भारत हेवी इलेक्ट्रिकल्स लिमिटेड
Bharat Heavy Electricals Limited

Tender for Supply, Installation, Testing & commissioning (SITC) of ONLINE UPS System (3 X 100 kVA, Three Phase, Parallel Redundant)

Tender Enquiry No. AA:GAX:14:ES:101

Bharat Heavy Electricals Limited
Corporate Administration Department
BHEL House, Siri Fort, New Delhi-110049
Tel: 011-6633 7438, Fax:011-6633 7428

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Bharat Heavy Electricals Limited

Ref: AA:GAX:14:ES:101
Date: 24.12.2014

Last date of submission of tender – 10:30 am on 15.01.2015
Due date for opening of tender – 11:00 am on 15.01.2015

Sub: Tender for Supply, Installation, Testing & Commissioning (SITC) of ONLINE UPS System (3 X 100 kVA, Three Phase, Parallel Redundant)

Your most competitive bid is invited in sealed cover for the subject tender. The terms & conditions of the tender are mentioned below:

1.0 GENERAL TERMS & CONDITIONS OF TENDER

1.1 The bill of quantities (BOQ) of items required is mentioned in **Annexure – I**. Technical Specification of the online UPS System to be supplied is mentioned in **Annexure – II**. The tenders should be strictly in accordance with the BOQ & specifications and the terms & conditions, mentioned herein, otherwise they are liable to be rejected.

1.2 UPS is to be installed at BHEL House.

1.3 The material is being procured on outright purchase basis.

1.4 Address for submission & opening of Tender

a) Opening of tender at:

BHARAT HEAVY ELECTRICALS LIMITED
BHEL House, Siri Fort, New Delhi – 110 049
Ph: 011 – 6633 7438

b) Submission of tenders:

Tender Box,
Reception Corporate Office Side
BHARAT HEAVY ELECTRICALS LIMITED
BHEL House, Siri Fort, New Delhi – 110 049

1.5 Pre-qualification criteria for the bidders:

a) Bidders should be original equipment manufacturers (OEM) of online UPS System or an authorized dealer. (Certificate of Original authorization from OEM for UPS to be enclosed with validity date).

b) All Technical documents should be vetted by OEMs.

c) Bidders should have support service centre/ service dealers in Delhi NCR, capable of serving the locations as per BHEL requirements. (Affidavit/ MOU on non-judicial stamp paper supporting service centre location with copy of lease/ sale deed for support service centre space which shall be verified by BHEL official's visit, if required).

d) The bidder/ OEM should hold valid ISO Certificate (Submit copy of Certificate).

e) The bidder should have PAN No., VAT/ TIN No. (Submit copy of each).

f) The bidder must have supplied minimum two units of 100 kVA or more capacity of similar brand in INDIA (Submit the copy of relevant Purchase order along with certificate of having successfully completed within last three years).

g) Bidder shall have average minimum turnover of Rs. 35 Lacks during last three financial years ending on 31.03.2014. A copy of the audited Balance Sheet & Profit & Loss Account shall be submitted as proof in this regard.

h) OEMs of UPS system must have registered offices and service centres in India since last Five years.

i) Type test reports from Govt. Approved Lab for IGBT based Rectifier and Inverter section to be submitted.

j) Valid Solvency certificate of minimum Two Crore.

k) Certificate from manufacturers (OEMs) for technical support for a minimum period of seven years.

1.6 All materials should be as per applicable Indian standards. Only brand new material/machine should be supplied.

1.7 Rates

Unit rates are to be quoted for items in the price bid format **(Annexure – X)** only. They should be inclusive of all taxes and duties. The unit rate should be quoted on FOR consignee address basis and should be inclusive of the charges for packing & forwarding, freight & insurance, loading & unloading and lifting up to installation site. The rates quoted for supply, installation, testing & commissioning should remain firm during the validity of the offer. The rates for item-1 should be valid for at least 3 months from the date of opening of Part-2 Bid or Reverse Auction (RA) as applicable.

1.8 Taxes & Duties: All taxes and duties should be indicated as a percentage as well as amount separately in the price bid. Any subsequent changes in taxes & duties shall be applicable to either side, subject to production of proof.

1.9 **Evaluation Price**: The bidder, quoting the lowest 'Total Package Price' (including all taxes), shall be L1. Normally, contract shall be awarded to the L1 bidder at lowest price (Refer Price Bid Format as per **Annexure-X**).

1.10 **EARNEST MONEY DEPOSIT**:

a) Every tender must be accompanied by the **EMD of Rs.1, 50, 000/- (One Lacs Fifty Thousand only)** as refundable, non-interest bearing. The amount of EMD shall be in the form of Pay Order or Demand Draft only, in favour of BHEL, payable at New Delhi.

b) Tenders received without Earnest Money in full in the manner prescribed above will not be considered.

c) The Earnest Money Deposit of the successful bidder will be retained towards part of Security Deposit. In the case of unsuccessful bidders, the Earnest Money will be refunded to them after finalization of the tender.

d) BHEL reserves the right of **forfeiture of Earnest Money deposit** in case the successful bidder.

i. After opening of tender, revokes/ withdraws his tender within the validity period or revises/ alters his earlier quoted rates/ conditions.

ii. Fails to submit 50% of the total, as Security Deposit before start of work by successful bidder.

1.11 Security deposit cum performance bank guarantee

The bidder must deposit the required amount of security within 15 days from the date of issue of order in any of the following form. The security deposit shall be 10% of the contract value.

a) Cash (as permissible under income tax act)
b) Pay order, Demand draft in favor of BHEL
c) Local cheques of scheduled banks, subject to realization.
d) Bank Guarantee from scheduled banks/ public financial institutions as prescribed proforma as per **Annexure - IV**.
e) 50% in any of the above forms and Balance 50% shall be recovered by deductions from running bills @ 10% of the value of each running bill, till the full Security Deposit is made up.

The validity of the Bank Guarantee furnished towards Security Deposit shall be up to the period of order issued. It may be noted that in no case the security deposit shall be refunded or released prior to passing of final bill.

1.12 Supply of the UPS should be completed in all respects within four months from date of issue of Purchase Order by BHEL. The Installation, Testing & Commissioning of the online UPS System should be completed within two months from the date of supply of UPS or within six months from the date of issue of Purchase Order by BHEL. The activity schedule for SITC of UPS is explained below. Penalty charges shall be imposed for delay in completion of work for the specific mile stone delayed @ half percent (0.5%) of the respective milestone value for every week of delay or part thereof, subjected to a maximum of 10% of the Purchase Order value without BHEL being required to establish and prove the actual loss/ damage suffered by BHEL on account of such delay. This penalty will be deducted from the bill presented by vendor.

Sl. No.	Activity	Activity Schedule (Months)					
		1	2	3	4	5	6
1	Manufacturing and related activities required at vendor's site regarding UPS supply. (two weeks prior notice for inspection date to be given)	----------					
2	BHEL/ Customer inspection at supplier's works for run test of UPS and verification of original test certificates and standards.			----------			
3	Transportation to destination at BHEL House, Asiad				--		
4	Installation, Commissioning and Acceptance Testing (ATP)					----------	

1.13 **Acceptance Testing (ATP)**

a) The vendor shall offer the UPS for ATP only after they have been successfully installed and run by the vendor.
b) ATP will be conducted by BHEL within 10 days of receipt of your written request for carrying out the same.
c) ATP would mean continuous operation of the UPS for four days.
d) The online UPS System will be deemed to have been commissioned only after successful completion of ATP as confirmed by BHEL.

1.14 Payment terms

i. 80% payment will be made within 30 days from the date of receipt of material. 10% payment will be made within 30 days from the date of commissioning. Balance 10% will be made within 30 days of expiry of warranty period.

ii. All payments will be released after deduction of taxes as per the rules in force and Tax Deduction at Source (TDS) certificate will be issued by BHEL as applicable.

