NDT personnel with area of specialization	Applicable / Not applicable Details attached at Annexure – F2.10 <i>(if applicable)</i>			
15.	List of out-sourced manufacturing processes with Sub-Vendors' names & addresses	Applicable / Not applicable Details attached at Annexure. –F2.11 <i>(if applicable)</i>			
16.	Supply reference list including recent supplies	Details attached at Annexure – F2.12 <i>(as per format given below)</i>			
Project/ package	Customer Name	Supplied Item (Type/Rating/Model /Capacity/Size etc)	PO ref no/date	Supplied Quantity	Date of Supply
17.	Product satisfactory performance feedback letter/certificates/End User Feedback			Attached at annexure - F2.13	
18.	Summary of Type Test Report (Type Test Details, Report No, Agency, Date of testing) for the proposed product <i>(similar or higher rating)</i> Note:- Reports need not to be submitted			Applicable / Not applicable Details attached at Annexure – F2.14 <i>(if applicable)</i>	
19.	Statutory / mandatory certification for the proposed product			Applicable / Not applicable Details attached at Annexure – F2.15 <i>(if applicable)</i>	
20.	Copy of ISO 9001 certificate <i>(if available)</i>			Attached at Annexure – F2.16	
21.	Product technical catalogues for proposed item (if available)			Details attached at Annexure – F2.17	
Name: Desig: Sign: Date:					

Company's Seal/Stamp:-



ಭಾರತ್ ಹವಿ ಎಲೆಕ್ಟ್ರಿಕಲ್ಸ್ ಲಿಮಿಟೆಡ್
भारत हेवी इलेक्ट्रिकल्स लिमिटेड

Bharat Heavy Electricals Ltd.,
(A Government of India undertaking)
Electronics Division

PB 2606 , Mysore Road Bangalore , 560026 INDIA

SCPV: BOS: ITB - Rev 04

INSTRUCTIONS TO BIDDERS (ITB)

Bidders are requested to read the instructions carefully and submit their quotations covering all the points:

A. GENERAL INSTRUCTIONS:

1. Any Purchase Order resulting from this enquiry shall be governed by the Instructions to Bidders (document reference: SCPV: BOS: ITB – Rev 01), General Conditions of Contract (document reference: SCPV: BOS: GCC - Rev 01) and Special Conditions of Contract (document reference: SCPV: BOS: SCC: I - Rev 01/ SCPV: BOS: SCC: F - Rev 01), if any, of the enquiry.
2. Any deviations from or additions to the “General Conditions of Contract” or “Special Conditions of Contract” require BHEL’s express written consent. The general terms of business or sale of the bidder shall not apply to this tender.
3. Bidders (also includes the term suppliers / contractors wherever used in this document) are instructed to quote their most competitive price and best delivery, etc. in the offer. Prices should be indicated in both figures & words. **(Please also refer clause 11 under section B)**
4. Regret letter (either through post or by mail) indicating reasons for not quoting must be submitted without fail, in case of non-participation in this tender. If a bidder fails to respond against 3 consecutive tenders for the same item, he will be liable for removal as a registered vendor of BHEL.
5. Procurement directly from the manufacturers shall be preferred. However, if the OEM / Principal insist on engaging the services of an agent, such agent shall not be allowed to represent more than one manufacturer / supplier in the same tender. Moreover, either the agent could bid on behalf of the manufacturer / supplier or the manufacturer / supplier could bid directly but not both. In case bids are received from the manufacturer / supplier and his agent, bid received from the agent shall be ignored.
6. Consultant / firm (and any of its affiliates) shall not be eligible to participate in the tender/s for the related goods for the same project if they were engaged for consultancy services for the same project.
7. If an Indian representative / associate / liaison office quotes on behalf of a foreign based bidder, such representative shall furnish compulsorily the following documents:
 - a. Authorization letter to quote and negotiate on behalf of such foreign-based bidder.
 - b. Undertaking from such foreign based bidder that such contract will be honored and executed according to agreed scope of supply and commercial terms and conditions.
 - c. Undertaking shall be furnished by the Indian representative stating that the co-ordination and smooth execution of the contract and settlement of shortages / damages / replacement / repair of imported scope till system is commissioned and handed over to customer will be the sole responsibility of the Indian representative / associates / agent / liaison office.
8. In case of imported scope of supply, customs clearance & customs duty payment will be to BHEL account after the consignment is received at Indian Airport / Seaport. Bidders must provide all original documents required for completing the customs clearance along with the shipment. Warehousing charges due to incomplete or missing documentation will be recovered from the supplier’s bill. All offers for imported scope of supply must be made from any of the gateway ports (within the country) indicated. **(Refer Annexure I)**
9. The offers of the bidders who are on the banned list and also the offers of the bidders, who engage the services of the banned firms, shall be rejected. The list of the banned firms is available on BHEL website: **www.bhel.com**.

10. Business dealings with bidders will be suspended if they are found to have indulged in any malpractices / misconduct which are contrary to business ethics like bribery, corruption, fraud, pilferage, cartel formation, submission of fake/false/forged documents, poor quality, certificates, information to BHEL or if they tamper with tendering procedure affecting the ordering process or fail to execute a contract, or rejection of 3 consecutive supplies or if their firms / works are under strike / lockout for a long period.

B. GUIDELINES FOR PREPARATION OF OFFER:

1. Quotation shall be submitted in Single Part Bid, Two Part Bid or Three Part Bid, as called for in the tender:
 - **SINGLE PART BID:** Technical and Commercial Bid with prices along with price summary & filled in BHEL Standard Commercial terms and conditions in a single sealed envelope.
 - **TWO PART BID:** Unpriced offer i.e. "Techno-commercial Bid" with filled in BHEL Standard Commercial terms and conditions in a sealed envelope **along with the copy of the "Price Bid" without the prices** should be enclosed in one cover and the cover must be super scribed "**Techno-commercial offer** and Priced offer i.e. "Price Bid" containing price summary in a separate sealed envelope and must be super scribed "**Price Bid**". Both these envelopes shall be enclosed in a single sealed envelope super scribed with enquiry number, due date of tender and any other details as called for in the tender document.
 - **THREE PART BID:** Pre-qualification Bid (Part-I), Techno Commercial Bid with filled in BHEL Standard Commercial terms and conditions (Part-II), and Price Bid (Part-III). All three envelopes shall be enclosed in a single sealed envelope super scribed with enquiry number due date of tender and any other details as called for in the tender document.

If any of the offers (Part I, Part II or Part III) are not submitted before the due date and time of submission at the venue/place specified or if any part of the offer is incomplete the entire offer of the bidder is liable for rejection.

2. Supplier shall ensure to super scribe each envelope with RFQ number, RFQ Date, RFQ Due date and time, Item Description and Project clearly & boldly. Also mention on the envelope whether it is "Techno Commercial Bid" or "Price Bid" or "Pre-Qualification Bid". Please ensure complete address, department name and purchase executive name is mentioned on the envelope (before dropping in the tender box or handing over) so that the tender is available in time for bid opening.
3. BHEL standard Commercial Terms and Conditions shall be duly filled, signed & stamped and must accompany Technical-Commercial offer without fail and should be submitted in original only. Photocopy will not be accepted. All documents submitted along with the offer shall be signed and stamped in each page by authorized representative of the bidder.
4. Any of the terms and conditions not acceptable to supplier, shall be explicitly mentioned in the Techno-Commercial Bid. If no deviations are brought out in the offer it will be treated as if all terms and conditions of this enquiry are accepted by the supplier without any deviation.
5. Deviation to this specification / item description, if any, shall be brought out clearly indicating "DEVIATION TO BHEL SPECIFICATION" without fail, as a part of Techno-Commercial Bid. If no deviations are brought out in the offer it will be treated as if the entire specification of this enquiry is accepted without deviation.
6. Suppliers shall submit one set of original catalogue, datasheets, bill of materials, dimensional drawings, mounting details and / or any other relevant documents called in purchase specification as part of Technical Bid.
7. "Price Bid" shall be complete in all respects containing price break-up of all components along with all applicable taxes and duties, packing & forwarding charges (if applicable), freight charges (if applicable) etc. Once submitted no modification / addition / deletion will be allowed in the "Price Bid." Bidders are advised to thoroughly check the unit price, total price to avoid any discrepancy.
8. In addition, bidder shall also quote for erection & commissioning charges (I&C charges), documentation charges, service charges, testing charges (type & routine), training charges, service tax, etc. wherever applicable. The price summary must indicate all the elements clearly.
9. Vendors should indicate "lump sum" charges (including To & Fro Fare, Boarding, Lodging, Local Conveyance etc.) for Supervision of Erection, Commissioning and handing over to customer. The quotation shall clearly indicate scope of work, likely duration of commissioning, pre-commissioning checklist and service tax (if any).
10. Wherever bidders require PAC (Project Authority Certificate) for import of raw materials, components required for Mega

Power Projects, Export Projects, MNRE Concession or other similar projects wherein supplies are eligible for customs duty /Excise duty benefits, lists and quantities of such items and their values (CIF) has to be mentioned in the offer. Prices must be quoted taking into account of such benefits.

11. All quotations shall be free from corrections /overwriting. Corrections if any should be authenticated with signature and seal. Any typographical error, totalling mistakes, currency mistake, multiplication mistake, summing mistakes etc. observed in the price bids will be evaluated as per **Annexure VI** "Guidelines for dealing with Discrepancy in Words & Figures – quoted in price bid". BHEL decision will be final.

C. GUIDELINES FOR OFFER SUBMISSION:

1. Offers / Quotations must be dropped in tender box before 13.00 Hrs. on or before due date mentioned in RFQ. The offers are to be dropped in the proper slot of the Tender Box kept in our reception area with caption "CE, SC&PV, DEFENCE." Tenders are opened on 3 days in a week (Monday/Wednesday/Friday). Tender must be deposited in the slot corresponding to the day (Monday - Box no.4/Wednesday - Box no. 6 /Friday - Box no.8) while depositing the offer. **(This clause will not be applicable for e-tenders).**
2. E-Mail / Internet / EDI offers received in time shall be considered only when such offers are complete in all respects. In case of offers received through E-mail, please send the offer to the email IDs within time of submission of tender.
3. In cases where tender documents are bulky, or due to some reasons tender documents are required to be submitted by hand or through posts/couriers, the offers are to be handed over to purchase officers.
4. Tenders will be opened on due date, time and venue as indicated in the RFQ in the presence of bidders at the venue indicated in the RFQ. In case of e-procurement, bidders can see tender results till seven days after due date and time.
5. Vendor will be solely responsible:
 - a. For submission of offers before due date and time. Offers submitted after due date and time will be treated as "Late offers" and will be rejected.
 - b. For submission of offers in the correct compartment of the tender box based on the day of due date (Monday/Wednesday/Friday). Please check before dropping your offer in the correct tender box.
 - c. For depositing offers in proper sealed condition in the tender box. If the bidder drops the tender in the wrong tender box or if the tender document is handed over to the wrong person BHEL will not be responsible for any such delays.
 - d. For offers received through email/courier etc., suppliers are fully responsible for lack of secrecy on information and ensuring timely receipt of such offers in the tender box before due date & time.
 - e. In case of e-tender, all required documents should be uploaded before due date and time. Availability of power, internet connections, etc. will be the sole responsibility of the vendor. Wherever assistance is needed for submission of e-tenders, help line numbers and executives of service provider of BHEL may be contacted.
Service provider: e-Procurement Technologies Limited (abc Procure)
Website address: <https://bhel.abcprocure.com>
Helpline no.: +91-79-68136819/809/862/867/823/872/842 (9:30 am to 5:30 pm)
10:00 AM - 07:00 PM (Monday - Friday)
10:00 AM-04:00 PM (Saturday)

Purchase Executive / BHEL will not be responsible for any of the activities relating to submission of offer.

D. PROCESSING OFFERS RECEIVED:

1. Any discount / revised offer submitted by the supplier on its own shall be accepted provided it is received on or before the due date and time of offer submission (i.e. Part-I bid). The discount shall be applied on pro-rata basis to all items unless specified otherwise by the bidder.
2. Changes in offers or Revised offers given after Part-I bid opening shall not be considered as a part of the original offer unless such changes / revisions are requested by BHEL.
3. In case there is no change in the technical scope and / or specifications and / or commercial terms & conditions by BHEL, the supplier will not be allowed to change any of their bids after Technical bids are opened (after the due date and time of tender opening of Part-1 Bid).

4. In case of changes in scope and/ or technical specifications and/ or commercial terms & conditions by BHEL and it accounts for price implications from vendors, all techno-commercially acceptable bidders shall be asked by BHEL (after freezing the scope, technical specifications and commercial terms & conditions) to submit the impact of such changes on their price bid. Impact price will be applicable only for changes in technical specification / commercial conditions by BHEL. The impact price must be submitted on or before the cut-off date specified by BHEL and the original price bid and the price impact bid will be opened together at the time of price bid opening. Impact price means only for those items which have been impacted by addition / deletion / changes in the technical specifications or commercial conditions. The impact may be +/- incremental value of the currency in which originally quoted. The impact price bid to be submitted on the cut-off date, time & venue as specified by BHEL. The impact price bid shall be opened along with original price bid.
5. Un-opened bids (including price bids) will be returned to the respective bidders after release of PO and receipt of order acknowledgement from the successful bidder.
6. After receipt of Purchase Order, supplier should submit required documents like drawings, bill of materials, datasheets, catalogues, quality plan, test procedure, type test report , O & M Manuals and / or any other relevant documents as per Specification / Purchase Order, as and when required by BHEL / Customer.
7. Any deviation to the terms and conditions not mentioned in the quotation by supplier in response to this enquiry will not be considered, if put forth subsequently or after issue of Purchase Order, unless clarification is sought for by BHEL EDN and agreed upon in the Purchase Order.
8. Evaluation shall be on the basis of delivered cost (i.e. "Total Cost to BHEL"). As per RFQ terms.
"Total Cost to BHEL" shall include total basic cost, packing & forwarding charges, taxes and duties, inspection charges, freight charges, test charges, insurance, service tax for services, any other cost indicated by vendor for execution of the contract and loading factors (for non-compliance to BHEL Standard Commercial Terms & Conditions). Benefits arising out of Nil Import Duty on Mega Projects, Physical Imports or such 100% exemptions & MNRE Exemptions (statutory benefits), customer reimbursements of statutory duties (like Excise Duty, CST, VAT) will also be taken into account at the time of tender evaluation. (Wherever applicable and as indicated in SCC document of tender)
9. For evaluation of offers in foreign currency, the exchange rate (TT selling rate of SBI) shall be taken as under:

Single part bids:	Date of tender opening
Two/three part bids:	Date of Part-I bid opening
Reverse Auction:	Date of Part-I bid opening

In case of Performance Bank Guarantee (PBG) also, exchange rate will be considered as mentioned above for converting foreign currency to Indian currency and vice versa.

If the relevant day happens to be a bank holiday, then the exchange rate as on the previous working day of the bank (SBI) shall be taken.
10. Ranking (L-1, L-2 etc.) shall be done only for the techno-commercially acceptable offers and on the basis or evaluation of Total Cost to BHEL.

E. INFORMATION ON PAYMENT TERMS:

1. All payments will be through Electronic Fund transfer (EFT). Vendor has to furnish necessary details as per BHEL standard format (**Refer Annexure IV**) for receiving all payments through NEFT. (Applicable for Indian vendors only)
2. Statutory deductions, if any, will be made and the deduction certificate shall be issued. In case vendor does not provide PAN details, the TDS deduction shall be at the maximum percentage stipulated as per the provisions of Income Tax Act. (Applicable for Indian vendors only). Foreign vendors shall submit relevant details of their bankers like Swift Code, Banker's Name & Address etc.
3. Vendors must submit bills & invoices along with required supporting documents in time. Incomplete documentation / delayed submission of invoice / documents will result in corresponding delay in payment.

F. STANDARD PAYMENT TERMS OF BHEL-EDN**Purchase Orders for indigenous procurement****(a) SUPPLY WITH I&C/SUPERVISION:****Supply:**

- 1) 80% of basic Supply value + 100% of taxes, duties and freight charges will be paid with 45 days credit from the receipt of material at site or 15 days credit from the date of submission of complete set of documentation whichever is later.
- 2) 10% of basic supply value will be paid on completion of I&C against submission of supplementary invoice along with proof of completion of I&C along with I&C charges (if any).
- 3) Balance 10% (retention money) against submission of supplementary invoice along with PBG valid for Warranty Period+3 months Claim Period from BHEL Consortium Bank.

I&C/Supervision: 100% on completion of I&C/Supervision and certification line item wise on pro-rata basis.

O&M: 100% O&M charges are payable as per RFQ terms against report certified by BHEL.

(b) SUPPLY ONLY:

- 1) 100% of Basic value with taxes, duties and freight will be paid with 45 days credit from the receipt of material at site or 15 days credit from the date of submission of complete set of documentation whichever is later)+ submission of PBG valid for Warranty Period+ 3 months Claim Period from BHEL Consortium Bank ,if applicable.