1.15 The bidder should insure the material at his own cost and any loss or damage to the material, during handling, transportation, storage, etc till commissioning shall be to the account of the bidder.

1.16 Warranty

The UPS shall remain under on site warranty for a period of one year from the date of commissioning. Warranty will be inclusive of the following.

a) Quarterly preventive maintenance and servicing of the UPS.

b) Breakdown maintenance whenever required including supply of spares at no extra cost to BHEL.

The downtime of the UPS should not be more than 3% time (cumulative) during the warranty period. In case the downtime is more than 3% then penalty shall be deducted at the rate of 10% of balance 10% amount payable after completion of warranty.

1.17 Only brand new machines and latest model should be supplied by the bidder.

1.18 The UPS is to be installed at BHEL House, Sirifort, New Delhi-110049

1.19 The prospective bidders should visit the site and see the site conditions before submitting their bid.

1.20 Power Supply & water supply for the installation shall be provided by BHEL free of cost.

1.21 Care should be taken by the bidder while handling and installing the UPS system to avoid damage to the building. The bidder shall be responsible for repairing all damages and restoring the same to their original finish at his own cost.

1.22 The bidder should remove at his cost all unwanted and waste materials arising from the installation work.

1.23 Provision of all tools and tackles shall be in the scope of the bidder.

1.24 On-site training will have to be provided by the bidder to BHEL staff regarding operation and maintenance of the equipment, free of cost.

1.25 Soft copy and Hard copy (minimum 3) of operation and maintenance manual should be provided at no extra cost.

1.26 BHEL reserves the right to accept or reject any of the bid/ all bids with or without deviation or cancel/ withdraw the invitation for bid without assigning any reason whatsoever and in such case no bidder shall have any claim arising out of such action by BHEL.

1.27 The bidder should accept all terms and conditions of the tender unconditionally. Offers with deviations from terms and conditions of this tender are liable to be rejected. Deviations, if any, mentioned elsewhere in bid apart from **Annexure VI-"Acceptance letter/ deviation certificate"** whether techno-commercial bid or price bid shall be treated as null and void by BHEL.

1.28 Bid should be free from correction and erasers. Corrections, if any, must be countersigned. If there is a difference between price quoted in words and figures or there is any other discrepancy in the price schedule, higher value(s) will be considered for evaluation and lower values will be considered for ordering.

1.29 Unsolicited bids shall not be entertained. Unsolicited revised Price Bids also, shall not be entertained at any stage of the tendering process and will lead to automatic disqualification of the party's bid.

1.30 Offer (Techno-commercial as well as price bid) should be valid for minimum **SIX MONTHS** from the date of opening of tender.

1.31 Any deviations in Annexure – III "Un – Priced Bid" and Annexure – X "Price Bid" will be treated as Null & Void by BHEL.

1.32 **Bidders may visit/ inspect the site of installation of UPS before submitting the bid, if required.**

2.0 CONTRACT LAW, NOTICE AND ARBITRATION

2.1 ARBITRATION

a) In the event of any dispute or difference arising out of the execution of the Order/Contract or the respective rights and liabilities of the parties or in relation to interpretation of any provision between BHEL & Service Provider in any manner touching upon the Order/Contract, such dispute or difference shall (except as to any matters, the decision of which is specifically provided for therein) be referred to the arbitration of the person appointed by the competent authority of BHEL.

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

b) In case of order/contract on Public Sector Enterprises (PSE) or a Govt. Deptt., the following clause shall be applicable:-

In the event of any dispute or difference relating to the interpretation and application of the provisions of the Order/Contract, such dispute or difference shall be referred to by either party to the arbitration of one of the arbitrators in the department of public enterprises. The award of the arbitrator shall be binding upon the parties to the dispute, provided, however, any party aggrieved by such award may make a further reference for setting aside or revision of the award to the Law secretary, Deptt. of Legal Affairs, Ministry of Law & 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 in the dispute will bear equally the cost of arbitration as intimated by the arbitrator.

2.2 LAWS GOVERNING THE CONTRACT

The Order/Contract shall be executed and governed by the laws of India and the courts of India alone shall have jurisdiction in respect of any matter arising under or in connection with the Order/Contract.

2.3 JURISDICTION OF COURT

Courts at Delhi/New Delhi shall have exclusive jurisdiction to decide the dispute, if any, arising out of or in respect of the contract(s) to which these conditions are applicable.

2.4 DEFAULT/BREACH OF CONTRACT, INSOLVENCY AND RISK PURCHASE

a) If the Service Provider / Contractor fails to provide the required services as per the Contract / fails to deliver the goods or materials or any instalment thereof within the period(s) fixed for such delivery or delivers goods or materials not of the contracted quality and failing to adhere to the contract specifications or at any time repudiates or otherwise abandons the contract before expiry of such period or refuses or is unable to supply / provide goods / services or materials covered by the Order/Contract either in whole or in part or otherwise fails to perform the Order/Contract or commits any breach of the Order/Contract not herein specifically provided for or in the event of the death or insanity or if the Seller/Contractor being an individual or if a firm on a partnership thereof, shall at any time, be adjudged insolvent or shall have a receiving order for administration of his estate made against him or shall take any proceeding for composition under any Insolvency Act for the time being in force or make any assignment of the Order/Contract or enter into any arrangement or composition with his creditors or suspend payment or if the firm dissolved under the Partnership Act or if the Seller/Contractor (Service Provider) being a company is wound up voluntarily or by order of a Court or a Receiver, Liquidator or Manager on behalf of the debenture holders and creditors is appointed or circumstances shall have arisen which entitles the Court of debenture holder and creditors to appoint a receiver, liquidator or manager, the purchaser without prejudice to his right to recover any expenses, losses or damages to which the purchaser may be put to incur or sustain by reason of the Seller/Contractor's default or breach of Order/Contract shall be entitled to cancel the Order/Contract either in whole or portion thereof without compensation to the Seller/Contractor (Service Provider) and if the purchaser so desires, he may procure upon such terms and in such manner as he deems appropriate, stores not so delivered or others of a similar description where stores exactly complying with particulars are not, in the opinion of the purchaser, which shall be final, readily procurable, at the risk and cost of the Seller/Contractor (Service Provider)and the Seller/Contractor (Service Provider) shall be liable to the purchaser for any excess costs provided that the Seller/Contractor (Service Provider) shall continue the performance of the Order/Contract to the extent not cancelled under the provisions of this clause. The Seller/Contractor (Service Provider) shall on no account be entitled to any gain on such repurchases.

Cost of the purchases/service made by the Purchaser/Service taker at the risk and cost of the seller/contractor (Service Provider) shall be worked out after levying 30% overheads as departmental charges on the cost of materials / services so purchased/hired.

3.0 PROCEDURE FOR SUBMISSION OF SEALED TENDERS

3.1 The offer is to be submitted as required in two parts with Pre-Qualification Criteria. However for quotations submitted in single bid against our requirement of two part bid will be considered only, if

the bid is techno-commercially accepted without seeking any clarification / missing documents from the bidder. Otherwise, the bid is liable to be rejected.

Part-1: Techno – Commercial Bid

This part shall contain-

a) First sealed envelope should prominently be super-scribed as "Part-1-A, Pre-Qualification Bid" indicating Tender Enquiry No. Name of Purchase, Due date and Address & reference of the bidder. **It should contain all documents as per Pre-qualification criteria for the bidders at clause No. 1.5 (a to j) of tender document with Demand Draft for EMD.**

b) Second sealed envelope should prominently be super-scribed as "Part-1-B Technical and Commercial Bid" indicating Tender Enquiry No., Name of Purchase, Due date and Address & reference of the bidder. **It should contain the following documents.**

a) The bill of quantities (BOQ) of items required is mentioned in **Annexure – I.**
b) Technical Specification of the online UPS System to be supplied is mentioned in **Annexure –II.**
c) Un-priced Price bid format as per **Annexure – III** with "Q" written in place of prices.
d) Security deposit format as per **Annexure – IV**
e) Specifications cum Technical compliance statement as per **Annexure – V**
f) Acceptance / Deviation Certificate as per **Annexure – VI**
g) Declaration as per **Annexure – VII**
h) Vendor's details as per **Annexure – VIII**
i) Check list as per **Annexure – IX**
j) Technical brochures, if any.