Purchase orders for import procurement:**(c) SUPPLY WITH I&C/SUPERVISION:****Supply:**

- 1) 80% of the basic value (excluding I&C charges) will be paid with 45 days credit, against Sight draft, from the date of AWB/BOL on submission of complete set of documents as in PO.
- 2) 10% of basic supply value will be paid on completion of I&C against submission of supplementary invoice along with proof of completion of I&C along with I&C charges (if any).
- 3) Balance 10% (retention money) against submission of supplementary invoice along with PBG valid for Warranty Period+3 months Claim Period from BHEL Consortium Bank.

I&C: 100% on completion of I&C/Supervision and certification line item wise on pro-rata basis.

(d) SUPPLY ONLY:

- 1) 100% of PO value will be paid against Sight draft with 45 days Credit from the date of dispatch or 15 days credit from the date of submission of complete set of documents whichever is later)+ submission of PBG valid for Warranty Period+3 months Claim Period from BHEL Consortium Bank ,if applicable.

Note for (a), (b), (c) and (d): In exceptional cases, if vendor fails to submit PBG after supplies, vendors can also accept for the final 10% payment, payable after the warranty period + 3 months of claim period against supplementary invoice subject to the completion of commissioning (if applicable) as PBG is linked to Warranty period.

G. LOADING FACTORS FOR PAYMENT TERMS & DELAYED DELIVERY:

Loading factors as detailed below will be added to the quoted price (basic) to evaluate the lowest quote for non-compliance of BHEL standard commercial term.

SI No	Deviation on	Nature of Deviation / Offered Terms	Loading %
1.	Payment Terms	For Purchase within India :-	
		1) Credit period less than 45 days	15
		* For Foreign Purchase :-	
		1) Payment through At Sight Letter of Credit	10
		2) Payment through Letter of Credit with usage of 45 days	
		3) Sight Draft with credit period less than 45	
2.	Penalty for Delayed Delivery	1) Non – Acceptance	10
		2) Partial Acceptance (X%)	(10 – X)

Please see last page (Page No.9) for Loading Factors for foreign Purchase

*** All bank charges shall be to seller's account. If bank charges of BHEL banker are to BHEL's account then additional loading of 2% on the quoted basic value is applicable.**

Offer/s with payment terms other than the standard payment terms indicated at Clause No. F or Deviated Payment Terms with loading indicated at Clause No. G above are liable for rejection.

NOTES:

- ADVANCE PAYMENT/LC: Quotations with "Advance payment/Inland LC" shall be rejected.
- Basic value of Purchase Order mentioned above will include all components of the purchase order and will exclude only taxes, duties, freight and I&C charges (wherever applicable).
- Wherever the Purchase Order is split into import portion and indigenous portion of supply the retention money will be 10% (as applicable) of both purchase order values put together.
- Non-Compliance of Warranty terms. Offers not complying with Warranty terms as per RFQ Terms is liable for rejection.
- SALE IN TRANSIT/ LOCAL VAT: Sale in transit under section 6(2) of CST is allowed if movement of goods is interstate. In case intra state movement of goods, benefit of sale in transit is not available.
- In case of intrastate movement i.e. supply within same state and VAT is applicable, the vendor shall furnish the respective BHEL's nodal agency TIN no. and address in their invoice. (Refer **Annexure IX**)

H. BANK GUARANTEE (BG) / PERFORMANCE BANK GUARANTEE (PBG):

- Bank guarantee (BG) / Performance bank guarantee (PBG) will be applicable as called in the tender documents. Such PBG shall be valid for a period of Warranty Period + claim period of 3 months for a value equal to 10 % of the basic value of the purchase order. No deviation for the duration of PBG / BG will be permitted.
 - PBG shall be from any of the BHEL consortium of bankers (**refer Annexure V**).
 - PBGs from nationalized banks are also acceptable.

- c. PBG should be sent directly by the bank to the dealing executive mentioned in the purchase order located at the address mentioned in the purchase order. PBG should be in the format indicated. **(Refer Annexure III)**. No deviation to these formats will be allowed.
- d. Confirmation from any of the BHEL consortium of banks or any of the Indian Public Sector Banks is essential for the acceptance of PBGs issued by foreign banks (located outside India).
- e. Expired BGs / PBGs will be returned only after expiry of the claim period or on completion of the contractual obligation.
- f. In case vendor does not accept for submission of PBG, the vendor is liable for rejection on commercial grounds.

I. DOCUMENTS (TRIPLICATE COPIES) REQUIRED AT THE TIME OF DISPATCH FOR PROCESSING OF BILL:

1. FOR INDIGENOUS SCOPE OF SUPPLY:

For Supply: Invoice in Triplicate, Lorry receipt (LR) copy, Packing List, PSI Call Letter Copy, Proof of delivery such as MRC (Material Receipt Certificate)/ original acknowledged LR, Insurance intimation Letter and Warranty Certificate. Note that document pertaining to Proof of delivery shall clearly mention number of boxes/panels etc which shall be in line with the Packing list.

For I&C: Supplementary Invoice in Triplicate with copy of I&C Certificate (Proof of Completion of I&C).

For PBG: Supplementary Invoice in Triplicate with copy of PBG. However, PBG should reach concerned Purchase Officer directly from the Bank.

2. FOR IMPORTED SCOPE OF SUPPLY:

For Supply: Invoice in Triplicate, Air Way Bill/Bill of Lading, Packing List, PSI Call Letter Copy, and Warranty Certificate.

For I&C: Supplementary Invoice in Triplicate with copy of I&C Certificate (Proof of Completion of I&C).

For PBG: Supplementary Invoice in Triplicate with copy of PBG. Both PBG & supplementary invoice should reach concerned Purchase Officer directly from the Bank.

J. PROVISIONS APPLICABLE FOR MSE VENDORS (MICRO AND SMALL ENTERPRISES)

Vendors who qualify as MSE vendors are requested to submit applicable certificates (as specified by the Ministry of Micro, Small and Medium Enterprises) at the time of vendor registration. Vendors have to submit any of the following documents along with the tender documents in the Part I / Technical bid cover to avail the applicable benefits.

- a. Valid NSIC certificate or
- b. Entrepreneur's Memorandum part II (EM II) certificate (deemed valid for 2 years).
- c. EM II certificate with CA certificate **(in the prescribed format given in Annexure VIII)** applicable for the year certifying that the investment in plant and machinery of the vendor is within permissible limits as per the MSME Act 2006 for relevant status where the deemed validity is over.
- d. Documents submitted for establishing the credentials of MSE vendors must be valid as on the date of part I / technical bid opening for the vendors to be eligible for the benefits applicable for MSE vendors. Documents submitted after the Part I / Technical bid opening date will not be considered for this tender.

PURCHASE PREFERENCE FOR MSE VENDORS:

- e. MSE vendors quoting within a price band of L1 + 15% shall be allowed to supply up to 25% of the requirement against this tender provided. Minimum of 3% reservation for women owned MSEs within the above mentioned 25% reservation.
 - 1. The MSE vendor matches the L1 price.
 - 2. L1 price is from a non MSE vendor.
 - 3. L1 price will be offered to the nearest vendor nearest to L1 in terms of price ranking (L2 - nearest to L1). In case of non-acceptance by the MSE vendor (L2) next ranking MSE vendor will be offered who is within the L1 + 15% band (if L3 is also within 15% band).
 - 4. 25% of the 25% (i.e. 6.25% of the total enquired quantity) will be earmarked for SC/ST owned MSE firms provided conditions as mentioned in (1) and (2) are fulfilled.
 - 5. In case no vendor under SC / ST category firms are meeting the conditions mentioned in (1) and (2) or have not participated in the tender, in such cases the 6.25% quantity will be distributed among the other eligible MSE vendors who have participated in the tender.

6. Serial no. 1 to 5 will not be applicable wherever it is not possible to split the tendered quantity / items on account of customer contract requirement, or the items tendered are systems. Such information that tendered quantity will not be split will be indicated in the SCC.

K. INTEGRITY COMMITMENT IN THE TENDER PROCESS, AND EXECUTION OF CONTRACTS:

1. Commitment by BHEL:

BHEL commits to take all measures necessary to prevent corruption in connection with the Tender process and execution of the Contract. BHEL will, during the tender process, treat all bidder / suppliers in a transparent and fair manner, and with equity.