Part - 2 Bid: Price Bid

Third sealed envelope should prominently be super-scribed as "Part-2 Price Bid" indicating Tender Enquiry No., Name of Purchase, Due date and Address & reference of the bidder. **It should contain only price bid format (Annexure – X) with prices.**

3.2 All the above three envelopes shall be put in one big envelope, duly sealed, super scribed as Part 1-A, Part 1-B and Part 2 along with Tender No., due date of opening, name & address of the officer inviting Tender and the address and reference of the Bidder. **All the pages of tender document should be duly filled in and all Annexures should be signed and stamped by the authorized signatory of the bidder and enclosed with the bid.**

3.3 The Part-1-A Pre-Qualification Bid of Techno – commercial bid of tender shall be opened on the due date and time as mentioned above in the presence of bidders or their authorized representatives who may like to be present.

3.4 The Part-1-B Techno – commercial bids of only those Bidders who have been found to meet the pre-qualifying criteria would be opened at a later date. These qualified bidders would be informed about the tender opening date of Part-1-B.

3.5 The Part-2 Price Bid of only those bidders, who qualify the evaluation of techno - commercial bids, shall be opened. Date of opening of Price Bid will be intimated separately to the Bidders who qualify in the Techno - commercial bid evaluation.

3.6 REVERSE AUCTION (RA)

a) BHEL may go for Reverse Auction (on-line bidding on Internet) instead of opening the submitted sealed paper price bid. The decision to go for Reverse Auction will be taken after techno-commercial evaluation. Information and general terms and conditions governing RA are given below.

b) For the proposed reverse auction, technically and commercially acceptable bidders only shall be eligible to participate.

c) BHEL will engage the services of a Service Provider who will provide all necessary training and assistance/ demonstration before commencement of on line bidding on internet.

d) BHEL will inform the Vendors in writing the details of Service Provider to enable them to contact for training/ demonstration.

e) Business rules like event date, time, start price, bid decrement, extensions etc. also will be communicated through Service Provider for compliance.

f) Vendors have to fax the Compliance form in the prescribed format (provided by Service provider) before start of Reverse Auction. Without this, the vendor will not be eligible to participate in the event.

g) BHEL may provide the calculation sheet which will help the Vendors to enable them to fill-in the price and keep it ready for keying in during the Auction.

h) Reverse auction will be conducted on a scheduled date & time.

i) At the end of Reverse Auction event, the lowest bid value will be known on the network.

j) The lowest bidder has to fax the duly signed filled-in prescribed format as provided to BHEL through Service Provider within 24 hours of Auction without fail.

k) Any variation between the on-line bid value and the signed document will be considered as sabotaging the tender process and will invite disqualification of vendor to conduct business with BHEL as per prevailing procedure.

l) In case BHEL decides not to go for Reverse Auction procedure for this tender enquiry, the paper Price bids already submitted and available with BHEL shall be opened as per BHEL's standard practice.

3.6 The bidders are required to quote for all the items & no column should be left blank. Tenders for part supply or incomplete in any respect, are liable to be rejected.

The tender(s) should be dropped in tender box on or before the due date mentioned above. BHEL will not be responsible for delay in receipt of tender(s), sent by post / courier. In case you have any queries regarding the above tender then the same should be sent via email to the undersigned within one week from the date of advertisement of NIT.

Manish Bhaskar 24/12/14

मनीष कुमार भास्कर / MANISH KR. BHASKAR
वरिष्ठ कार्यपालक / Senior Executive
मानव संसाधन / Human Resources
भारत हेवी इलेक्ट्रिकल्स लिमिटेड / Bharat Heavy Electricals Ltd.
बी.एच.ई.एल. हाऊस, सीरी फोर्ट / BHEL House, Siri Fort
नई दिल्ली–110 049 / New Delhi - 110 049

Enclosures: Annexure-I, II, III, IV, V, VI, VII, VIII, IX, X

Annexure - I

BOQ

BHARAT HEAVY ELECTRICALS LTD., BHEL HOUSE, SIRI FORT, NEW DELHI

Sub: Tender for Supply, Installation, Testing & Commissioning (SITC) of ONLINE UPS System (3 X 100 kVA, Three Phase, Parallel Redundant)

S. No.	Description of Items	Qty.
1	Supply of 100 kVA, Three Phase ONLINE UPS system (Rectifier/ Charger + Inverter), IGBT based with input phase sequence correction system including Input & Output Panels. **(UPS Makes: Emerson, Mitsubishi, APC, Gutor, Merlin Gerin)**	3
2	System Synchronization Kit	3
3	Battery circuit Breaker	3
4	Static bypass via static switch and Manual maintenance bypass	3
5	Isolation Transformer at the global input/ output of inverter and static bypass	3
6	Sealed maintenance free batteries with back-up time of 15 minutes at full load on each UPS with inter connecting copper cables, racks and standard accessories	3 sets
7	Static Switch Module to be installed in Output Panel for every Floor to provide dual protection to UPS and for identification of faults in respect of individual floor	7

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Bharat Heavy Electricals Limited

Annexure - II

Specification guide for ONLINE UPS system (3 X 100 KVA, Three Phase, Parallel Redundant)

1. Introduction
2. Scope of Supply
3. Operating Principle
4. UPS system Design requirement
5. Product materials characteristics
6. Product components Electrical characteristics
7. Environment conditions
8. Display and controls
9. Documentations
10. Warranty
11. Services
12. Standards, Test & Quality assurance
13. Test Procedure

BHEL HOUSE, Siri Fort, New Delhi – 110049

1 - Introduction

The Specification defines the electrical and mechanical characteristics of Uninterruptible Power Supply (referred to as UPS in the rest of this document). It is required to have highly reliable, solid state type true on line fully microprocessor controlled, Double conversion PWM IGBT based UPS system to be operated in parallel redundant mode. The UPS system shall provide high quality AC power for sensitive electronic equipment loads without any break in the presence/ absence of grid power. Under no conditions will protected system get direct supply from the grid mains unless there is fault in the protected system.

The manufacturer has to ensure that their UPS conforms to IEC 62040-3 or any latest IEC standards available shall be confirmed by certification from independent laboratories (e.g. TUV, Veritas).

2 - Scope of supply

2.1 100 KVA online UPS, Input 415V AC, 3 phase 50 Hz, Output 415V AC, 50Hz, 3 Phase comprising of the following major components:

Sl. No.	Description	Qty. (No.)
1.	100 kVA, 3 phase on-line UPS system (Rectifier/ Charger + Inverter) IGBT based with Input & Output Panels	3
2.	System Synchronizing kit	3
3.	Battery Circuit Breaker	3
4.	Static bypass via static switch and Manual maintenance bypass	3
5.	Isolation Transformer at the global input/ output of inverter and static bypass	3
6.	Sealed maintenance free batteries with back- up time of 15 minutes at full load on each UPS with inter connecting copper cables, racks and standard accessories	3 sets
7.	Static Switch Module to be installed in Output Panel for every Floor to provide dual protection to UPS and for identification of faults in respect of individual floor	7

2.2 Transient Voltage Surge Suppressor (TVSS), 3 No.

Critical and expensive electronic equipment should be protected from transient over-voltages by TVSS. The selection of surge protective devices typically depends on the location of the device. TVSS device for ITE equipment shall be as per following specifications. TVSS shall be connected with Each UPS.

Sl. No.	Description		
1.	All Modes Protection	:	L-L, L-N, L-G, N-G
2.	Surge Current Capacity	:	25 kA
3.	Connection Type	:	Parallel
4.	Protection Level	:	<1 kV
5.	MCOV (Max. Continuous Operating Voltage)	:	Min. 260 Volts
6.	Response Time	:	< 0.5 nanoseconds
7.	Status Indication	:	LED, Dry contacts
8.	EMI/RFI Attenuation	:	40 dB typical
9.	Certification	:	UL/ CE

i. The main incoming switchboard (MSB) and distribution boards (DB) shall be equipped with TVSS as defined in the IEEE standard 1100(1999).

ii. The surge protective devices shall be sized as per IEEE Std C62.41-1991 and IEEE Std C62.45-1992.

iii. Surge protective devices used for three-phase, four-wire circuits shall be connected in all combinations of line-to-line, line-to-neutral, line-to-ground, and neutral-to-ground. (L-L, L-N, L-G, N-G).

iv. The TVSS shall have a UL or CE listing.

v. The unit shall have a maximum continuous operating voltage (MCOV) rating of minimum 320 VRMS.

vi. The Response time of TVSS shall be ≤ 0.5 nanoseconds.

vii. The TVSS shall provide up to 40dB for RFI & EMI noise attenuation.

3 – Operating Principle

Each single UPS unit shall operate in double-conversion mode (also called on-line mode) made up of the following components described in details in this specification.

3.1 Normal operation *(normal AC source available)*

The rectifier shall supply the corresponding inverter with DC current while the charger simultaneously float charges its battery. The load is continuously supplied with dependable electrical power by the inverter.

3.2 Operation on battery power *(normal AC source not available or outside tolerances)*

Upon failure or excessive deterioration of the normal AC source, the inverter shall continue to supply the load with power from its battery without interruption or disturbance, within the limits imposed by the specified battery backup time.

3.3 Battery recharge *(normal AC source restored)*

When the normal AC source is restored, the rectifier shall again power the corresponding inverter, without interruption or disturbance to the load, while the charger automatically recharges the battery. The UPS system shall ensure equal sharing of the total load between the various parallel-connected units.

3.4 Parallel operation and redundancy

The units shall operate in parallel with redundancy, with the load shared equally between the units. Redundancy shall be of the "2n+1" type, i.e. "1" units shall be redundant in the total of n units. If a major fault occurs on a unit, it shall automatically disconnect. If the remaining units are sufficient to supply the load, it/ they shall remain in operation. If the total available power is insufficient, the load shall be automatically transferred, without interruption, to the bypass AC source, if it is within tolerances.

3.5 Transfer to bypass AC source

In the event of an overload exceeding system capabilities (short-circuits, heavy inrush currents, etc.) the load shall be automatically transferred, instantaneously and without interruption, to the bypass AC

source, on the condition that bypass power is available and within tolerances. To that end, synchronisation of each inverter in phase and frequency with the bypass source shall be automatic. Transfer of the load back to the UPS-unit outputs shall be automatic or manual. During transfer, the load shall not suffer an outage or disturbance in the supply of power. To ensure transfer in complete safety, the system shall simultaneously control the static switches.

On request, the UPS system may automatically transfer the load with a micro-interruption if a major fault occurs on the UPS system and if synchronisation with the bypass source has not been established.

The bypass AC source shall continue to supply the load, without interruption, if its characteristics remain within voltage tolerances (340 to 470 volts). Outside these tolerances, it shall be possible to supply the load, but in downgraded mode.

3.6 Maintenance on UPS units

For maintenance purposes, all electronic components shall be accessible from the front of the UPS.

In addition, a built-in manually-operated mechanical bypass system shall be installed in each UPS unit

For personnel safety during servicing or testing, this system shall be designed to isolate the UPS units while continuing to supply power to the load from the bypass AC source. Transfer to the manual bypass mode and back shall be possible without interruption to the load.

The UPS shall also include a device making it possible to isolate the rectifiers and the chargers from the normal AC source.

3.7 Battery maintenance

For safe maintenance on the battery of each UPS unit, the system shall include a circuit breaker to isolate the battery from the corresponding rectifier/charger and inverter. The battery circuit breaker should have under voltage coil to trip the breaker by UPS during DC fault and auxiliary contact to sense the breaker position by the UPS.

When the battery is isolated from the system, the UPS shall continue to supply the load without interruption or disturbance, except in the event of a normal AC source outage.

3.8 Battery Management Software

The UPS should have Battery Management Software with following features:

A. Periodic Battery Test
B. Controlling Charging Time and Current
C. Increase in Battery Life
D. Protection: Battery low Cut-off without draining current

4- UPS System Design requirement

1. Total Harmonic Distortion of Current at 100% Non Linear Load : <3% without active or passive filter.

2. RS 232 and SNMP (Simple Network Management Protocol) interface to be provided for remote monitoring.

3. Battery bank (Sealed Maintenance Free) with UPS shall be designed to provide Fifteen minutes (15) back-up at full load for each UPS.

5 – Product materials characteristics

5.1 Materials

All materials of the UPS shall be new and of present state of the art, of current manufacture, high grade and free from all defects and shall not have been in prior service except as required during factory testing.

5.2 Construction and Mounting

The UPS unit comprised of Input Isolator, Rectifier/ Charger, Inverter, Static transfer switch, Maintenance Bypass switch and static bypass Input switch shall be housed in a free standing steel enclosure with key lockable doors. Front/ rear access shall be required for expedient servicing, adjustments and installation. The enclosure will be built to comply **with IP21**. The UPS shall be constructed of replaceable sub-assemblies. Printed circuit assemblies shall be plug – in type.

5.3 Cooling

Cooling of the UPS shall be by forced air ventilation. Low velocity fan shall be used to minimize audible noise output. Fan power shall be provided by the UPS output. Temperature shall be monitored by thermal sensors.

5.4 Cable Entry

To facilitate connections, all terminal blocks must be easily accessible from the front when the UPS is installed with the back to the wall. Entry of upstream and downstream power cables, as well as any auxiliary cables, shall be possible through the bottom/ top as required through detachable gland plate.

The neutral conductor shall be oversized for any third-order harmonic currents and their multiples (the size of the neutral shall be 1.5 times that of each phase).

5.5 Service Area Requirements

All serviceable subassemblies shall be modular and capable of being replaced from front of the UPS. The UPS module preferably shall require not more than 1.5 meter of front service access room and shall not require side access for service.

6 – Product components Electrical characteristics

6.1 Rectifiers and Chargers

The rectifier and charger module shall be supplied via the normal AC input. The rectifier should be of 125% capacity of Inverter to cater the charging the batteries even when there is full load.

6.1.1 – Normal AC source

The normal AC source supplying the UPS shall, under normal operating conditions, have the following characteristics:

- Rated voltage: 340 - 470 V at full rated load.
- Number of phases: 3 ph + Earth. Only 3 phases will be provided from mains or UPS System input.
- Frequency: 50 ± 10%.

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6.1.2 - Inrush current

A device shall be provided to limit inrush currents. When AC power fails and during genset start, the rectifier shall limit the power drawn to 70% of its rating for ten seconds. The remaining 30% shall be supplied by the battery.

6.1.3 – Battery Charger Capacity and current limiting

In addition to supply power for the inverter load, the rectifier/ charger shall be capable of producing battery charging current to recharge the batteries. After the battery is recharged, the rectifier/ charger shall maintain the battery at full charge unit the next emergency operation. It should be Automatic Float-cum-Boost charger having I/U characteristics conforming to DIN 41772, automatic Float-to-Boost charge switching with current measuring criterion plus control of charging time.

The UPS should have a battery circuit breaker (MCCB having thermal, magnetic and U/V trip facility) mounted near to the batteries. When this breaker is opened, no battery voltage should be present in the UPS enclosure. The UPS module should be automatically disconnected when the battery reaches to the minimum discharge voltage level or when signaled by other control functions. Remote tripping of battery circuit breaker facility should be incorporated. No contactor type arrangement in the battery path should be used.