2. Commitment by Bidder(s)/ Contractor(s):

- a. The Bidder(s)/ Contractor(s) commit(s) to take all measures to prevent corruption and will not directly or indirectly try to influence any decision or benefit which he is not legally entitled to.
- b. The Bidder(s)/ Contractor(s) will not enter with other Bidder(s) into any undisclosed agreement or understanding or any actions to restrict competition.
- c. The Bidder(s)/ Contractor(s) will not commit any offence under the relevant Acts. 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 BHEL as part of business relationship.
- d. 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 and shall adhere to the relevant guidelines issued from time to time by Government of India/ BHEL.

If the Bidder(s) / Contractor(s), before award or during execution of the Contract commit(s) a transgression of the above or in any other manner such as to put his reliability or credibility in question, BHEL is entitled to disqualify the Bidder(s) / Contractor (s) from the tender process or terminate the contract and/ or take suitable action as deemed fit.

L. FRAUD PREVENTION POLICY:

The bidder along with its associate/collaborators/sub-contractors/sub-vendors/consultants/service providers shall strictly adhere to BHEL Fraud Prevention Policy displayed on BHEL website <http://www.bhel.com> and shall immediately bring to the notice of BHEL Management about any fraud or suspected fraud as soon as it comes to their notice. Fraud Prevention policy and List of Nodal Officers shall be hosted on BHEL website, vendor portals of Units/regions intranet.

PURCHASE EXECUTIVE

Clause G of ITB: Loading Factors for Foreign Purchases

Nature of Deviation / Offered Terms	Loading %
100% Sight Draft	1 %
100% Usance LC with 45 days credit	2.5 %
100% LC at Sight	4.5 %



ಭಾರತ್ ಹೆವಿ ಎಲೆಕ್ಟ್ರಿಕಲ್ಸ್ ಲಿಮಿಟೆಡ್
भारत हेवी इलेक्ट्रिकल्स लिमिटेड

Bharat Heavy Electricals Ltd.,
(A Government of India undertaking)
Electronics Division

PB 2606 , Mysore Road Bangalore , 560026 INDIA

SCPV: BOS: GCC - Rev 03

GENERAL COMMERCIAL CONDITIONS FOR CONTRACT (GCC)

These 'General Commercial Conditions for Contract for Purchase' hereinafter referred to as GCC apply to all enquiries, tenders, requests for quotations, orders, contracts and agreements concerning the supply of goods and the rendering of related services (hereinafter referred to as "deliveries") to Bharat Heavy Electricals Limited and any of its units, regions or divisions (hereinafter referred to as "BHEL" or the Purchaser) or its projects / customers.

Any deviations from or additions to these GCC require BHEL's express written consent. The general terms of business or sale of the vendor shall not apply to BHEL. Acceptance, receipt of shipments or services or effecting payment shall not mean that the general terms of business or sale of the vendor have been accepted.

Orders, agreements and amendments thereto shall be binding if made or confirmed by BHEL in writing. Only the Purchasing department of BHEL is authorized to issue the Purchase Order or any amendment thereof.

Definitions: Throughout these conditions and in the specifications, the following terms shall have the meanings assigned to them, unless the subject matter or the context requires otherwise.

- 'The Purchaser' means Bharat Heavy Electricals Limited, Electronics division, Mysore road, Bangalore 560 026, a Unit of Bharat Heavy Electricals Limited (A Govt. of India Undertaking) incorporated under the Companies Act having its registered office at BHEL House, Siri Fort, New Delhi-110049, India and shall be deemed to include its successors and assigns. It may also be referred to as BHEL.
- 'The vendor' means the person, firm, company or organization on whom the Purchase Order is placed and shall be deemed to include the vendor's successors, representative heirs, executors and administrator as the case may be. It may also be referred to as Seller, Contractor or Supplier.
- 'Contract' shall mean and include the Purchase Order incorporating various agreements, viz. tender/ RFQ, offer, letter of intent / acceptance / award, the General Conditions of Contract and Special Conditions of Contract for Purchase, Specifications, Inspection / Quality Plan, Schedule of Prices and Quantities, Drawings, if any enclosed or to be provided by BHEL or his authorized nominee and the samples or patterns if any to be provided under the provisions of the contract.
- 'Parties to the Contract' shall mean the 'The Vendor' and the Purchaser as named in the main body of the Purchase Order.
- "Bidder" shall mean duly established reputed organisation, manufacturer etc. having requisite financial and technical capability and experience of participating in the bid invited by the purchaser for the tender.
- Bid- The term "bid" or "bidding" can also relate to the documented Offer submitted in response to a request for quotation (RFQ) /Tender.

Interpretation:

In the contract, except where the context requires otherwise:

- words indicating one gender include all genders;
- words indicating the singular also include the plural and words indicating the plural also include the singular;
- provisions including the word "agree", "agreed" or "agreement" require the agreement to be recorded in writing, and
- "Written" or "in writing" means hand-written, type-written, printed or electronically made, and resulting in a permanent record.

Applicable Conditions:

1. **Price Basis:** All prices shall be firm until the purchase order is executed / completed in all respects. No price variations / escalation shall be permitted unless otherwise such variations / escalations are provided for and agreed by BHEL in writing in the purchase order.
2. **Validity:** The offer will be valid for a period of 90 days from the date of technical bid opening date. Validity beyond 90 days, if required, will be specified in the SCC (special conditions of contract).
3. **Taxes & Duties:** Taxes as mentioned in the Contract Price or Price Schedule shall be paid to the Contractor subject to the Contractor complying with all the statutory requirements and furnishing the relevant documents including error free invoices containing detailed break-up of the taxes. Any duties, levies or taxes not mentioned in Contract Price or Price Schedule but applicable as per any statute(s) shall be deemed to be included in the Contract price and shall be to the account of the Contractor.
The Contractor shall bear and pay all the costs, liabilities, levies, interest, penalties in respect of non-compliances of any legal requirements as per various statutory provisions. The contractor shall keep the owner indemnified at all times from any tax liability, interest, penalties or assessments that may be imposed by the statutory authorities for non-compliances or non-observation of any statutory requirements by the Contractor.
4. **Ordering and confirmation of Order:** Vendor shall send the order acceptance on their company letter head within two weeks from the date of Purchase Order or such other period as specified / agreed by BHEL. BHEL reserves the right to revoke the order placed if the order confirmation differs from the original order placed. The acceptance of goods/services/supplies by BHEL as well as payments made in this regard shall not imply acceptance of any deviations.
The purchase order will be deemed to have been accepted if no communication to the contrary is received within two weeks (or the time limit as specified / agreed by BHEL) from the date of the purchase order.
5. **Documentation:** After receipt of Purchase Order, vendor should submit required documents like drawings, bill of materials, datasheets, catalogues, quality plan, test procedure, type test report , O & M Manuals and/or any other relevant documents as per Specification/Purchase Order, as and when required by BHEL/Customer.
At any stage within the contract period, the vendor shall notify of any error, fault or other defect found in BHEL's documents /specifications or any other items for reference. If and to the extent that (taking account of cost and time) any vendor exercising due care would have discovered the error, fault or other defect when examining the documents/specifications before submitting the tender, the time for completion shall not be extended. However if errors, omissions, ambiguities, inconsistencies, inadequacies or other defects are found in the vendor's documents, they shall be corrected at his cost, notwithstanding any consent or approval.
6. **TERMS OF DELIVERY:**
FOR IMPORTED PURCHASE:
Price offered shall be for goods packed and delivered CIF Seaport/ International Airport (FCA) including packing, forwarding, Handling, Ancillary charges like processing of Sight Draft, negotiation charges of bank, Export declaration, Certificate of origin etc.
Packing shall be Air/Sea worthy, best suitable for trans-shipment and to take care of transit damages. If containerized, no. of containers & size of container shall be mentioned. Packing weight (gross & net) Packing dimensions shall be given prior to shipment to ascertain whether the consignment can be carried on standard cargo in contract or as ODC.
Wooden packing material for all the foreign consignments should be treated as per ISPM-15 & Fumigation / Phytosanitary certificate to be submitted to the freight forwarders/ BHEL along with the invoice, B/L, packing list etc.
Vendors shall indicate the name of International Airport/Seaport. The consignment shall be handed over to BHEL approved freight forwarder as mentioned in PO.

FOR INDIGENOUS PURCHASE:

Equipment shall be delivered on "FOR SITE" basis, inclusive of freight, packing, insurance & forwarding charges.

Packing shall be Road / Rail / Air / Sea worthy, best suitable for transshipment and to take care of transit damages. Smaller consignments can be dispatched through Courier services/ RPP with the prior approval of the purchasing Executive.