6.1.4 - Operating mode

The standard charger of each unit shall be sized to recharge the battery rapidly:
a battery bank with a backup time of 15 minutes should be recharged in less than **8 hours** following a complete discharge to recover 90% of backup time. The charging current delivery capacity of the charger should be at least 15% of connected battery capacity in ampere hour.

6.1.5 - Voltage regulation

Rectifier/ Charger regulation on each unit shall take into account the ambient temperature of the battery and shall ensure DC output voltage fluctuations of less than 1% irrespective of load and AC input voltage variations (within the limits specified in section 6.1.1 "Normal AC source").

6.1.6 - Fuse failure Protection

Power semi-conductors in Rectifier/ Charger shall be fused with fast acting fuses so that loss of any power semi-conductor shall not cause cascading failures.

6.1.7 - DC Filter

The Rectifier/ Charger shall have an output filter to minimize ripple voltage into the battery. Under no condition shall ripple voltage into the battery exceed 1% RMS. The filter shall be adequate to ensure that the DC output at the rectifier charger will meet the input requirement of the inverter. The inverter shall be able to operate from the rectifier of the charger with the Battery disconnected.

6.2 Batteries

Each UPS unit shall be equipped battery banks consist of 12 Volt valve regulated sealed lead-acid (VRLA) type batteries. The battery shall be sized to ensure continuity in the supply to the inverter for at least 15 minutes for a power rating of 100 kVA at a power factor (pf) of 0.9.

The **12 Volt VRLA** batteries shall have warranty for a minimum period of **2 years.**

The battery shall be installed in open MS rack, powder coated with top fully covered to provide protection from falling objects.

6.2.1 Battery Digital Monitoring

The UPS shall be equipped with a system for battery digital management.
Based on a number of parameters (percent load, temperature, battery type and age), the system shall

control the battery charge voltage and continuously calculate:

1. The true available backup time

6.3 Inverters

The term inverter shall denote the solid state equipment and controls to convert DC power from the Rectifier/ Charger or Battery to regulated AC power for supporting the critical load. The inverter shall be IGBT based pulse width modulated (PWM) design capable of providing the required AC output. In normal conditions, load should get power only from Inverter. In case of grid failure, Inverter should be using power from battery bank and keep on feeding the connected load without any interruption till the available backup time.

6.3.1 - Output voltage
Rated voltage: (380/ 400/ 415) Volts rms, adjustable within tolerances of +/- 3%.

Number of phases: 3 phases + Neutral + Earth.

Steady-state conditions: The variation in the rated voltage shall be limited to ± 1% for a balanced load between 0 and 100% of the rated power, irrespective of normal AC input, within the limits specified in section 6.1.1 "Normal AC source"

6.3.2 - Output frequency
Rated frequency: 50 Hz with allowed Variations: ± 0.5 Hz

6.3.3 - Overload capacity
The UPS shall be capable of supplying for at least:
- 30 minute a load representing 110% of the rated load;
- 10 minute a load representing 125% of the rated load;
- 30 second a load representing 150% of the rated load;
- 1 second a load representing 200% of the rated load.

If necessary, the UPS shall operate as a generator (current limiting) with a max current capacity of at least 275% of nominal current for 150 milliseconds, to allow highly disturbed transient operating states (high overloads, very high crest factors, downstream fault etc.) without transferring the load to the bypass.

6.3.4 - Branch fuse cleaning capacity
Inverter shall be capable to clean HRC fuse @ 20% in the branch without tripping so that in the event of short circuit in any branch, fuse of that particular branch blows off while inverter maintains the operation uninterrupted.

7 - Environment conditions

7.1 - UPS (not including batteries)

7.1.1 - Operation
UPS shall be capable of operating under the following environmental conditions without loss of performance:
1. Ambient temperature range: 0° C to +40° C;
2. Recommended temperature range: +20° C to + 25° C;
3. Maximum relative humidity: 95% at 25° C;
4. Maximum altitude without de-rating: 1 000 meters.

7.1.2 - Storage

The UPS, not including the battery, shall be designed for storage under the Ambient Temperature range: -10° C to +70° C.

8 - Display and Controls

UPS operation shall be facilitated by a user interface for Graphic Display, Controls and Status indications with mimic panel on each UPS unit.

8.1- Graphic Display

The graphic display shall facilitate operation and assist the user by providing step by step help in the user's language. It shall be possible to display the following and others as required:

8.1.1 Measurements Display

1. Inverter output phase-to-phase voltages
2. Inverter output currents
3. Inverter output frequency
4. Voltage across battery terminals
5. Battery charge or discharge current
6. Rectifier/ Charger input phase-to-phase voltages
7. Rectifier/ Charger input currents
8. Crest factor
9. Active and apparent power
10. Power factor of the load
11. Battery temperature

8.1.2 Events Display

1. Load on battery power
2. Load on UPS
3. Load on automatic bypass
4. General alarm
5. Battery fault
6. Remaining battery backup time
7. Low battery warning
8. Bypass AC source outside tolerances
9. Mains Failure

8.2 - Controls

All of the operator controls shall be located on front of the UPS Cabinet. UPS shall comprise of the following controls:

1. ON/ OFF buttons located on the front panel of UPS to control ON/ OFF status of UPS-unit.
2. Emergency Power Off (EPO) terminal block for complete system shutdown. The EPO command shall result in shutdown of UPS units, opening of the static switch on bypass line and of the battery circuit breaker.
3. Alarm reset button to turn off audio alarms (buzzer), if a new alarm is detected after clearing the first, the buzzer sounds again.

8.3 – Status indications with mimic panel

There shall be a multi coloured LED based mimic Indication panel provided in the front panel of UPS which is independent of Graphic Display. It shall provide the operating status conditions of UPS, even during cease of operation of Graphic Display.

The mimic panel shall represent the UPS and indicate the status of the load, supply using five/ Six numbers of two-colour (red and green) LEDs where green for good operation and red for fault. Mimic panel may show the following.

NORMAL This symbol shall be lit when the UPS is operating in normal Mode.

BATTERY This symbol shall be lit when the UPS is operating in battery mode.

BYPASS This symbol shall lit when the UPS is operating in bypass mode.

WARNING This symbol shall lit when the system needs attention. Some notices shall be displayed and shall include;
UPS on Maintenance Bypass
Inverter
Battery on load
Load on Bypass

ALARM This symbol shall lit when a situation requires immediate Attention. All alarms shall be accompanied by the Audio alarms. Alarm shall include
Emergency Stop
Inverter Off or Failed
Over – temperature (Battery/ Ambient)
Overload
Battery Breaker Open
Rectifier Off or Failed
Input Breaker Open
Output Breaker Open

9 - Documentation

1. Manufacturer shall supply soft copy of operation instruction of the specified system.
2. Manufactures shall supply minimum three set of hard copy of technical documentation for operation and maintenance of UPS with circuit diagram, make and specifications of components used.
3. Complete technical literature and catalogue of UPS along with its accessories including starting device, cooling system, control system etc.

10 - Warranty

The UPS and its components shall be guaranteed (parts and labour on site) for **one year** following the start-up date. The sealed lead-acid battery shall be covered with **Two years** warranty.

11 - Services

11.1 - Maintenance

The supplier shall propose contracts covering four levels of maintenance.
1. Level one: simple checks and settings, procedures accessible without any dismounting and involving no risk.
2. Level two: preventive maintenance, checks not inhibiting continuous operation of the system and preparing operators for Manufacturer services.

3. Level three: trouble-shooting. Repairs by standard exchange of subassemblies and functional power and control components. Preventive-maintenance operations, both systematic and when indicated by qualified diagnosis.
4. Level four: major preventive and corrective maintenance operations or technical upgrades during start-up, operation or renovation of the UPS installation and recycling of equipment or components representing a risk. These operations require the use of devices and means that have been calibrated by certified organisations.

11.2 - System start-up

The system and equipment shall be started up on site by the supplier or its authorised agent. The procedure shall include checks on the characteristics of the upstream and downstream protection devices and on the UPS installation parameters.

11.3 - Replacement parts

The suppler shall undertake to provide certified original replacement parts for at least **ten years** following the date of delivery.

11.4 - Services
Required services include:

1. Supply of the UPS and any accessory parts or elements
2. UPS handling and installation on the site
3. Connections between the battery and the UPS
4. Connection of the normal AC source to the Rectifier/ Charger
5. Connection of the bypass AC source to bypass input
6. Connection of the load circuits to the UPS output

12 - Standards, tests and quality assurance

12.1 - Standards
All equipment shall be designed and built in accordance with accepted engineering practice and applicable international standards, in particular the standards listed below.
1. IEC 6014B-4: UPS - Performance.
2. IEC 62040-1 and EN 62040-1: UPS - Safety.
3. IEC 62040-2 level A: UPS - Electromagnetic compatibility [level C3 / C2 class A is optional].
4. IEC 62040-3 and EN 62040-3: UPS - Performance.
5. IEC 60950 / EN 60950: Safety of IT equipment, including electrical business equipment.
6. IEC 61000-2-2: Compatibility levels for low-frequency conducted disturbances and signalling in public low-voltage power supply systems.
7. IEC 61000-3-4: Limits for harmonic current emissions (equipment input current > 16 A/ph).
8. IEC 61000-4: EMC - Electrical fast transient/burst immunity.
9. EN 55011 and EN 55022: Limits and methods of measurement of radio interference characteristics of industrial, scientific and medical (ISM) radio-frequency equipment - Level A conducted and radiated emissions.
10. IEC 439: Low-voltage switchgear and control gear assemblies.
11. IEC 60529: Degrees of protection provided by enclosures (IP Code).
12. ISO 3746: Sound power levels.
13. CE marking.

What is more, the equipment must comply with environmental-protection standards, with production taking place on premises certified ISO 14001. The UPS design procedure shall be covered by an ISO

9001 quality system as well as a dependability study to ensure maximum reliability.

12.2 - Certification of conformity

The manufacturer shall provide, a complete qualification file demonstrating compliance with the above standards. The indicated levels of performance shall be confirmed by certification from independent laboratories (e.g. TÜV or Veritas).

13 - TEST PROCEDURE

The following inspections and test procedures shall be performed by factory trained field service personnel in the presence of BHEL representative.

13.1 Test which shall be performed at Factory before delivery

1. Check the Performance of UPS. Demonstrate the Input PF & THDI, Output THDU, Efficiency etc. with 50% and 100% Load.
2. Demonstration of smooth operation of UPS on unbalance load. Check smooth operation of output voltage regulation on unbalanced load.

3. Overload Tests. Demonstrate system overload capability at 125% and 150% load.
4. No break load transfer function of Static Bypass Switch. Demonstrate the smooth operation of the UPS in case of transfer to Static Switch and return to Inverter.
5. Short Circuit Test. Demonstrate the good operation of the module in case of Short circuit.

13.2 Test which shall be performed at Site of Installation

1. Visual Inspection. Integrity of mechanical Assembly, Labelling, Overall finish.
2. Physical Verification. Color, IP Grade, Dimension, Breakers, Switches, Fan, Protective Earth Bus etc.
3. Local display and indications Check. Check the smooth operation of the LCD display and LED indications of the unit.
4. Interconnection Cable Check. The interconnecting cables (input, output, battery, earth etc) shall be checked for correct wiring, insulation and quality of wiring terminations.
5. Verify correct operation of control switches. Demonstrate the operation and sensing of Input, Output, Static Bypass, Manual Bypass & Battery Breakers.
6. No break load transfer function of Static Bypass Switch. Demonstrate the smooth operation of the UPS in case of transfer to Static Switch and return to Inverter.
7. Loss and Return of AC Normal Mains. Demonstrate the smooth operation of the UPS in case of loss and return of AC normal mains.
8. Active redundancy Test for Parallel UPS. Demonstrate the parallel operation of three UPS and load transfer between them.

Specification guide for ON LINE UPS system (3 X 100 kVA, Three Phase, Parallel Redundant)

Sl. No.	Description	Required Parameters	Compliance
1	**Input Electrical Characteristics**		
1.1	Type of rectifier (switching device)	PWM and IGBT as a switching device	
1.2	Input voltage	340 to 470 Volts, 3 phase	
1.3	Input frequency	45 to 55 Hz	
1.4	System Power walk – in period	Upto 60 seconds selectable	
1.5	Input Current Harmonic Distortion THD @ 50 % load THD @ 100 % load	 ≤ 5% ≤ 3%	
1.6	Input power factor	0.99 equivalent to unity	
1.7	Charging time	90% recovery in < 8 hrs after complete discharge.	

Sl. No	Description	Required Parameters	Compliance
2	**Output Electrical Characteristics**		
2.1	Each UPS unit full load rating	100 KVA and Isolation transformer in the global input/ output of inverter and static bypass	
2.2	Output Voltage	380/ 400/ 415 Volts Selectable, 3 Phase & Neutral (4 Wire)	
2.3	Output Frequency	50 Hz +/-0.2 % for free running	
2.4	Output Wave form	Pure Sinusoidal	
2.5	Phase Voltage asymmetry (for three phase output UPS) 100% Balance Load 100% unbalanced load	 +/- 1% +/- 2%	
2.6	Phase displacement (for three phase output UPS)		

	a) with 100% balanced load b) with 100% unbalanced load	120 +/- 1 deg. 120 +/- 3 deg.	
2.7	Output power factor @ rated capacity	0.90 or better	
2.8	Crest Factor	3:1	
2.9	Overload rating	110% for 30 minutes 125% for 10 minutes 150% for 60 seconds	
2.10	Overall efficiency at load (50- 100%)	>94%	
2.11	Transient recovery time	Recovery to +/ - 1% in 20 msec	

Sl. No	**Description**	Required Parameters	Compliance
3	**DC CHARACTERISTICS**		
3.1	Nominal DC bus voltage	Vendor to specify	
3.2	No. of cells	Vendor to specify	
3.3	Battery fully discharge voltage	Vendor to specify	
3.4	Battery float voltage	Vendor to specify	
3.5	Battery end voltage	Vendor to specify	
3.6	DC bus voltage ripple	< 1 RMS	
3.7	Battery recharge current limit	8-40 Amps	
3.8	Allowable voltage drop in battery cables	3 volts at end of discharge voltage	
3.9	Battery isolation	Manually closed circuit breaker with under voltage release and over current and short circuit trip.	

Sl. No	**Description**	Required Parameters	Compliance
4	**DC LINK CHARCTERISTIC FOR 15 MINUTES BATTERY RUN TIME ON FULL LOAD FOR EACH UPS MODULE**		

4.1	No. of 12V SMF Valve Regulated lead acid batteries	Vendor to specify	
4.2	AH rating	Vendor to specify	
4.3	Module/ Make	Vendor to specify	
4.4	Final discharge voltage	1.75 Volts per cell	
4.5	Voltage tolerance	+/- 1%	
4.6	DC ripple	< 1 %	
4.7	Battery Isolation	With U/V release type Battery Circuit Breaker.	

Sl. No	**Description**	Required Parameters	Compliance
5	**MECHANICAL DIMENSIONS**		
5.1	Weight of UPS-Kg	Vendor to specify	
5.2	Dimension of UPS (L x D x H) in mm	Vendor to specify	
5.3	Ventilation	Internal fans	
5.4	Colour	Epoxy powder coated RAL – 7032 as per D/N	
5.5	Protection Level	IP 21	

Sl. No	**Description**	Required Parameters	Compliance
6	**ENVIRONMENTAL**		
6.1	Operating temperature	40 degree c. continues at full load	
6.2	Relative humidity	<90 % (20 degree c.)	
6.3	Altitude	1000 m	
6.4	Storage temp.	From – 25 to + 70 degree c.	

Sl. No	Description	Compliance
7	**CONTROLS**	
7.1	Charger input Isolator	
7.2	Battery circuit breaker (mounted in its own enclosure)	
7.3	Inverter output Isolator.	
7.4	Bypass line Isolator	
7.5	Maintenance Bypass Isolator.	
7.6	Alarm acknowledge / Reset button	
7.7	Inverter on-off pushbutton for manually switching of the inverter.	
7.8	Emergency off push button	

Sl. No	Description	Compliance
8	**MEASURING INSTRUMENTS**	
8.1	LCD panel for measuring output voltage. Output current and frequency. Battery voltage and charging/ discharging current. Efficiency etc.	
8.2	LCD panel should display status of the battery capacity and backup time in minutes.	
8.3	SNMP Protocol should be provided for network monitoring of UPS System.	

Sl. No	Description	Compliance
9	**PROTECTIONS**	
9.1	RC surge suppressor.	
9.2	Sustained under voltage on input side.	
9.3	Phase loss on input side.	
9.4	Auto correction of reverse phase conditions at input side	
9.5	Semiconductor fuses in the lines for thyristor	
9.6	Snubber circuit for device dv/dt protection	
9.7	Charger input current limit.	

9.8	HRC fuses for filter capacitors.	
9.9	Battery current limit.	
9.10	DC over voltage.	
9.11	Low battery.	
9.12	Semiconductor fuses at inverter output.	
9.13	Overload.	
9.14	Over temperature for the inverter.	
9.15	HRC fuses in the control circuit.	
9.16	Short circuit protection (3.4 times)	

Sl. No	**Description**	Compliance
10	**INDICATIONS (ALARMS)**	
10.1	Inverter failure	
10.2	Overload (if load exceeds 100%)	
10.3	Overload shutdown	
10.4	Emergency shutdown	
10.5	Equipment over temperature	
10.6	Maintenance Bypass On	
10.7	DC overvoltage	
10.8	Low battery	
10.9	Battery circuit breaker open	
10.10	Battery on load	
10.11	Mains failure	
10.12	Rectifier Failed or off	
10.13	Inverter unsynchronized	
10.14	Load on bypass	
10.15	Output voltage error	

Sl. No	**Description**	Required Parameters	Compliance
11	**PANELS (INPUT & OUTPUT), BUS BARS & CABLES**		
11.1	Input Panel - 3 Pole MCCB for UPS Main Input 3 Pole MCCB for each UPS (3 nos.)	Ratings of MCCB to be specified by Vendors	
11.2	Output Panel- 4 Pole MCCB for UPS Output 4 Pole MCCB for each Floor (7 nos.)	Ratings of MCCB to be specified by Vendors	
11.3	Copper Bus Bars (for Input & Output Panels)	Ratings to be specified by vendor	
11.4	Copper Cables (between Input Panel & UPS, between UPS & Output Panel)	Ratings to be specified by vendor	

Annexure - III

UN - PRICED BID

Sub: Tender for Supply, Installation, Testing & Commissioning (SITC) of ONLINE UPS System (3 X 100 kVA, Three Phase, Parallel Redundant)

S. No.	Description of Items	Qty.	Unit	Rate (Rs.)	Amount (Rs.)
1	Supply, Installation, Testing & Commissioning (SITC) of ONLINE UPS system (3*100 kVA, Three Phase, Parallal Redundant) based on IGBT Rectifier, including Input & Output Panels & Inverter having input power factor >0.99, output power factor 0.9 @ rated capacity,THDi ≤ 3% @ 100% load, Overall Efficiency > 94 % at load (50-100%). The UPS system should be suitable for operation on 340 to 470 Volts, Three Phase, 45 to 55 Hz supply with input phase sequence correction system. The system shall be complete with lead acid type maintenance free batteries, capable of proving a **backup of 15 minutes at full load on each UPS** and Transient Voltage Surge Suppressor (TVSS) as per technical specification. This will also include prices of- a) System Synchronization Kit (3 Nos.), b) Battery Circuit Breaker (3 Nos.), c) Static Bypass via Static & Manual Maintenance Bypass (3 Nos.), d) Isolation Transformer in the Inverter Output (3 Nos.), e) Sealed Maintenance free batteries with back-up time of 15 minutes with interconnecting cables, racks and standard accessories (3 Sets), and f) Static Switch Modules for each floor (7 Nos.). **(UPS Makes: Emerson, Mitsubishi, APC, Gutor, Merlin Gerin).** The cost of interconnection between the UPS to battery bank and back to UPS: from UPS control panel to individual UPS input connector, from UPS to output panel connector etc. shall be included in the quoted rate. The complete system shall be mounted on the expandable rail rack as required at site. The technical details of the UPS shall be as per technical specification indicated in the tender.	3	Nos.	Q	Q
2	Excise Duty				Q
3	VAT/ Sales Tax				Q
4	Packing, Forwarding & Freight Charges				Q
5	Applicable Service Tax				Q
6	Any Other Charges				Q
7	**TOTAL PACKAGE PRICE (Rs.)**				**Q**

Note: Any deviation in Un - Priced Bid will be treated as Null & Void by BHEL.

ANNEXURE - IV

SECURITY DEPOSIT BANK GUARANTEE

This deed of Guarantee made this .....day of ..... two thousand and ..... by .....(Bank) herein after called the " The Guarantor" (which expression shall unless repugnant to the context or meaning thereof be deemed to include it's successors and assigns) in favour of M/s Bharat Heavy Electricals Limited (A Govt. of India Undertaking) a company incorporated under the Companies Act, 1956, having it's registered office at BHEL House , Siri Fort, Asiad, New Delhi- 110049 through it's office complex at Noida, distt, Gautam Budha Nagar (UP) -201301 herein after called " The Company" (which expression shall unless repugnant to the context or meaning thereof by deemed to include it's successors and assigns)

WHEREAS .....(herein after referred to as the Contractor) have entered into contract arising out of Letter of Intent no. ..... dt.....(herein after referred to as "the contract") for the construction of ..... with the company.

AND WHEREAS the contract inter-alia provides that the contractor shall furnish to the company a sum of Rs.....(Rupees .....) towards security deposit for due and faithful performance of the contract in the form and manner specified therein .

AND WHEREAS the contractor has approached the Guarantor and in consideration of the arrangement arrived at between the Contractor and the Guarantor, the Guarantor has agreed to give the Guarantee as hereinafter mentioned in favor of the company.

The Guarantor do hereby guarantee to the company the due and faithful performance, observance or discharge of the Contract by the contractor and further unconditionally and irrevocably undertake to pay to the Company without demur and merely on a demand, to the extent of Rs.....(Rupees.....) against any claim by the company on them for any loss , damage, costs, charges and expenses caused to or suffered by the company by reasons of the contractor making any default in the performance, observance or discharge of the terms, conditions, stipulations or undertakings or any of them as contained in the contract.

The decision of the company whether any default has occurred or has been committed by the contractor in the performance, observance or discharge of any of the terms, conditions, stipulations or undertakings or any one of them as contained in the contract and/ or as to the extent of loss, damage, costs, charges and expenses caused to or suffered by the company by reason of the contractor making any default in the performance, observance or discharge of any of the terms, conditions, stipulations or undertakings or any one of them shall be conclusive and binding on the Guarantor irrespective of the fact whether the contractor admits or denies the default or questions the correctness of any demand made by the company in any Court, Tribunal or Arbitration proceedings or before any other Authority.

The company shall have the fullest liberty without affecting in any way the liability of the Guarantor under this Guarantee, from time to time to vary any of the terms and conditions of the contract or extend time of performance by the contractor or to postpone for any time and from time to time any of the powers excercisable by it against the contractor and either enforce or forebear from enforcing any of the terms and conditions governing the contract or securities available to the company and the

Guarantor shall not be released from it's liability under these presents by any exercise by the company of the liberty with reference to the matters aforesaid or by reasons of time being given to the contractor or any other forbearance act or commission on the part of the company or any indulgence by the company to the contractor or any other matter or thing whatsoever which under the law relating to sureties would, but for this provision have the effect of so releasing the Guarantor from it's liability under this guarantee.

The Guarantor further agrees that the Guarantee herein contained shall remain in full force and effect during the period that would be taken for the performance of the contract and it's claim satisfied or discharged and till the company certifies that the terms and conditions of the contract have been fully and properly carried out by the contractor accordingly discharges this Guarantee, subject however, that the company shall have no claim under this Guarantee after..... i.e, (the present date of validity of Bank Guarantee unless the date of validity of this Bank Guarantee is further extended from time to time, as the case may be) unless a notice of the claim under this Guarantee has been served on the Guarantor before the expiry of the said period in which case the same shall be enforceable against the Guarantor not withstanding the fact that the same is enforced after the expiry of the said period.

The Guarantor undertakes not to revoke this Guarantee during the period it is in force except with the previous consent of the Company in writing and agrees that any liquidation or winding up or insolvency or dissolution or any change in the constitution of the contractor or the Guarantor shall not discharge the Guarantor's liability hereunder.

It shall not be necessary for the company to proceed against the contractor before proceeding against the Guarantor and the Guarantee herein contained shall be enforceable against them not withstanding any security which the company may have obtained or obtain from the Contractor shall at the time when proceedings are taken against the Guarantor hereunder be outstanding or unrealized.

Notwithstanding anything contained herein before, our liability under the Guarantee is restricted to Rs ..... (Rupees.....). Our guarantee shall remain in force un till....., i.e, (the present date of validity of Bank Guarantee unless the date of validity of this Bank Guarantee is further extended from time to time) unless a claim or demand under this guarantee is made against us on or before.....we shall be discharged from our liabilities under this Guarantee thereafter.

Any claim or dispute arising under the terms of this document shall only be enforced or settled in the courts having jurisdictions at New Delhi only.

The Guarantor hereby declares that it has power to execute this guarantee and the executants have full powers to do so on behalf of the Guarantor.

IN WITNESS whereof the .....(Bank) has hereunto set and subscribed it's hand the day, month and year first, above written,

Signed for and on behalf of the Bank
(Signatory No. .....)

WITNESSES

1. Name and Address

2. Name and Address

Notes:

1. The above BG shall be executed on the non-judicial stamp papers of adequate value procured in the name of the bank in the state where the bank is located.
2. The above BG is required to be sent by the executing bank directly to BHEL at the address where tender is submitted/ accepted under seal cover.

Annexure – V

Specifications cum Technical Compliance Statement

Tender for Supply, Installation, Testing & Commissioning (SITC) of ONLINE UPS System (3 X 100 KVA, Three Phase, Parallel Redundant)

Specifications	Complied (Yes/No)	Deviations (if any)

Signature
With name, Designation & seal of the firm

Annexure – VI

Acceptance Letter / No Deviation Certificate

Tender for Supply, Installation, Testing & Commissioning (SITC) of ONLINE UPS System (3 X 100 kVA, Three Phase, Parallel Redundant)

Notwithstanding anything mentioned in our bid, we hereby accept all terms and conditions of the above tender.

Or

We hereby accept all terms and conditions of the above tender except the following:
(Give reference to Clause Nos. of Terms & Conditions which are not acceptable)

1.

2.

3.

4.

5.

Note: Deviations may or may not be accepted by BHEL.

"I, _____ hereby certify that except the deviations mentioned above, we do not have any other deviations to the tender no AA:GAX:14:ES:101 dated 24.12.2014. Deviations, if any, mentioned elsewhere in our bid (whether Techno-commercial bid or Price bid) may be treated as null and void by BHEL.

Signature
With name, Designation & seal of the firm

Annexure-VII

DECLARATION

Tender for Supply, Installation, Testing & Commissioning (SITC) of ONLINE UPS System (3 X 100 kVA, Three Phase, Parallel Redundant)

I/ We hereby declare that I / we have not been banned or de-listed by any PSU / Government Department / Financial Institute / Court and no case is pending with the police / court against our firm/ partner or the company.

Signature
With name, Designation & seal of the firm

भारत हेवी इलेक्ट्रिकल्स लिमिटेड
Bharat Heavy Electricals Limited

Annexure VIII

Vendor's Details

Tender for Supply, Installation, Testing & Commissioning (SITC) of ONLINE UPS System (3 X 100 kVA, Three Phase, Parallel Redundant)

Sl. No.	Vendor's Details	
1	Name of Vendor/ Party/ Firm	
2	Name of Representative	
3	Postal Address	
4	Phone/ Landline Nos.	
5	Mobile Nos.	
6	Fax No.	
7	E-Mail address	
8	Web Site Address (if any)	
9	Bank details for payment through NEFT/ RTGS	Name of Bank Branch Account No. IFSC No. MICR No.

Note: Submit a cancelled cheque for verification of above bank details.

Signature
With name, Designation & seal of the firm

Annexure-IX

CHECK-LIST

Tender for Supply, Installation, Testing & Commissioning (SITC) of ONLINE UPS System (3 X 100 kVA, Three Phase, Parallel Redundant)

SUMMARY OF COMPLIANCE TO REQUIREMENT OF TENDER

S. No.	Description of requirement	Yes/ No/ NA	Page Nos.
1	Tender Terms & Conditions		
2	BOQ (Bill of Quantity) as per Annexure - I		
3	Technical specifications as per Annexure – II		
4	UN – Price bid format as per Annexure – III		
5	Security deposit format as per Annexure- IV		
6	Specification cum technical compliance as per Annexure – V		
7	Acceptance / Deviation Certificate as Annexure – VI		
8	Declaration as per Annexure – VII		
9	Vendor's Details as per Annexure – VIII		
10	Checklist as per Annexure – IX		
11	Price Bid as per Annexure – X		

Signature
With name, Designation & seal of the firm

Manish Bhanker

PRICE BID

Annexure - X

Sub: Tender for Supply, Installation, Testing & Commissioning (SITC) of ONLINE UPS System (3 X 100 kVA, Three Phase, Parallel Redundant)

S. No.	Description of Items	Qty.	Unit	Rate (Rs.)	Amount (Rs.)
1	Supply, Installation, Testing & Commissioning (SITC) of ONLINE UPS system (3*100 kVA, Three Phase, Parallal Redundant) based on IGBT Rectifier, including Input & Output Panels & Inverter having input power factor >0.99, output power factor 0.9 @ rated capacity,THDi ≤ 3% @ 100% load, Overall Efficiency > 94 % at load (50-100%). The UPS system should be suitable for operation on 340 to 470 Volts, Three Phase, 45 to 55 Hz supply with input phase sequence correction system. The system shall be complete with lead acid type maintenance free batteries, capable of proving a **backup of 15 minutes at full load on each UPS** and Transient Voltage Surge Suppressor (TVSS) as per technical specification. This will also include prices of- a) System Synchronization Kit (3 Nos.), b) Battery Circuit Breaker (3 Nos.), c) Static Bypass via Static & Manual Maintenance Bypass (3 Nos.), d) Isolation Transformer in the Inverter Output (3 Nos.), e) Sealed Maintenance free batteries with back-up time of 15 minutes with interconnecting cables, racks and standard accessories (3 Sets), and f) Static Switch Modules for each floor (7 Nos.). **(UPS Makes: Emerson, Mitsubishi, APC, Gutor, Merlin Gerin).** The cost of interconnection between the UPS to battery bank and back to UPS: from UPS control panel to individual UPS input connector, from UPS to output panel connector etc. shall be included in the quoted rate. The complete system shall be mounted on the expandable rail rack as required at site. The technical details of the UPS shall be as per technical specification indicated in the tender.	3	Nos.		
2	Excise Duty				
3	VAT/ Sales Tax				
4	Packing, Forwarding & Freight Charges				
5	Applicable Service Tax				
6	Any Other Charges				
7	**TOTAL PACKAGE PRICE (Rs.)**				

Note: Any deviation in Price Bid will be treated as Null & Void by BHEL.