Deviation for the delivery term is liable for rejection.

7. Penalty:

For delay in delivery: In the event of delay in agreed contractual delivery as per Purchase Order, penalty @ 0.5 % (half percent) per week or part thereof but limited to a max of 10% (ten percent) value of undelivered portion (basic material cost) will be applicable. Delivery will commence from the date of document approval by customer / BHEL or date of issue of manufacturing clearance, whichever is later. The date for which Inspection call is issued by vendor along with test certificates / test reports / Certificate of Conformance / calibration reports, as proof of completion of manufacturing will be treated as date of deemed delivery for penalty calculation. In the absence of furnishing such document indicated above as proof of completion of manufacturing along with inspection call, actual date of inspection will be considered as date of deemed delivery and BHEL will not be responsible for delay in actual date of inspection.

Penalty for delayed delivery, if applicable, shall be deducted at the time of first payment. If penalty is applicable for duration of less than a week, penalty @ 0.5% (half percent) of the basic material value will be deducted.

8. **Contract variations (Increase or decrease in the scope of supply):** BHEL may vary the contracted scope as per requirements at site. If vendor is of the opinion that the variation has an effect on the agreed price or delivery period, BHEL shall be informed of this immediately in writing along with technical details. Where unit rates are available in the Contract, the same shall be applied to such additional work. Vendor shall not perform additional work before BHEL has issued written instructions / amendment to the Purchase Order to that effect. The work which the vendor should have or could have anticipated in terms of delivering the service(s) and functionality (i.e.) as described in this agreement, or which is considered to be the result of an attributable error on the vendor's part, shall not be considered additional work.

9. **Reverse Auction:** BHEL reserves the right to go for Reverse Auction (RA) (Guidelines as available on www.bhel.com) instead of opening sealed bids submitted by the bidder. This will be decided after techno-commercial evaluation and their acceptance with the offer for participation in RA. Non-acceptance of RA will be in non-consideration of their bids, in case BHEL decides to go for RA.

Reverse Auction not applicable to this tender. Price Bid Opening will be done. Vendors to quote their best prices.

Those bidders who have given their acceptance to participate in Reverse Auction will have to necessarily submit 'Process compliance form' (to the designated service provider) as well as 'Online sealed bid' in the Reverse Auction. Non-submission of 'Process compliance form' or 'Online sealed bid' by the agreed bidder(s) will be considered as tampering of the tender process and will invite action by BHEL as per extant guidelines for suspension of business dealings with suppliers/ contractors (as available on www.bhel.com).

The bidders have to necessarily submit online sealed bid less than or equal to their envelope sealed price bid already submitted to BHEL along with the offer. The envelope sealed price bid of successful L1 bidder in RA, if conducted, shall also be opened after RA and the order will be placed on lower of the two bids (RA closing price & envelope sealed price) thus obtained. The bidder having submitted this offer specifically agrees to this condition and undertakes to execute the contract on thus awarded rates.

~~If it is found that L1 bidder has quoted higher in online sealed bid in comparison to envelope sealed bid for any item(s), the bidder will be issued a warning letter to this effect. However, if the same bidder again defaults on this count in any subsequent tender in the unit, it will be considered as fraud and will invite action by BHEL as per extant guidelines for suspension of business dealings with suppliers/ contractors (as available on www.bhel.com).~~

10. **Pre Shipment Inspection:** Prior written notice of at least one week shall be given along with internal test certificates / COC and applicable test certificates. Materials will be inspected by BHEL-EDN-QS/CQS or BHEL nominated Third Party Inspection Agency (TPIA) or BHEL authorized Inspection Agency or Customer / Consultant or jointly by BHEL & Customer / consultant. All tests have to be conducted as applicable in line with approved Quality plan or QA Checklist or Purchase specification and original reports shall be furnished to BHEL-EDN, Bangalore for verification / acceptance for issue of dispatch clearance. All costs related to inspections & re-inspections shall be borne by vendor. Whether the Contract provides for tests on the premises of the vendor or any of his Sub-contractor/s, vendor shall be responsible to provide such assistance, labour, materials, electricity, fuels, stores, apparatus, instruments as may be required and as may be reasonably demanded to carry out such tests efficiently. Cost of any type test or such other special tests shall be borne by BHEL only if specifically agreed to in the purchase order.
11. **Transit Insurance:** Transit insurance coverage between vendor's works and project site shall be to the account of BHEL, unless specifically agreed otherwise. However, vendor shall send intimation directly to insurance agency through fax/courier/e-mail, immediately on dispatch of goods for covering insurance. A copy of such intimation sent by vendor to insurance agency shall be given to BHEL along with dispatch documents. Dispatch documents will be treated as incomplete without such intimation copy. BHEL shall not be responsible for sending intimations to insurance agency on behalf of the vendor.
12. **Packaging and dispatch:** The Seller shall package the goods safely and carefully and pack them suitably in all respects considering the peculiarity of the material for normal safe transport by Sea / Air / Rail / Road to its destination suitably protected against loss, damage, corrosion in transit and the effect of tropical salt laden atmosphere. The packages shall be provided with fixtures / hooks and sling marks as may be required for easy and safe handling. If any consignment needs special handling instruction, the same shall be clearly marked with standard symbols / instructions. Hazardous material should be notified as such and their packing, transportation and other protection must conform to relevant regulations. The packing, shipping, storage and processing of the goods must comply with the prevailing legislation and regulations concerning safety, the environment and working conditions. Any Imported/Physical Exports items packed with raw / solid wood packing material should be treated as per ISPM – 15 (fumigation) and accompanied by Phytosanitary / Fumigation certificate. If safety information sheets (MSDS – Material Safety Data Sheet) exist for an item or the packaging, vendor must provide this information without fail along with the consignment. Each package must be marked with Consignee name, Purchase order number, Package number, Gross weight and net weight, dimensions (L x B x H) and Seller's name. Packing list of goods inside each package with PO item number and quantity must also be fixed securely outside the box to indicate the contents of each box. Total number of packages in the consignment must also be indicated. Separate packing & identification of items should be as follows.
 1. Main Scope - All items must be tagged with part no. & item description.
 2. Commissioning spares - All items must be tagged with part no. & item description.
 3. Mandatory spares - All items must be tagged with part no. & item description.
13. **Assignment of Rights & Obligations; Subcontracting:** Vendor is not permitted to subcontract the delivery or any part thereof to third party or to assign the rights and obligations resulting from this agreement in whole or in part to third parties without prior written permission from BHEL. Any permission or approval given by the BHEL shall, however, not absolve the vendor of the responsibility of his obligations under the Contract.
14. **Progress report:** Vendor shall render such report as to the progress of work and in such form as may be called for by the concerned purchase officer from time to time. The submission and acceptance of such reports shall not prejudice the rights of BHEL in any manner.

15. **Non-disclosure and Information Obligations: Vendor** shall provide with all necessary information pertaining to the goods as it could be of importance to BHEL. Vendor shall not reveal confidential information that may be divulged by BHEL to Vendor's employees not involved with the tender/ contract & its execution and delivery or to third parties, unless BHEL has agreed to this in writing beforehand. Vendor shall not be entitled to use the BHEL name in advertisements and other commercial publications without prior written permission from BHEL.
16. **Cancellation / Termination of contract:** BHEL shall have the right to completely or partially terminate the agreement by means of written notice to that effect. Termination of the Contract, for whatever reason, shall be without prejudice to the rights of the parties accrued under the Contract up to the time of termination.
BHEL shall have the right to cancel/foreclose the Order/ Contract, wholly or in part, in case it is constrained to do so, on account of any decline, diminution, curtailment or stoppage of the business.
17. **Risk Purchase Clause:** In case of failure of supplier, BHEL at its discretion may make purchase of the materials / services NOT supplied / rendered in time at the RISK & COST of the supplier. Under such situation, the supplier who fails to supply the goods in time shall be wholly liable to make good to BHEL any loss due to risk purchase.
In case of items demanding services at site like erection and commissioning, vendor should send his servicemen /representatives within 7 days from the service call. In case a vendor fails to attend to the service call, BHEL at its discretion may also make arrangements to attend such service by other parties at the **RISK & COST** of the supplier. Under such situation the supplier who fails to attend the service shall be wholly liable to make good to BHEL any loss due to risk purchase / service including additional handling charges due to the change.
18. **Shortages:** In the event of shortage on receipt of goods and/or on opening of packages at site, all such shortages shall be made good within a reasonable time that BHEL may allow from such intimation and free of cost.
Transit Damages: In the event of receipt of goods in damaged condition or having found them so upon opening of packages at site, Supplier shall make good of all such damages within a reasonable time from such intimation by BHEL.
19. **Remedial work:** Notwithstanding any previous test or certification, BHEL may instruct the vendor to remove and replace materials/goods or remove and re-execute works/services which are not in accordance with the purchase order. Similarly BHEL may ask the vendor to supply materials or to execute any services which are urgently required for any safety reasons, whether arising out of or because of an accident, unforeseeable event or otherwise. In such an event, Vendor shall provide such services within a reasonable time as specified by BHEL.
20. **Indemnity Clause:** Vendor shall comply with all applicable safety regulations and take care for the safety of all persons involved. Vendor is fully responsible for the safety of its personnel or that of his subcontractor's men / property, during execution of the Purchase Order and related services. All statutory payments including PF, ESI or other related charges have to be borne by the vendor. Vendor is fully responsible for ensuring that all legal compliances are followed in course of such employment.
21. **Product Information, Drawings and Documents:** Drawings, technical documents or other technical information received by Vendor from BHEL or vice versa shall not, without the consent of the other party, be used for any other purpose than that for which they were provided. They may not, without the consent of the Disclosing party, otherwise be used or copied, reproduced, transmitted or communicated to third parties. All information and data contained in general product documentation, whether in electronic or any other form, are binding only to the extent that they are by reference expressly included in the contract.
Vendor, as per agreed date/s but not later than the date of delivery, provide free of charge information and drawings which are necessary to permit and enable BHEL to erect, commission, operate and maintain the product. Such information and drawings shall be supplied in as many numbers of copies as may be agreed upon.
All intellectual properties, including designs, drawings and product information etc. exchanged during the

formation and execution of the Contract shall continue to be the property of the disclosing party.

22. **Intellectual Property Rights, Licenses:** If any Patent, design, Trade mark or any other intellectual property rights apply to the delivery (goods / related service) or accompanying documentation shall be the exclusive property of the Vendor and BHEL shall be entitled to the legal use thereof free of charge by means of a non-exclusive, worldwide, perpetual license. All intellectual property rights that arise during the execution of the Purchase Order/ contract for delivery by vendor and/or by its employees or third parties involved by the vendor for performance of the agreement shall belong to BHEL. Vendor shall perform everything necessary to obtain or establish the above mentioned rights. The Vendor guarantees that the delivery does not infringe on any of the intellectual property rights of third parties. The Vendor shall do everything necessary to obtain or establish the alternate acceptable arrangement pending resolution of any (alleged) claims by third parties. The Vendor shall indemnify BHEL against any (alleged) claims by third parties in this regard and shall reimburse BHEL for any damages suffered as a result thereof.

23. **Force Majeure:** Notwithstanding anything contained in the purchase order or any other document relevant thereto, neither party shall be liable for any failure or delay in performance to the extent said failures or delays are caused by the "Act of God" and occurring without its fault or negligence, provided that, force majeure will apply only if the failure to perform could not be avoided by the exercise of due care and vendor doing everything reasonably possible to resume its performance.
A party affected by an event of force majeure which may include fire, tempest, floods, earthquake, riot, war, damage by aircraft etc., shall give the other party written notice, with full details as soon as possible and in any event not later than seven (7) calendar days of the occurrence of the cause relied upon. If force majeure applies, dates by which performance obligations are scheduled to be met will be extended for a period of time equal to the time lost due to any delay so caused.

Notwithstanding above provisions, in an event of Force Majeure, BHEL reserves for itself the right to cancel the order/ contract, wholly or partly, in order to meet the overall project schedule and make alternative arrangements for completion of deliveries and other schedules.

24. **Guarantee / Warranty:** Wherever required, and so provided in the specifications / Purchaser Order, the Seller shall guarantee that the stores supplied shall comply with the specifications laid down, for materials, workmanship and performance. The guarantee / warranty period as described shall apply afresh to replaced, repaired or re-executed parts of a delivery. If the vendor fails to take proper corrective action to repair/replace defects satisfactorily within a reasonable period, Purchaser shall be free to take corrective action as may be deemed necessary at vendor's risk and cost after giving notice to the vendor, including arranging supply of goods from elsewhere at the sole risk and cost of the vendor. Unless otherwise specifically provided in the Purchase Order, Vendor's liability shall be co terminus with the expiration of the applicable guarantee / warranty period.

25. **Limitation of Liability:** Vendor's liability towards this contract is limited to a maximum of 100% of the contract value and consequential damages are excluded. However the limits of liability will have no effect in cases of criminal negligence or wilful misconduct.
The total liability of Vendor for all claims arising out of or relating to the performance or breach of the Contract or use of any Products or Services or any order shall not exceed the total Contract price.

26. **Liability during guarantee / warranty:** Vendor shall arrange replacement / repair of all the defective materials / services under its obligation under the guarantee / warranty period. The rejected goods shall be taken away by vendor and replaced / repaired. In the event of the vendor's failure to comply, BHEL may take appropriate action including disposal of rejections and replenishment by any other sources at the cost and risk of the vendor.
In case, defects attributable to vendor are detected during first time commissioning or use, vendor shall be responsible for replacement / repair of the goods as required by BHEL at vendor's cost. In all such cases expiry of guarantee / warranty will not be applicable.

27. **Liability after guarantee / warranty period:** At the end of the guarantee / warranty, the Vendor's liability ceases except for latent defects (latent defects are defects / performance issues noticed after the

guarantee / warranty has expired). The Contractor's liability for latent defects warranty for the plant and equipment including spares shall be limited to a period of six months from the end of the guarantee / as specified in RFQ.

28. **Compliance with Laws:** Vendor shall, in performing the contract, comply with all applicable laws. The vendor shall make all remittances, give all notices, pay all taxes, duties and fees, and obtain all permits, licences and approvals, as required by the laws in relation to the execution and completion of the contract and for remedying of any defects; and the Contractor shall indemnify and hold BHEL harmless against and from the consequences of any failure to do so.
29. **Settlement of Disputes:** Except as otherwise specifically provided in the Purchase Order, decision of BHEL shall be binding on the vendor with respect to all questions relating to the interpretation or meaning of the terms and conditions and instructions herein before mentioned and as to the completion of supplies/work/services, other questions, claim, right, matter or things whatsoever in any way arising out of or relating to the contract, instructions, orders or these conditions or otherwise concerning the supply or the execution or failure to execute the order, whether arising during the schedule of supply/work or after the completion or abandonment thereof. Any disputes or differences among the parties shall to the extent possible be settled amicably between the parties thereto, failing which the disputed issues shall be settled through arbitration. Vendor shall continue to perform the contract, pending settlement of dispute(s).
30. **Arbitration Clause:** In case amicable settlement is not reached in the event of any dispute or difference arising out of the execution of the Contract or the respective rights and liabilities of the parties or in relation to interpretation of any provision in any manner touching upon the Contract, such dispute or difference shall (except as to any matters, the decision of which is specifically provided for therein) be referred by either party to the sole arbitration of an Arbitrator appointed by the Executive Director/ General Manager of the purchasing unit/ region/ division of BHEL. Vendor shall have no objection even if the Arbitrator so appointed is an employee of BHEL or has ever dealt/ had to deal with any matter relating to this Contract.
 Subject as aforesaid the provisions of the Arbitration and Conciliation Act, 1996 of India or any statutory modification or re-enactment thereof and the rules made there under and for the time being in force shall apply to the arbitration proceedings under this clause. It is a term of contract that the party initiating arbitration shall specify the dispute or disputes to be referred to arbitration under this clause together with the amount or amounts claimed in respect of each such dispute. The venue for the arbitration shall be Bangalore, India. The award of the arbitrator shall be a speaking award and shall be final, conclusive and binding on all parties to this contract.
 The cost of arbitration shall be borne equally by the parties. Notwithstanding the existence of any dispute or difference or any reference for the arbitration, the vendor shall proceed with and continue without hindrance the performance of the work under the contract with due diligence and expedition in a professional manner.
31. **Applicable Laws and Jurisdiction of Courts:** Prevailing Indian laws both substantive and procedural, including modifications thereto, shall govern the Contract. Subject to the conditions as aforesaid, the competent courts in BANGALORE alone shall have jurisdiction to consider over any matters touching upon this contract.
32. **General Terms:** That any non-exercise, forbearance or omission of any of the powers conferred on BHEL and /or any of its authorities will not in any manner constitute waiver of the conditions hereto contained in these presents.
 That the headings used in this agreement are for convenience of reference only.
 That all notices etc., to be given under the Purchase order shall be in writing, type script or printed and if sent by registered post or by courier service to the address given in this document shall be deemed to have been served on the date when in the ordinary course, they would have been delivered to the addressee.
33. Vendors shall provide their state wise list of GSTIN number as per Govt of India Statute.

34. If the vendor is below the threshold limit, viz Rs.20. lacs as per existing provisions, then a declaration to be provided to that effect along with copy of accounts, failing which the supplier will be treated as an Unregistered dealer (URD) for which tax is payable on reverse charge (RCM) by BHEL.
35. If the vendor is above the threshold limit & is yet not registered, GST is payable by BHEL on reverse charge basis.
36. All supply items are linked to HSN code (Harmonised System Nomenclature). This goods list is mapped with HSN code which is released by Govt of India & available in public domain. All registered suppliers submitting the quote shall mandatorily mention HSN code relevant for the goods quoted.
37. Under GST, Govt of India has linked every service to a service accounting code called SAC. The list of services and the corresponding service accounting code (SAC) is released by Govt of India & available in public domain. All registered suppliers submitting the quote shall mandatorily mention SAC code relevant for the service quoted.
38. The rate of tax applicable for 35 services is also released by Government and rate for any service not falling in the list of 35 services is 18%.
39. Invoice should contain all particulars as per invoice Rules and should include the GST registration number (GSTIN), service accounting code (SAC) apart from all other details mentioned.
40. Invoice should contain all particulars as per invoice Rules and should include the GST registration number (GSTIN), HSN code apart from all other details mentioned.
41. In case GST is payable on reverse charge (RCM) invoice should mention that tax is payable on reverse charge
42. For a registered supplier, the supplier uploaded sales data for the month will be available to recipient on 11th of the subsequent month & details can be verified by BHEL. Credit availment can be confirmed based on this verified data
43. If the Supplier is not registered, then tax is payable on Reverse charge & will be to the account of the supplier
44. All services in the course of business or furtherance of business are eligible to credit subject to other compliances listed herein.
45. If service is eligible for credit, then the credit can be availed only if the invoice is as per the prescribed format, the supplier has uploaded the invoice in the GSTN portal, paid the taxes & uploaded the return, and matches with our inward data, failing which any availment of credit attracts interest.
46. Even in case of services where credit is not eligible,
 - (i) either the supplier should have registered (if above threshold limit) & comply with all above statutory provisions relating to invoice, tax remittance, return filing etc. This can be verified by BHEL from the GSTN portal OR
 - (ii) if not registered BHEL shall be liable to pay applicable taxes on reverse charge
47. For any deficiency in services, where a recovery is made / adjusted in supplier bills, the supplier has to raise a credit note on BHEL & upload in GSTN portal. All above rules applicable for invoice also apply for credit note.
48. All notifications and rules as per central board of excise and customs will be applicable.

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 _____ dated _____³ valued at Rs _____⁴ (Rupees -----)/FC _____ (in words _____) for _____⁵ (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 the _____ bank 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.

We, _____ BANK 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 the _____⁸ we 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 to _____⁷
- c) Unless the Bank is served a written claim or demand on or before _____⁸ 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

Note:

1. Units are advised that expiry of claim period may be kept 3-6 months after validity date. It may be ensured that the same is in line with the agreement/ contract entered with the Vendor.
2. The BG should be on Non-Judicial Stamp paper/e-stamp paper of appropriate value as per Stamp Act prevailing in the State(s) where the BG is submitted or is to be acted upon or the rate prevailing in the State where the BG was executed, whichever is higher. The Stamp Paper/e-stamp paper shall be purchased in the name of Vendor/Contractor/Supplier /Bank issuing the guarantee.
3. In line with the GCC, SCC or contractual terms, Unit may carry out minor modifications in the Standard BG Formats. If required, such modifications may be carried out after taking up appropriately with the Unit/Region's Law Deptt.

4. In Case of Bank Guarantees submitted by Foreign Vendors-

- a. **From Nationalized/Public Sector / Private Sector/ Foreign Banks (BG issued by Branches in India)** can be accepted subject to the condition that the Bank Guarantee should be enforceable in the town/city or at nearest branch where the Unit is located i.e. Demand can be presented at the Branch located in the town/city or at nearest branch where the Unit is located.
- b. **From Foreign Banks (wherein Foreign Vendors intend to provide BG from local branch of the Vendor country's Bank)**
 - b.1 In such cases, in the Tender Enquiry/ Contract itself, it may be clearly specified that Bank Guarantee issued by **any of the Consortium Banks only** will be accepted by BHEL. As such, Foreign Vendor needs to make necessary arrangements for issuance of Counter- Guarantee by Foreign Bank in favour of the Indian Bank's (BHEL's Consortium Bank) branch in India. It is advisable that all charges for issuance of Bank Guarantee/ counter- Guarantee should be borne by the Foreign Vendor. The tender stipulation should clearly specify these requirements.
 - b.2 **In case, Foreign Vendors intend to provide BG from Overseas Branch of our Consortium Bank** (e.g. if a BG is to be issued by SBI Frankfurt), the same is acceptable. However, the procedure at **sl.no. b.1** will required to be followed.
 - b.3 The BG issued may preferably be subject to Uniform Rules for Demand Guarantees (URDG) 758 (as amended from time to time). The BG Format provided to them should clearly specify the same.

ANNEXURE - IV

Electronic Funds Transfer (EFT) OR Paylink Direct Credit Form

Please Fill up the form in **CAPITAL LETTERS** only.

TYPE OF REQUEST(Tick one): _____ CREATE _____ CHANGE

BHEL Vendor / Supplier Code:	
Company Name :	
Permanent Account Number(PAN):	
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: Savings/Cash Credit	
6 9 Digit Code Number of Bank and branch appearing on MICR cheque issued by Bank	
7 Bank swift Code(applicable for EFT only)	
8 Bank IFSC code(applicable for RTGS)	
9 Bank IFSC code(applicable for NEFT)	

- A I hereby certify that the particulars given above are true, correct and complete and that I, as a representative for the above named Company, hereby authorise BHEL, EDN, Bangalore to electronically deposit payments to the designated bank account.
- B If the transaction is delayed or not effected at all for reasons of incomplete or incorrect information, I would not hold BHEL / transferring Bank responsible.
- C This authority remains in full force until BHEL, EDN, Bangalore receives written notification requesting a change or cancellation.
- D I have read the contents of the covering letter and agree to discharge the responsibility expected of me as a participant under ECS / EFT.

Date:

Authorised Signatory:

Designation:

Telephone NO. with STD Code

Company Seal

Bank Certificate

We certify that _____ has an Account No _____ with us and we confirm that the bank details given above are correct as per our records.

Date: _____ (.....)

Place: _____ Signature

Please return completed form along with a blank cancelled cheque or photocopy thereof to:

Bharath Heavy Electricals Ltd,

Attn:

Electronics Division, Mysore Road,

BANGALORE - 560 026

In case of any Query, please call : 080-26998xxx / 2674xxxx or fax no. 080-2674xxxx

List of Consortium Banks

Sl. No	Nationalised Banks	Sl. No	Public Sector Banks
1	State Bank of India	18	IDBI
2	Allahabad bank		
3	Andhra bank	Sl. No	Private banks
4	Bank of Baroda	19	Axis Bank
5	Canara Bank	20	HDFC
6	Corporation bank	21	ICICI
7	Central bank	22	The Federal Bank Limited
8	Indian Bank	23	Kotak Mahindra Bank
9	Indian Oversea Bank	24	Indusind Bank
10	Oriental bank of Commerce	25	Yes Bank
11	Punjab National Bank		
12	Punjab & Sindh Bank	Sl. No	Foreign banks
13	Syndicate Bank	26	CITI Bank N.A
14	UCO Bank	27	Deutsche Bank AG
15	Union Bank of India	28	HSBC
16	United Bank of India	29	Standard Chartered Bank
17	Vijaya Bank	30	J P Morgan

ANNEXURE - VI

DISCREPANCY IN WORDS & FIGURES – QUOTED IN PRICE BID

Following guidelines will be followed in case of discrepancy in words & figures-quoted in price bid:

- (a) If, in the price structure quoted for the required goods/services/works, there is discrepancy between the unit price and the total price (which is obtained by multiplying the unit price by the quantity), the unit price shall prevail and the total price corrected accordingly, unless in the opinion of the purchaser there is an obvious misplacement of the decimal point in the unit price, in which case the total price as quoted shall govern and the unit price corrected accordingly.
- (b) If there is an error in a total corresponding to the addition or subtraction of subtotals, the subtotals shall prevail and the total shall be corrected; and
- (c) If there is a discrepancy between words and figures, the amount in words shall prevail, unless the amount expressed in words is related to an arithmetic error, in which case the amount in figures shall prevail subject to (a) and (b) above.
- (d) If there is such discrepancy in an offer, the same shall be conveyed to the bidder with target date upto which the bidder has to send his acceptance on the above lines and if the bidder does not agree to the decision of the purchaser, the bid is liable to be ignored.

ANNEXURE - VII

BENEFITS FOR MSE SUPPLIERS AS PER MSMED ACT 2006 AND PUBLIC PROCUREMENT POLICY 2012

MSE suppliers can avail the intended benefits only if they submit along with the offer, attested copies of either EM II certificate having deemed validity (five years from the date of issue of Acknowledgement in EM II).

Or

Valid NSIC certificate or EM II certificate along with attested copy of CA certificate (Format enclosed: ANNEXURE VIII) where deemed validity of EM II certificate of five years has expired) applicable for the relevant financial year (latest audited).

Date to be reckoned for determining the deemed validity will be the date of bid opening (Part 1 in case of two part bid).

Non-submission of such documents will lead to consideration of their bid at par with other bidders.

No benefit shall be applicable for this enquiry if any deficiency in the above required documents are not submitted before price bid opening. If the tender is to be submitted through e-procurement portal, then the above required documents are to be uploaded on the portal. Documents should be notarized or attested by a Gazette officer.

Annexure - VIII

Certificate by Chartered Accountant on letter head

This is to Certify that M/S _____
(hereinafter referred to as 'company') having its registered office at _____
is registered under MSMED Act 2006, Udyam
Registration Number: _____ dtd: _____
Category: _____ (Micro/Small). (Copy enclosed).

Further verified from the Books of Accounts that the investment and turnover of the company
as per the latest audited financial year _____. as per MSMED Act 2006 is as follows:

1. **For Enterprises:** Investment in plant and machinery (i.e. original cost excluding land and building and the items specified by the Ministry of Small Scale Industries vide its notification No.S.O. 2119(E) dated June 26, 2020 is INR_____.Lacs

The above investment of INR _____.Lacs is within permissible limit of INR _____Lacs for _____Micro / Small (Strike off which is not applicable) Category under MSMED Act 2006.

2. **.For Enterprises:** turnover specified by the Ministry of Small Scale Industries vide its notification No. S.O. 2119(E) dated June 26, 2020 is INR_____.Lacs.

The above turnover of INR _____Lacs is within permissible limit of INR _____Lacs for _____Micro / Small (Strike off which is not applicable) Category under MSMED Act 2006.

Based on above details, considering Composite criteria of investment and turnover for classification under clause no 3.1; 3.2 and 3.3 of said notification, the enterprise is classified under category:_____

Date.

(Signature)

Name -

Membership number –

UDIN:

Seal of Chartered Accountant

Public Procurement (Preference to Make in India)

For this procurement, Public Procurement (Preference to Make in India), Order 2017 dated 15.06.2017, 28.05.2018, 29.05.2019 & 04.06.2020 and subsequent Orders issued by the respective Nodal Ministry shall be applicable even if issued after issue of this NIT but before finalization of contract/ PO/ WO against this NIT.

In the event of any Nodal Ministry prescribing higher or lower percentage of purchase preference and/ or local content in respect of this procurement, same shall be applicable.

Arbitration Clause in case of Contract with contractors/vendors /consultants other than Public Sector Enterprise (PSE) or a Government Department:

ARBITRATION & CONCILIATION

The parties shall attempt to settle any disputes or difference arising out of the formation, breach, termination, validity or execution of the Contract; or, the respective rights and liabilities of the parties; or, in relation to interpretation of any provision of the Contract; or, in any manner touching upon the Contract, or in connection with this contract through friendly discussions. In case no amicable settlement can be reached between the parties through such discussions, in respect of any dispute; then, either Party may, by a notice in writing to the other Party refer such dispute or difference to the sole arbitration of an arbitrator appointed by Head of the BHEL – EDN. Such Sole Arbitrator appointed, shall conduct the arbitration in English language.

The Arbitrator shall pass a reasoned award and the award of the Arbitration shall be final and binding upon the Parties.

Subject as aforesaid, the provisions of Arbitration and Conciliation Act 1996 (India) or statutory modifications or re-enactments thereof and the rules made thereunder and for the time being in force shall apply to the arbitration proceedings under this clause. The seat of arbitration shall be Bangalore.

The cost of arbitration shall be borne as decided by the Arbitrator upon him entering the reference.

Subject to the Arbitration Clause as above, the Courts at Bangalore alone shall have exclusive jurisdiction over any matter arising out of or in connection with this Contract.

Notwithstanding the existence or any dispute or differences and/or reference for the arbitration, the parties shall proceed with and continue without hindrance the performance of its obligations under this Contract with due diligence and efficiency in a professional manner except where the Contract has been terminated by either Party in terms of this Contract.

Arbitration Clause in case of Contract with contractors/vendors /consultants when they are a Public Sector Enterprise (PSE) or a Government Department:

In the event of any dispute or difference relating to the interpretation and application of the provisions of the Contract, such dispute or difference shall be referred by either party for Arbitration to the Sole Arbitrator in the Department of Public Enterprises to be nominated by the Secretary to the Government of India in-charge of the Department of Public Enterprises. The Arbitration and Conciliation Act, 1996 shall not be applicable to arbitration under this clause. The award of the Arbitrator shall be binding upon the parties to the dispute, provided, however, any Party aggrieved by such Award may make further reference for setting aside or revision of the Award to the Law Secretary, Department of Legal Affairs, Ministry of Law and Justice, Government of India. Upon such reference the dispute shall be decided by the Law Secretary or the Special Secretary or Additional Secretary when so authorized by the Law Secretary, whose decision shall bind the Parties hereto finally and conclusively. The Parties to the dispute will share equally the cost of arbitration as intimated by the Arbitrator.”

Annexure - VIII

Certificate by Chartered Accountant on letter head

This is to Certify that M/S _____
(hereinafter referred to as 'company') having its registered office at _____
is registered under MSMED Act 2006, Udyam
Registration Number: _____ dtd: _____
Category: _____ (Micro/Small)). (Copy enclosed).

Further verified from the Books of Accounts that the investment and turnover of the company
as per the latest audited financial year _____. as per MSMED Act 2006 is as follows:

1. **For Enterprises:** Investment in plant and machinery (i.e. original cost excluding land and building and the items specified by the Ministry of Small Scale Industries vide its notification No.S.O. 2119(E) dated June 26, 2020 is INR_____.Lacs

The above investment of INR _____.Lacs is within permissible limit of INR _____Lacs for _____Micro / Small (Strike off which is not applicable) Category under MSMED Act 2006.

2. **.For Enterprises:** turnover specified by the Ministry of Small Scale Industries vide its notification No. S.O. 2119(E) dated June 26, 2020 is INR_____.Lacs.

The above turnover of INR _____Lacs is within permissible limit of INR _____Lacs for _____Micro / Small (Strike off which is not applicable) Category under MSMED Act 2006.

Based on above details, considering Composite criteria of investment and turnover for classification under clause no 3.1; 3.2 and 3.3 of said notification, the enterprise is classified under category:_____

Date.

(Signature)

Name -

Membership number –

UDIN:

Seal of Chartered Accountant

Certificate by statutory auditor or cost auditor of the company (in the case of companies)

or

from a practicing cost account or the practicing chartered accountant (in respect of supplies other than companies) on their letter head

In line with Government Public Procurement Order No. P-45021/2/2017-BE-II dt. 15.06.2017, P-45021/2/2017-PP (BE-II) dated 28.05.2018

AND

P-45021/2/2017-PP (BE-II) dated 29.05.2019, issued by Ministry of Commerce and Industry

AND

Office Memorandum issued by MNRE REF no F No. 146/57/2018-P&C dated 11/12/2018

We hereby certify that

.....

(Supplier name) are local supplier meeting requirement of minimum local content (40%) defined in as above orders for the material against Enquiry No. (details of tender mentioned)

.....

Details of location at which local value addition will be made is as follows:

.....

.....

.....

We also understand, false declarations will be in breach of the Code of Integrity under Rule 175(1)(i)(h) of the General Financial Rules for which a bidder or its successors can be debarred for up to two years as per Rule 151 (iii) of the General Financial Rules along with such other actions as may be permissible under law.

Seal and Signature of Authorized
Signatory with date

CIN: