

Bharat Heavy Electricals Ltd  
Electronics Division  
Mysore Road, Bangalore – 560 026

### **Tender Document for "UPS to Patratu & Mouda FGD"**

<b>TENDER REFERENCE</b>	SBA0000527
<b>TENDER DOCUMENT AVAILABLE FROM</b>	As per <a href="https://eprocurebhel.co.in">https://eprocurebhel.co.in</a> website
<b>LAST DATE AND TIME FOR SUBMISSION OF TENDER</b>	
<b>DATE AND TIME FOR TENDER OPENING</b>	
<b>SUBMISSION OF TENDER</b>	The bidder should submit their offer in e-Procurement portal only : <a href="https://eprocurebhel.co.in">https://eprocurebhel.co.in</a>
<b>Note: Bidder to refer E-procurement portal(<a href="https://eprocurebhel.co.in">https://eprocurebhel.co.in</a>) for any corrigendum, due date extension, etc.</b>	

This Tender Document Contains documents as per below index:

#### **INDEX**

<b><u>SL No.</u></b>	<b><u>DESCRIPTION</u></b>	<b><u>PAGE No.</u></b>
1	INSTRUCTIONS TO BIDDERS	2-32
2	GENERAL COMMERCIAL CONDITIONS FOR CONTRACT	33-40
3	SPECIAL COMMERCIAL CONDITIONS OF CONTRACT(SCC)	41-45
4	pdf copy of excel BOQ used for upload of price bid in <a href="https://eprocurebhel.co.in">https://eprocurebhel.co.in</a>	46-48
5	TECHNICAL SPECIFICATION WITH PREQUALIFICATION REQUIREMENTS	49-89

Contact Person at BHEL: Manager(CE-MM-PR) Ph: 080-26998728,9449869725



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

CE:PR:001- Rev 04

**INSTRUCTIONS TO BIDDERS**

**Bidder is requested to read the instructions carefully and submit their quotation taking into consideration of all the points:**

**A. GENERAL INSTRUCTIONS:**

1. Any Purchase Order resulting from this enquiry shall be governed by the Instructions to Bidders (document reference: CE: PR: 001 – Rev 03), General Conditions of Contract (document reference: CE: PR: 002 - Rev 02) and Special Conditions of Contract, 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. Regret letter (either through post or by mail or by EPS) indicating reasons for not quoting must be submitted without fail, in case of non-participation in this tender.

Supplier shall be liable for removal as a registered vendor of BHEL when the supplier fails to quote against four consecutive tender enquiries for the same item or all enquiries in last two years for the same item, whichever is earlier.

4. Procurement directly from the manufacturers is 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. Agent/Representative authorized by the OEM/Principal in turn cannot further sub authorize any other firm for submitting the offer or for placement of order.

In case bids are received from the manufacturer/ supplier and his agent, bid received from the agent shall be ignored.

5. 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.
6. If an Indian representative/associate/liaison office quotes on behalf of a foreign based bidder, such representative shall furnish 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 the equipment is commissioned and handed over to customer will be the sole responsibility of the Indian representative/associates/agent/liaison office.

d. Refer **Annexure I** on “Guidelines for Indian Agents”.

7. 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 to supplier's account. All offers for imported scope of supply by air, must be made from any of the gateway ports (within the country) indicated (**Refer Annexure II**).

8. 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: [http://www.bhel.com/vender\\_registration/vender.php](http://www.bhel.com/vender_registration/vender.php)
9. 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, 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. Bidder may refer “Guidelines for Suspension of Business Dealings with Suppliers/ Contractors” available on [www.bhel.com](http://www.bhel.com) for more details.

The Bidder declares that they will not enter into any illegal or undisclosed agreement or understanding, whether formal or informal with other Bidder(s). This applies in particular to prices, specifications, certifications, subsidiary contracts, submission or non-submission of bids or any other actions to restrict competitiveness or to introduce cartelization in the bidding process. In case, the Bidder is found having indulged in above activities, suitable action shall be taken by BHEL as per extant policies / guidelines.

10. 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 your notice.
11. Offer is to be submitted in English language only.
12. For this procurement, the local content to categorize a supplier as a Class-I local supplier/ Class-II local supplier/ Non-local supplier and purchase preference to Class-I local supplier, is as defined in Public procurement (Preference to Make in India), Order 2017 dated 16.09.2020 issued by DPIIT.

In case of subsequent Orders issued by the Nodal Ministry, changing the definition of local content for the items of the NIT, the same shall be applicable even if issued after issue of this NIT, but before opening of price bids against this NIT. Default margin of purchase preference shall be 20% for Class-I local supplier only.

13. The Bidder shall mandatorily submit Declaration as mentioned under Rule 144(xi) of General Financial Rules, 2017 amendment dt 23.07.2020 issued by Ministry of Finance, Govt. of India. Where applicable, evidence of valid registration by the Competent Authority shall be attached.

The Competent Authority for the purpose of registration under this Order shall be the Registration Committee constituted by the Department for Promotion of Industry and Internal Trade (DPIIT). Refer Annexure-X for ‘Restrictions under Rule 144(Xi) of General Financial Rules,2017 amendment dt: 23.07.2020’.

**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 superscribed 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 superscribed 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 (or) if any part of the offer is incomplete, the entire offer of the bidder is liable for rejection.

2. Supplier shall ensure to superscribe 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 (duly filled, signed & stamped) must accompany Technical-Commercial offer without fail and should be submitted in original only.

The above indicated submission of Offers in “sealed envelope/hard copy” as mentioned in points B.1-B.3 is applicable for tenders that are not floated through E-Procurement System (EPS).

4. Validity: Unless otherwise specified in SCC (special commercial conditions of contract), the offer will be valid for a period of 90 days from the date of part-I bid opening and in case of Negotiation/Counter-offer/Reverse Auction, price validity will apply afresh for a period of 30 days from the date of according final price by bidder (or) up to original validity period, whichever is later.

5. 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 deviation.

6. 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.

7. 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.
8. "Price Bid" shall be complete in all respects containing price break-up of all components along with all applicable taxes and duties, 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.
9. In addition, bidder shall also quote for erection & commissioning charges/erection supervision & commissioning charges (E&C service charges), documentation charges, testing Charges (type & routine), training charges etc. if & as applicable along with corresponding tax. The price summary must indicate all the elements clearly.
10. Wherever applicable, bidders should indicate "lumpsum" Erection and Commissioning (or) Erection Supervision and Commissioning charges, as applicable (including To & Fro Fare, Boarding, Lodging, Local Conveyance etc.) for carrying out E&C activity and further handing over to customer.  
The quotation shall clearly indicate scope of work, likely duration of commissioning, pre-commissioning checklist (if any).
11. Wherever bidders require PAC (Project Authority Certificate)/applicable certificates for import of raw materials, components required for DECC,EPCG Power Projects, Export Projects or other similar projects wherein supplies are eligible for customs 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.
12. Prices should be indicated in both figures & words. Bid should be free from correction/overwriting, using corrective fluid, etc. Any interlineation, cutting, erasure or overwriting shall be valid only if they are attested under full signature(s) of person(s) signing the bid else bid shall be liable for rejection.  
Any typographical error, totalling mistakes, currency mistake, multiplication mistake, summing mistakes etc. observed in the price bids will be evaluated as per **Annexure III** "Guidelines for dealing with Discrepancy in Words & Figures – quoted in price bid" and BHEL decision will be final.
13. Documents submitted with the offer shall be signed and stamped in each page by authorized representative of the bidder. However, this requirement is not mandatory for offers uploaded through E-Procurement System (EPS).

#### **C. GUIDELINES FOR OFFER SUBMISSION:**

The under-mentioned clauses 1, 2&3 will not be applicable for EPS tenders.

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.
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 ID specified in the SCC document of the tender.
3. Offers of Vendors who already have a valid Technical/Commercial MOU with BHEL-EDN for the items of the RFQ shall mention the relevant MOU reference no. and give only such other details not covered in the MOU.

4. 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 either of the two purchase officers whose names are mentioned in the SCC document of tender RFQ.
5. 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. For EPS tenders, e-mail notifications will be automatically generated and forwarded to registered e-mail ID/s of bidders during opening of tenders.
6. Bidder 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 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 (This clause will not be applicable for EPS tenders).

The above indicated submission of Offers as mentioned in points 6.a-6.d is applicable for tenders that are not floated through EPS.

- e. In case of e-tender, all required documents should be uploaded before due date and time. Availability of power, internet connections, system/software requirements etc. will be the sole responsibility of the bidder.

Wherever assistance is needed for submission of e-tenders, help-line numbers as available in the web-site of service provider of BHEL may be contacted.

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

#### **D. PROCESSING OF 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.  
In case of withdrawal of any Technical/Commercial deviation(s) by the bidder before opening of price bids/conducting the Reverse Auction, revision of price/impact bid will not be accepted.
3. In case there is no change in the technical scope and/ or specifications and/ or commercial terms & conditions, 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).

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 bidders, 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.

5. Un-opened bids (including price bids) will be returned to the respective bidders after release of Purchase order.

Regarding Offers for EPS tenders that get rejected on PQC/ techno-commercial grounds, the bids for the subsequent parts will not be opened i.e., both technical bid and price bid (Parts-II & III) will not be opened in case of rejection on PQC ground and price bid (Part-II/Part-III, as applicable) will not be opened in case of rejection on techno-commercial ground.

6. After receipt of Purchase Order, supplier should submit required documents viz., specified 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 and agreed upon in the Purchase Order.
8. Evaluation shall be on the basis of delivered cost (i.e. "Total Cost to BHEL").

"Total Cost to BHEL" shall include total basic cost, packing & forwarding charges, taxes and/or duties (as applicable), freight charges, taxes on Services, customs clearance charges for imported items, any other cost indicated by bidder 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 DEEC, EPCG, DFIA Projects, Physical Exports or such 100% exemptions (statutory benefits), project imports, customer reimbursements of statutory duties (like Basic Customs Duty and cess on customs duty), Input tax credits as applicable will also be taken into account for arriving at the Total cost to BHEL (wherever applicable and as indicated in SCC document of tender).

For EPS tenders, it shall be noted that the prices (including discounts) vis-a-vis currency quoted in EPS portal only will be considered as Final for the purpose of evaluation of the lowest bidder.

Bidder shall ensure to indicate the applicable taxes against each line item in online portal, failing to which the same will be considered as inclusive/NIL.

In the course of evaluation, if more than one bidder happens to occupy L-1 status, effective L-1 will be decided by soliciting discounts from the respective L-1 bidders.

In case more than one bidder happens to occupy the L-1 status even after soliciting discounts, the L-1 bidder shall be decided by a toss/draw of lots, in the presence of the respective L-1 bidder(s) or their representative(s).

Ranking will be done accordingly. BHEL's decision in such situations shall be final and binding.



9. The evaluation currency for this tender shall be INR. 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.
11. GeM Seller ID shall be mandatory before placement of order/award of contract for goods and services to the successful bidder(s), for orders exceeding Rs.25 lakhs (including all taxes etc.).

Department of Expenditure (DoE) OM no.6/9/2020-PPD dated: 24.08.2020 may be referred in this regard.

#### **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. In case of High Sea Sales transaction, customs clearance of the consignment landed on Indian Sea/Air ports will be done by BHEL based on the original HSS documents provided by vendors.  
All warehousing charges due to delay in submission of complete and or correct HSS documents to BHEL will be to supplier's account only. Such recovery will be made out of any of the available bills (**Refer Annexure V**).
3. Statutory deductions, if any, will be made and the deduction certificate shall be issued.
  - A. 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.  
In addition to the above, Foreign vendors shall also submit relevant details of their bankers like Swift Code, Banker's Name & Address etc.
  - B. TDS deduction as per section 51 of CGST Act, 2017 shall be applicable as per Gazette Notification No. 50/2018-Central Tax, Dated: 13th September 2018. TDS deduction is also applicable on purchase of goods as per the latest notification under section 194Q, and subsequent notification(s) as and when released by Govt. authorities.
4. Procurement of Goods/ Works/ Services/ Consultancy Services [under clause relating to "Income Tax and Corporate Tax" or "TDS" of Model ITBs]
  - a) Provision w.r.t. TDS on Purchase of Goods under section 194Q of Income Tax Act applicable from 01.07.2021 is as under:
    - i. TDS as applicable will be deducted by BHEL under section 194Q of the Income Tax Act, 1961 on Purchases exceeds, the amount of Rupees. 50 Lakhs or limit defined therein from time to time during the financial year under the Indian Income Tax act 1961.
    - ii. Since BHEL is liable to deduct Income Tax TDS under section 194Q, the provision of TCS as per section 206C(1H) of the Income Tax Act, 1961 shall not be applicable.



- b) Higher rate of TDS for non-filers of ITR as per Section 206AB of Income Tax Act, 1961, in case of any vendor who does not filed their Income Tax Return for both of the two previous years preceding to current year and aggregate amount of TDS is more than or equal to Rs. 50,000/- in each of those previous two years (or limit defined by Govt. from time to time), then TDS will be deducted at the higher of following rates:
- (i) Twice the rate mentioned in relevant TDS section.
  - (ii) Twice the rate or rates in force
  - (iii) 5%
5. Incomplete documentation will not be accepted. Delayed submission of invoice / documents may result in corresponding delay in payment. In this connection, request to also refer clause: G about invoicing & payment formalities under GST regime.
- Applicable documents shall be submitted to the purchaser at the time of execution of supplies/services for availing GST input credits.

#### **F. STANDARD PAYMENT TERMS OF BHEL-EDN:**

<b><u>PURCHASE ORDERS FOR:</u></b>	<b><u>SUPPLY WITH SERVICE(S)</u></b>	<b><u>SUPPLY ONLY</u></b>
<b><u>INDIGENOUS PROCUREMENT</u></b>	<p>a. 100% of basic value with taxes and freight will be paid in 45 days from the date of dispatch or 15 days from the date of submission of complete set of documentation, whichever is later.</p> <p><u>Note:</u> In case PBG is not furnished, only 90% payment will be released against 100% claim without the consent of Vendor. This 10% basic amount withheld towards PBG will be paid either against submission of supplementary invoice &amp; Original PBG (or) against supplementary invoice without PBG after expiry of Warranty period.</p>	<p>b. 100% of PO value with taxes and freight will be paid in 45 days from the date of dispatch or 15 days from the date of submission of complete set of documentation, whichever is later.</p>
<b><u>IMPORT PROCUREMENT</u></b>	<p>c. 100% of basic value will be paid against usance draft of 45 days from the date of AWB/BOL on submission of complete set of documents.</p> <p><u>Note:</u> In case PBG is not furnished, only 90% payment will be released against 100% claim without the consent of Vendor. This 10% basic amount withheld towards PBG will be paid either against submission of supplementary invoice &amp; Original PBG (or) against supplementary invoice without PBG after expiry of Warranty period.</p>	<p>d. 100% of PO value will be paid against usance draft of 45 days from the date of AWB/BOL on submission of complete set of documents.</p>

<b><u>HIGH-SEA SALES PROCUREMENT</u></b>	<p>e. 100% of basic value will be paid in 45 days from the date of signing of High Sea Sale agreement or 15 days from the date of submission of complete set of documentation, whichever is later</p> <p><u>Note:</u> In case PBG is not furnished, only 90% payment will be released against 100% claim without the consent of Vendor. This 10% basic amount withheld towards PBG will be paid either against submission of supplementary invoice &amp; Original PBG (or) against supplementary invoice without PBG after expiry of Warranty period.</p>	<p>f. 100% of basic value will be paid in 45 days from the date of signing of High Sea Sale agreement or 15 days from the date of submission of complete set of documentation, whichever is later.</p>
--	---	--

**g. Erection and Commissioning:**

**Evaluation methodology:** Unless and otherwise specified in SCC, E&C charges should not be less than 10% of the main supply value. In case the quoted total E&C value is less than 10% of the main supply value, BHEL shall evaluate Bidders Price deducting differential amount from main supply price proportionally from all items and apportioning towards E&C charges.

**Payment term:** 100% E&C charges along with tax as applicable, will be paid in 15 days from the date of submission of supplementary invoice/documents against proof of completion of E&C.

**h. Erection Supervision and Commissioning:**

**Evaluation methodology:** Unless and otherwise specified in SCC, E&C charges should not be less than 5% of the main supply value. In case the quoted total E&C value is less than 5% of the main supply value, BHEL shall evaluate Bidders Price deducting differential amount from main supply price proportionally from all items and apportioning towards E&C charges.

**Payment term:** 100% E&C charges along with tax as applicable, will be paid in 15 days from the date of submission of supplementary invoice/documents against proof of completion of E&C.

**i. Comprehensive Annual Maintenance Contract:**

**Evaluation methodology:** Unless and otherwise specified in SCC, CAMC will be applicable for a period of 04 years from the date of expiry of warranty period (or) from the date of completion of commissioning of equipment, whichever is later and the total CAMC value should not be less than 20% of the main supply value. In case the quoted total CAMC value is less than 20% of the main supply value, BHEL shall evaluate Bidders Price deducting differential amount from main supply price proportionally from all items and apportioning towards CAMC charges.

**Payment terms:** 100% CAMC charges along with tax as applicable, will be paid in 15 days from the date of submission of supplementary invoice/documents against proof of completion of CAMC on yearly basis.

**j. Terms of Payment for Training:** 100% payment will be made in 45 days from the date of completion of Training or 15 days from the date of submission of complete set of invoice along with documentary evidence, whichever is later.

**LOADING FACTORS FOR DEVIATION IN PAYMENT TERMS (APPLICABLE FOR IMPORT PROCUREMENT ONLY):**

- 1) For offers received with Sight draft payment term in place of Usance draft, loading applicable will be 1.0% of basic value.
- 2) For offers received with Letter of Credit payment term with Usance of 45 days, loading applicable will be 2.5% of basic value.  
Additional loading of 2% will be applicable for payment term as Letter of Credit at Sight.
- k. Any payment term with credit period of less than 45 days for indigenous supply/HSS and any other variation of payment terms are liable for rejection.
- l. Standard payment terms indicated in Clauses: F (a), (b), (c), (d), (e), (f), (g), (h), (i) & (j) will not attract any loading.

**Note 1:** Basic value of Purchase Order mentioned above will include all components of the purchase order and will exclude only taxes, duties, freight, training charges, E&C and AMC charges (wherever applicable). Wherever the Purchase Order is split into import portion and indigenous portion of supply, minimum % to be quoted for Services, wherever mentioned, will be of both purchase order values put together.

**Note 2:** In case of multiple packages/units in a power plant, payment of E&C charges will be processed on pro-rata basis.

**Note 3:** No deviation will be permitted from the duration of Guarantee/Warranty and/or Comprehensive Annual Maintenance Contract period specified in SCC.

**G. Terms & Conditions to be complied under GST regime:**

1. All invoices to contain BHEL-EDN (buyer) GSTIN number: 29AAACB4146P1ZB. However for CGST +SGST/UGST billing outside the state of Karnataka, invoice has to be generated with BHEL's Nodal Agency GSTIN number. Address of Nodal Agency along with GSTIN number will be provided by BHEL at the time of issuing dispatch clearance.
2. The Bidder shall mention Bidder's GSTIN number in all quotations and Invoices submitted.
3. The Bidder shall also mention HSN (Harmonized System of Nomenclature) / SAC (Services Accounting Code) mandatorily in all quotations and invoices submitted.
4. Invoice submitted should be in the format as specified under GST Laws viz., all details as mentioned in Invoice Rules like GST registration number(GSTIN), invoice number with date of issue, quantity, rate, value, taxes with nomenclature – CGST, SGST, UGST,IGST mentioned separately, HSN Code / SAC Code etc. Invoice should be submitted in original for buyer plus duplicate for credit availment.
5. Payment of GST to Vendor will be made only if it is matching with data uploaded by the Vendor in GST portal.
6. For invoices paid on Reverse charge basis – “Tax payable on reverse charge basis” to be mentioned on the invoice.
7. In case GST credit is delayed/denied to BHEL due to non/delayed receipt of goods and/or tax invoice or expiry of timeline prescribed in GST law for availing such ITC, or any other reasons not attributable to BHEL, GST amount will be recoverable from vendor along with interest levied/ leviable on BHEL.
8. In case vendor delays declaring such invoice in his return and GST credit availed by BHEL is denied or reversed subsequently as per GST law, GST amount paid by BHEL towards such ITC reversal as per GST law will be recoverable from vendor/contractor along with interest levied/ leviable on BHEL.

9. Vendor should intimate BHEL immediately on the same date of invoicing without any delay.
10. In case of discrepancy in the data uploaded by supplier in the GSTN portal or in case of any shortages or rejection in the supply, then BHEL will not be able to avail the tax credit and will notify the supplier of the same. Supplier has to rectify the data discrepancy in the GSTN portal or issue credit note (details to be uploaded in GSTN portal) for the shortages or rejections in the supplies, within the calendar month notified by BHEL.
11. Bidders to note that Rules & Regulations pertaining to E-way bill system are to be strictly adhered to, as and when notified by Govt. authorities.
12. As per Notification 88/2020-Central Tax dated 10th November 2020 (applicable w.e.f. 01 January 2021), the turnover for applicability of E-invoicing provisions has been reduced from 500 crores to 100 crores. In other words, registered person [other than a SEZ unit and those referred in Rule 54(2), 54(3), 54(4) and 54(4A) of the CGST Rules], whose aggregate turnover in any preceding financial year from 2017-18 onwards exceeds 100 crores, is required to comply with the requirement of IRN and QR code in respect of supply of goods or services or both to a registered person or for exports.

#### **H. Performance bank guarantee (PBG):**

Performance bank guarantee (PBG) will be applicable as called in the tender documents. Unless otherwise specified in the SCC, the PBG against performance of the contract shall be valid for a period of 24 months from the date of dispatch of goods + claim period of 03 months, for a value equal to 10 % of the basic value of the purchase order which will include all components of the purchase order and will exclude only taxes, duties, freight, training charges, E&C and AMC charges (wherever applicable).

1. The BG issued in Indian Rupees by Banks in India is to be executed 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/Bank issuing the guarantee.
2. No deviation for the duration and value of PBG will be permitted.
3. PBG shall be from any of the BHEL consortium of bankers (**refer Annexure VI**).
4. PBGs from nationalized banks are also acceptable.
5. 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.
6. PBG should be in the format specified (**refer Annexure VII**). No deviation to this format will be allowed. However in case BHEL changes the PBG format, bidder shall honor the same.
7. Bank Guarantee should be enforceable in Bangalore.
8. 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 Bangalore.
  - b. From Foreign Banks (wherein Foreign Vendors intend to provide BG from local branch of the Vendor country's Bank)
    - b.1 Please note 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 shall be noted that all charges for issuance of Bank Guarantee/ counter- Guarantee should be borne by the Foreign Vendor.

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 is 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).

9. Expired PBGs will be returned only after expiry of the claim period.

10. PBG shall not be applicable for spares.

#### **I. PURCHASE PREFERENCE FOR MSE(MICRO AND SMALL ENTERPRISES) VENDORS:**

Purchase preference will be given to MSEs as defined in Public Procurement Policy for Micro and Small Enterprises (MSEs) Order, 2012 dated 23.03.2012 issued by Ministry of Micro, Small and Medium Enterprises and its subsequent Orders/Notifications issued by concerned Ministry. If the bidder wants to avail the Purchase preference, the bidder must be the manufacturer of the offered product in case of bid for supply of goods. Traders are excluded from the purview of Public Procurement Policy for Micro and Small Enterprises. Relevant documentary evidence in this regard shall be uploaded along with the bid in respect of the offered product. Purchase preference to Micro and Small Enterprises clause in the bid, the same will get precedence over Preference to Make In India.

1. If tendered quantity is Splitable: In tender, participating MSEs quoting price within price band of L1+15 percent shall also be allowed to supply a portion of requirement by bringing down their price to L1 price in a situation where L1 price from someone other than a MSE and such MSE shall be allowed to supply at least 25% of total tendered value. In case of more than one such MSE, the supply shall be shared proportionately (to tendered quantity).

- 3% of the 25% will be earmarked for women owned MSEs.
- 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) & (2) are fulfilled.
- In case where no SC/ST category firms are meeting the conditions mentioned in (1) and (2) or have not participated in the tender, the 6.25% of earmarked quantity for SC/ST owned MSE firms will be distributed among the other eligible MSE vendors who have participated in the tender.

2. If tendered quantity is Non-Splitable: If L-1 is not an MSE and MSE Seller (s) has/have quoted price within L-1+ 15% of margin of purchase preference /price band defined in relevant policy, such Seller shall be given opportunity to match L-1 price and contract will be awarded for 100% of total value.

#### **J. 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.

**K. Integrity Pact (IP):**

- a) IP is a tool to ensure that activities and transactions between the Company and its Bidders/ Contractors are handled in a fair, transparent and corruption free manner.

Following independent External Monitors (IEMs) on the present panel have been appointed by BHEL with the approval of CVC to oversee implementation of IP in BHEL.

1. Shri Arun Chandra Verma,IPS (Retd.)  
Email: acverma1@gmail.com
2. Shri Virendra Bahadur Singh,IPS (Retd.)  
Email: vbsinghips@gmail.com

- b) Please refer Section-8 of the IP for Role and Responsibilities of IEMs (Annexure IX). In case of any complaint arising out of the tendering process, the matter may be referred to any of the above IEM(s). All correspondence with the IEM/s shall be done through email only.

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



Annexure

Annexure I  
Guidelines for Indian Agents

- **Definition of Indian Agent:** An Indian Agent of foreign principal is an individual, a partnership, an association of persons, a private or public company, that carries out specific obligation(s) towards processing of BHEL tender or finalization or execution of BHEL's contract on behalf of the foreign supplier.

In case of yes, vendor to note the following and reply accordingly:

- i. BHEL shall deal directly with foreign vendors, wherever required, for procurement of goods. However, if the foreign principal desires to avail of the services of an Indian agent, then the foreign principal should ensure compliance to regulatory guidelines - which require mandatory submission of an Agency Agreement.
- ii. It shall be incumbent on the Indian agent and the foreign principal to adhere to the relevant guidelines of Government of India, issued from time to time.
- iii. The Agency Agreement should specify the precise relationship between the foreign OEM / foreign principal and their Indian agent and their mutual interest in the business. All services to be rendered by agent/ associate, whether of general nature or in relation to the particular contract, must be clearly stated by the foreign supplier/ Indian agent. Any payment, which the agent or associate receives in India or abroad from the OEM, whether as commission or as a general retainer fee should be brought on record in the Agreement and be made explicit in order to ensure compliance to laws of the country.
- iv. Any agency commission to be paid by BHEL to the Indian agent shall be in Indian currency only.
- v. Tax deduction at source is applicable to the agency commission paid to the Indian agent as per the prevailing rules.
- vi. In the absence of any agency agreement, BHEL shall not deal with any Indian agent (authorized representatives / associate / consultant, or by whatever name called) and shall deal directly with the foreign principal only for all correspondence and business purposes.
- vii. The "Guidelines for Indian Agents of Foreign Suppliers" enclosed at annexure -'A' shall apply in all such cases.



- viii. The supply and execution of the Purchase Order (including indigenous supplies/ service) shall be in the scope of the OEM/ foreign principal. The OEM/ foreign principal should submit their offer inclusive of all indigenous supplies/ services and evaluation will be based on 'total cost to BHEL'. In case OEM/ foreign principal recommends placement of order(s) towards indigenous portion of supplies/ services on Indian supplier(s)/ agent on their behalf, the credentials/ capacity/ capability of the Indian supplier(s)/ agent to make the supplies/ services shall be checked by BHEL as per the extant guidelines of Supplier Evaluation, Approval & Review Procedure (SEARP), before opening of price bids. In this regard, details may be checked as per Annexure-B (copy enclosed). It will be the responsibility of the OEM/ foreign principal to get acquainted with the evaluation requirements of Indian supplier/ agent as per SEARP available on [www.bhel.com](http://www.bhel.com).

The responsibility for successful execution of the contract (including indigenous supplies/ services) lies with the OEM/ foreign principal. All bank guarantees to this effect shall be in the scope of the OEM/ foreign principal.

—X—

Vendor's Signature with Seal

Guidelines for Indian Agents of Foreign Suppliers

- 1.0 There shall be compulsory registration of agents for all Global (Open) Tender and Limited Tender. An agent who is not registered with BHEL shall apply for registration in the registration form in line with SEARP.
- 1.1 Registered agents will file an authenticated Photostat copy duly attested by a Notary Public/Original certificate of the Principal confirming the agency agreement and giving the status being enjoyed by the agent and the commission/ remuneration/ salary/ retainership being paid by the principal to the agent before the placement of order by BHEL.
- 1.2 Wherever the Indian representatives have communicated on behalf of their principals and the foreign parties have stated that they are not paying any commission to the Indian agents, and the Indian representative is working on the basis of salary or as retainer, a written declaration to this effect should be submitted by the party (i.e. Principal) before finalizing the order.
- 2.0 **Disclosure of particulars of agents/ representatives in India, if any.**
- 2.1 Tenderers of Foreign nationality shall furnish the following details in their offers:
  - 2.1.1 The Bidder(s)/ Contractor(s) of foreign origin shall disclose the name and address of the agents/ representatives in India if any and the extent of authorization and authority given to commit the Principals. In case the agent/ representative be a foreign Company, it shall be confirmed whether it is existing Company and details of the same shall be furnished.
  - 2.1.2 The amount of commission/ remuneration included in the quoted price(s) for such agents/ representatives in India.
  - 2.1.3 Confirmation of the Tenderer that the commission/ remuneration, if any, payable to his agents/ representatives in India, may be paid by BHEL in Indian Rupees only.
- 2.2 Tenderers of Indian Nationality shall furnish the following details in their offers:
  - 2.2.1 The Bidder(s)/ Contractor(s) of Indian Nationality shall furnish the name and address of the foreign principals, if any, indicating their nationality as well as their status, i.e. whether manufacturer or agents of manufacturer holding the Letter of Authority of the Principal specifically authorizing the agent to make an offer in India in response to tender either directly or through the agents/ representatives.
  - 2.2.2 The amount of commission/ remuneration included in the price (\$) quoted by the Tenderer for himself.
  - 2.2.3 Confirmation of the foreign principals of the Tenderer that the commission/ remuneration, if any, reserved for the Tenderer in the quoted price(s), may be paid by BHEL in India in equivalent Indian Rupees on satisfactory completion of the Project or supplies of Stores and Spares in case of operation items.
- 2.3 In either case, in the event of contract materializing, the terms of payment will provide for payment of the commission/ remuneration, if any payable to the agents/ representatives in India in Indian Rupees on expiry of 90 days after the discharge of the obligations under the contract.
- 2.4 Failure to furnish correct and detailed information as called for in paragraph 2.0 above will render the concerned tender liable to rejection or in the event of a contract materializing, the same liable to termination by BHEL. Besides this there would be a penalty of banning business dealings with BHEL or damage or payment of a named sum.



**ANNEXURE - II**  
**LIST OF INTERNATIONAL GATEWAY AIRPORTS**

For air based consignment, terms of delivery will be on FCA basis from following listed airports only. Vendors are requested to verify this list for use before submission of offer.

SCHEDULE NO	COUNTRY	CURRENCY CODE	AIRPORT
D01	UK	GBP	LONDON (HEATHROW)
D02	UK	GBP	NEW CASTLE
D03	UK	GBP	OXFORD. CHETLAM
D04	UK	GBP	BRISTOL. WELLINGBOROUGH
D05	UK	GBP	BIRMINGHAM
D06	UK	GBP	EAST MIDLANDS
D07	UK	GBP	MANCHESTER
D08	UK	GBP	LEEDS
D09	UK	GBP	GLASGOW
D10	FRANCE	EURO	PARIS (ROISSY) & LYON
D11	SWEDEN	EURO	STOCKHOLM
D12	SWEDEN	EURO	GOTHENBERG & MALMO
D13	ITALY	EURO	ROMA, MILAN
D14	ITALY	EURO	TURIN, BOLOGNA, FLORENCE
D15	NETHERLANDS	EURO	AMSTERDAM, ROTTERDAM
D16	AUSTRIA	EURO	VIENNA, LINZ, GRAZ
D17	BELGIUM	EURO	ANTWERP, BRUSSELS
D18	DENMARK	DKK	COPENHAGEN
D19	JAPAN	JPY	TOKYO, OSAKA
D20	SINGAPORE	SGD	SINGAPORE
D21	CANADA	CAD	TORONTO
D22	CANADA	CAD	MONTREAL
D23	USA	USD	NEW YORK, BOSTON
D24	USA	USD	CHICAGO
D25	USA	USD	SAN FRANCISCO, LOS ANGELES
D26	USA	USD	ALANTA, HOUSTON
D27	GERMANY	EURO	MUNICH, KOLN, DUSSELDORF, HANNOVER, HAMBURG, STUTTGART, DAMSTADT, MANIHIEM, NURUMBERG
D28	GERMANY	EURO	FRANKFURT
D29	GERMANY	EURO	BERLIN
D30	SWITZERLAND	SFR	BASLE, ZURICH, GENEVA
D31	SPAIN	EURO	BARCELONA
D32	AUSTRALIA	AUD	SYDNEY
D33	AUSTRALIA	AUD	MELBOURNE
D34	AUSTRALIA	AUD	PERTH
D35	CZECH	EURO	PRAGUE
D36	HONG KONG	HKD	HONG KONG
D37	NEW ZELAND	NZD	AUCKLAND
D38	RUSSIA	USD	MOSCOW
D39	SOUTH KOREA	USD	KIMPO INTERNATIONAL, INCHEON
D40	FINLAND	EURO	HELSINKI
D41	ROMANIA	EURO	BUCHAREST
D42	NORWAY	EURO	OSLO
D43	IRELAND	EURO	DUBLIN
D44	ISRAEL	USD	TEL AVIV
D45	UAE	USD	DUBAI
D46	OMAN	USD	MUSCAT
D47	EGYPT	USD	CAIRO
D48	TAIWAN	USD	TAIPEI
D49	UKRAINE	USD	KIEV
D50	CHINA	USD	SHANGHAI, SHENZHEN
D51	PHILIPINES	USD	MANILA
D52	MALAYSIA	USD	KUALALUMPUR, PE NANG
D53	CYPRUS	USD	LARNACA
D54	SOUTH AFRICA	USD	JOHANNESBERG, DURBAN
D55	SLOVAKIA	EURO	BARTISLOVA
D56	SAUDI ARABIA	SAR	RIYADH
D57	TURKEY	EURO	ISTANBUL
D58	THAILAND	USD	BANGKOK
D59	BRAZIL	USD	SAO PAULO, RIO DE JANEIRO

**ANNEXURE – III**  
**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 - 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 IFSC Code(applicable for NEFT )

8 Bank IFSC code(applicable for RTGS)

(Indian Financial System Code)

- 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 concerned purchase executive.

**ANNEXURE - V**  
**PRESENT PROCEDURE FOR SALE IN TRANSIT (HIGH SEA SALES)**

In case of High Sea Sales, vendor should submit following documents:

**1. ORIGINAL HIGH SEA SALES AGREEMENT**

- Sale agreement (on Rs. 200/- non-judicial stamp paper & notarised with 2 witnesses with identity) has to be signed between BHEL and the Party importing material. The date of the sale documents should be in between the date of House Air Way Bill / Bill of Lading and before landing of the goods in Indian origin.
- Following shall be included in the High Sea Sales Agreement:  
"THE BUYER ALSO UNDERTAKE DISCHARGES, THE OBLIGATION AND FULFILLMENT OF CONDITIONS, IF ANY, ATTACHED TO THE IMPORTATION, ASSESSMENT AND CLEARANCE OF THE GOODS IN TERMS CUSTOMS TARIFF ACT 1975, THE CUSTOMS ACT 1962 & RULES & REGULATIONS MADE THERE UNDER AND OTHER RELEVANT ACTS, ORDERS, NOTIFICATIONS".

**2. ORIGINAL INVOICES: INDIGENOUS RUPEE INVOICE & FOREIGN CURRENCY INVOICE**

- Prices should be C.I.F., designated airport/seaport basis.
- I.E.C., C.S.T., K.S.T. Nos. to be mentioned.
- Description of item (Nomenclature), Unit & Quantity in both the Foreign Currency & the Indigenous Invoice in Rupee shall be exactly as per Purchase Order Description of item, Quantity and Unit. The Indigenous Invoice value shall be exactly as per Purchase Order value.
- Seller should give Foreign Currency Invoice from the original consignor. The Foreign Currency Invoice value should be at least 2% (two per cent) less than the Indigenous Rupee Invoice value in equivalent foreign currency.

**4. ORIGINAL HOUSE AIR WAY BILL/ BILL OF LADING**

- The sale agents should duly endorse House Air Way Bill (HAWB) for air shipments or original Bill of Lading (O.B.L.) for sea shipments and Foreign Currency Invoice in favour of BHEL-EDN.

**5. ORIGINAL CARGO ARRIVAL NOTICE FROM FORWARDER.**

**6. ORIGINAL DELIVERY ORDER ISSUED IN NAME OF BHEL-EDN.**

**7. ORIGINAL PACKING LIST.**

**8. A LETTER TO THE COMMISSIONER OF CUSTOMS FOR EFFECTING ABOVE SALE.**

**9. A LETTER TO THE DEPUTY ASSESSOR (OCTROI) FOR EFFECTING ABOVE SALE IN FAVOUR OF BHEL.**

**REMARKS:** In case vendor needs any clarifications on the above, the same may be sought in writing.



ELECTRONICS DIVISION, BANGALORE

**Annexure-VI**

**BHEL MEMBER BANKS (LIST OF CONSORTIUM BANKS)**

Bank Guarantee (BG) shall be issued from the following banks only:

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

**Note:**

- All BGs must be issued from BHEL consortium banks listed above.
- This list is subject to changes. Hence vendors are requested to check this list every time before issuing BGs.
- Bank Guarantees issued by Co-operative Banks/Financial Institutions cannot be accepted under any circumstance.



Annexure-VII

**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 \_\_\_\_\_<sup>1</sup> through its Unit at.....(name of the Unit) having awarded to ( Name of the Vendor / Contractor / Supplier) with its registered office at \_\_\_\_\_<sup>2</sup> 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 .....<sup>3</sup> valued at Rs.....<sup>4</sup> ( Rupees -----)/FC.....(in words.....) for .....<sup>5</sup> (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 -- -----<sup>6</sup> ( 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.....<sup>7</sup> 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 .....<sup>8</sup> 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.....<sup>6</sup>
- b) This Guarantee shall be valid up to .....<sup>7</sup>
- c) Unless the Bank is served a written claim or demand on or before .....<sup>8</sup> 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.....

<sup>1</sup> NAME AND ADDRESS OF EMPLOYER I.e Bharat Heavy Electricals Limited

<sup>2</sup> NAME AND ADDRESS OF THE VENDOR /CONTRACTOR / SUPPLIER.

<sup>3</sup> DETAILS ABOUT THE NOTICE OF AWARD/CONTRACT REFERENCE

<sup>4</sup> CONTRACT VALUE

<sup>5</sup> PROJECT/SUPPLY DETAILS

<sup>6</sup> BG AMOUNT IN FIGURES AND WORDS

<sup>7</sup> VALIDITY DATE

<sup>8</sup> DATE OF EXPIRY OF CLAIM PERIOD

---



**INTEGRITY PACT****Between**

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

**and**

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

**Preamble**

The Principal intends to award, under laid-down organizational procedures, contract/s for

— **RFQ No.SBA0000527- UPS to Patratu & Mouda FGD** —

\_\_\_\_\_. The Principal values full compliance with all relevant laws of the land, rules and regulations, and the principles of economic use of resources, and of fairness and transparency in its relations with its Bidder(s)/ Contractor(s).

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

**Section 1- Commitments of the Principal**

1.1 The Principal commits itself to take all measures necessary to prevent corruption and to observe the following principles:-

1.1.1 No employee of the Principal, personally or through family members, will in connection with the tender for, or the execution of a contract, demand, take a promise for or accept, for self or third person, any material or immaterial benefit which the person is not legally entitled to.

1.1.2 The Principal will, during the tender process treat all Bidder(s) with equity and reason. The Principal will in particular, before and during the tender process, provide to all Bidder(s) the same information and will not provide to any Bidder(s) confidential/ additional information through which the Bidder(s) could obtain an advantage in relation to the tender process or the contract execution.

1.1.3 The Principal will exclude from the process all known prejudiced persons.

1.2 If the Principal obtains information on the conduct of any of its employees which is a penal offence under the Indian Penal Code 1860 and Prevention of Corruption Act 1988 or any other statutory penal enactment, or if there be a substantive suspicion in this regard, the Principal will inform its Vigilance Office and in addition can initiate disciplinary actions:



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

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

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

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

## **Section 4 - Compensation for Damages**

- 4.1 If the Principal has disqualified the Bidder from the tender process prior to the award according to Section 3, the Principal is entitled to demand and recover the damages equivalent Earnest Money Deposit/ Bid Security.
- 4.2 If the Principal has terminated the contract according to Section 3, or if the Principal is entitled to terminate the contract according to section 3, the Principal shall be entitled to



demand and recover from the Contractor liquidated damages equivalent to 5% of the contract value or the amount equivalent to Security Deposit/ Performance Bank Guarantee, whichever is higher.

### **Section 5 - Previous Transgression**

- 5.1 The Bidder declares that no previous transgressions occurred in the last 3 years with any other company in any country conforming to the anti-corruption approach or with any other Public Sector Enterprise in India that could justify his exclusion from the tender process.
- 5.2 If the Bidder makes incorrect statement on this subject, he can be disqualified from the tender process or the contract, if already awarded, can be terminated for such reason.

### **Section 6 - Equal treatment of all Bidders/ Contractors / Sub-contractors**

- 6.1 The Principal will enter into agreements with identical conditions as this one with all Bidders and Contractors. In case of sub-contracting, the Principal contractor shall be responsible for the adoption of IP by his sub-contractors and shall continue to remain responsible for any default by his sub-contractors.
- 6.2 The Principal will disqualify from the tender process all bidders who do not sign this pact or violate its provisions.

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

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

### **Section 8 - Independent External Monitor(s)**

- 8.1 The Principal appoints competent and credible Independent External Monitor for this Pact. The task of the Monitor is to review independently and objectively, whether and to what extent the parties comply with the obligations under this agreement.
- 8.2 The Monitor is not subject to instructions by the representatives of the parties and performs his functions neutrally and independently. He reports to the CMD, BHEL.
- 8.3 The Bidder(s)/ Contractor(s) accepts that the Monitor has the right to access without restriction to all contract documentation of the Principal including that provided by the Bidder(s)/ Contractor(s). The Bidder(s)/ Contractor(s) will grant the monitor, upon his request and demonstration of a valid interest, unrestricted and unconditional access to his contract documentation. The same is applicable to Sub-contractor(s). The Monitor is under contractual obligation to treat the information and documents of the Bidder(s)/ Contractor(s) / Sub-contractor(s) with confidentiality in line with Non- disclosure agreement.
- 8.4 The Principal will provide to the Monitor sufficient information about all meetings among the parties related to the contract provided such meetings could have an impact on the contractual relations between the Principal and the Contractor. The parties offer to the Monitor the option to participate in such meetings.



- 8.5 The role of IEMs is advisory, would not be legally binding and it is restricted to resolving issues raised by an intending bidder regarding any aspect of the tender which allegedly restricts competition or bias towards some bidders. At the same time, it must be understood that IEMs are not consultants to the Management. Their role is independent in nature and the advice once tendered would not be subject to review at the request of the organization.
- 8.6 For ensuring the desired transparency and objectivity in dealing with the complaints arising out of any tendering process, the matter should be examined by the full panel of IEMs jointly as far as possible, who would look into the records, conduct an investigation, and submit their joint recommendations to the Management.
- 8.7 The IEMs would examine all complaints received by them and give their recommendations/ views to CMD, BHEL, at the earliest. They may also send their report directly to the CVO and the Commission, in case of suspicion of serious irregularities requiring legal/ administrative action. IEMs will tender their advice on the complaints within 10 days as far as possible.
- 8.8 The CMD, BHEL shall decide the compensation to be paid to the Monitor and its terms and conditions.
- 8.9 IEM should examine the process integrity, they are not expected to concern themselves with fixing of responsibility of officers. Complaints alleging mala fide on the part of any officer of the organization should be looked into by the CVO of the concerned organisation.
- 8.10 If the Monitor has reported to the CMD, BHEL, a substantiated suspicion of an offence under relevant Indian Penal Code/ Prevention of Corruption Act, and the CMD, BHEL has not, within reasonable time, taken visible action to proceed against such offence or reported it to the Vigilance Office, the Monitor may also transmit this information directly to the Central Vigilance Commissioner, Government of India.
- 8.11 The number of Independent External Monitor(s) shall be decided by the CMD, BHEL.
- 8.12 The word 'Monitor' would include both singular and plural.

## **Section 9 - Pact Duration**

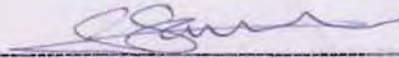
- 9.1 This Pact shall be operative from the date IP is signed by both the parties till the final completion of contract for successful bidder and for all other bidders 6 months after the contract has been awarded. Issues like warranty / guarantee etc. should be outside the purview of IEMs.
- 9.2 If any claim is made/ lodged during currency of IP, the same shall be binding and continue to be valid despite the lapse of this pact as specified above, unless it is discharged/ determined by the CMD, BHEL.

## **Section 10 - Other Provisions**

- 10.1 This agreement is subject to Indian Laws and jurisdiction shall be registered office of the Principal, i.e. New Delhi.



- 10.2 Changes and supplements as well as termination notices need to be made in writing. Side agreements have not been made.
- 10.3 If the Contractor is a partnership or a consortium, this agreement must be signed by all partners or consortium members.
- 10.4 Should one or several provisions of this agreement turn out to be invalid, the remainder of this agreement remains valid. In this case, the parties will strive to come to an agreement to their original intentions.
- 10.5 Only those bidders / contractors who have entered into this agreement with the Principal would be competent to participate in the bidding. In other words, entering into this agreement would be a preliminary qualification.

  
 ಸರವಣ ಬಾಬು ಎ., ಉಪ ವ್ಯವಸ್ಥಾಪಕರು/ನಿ.ಉ.-ಎಂ.ಎಂ.-ಪಿ.ಆರ್.  
 For & On behalf of the Principal  
 SARAVANA BABU A., MANAGER/CE-MM-PR  
 BHEL-EDN, MYSORE ROAD, BANGALORE-560025

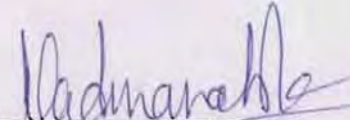
(Office Seal)

\_\_\_\_\_  
 For & On behalf of the Bidder/  
 Contractor

(Office Seal)

Place Bengaluru

Date \_\_\_\_\_

Witness:   
 (Name & Address) Bengaluru  
M. PADMANABHA  
SDGM-CE-MM-PR  
BHEL EDN, Bengaluru

Witness: \_\_\_\_\_

(Name &amp; Address) \_\_\_\_\_

## Annexure-X

### Restrictions under Rule 144(xi) of General Financial Rules, 2017 amendment dt: 23.07.2020

- I. Any bidder from a country which shares a land border with India will be eligible to bid in this tender only if the bidder is registered with the Competent Authority.
- II. "Bidder" (including the term 'tenderer', 'consultant' or 'service provider' in certain contexts) means any person or firm or company, including any member of a consortium or joint venture (that is an association of several persons, or firms or companies), every artificial juridical person not falling in any of the descriptions of bidders stated hereinbefore, including any agency branch or office controlled by such person, participating in a procurement process.
- III. "Bidder from a country which shares a land border with India" for the purpose of this Order means :-
  - a. An entity incorporated, established or registered in such a country; or
  - b. A subsidiary of an entity incorporated, established or registered in such a country; or
  - c. An entity substantially controlled through entities incorporated, established or registered in such a country; or
  - d. An entity whose *beneficial owner* is situated in such a country; or
  - e. An Indian (or other) agent of such an entity; or
  - f. A natural person who is a citizen of such a country; or
  - g. A consortium or joint venture where any member of the consortium or joint venture falls under any of the above
- IV. The *beneficial owner* for the purpose of (iii) above will be as under:
  1. In case of a company or Limited Liability Partnership, the beneficial owner is the natural person(s), who, whether acting alone or together, or through one or more juridical person, has a controlling ownership interest or who exercises control through other means.

Explanation--

    - a. "Controlling ownership interest" means ownership of or entitlement to more than twenty-five per cent of shares or capital or profits of the company;
    - b. "Control" shall include the right to appoint majority of the directors or to control the management or policy decisions including by virtue of their shareholding or management rights or shareholders agreements or voting agreements;
  2. In case of a partnership firm, the beneficial owner is the natural person(s) who, whether acting alone or together, or through one or more juridical person, has ownership of entitlement to more than fifteen percent of capital or profits of the partnership;

3. In case of an unincorporated association or body of individuals, the beneficial owner is the natural person(s), who, whether acting alone or together, or through one or more juridical person, has ownership of or entitlement to more than fifteen percent of the property or capital or profits of such association or body of individuals;
4. Where no natural person is identified under (1) or (2) or (3) above, the beneficial owner is the relevant natural person who holds the position of senior managing official;
5. In case of a trust, the identification of beneficial owner(s) shall include identification of the author of the trust, the trustee, the beneficiaries with fifteen percent or more interest in the trust and any other natural person exercising ultimate effective control over the trust through a chain of control or ownership.

V. An Agent is a person employed to do any act for another, or to represent another in dealings with third person.



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

CE: PR: 002- Rev 03

#### **GENERAL COMMERCIAL CONDITIONS FOR CONTRACT**

These 'General Commercial Conditions for Contract for Purchase' herein after 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.

- a) '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.
- b) '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.
- c) '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.
- d) 'Parties to the Contract' shall mean the 'The Vendor' and the Purchaser as named in the main body of the Purchase Order.

#### **Order of Precedence:**

In case of any inconsistency or contradiction between any of the documents, the order of precedence shall be Purchase Order, LOI / LOA, Special Conditions of Contract and General Conditions of Contract for commercial conditions; and specific agreement on technical conditions, RFQ/offer and specification for Technical Conditions.

#### **Interpretation:**

In the contract, except where the context requires otherwise:

- a) words indicating one gender include all genders;
- b) words indicating the singular also include the plural and words indicating the plural also include the singular;

- c) provisions including the word "agree", "agreed" or "agreement" require the agreement to be recorded in writing, and
- d) "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.
2. **Ordering and confirmation of Order:** Vendor shall send the order acceptance on their company letter head/ through e-mail within a week from the date of receipt 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 one week (or the time limit as specified/agreed by BHEL) from the date of receipt of the purchase order.
3. **Documentation:** After receipt of Purchase Order, vendor should submit necessary documents (if & as applicable) like drawings specified, 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.
4. **Penalty:**
  - a. **For delay in documentation:** In the event of delay in submission of complete set of specified documents ((like drawings, bill of materials, datasheets, catalogues, quality plan etc. as called in tender specifications including soft copies wherever applicable) in required sets beyond two(02) weeks (or as agreed/indicated in the SCC/Purchase Order) from the date of receipt of Purchase Order (by email), penalty at 0.5% (half percent) per week or part thereof, limited to a maximum of 5% (five percent) of the basic material value of the Purchase Order will be applicable.  
  
Penalty for delayed documentation if applicable, shall be deducted at the time of first supply 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. GST as applicable will be recovered along with penalty amount.
  - b. **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 issue of Manufacturing clearance along with approved document. 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 supply 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. GST as applicable will be recovered along with penalty amount.

5. 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 the basis for 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.
6. Inspection: Prior written notice of at least 10 days 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. BHEL reserves the right for conducting repeat test, if required.  
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.
7. 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 (as mentioned in dispatch instructions issued by BHEL) 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.
8. Mode of dispatch:  
Indigenous Scope: By road on Door Delivery Consignee Copy attached basis through your approved transporter (unless otherwise indicated in Dispatch Instructions), only on receipt of Despatch Clearance from BHEL.  
Imported Scope: By Air/Sea through BHEL approved Freight Forwarder/supplier approved Consolidator respectively as per agreed contractual terms, only on receipt of Dispatch Clearance from BHEL.
9. Changes in Statutory levies:  
If any rates of Tax are increased or decreased, a new Tax is introduced, an existing Tax is abolished, or any change in interpretation or application of any Tax occurs in the course of the execution of Contract, which was or will be assessed on the bidder in connection with performance of the Contract, an equitable adjustment of the Contract Price shall be made to fully take into account any such change by addition to the Contract Price or deduction there from, as the case may be. However, these adjustments would be restricted to direct transactions between BHEL and the bidder /agent of foreign bidder (if applicable). These adjustments shall not be applicable on procurement of raw materials, intermediary components etc. by the bidder /agent.
10. Availing duty/tax exemption benefits by bidder, wherever applicable: BHEL shall issue the required Certificate/s, as per relevant policies of the Govt. of India, to facilitate the bidders to avail any such benefits under the Contract. In case of failure of the bidders to receive the benefits partly or fully from the Govt. of India and/or in case of any delay in receipt of such benefits, BHEL shall neither be liable nor responsible in any manner whatsoever.

11. Taxes against sub-vendor dispatches: All taxes/levies, as applicable in respect of all components, equipments and material to be despatched directly from the sub-vendor's works to Site irrespective of the fact whether such taxes and levies are assessable and chargeable on Vendor or the BHEL, shall be to the vendor's account and no separate claim in this regard will be entertained by BHEL.
12. High Sea Sales (HSS): Customs clearance of the consignment landed on Indian Sea/Air ports will be done by BHEL based on the original HSS documents provided by vendors.  
Any delay in submission of complete/correct HSS documents to BHEL may incur demurrage charges. All demurrage charges on account of incomplete /incorrect HSS documents submission by vendor will be to vendor's account and all such charges will be recovered from any of the available vendor bills with BHEL.
13. 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 (LxBxH) 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 in the packing list.  
Separate packing & identification of items should be as follows.
  1. Main Scope - All items must be tagged with part no. & item description.
  2. Commissioning accessories/spares - All items must be tagged with part no. & item description.
  3. Mandatory spares - All items must be tagged with part no. & item description.
 Nevertheless, vendor shall adhere to dispatch & packing instructions issued by BHEL at the time of dispatch.
14. 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.
15. 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.
16. 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 any specified 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.
17. 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.



18. 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.

19. Shortages: In the event of shortage on receipt of goods and/or on opening of packages at site, all such shortages, caused by supplier's act or omission, shall be made good at free of cost within a reasonable time that BHEL may allow from such intimation.

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. In case BHEL raises an insurance claim, the cost of material limited to insurance settled amount less handling charges will be reimbursed to supplier.

20. 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.

21. 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. Vendor shall fully indemnify and keep indemnified BHEL against all claims of whatsoever nature arising during the course and out of execution of this Order/Contract.

22. Product Information, Drawings and Documents: All specified 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.

23. 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.

24. 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.

25. Warranty:

Wherever required, and so provided in the specifications/ Purchaser Order, the Seller shall ensure that the goods supplied shall comply with the specifications laid down, for materials, workmanship and performance.

Unless otherwise specified in SCC, warranty period shall be applicable for a period of 24 months from the date of delivery of goods or 18 months from the date of commissioning of goods, whichever is earlier.

The warranty period as described above shall apply afresh to replaced, repaired or re-executed parts of a delivery. Unless otherwise specifically provided in the Purchase Order, Vendor's liability shall be co terminus with the expiration of the applicable warranty period.

26. 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.

27. Liability during warranty: Vendor shall arrange replacement / repair of all the defective materials / services under its obligation during the 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 Warranty period or where the commissioning call is issued within the warranty period, vendor shall be responsible for replacement/ repair of the goods as required by BHEL at vendor's cost even after expiry of warranty period.

Further if the equipment or any part thereof cannot be used by reason of such defect and/or making good of such defect, the warranty period of the equipment or such part, as the case may be, shall be extended by a period equal to the period during which the equipment or such part cannot be used by BHEL because of any of the aforesaid reasons. Upon correction of the defects in the facilities or any part thereof by repair/replacement, such repair/replacement shall have the warranty period for a period of twelve (12) months from the time such replacement/repair of the equipment or any part thereof has been completed.

28. Liability after warranty period: At the end of the warranty, the Vendor's liability ceases except for latent defects. For the purpose of this clause, latent defects shall be the defects inherently lying within the material or arising out of design deficiency which do not manifest themselves during the warranty Period, but later. The Contractor's liability for latent defects warranty for the equipment including spares shall be limited to a period of six months from the end of the warranty period of the respective equipment including spares or first time commissioning, whichever is later but not later than one (01) year from the date of expiry of warranty period.

29. 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.
30. 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).
31. Arbitration Clause in case of Contract with vendors 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 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.'

32. 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.
33. 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.



ಭಾರತ್ ಹೆವಿ ಎಲೆಕ್ಟ್ರಿಕಲ್ಸ್ ಲಿಮಿಟೆಡ್  
भारत हेवी इलेक्ट्रिकल्स लिमिटेड

Page 1 of 5

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

CE: PR: 003- Rev 02

PB 2606 , Mysore Road Bangalore , 560026 INDIA

**SPECIAL COMMERCIAL CONDITIONS OF CONTRACT**

**Reference is brought to BHEL's Instructions to Bidders (Document Ref: CE: PR: 001- Rev 04) and General Commercial Conditions for Contract (Document Ref: CE: PR: 002- Rev 03).**

**These two documents along with Special Conditions of Contract annexed to this RFQ will form an integral part of the contract as and when the RFQ culminates into a Purchase Order / Contract.**

RFQ No. : **SBA0000527**  
RFQ Date : As per E-procurement website  
RFQ Due Date : As per E-procurement website  
Customer/Project : **PVUNL PATRATU (3x660 MW) & MOUDA STG-I (2x500 MW) FGD**  
Scope Description : **UPS**

Kindly submit your quotation as **two part bid** (Pre-Qualification Criteria & Techno-Commercial bid-1st part & Price bid-2nd Part) in E-Procurement System portal: <https://eprocurebhel.co.in> within the Due- Date of \_\_\_ As per E-procurement website \_\_\_ before \_\_\_ As per E-procurement website \_\_\_ hours IST and note that tenders will be opened on the same day at \_\_\_ As per E-procurement website \_\_\_ hours IST.

**Purchase Executives:** Clarifications with regard to the tender shall be addressed to purchase officers whose e-mail IDs are given below:

[saravanababu@bhel.in](mailto:saravanababu@bhel.in) or [padmanabha@bhel.in](mailto:padmanabha@bhel.in)

**Splitting of tendered quantity to MSE vendors for Purchase preference:** Non-Splittable

**Destination:** For Indigenous scope of supply, items are to be directly despatched to BHEL site office/stores located at \_\_\_Patratu & Mouda\_\_\_TPP in \_\_\_Jharkhand & Maharashtra\_\_\_ state respectively, India. Detailed Consignee details will be issued by BHEL along with Despatch Clearance.

Imported scope of supply:

Project Imports: Eligible for Concessional Basic Custom Duty.

**Terms of Delivery:**

- **Indigenous scope of supply:** Ex-works, \_\_\_<indicate station of dispatch>\_\_\_ (including Packing & Forwarding charges but excluding Taxes).
- **Imported scope of supply:**  
C.I.F. (for sea consignments) < ICD, Bangalore > (including Packing, Forwarding, Handling, Ancillary charges like processing of Sight Draft/ Letter of Credit, negotiation of bank documents, Export declaration, Country of Origin etc.).  
Kindly indicate the approximate weight of the total imported consignment, which is required for calculating air-freight/Inland freight charges:\_\_\_\_\_



**Under-mentioned details shall be provided against indigenous supplies & services:**

- a. GSTIN of place of supply : \_\_\_\_\_
- b. HSN (Harmonized System of Nomenclature) code : \_\_\_\_\_  
 Applicable tax and Rate : \_\_\_\_\_ & \_\_\_\_\_
- c. GSTIN of place of supply of service : \_\_\_\_\_
- d. SAC (Service Accounting Code) : \_\_\_\_\_  
 Applicable tax and Rate : \_\_\_\_\_ & \_\_\_\_\_
- e. GeM Seller ID mandatorily required for PO placement: \_\_\_\_\_
- f. MSE vendor : Yes-MSE supporting documents enclosed/No  
 (If MSE, supporting documents such as Udyam certificate to be enclosed)

**I. Bidders to mandatorily provide confirmation/compliance for the under-mentioned terms:**

SL NO	TERMS	BHEL ACCEPTABLE TERM	BIDDER'S CONFIRMATION	REMARKS,if any														
01	Reverse Auction (RA)	BHEL shall be resorting to Reverse Auction (Guidelines as available on http://www.bhel.com/index.php/vender) for this tender. RA shall be conducted among all the techno-commercially qualified bidders. Price bids of all techno-commercially qualified bidders shall be opened and same shall be considered as initial bids of bidders in RA. In case any bidder(s) do(es) not participate in online Reverse Auction, their sealed envelope price bid along with applicable loading, if any, shall be considered for ranking.	AGREE															
03	Delivery Period	Within _12_ weeks from the date of issue of Manufacturing clearance along with approved document. Delay in contractual delivery will attract Penalty as per GCC Clause no.:04.b. Staggered manufacturing clearance for below locations & Mandatory spares of Patratu will be provide later as per site delivery schedule. Present delivery schedule is indicated below: <table><tr><td>Location Name</td><td>Delivery schedule</td></tr><tr><td>UPS Compressor House</td><td>Jul 2022</td></tr><tr><td>UPS Main Unit 1</td><td>Jul 2022</td></tr><tr><td>UPS Main Unit 2</td><td>Nov 2022</td></tr><tr><td>UPS Main Unit 3</td><td>Mar 2023</td></tr><tr><td>FGD UPS common for 3 units</td><td>Mar 2023</td></tr><tr><td>AHP UPS</td><td>Mar 2023</td></tr></table>	Location Name	Delivery schedule	UPS Compressor House	Jul 2022	UPS Main Unit 1	Jul 2022	UPS Main Unit 2	Nov 2022	UPS Main Unit 3	Mar 2023	FGD UPS common for 3 units	Mar 2023	AHP UPS	Mar 2023	AGREE  ..... weeks	
Location Name	Delivery schedule																	
UPS Compressor House	Jul 2022																	
UPS Main Unit 1	Jul 2022																	
UPS Main Unit 2	Nov 2022																	
UPS Main Unit 3	Mar 2023																	
FGD UPS common for 3 units	Mar 2023																	
AHP UPS	Mar 2023																	

		CHP UPS	Mar 2023		
		Simulator UPS	Jun 2023		
		Mandatory Spares	Nov 2023		
04	<b>Terms of Payment at the time of material supply</b>	Refer Clause "F" of Instructions to Bidder for BHEL standard Payment terms and loading factors applicable for non-compliance against payment terms: <b>Indigenous Scope :</b> a)Supply with Service(s) <b>Imported Scope :</b> c)Supply with Service(s) <b>High-Sea sales :</b> e)Supply with Service(s) <b>Spares :</b> b) and/or d)/f) depending upon the scope			AGREE
05	<b>Declaration of local content :</b> The 'Class-I local supplier' shall be required to indicate percentage of local content and provide certification that the item offered meets the local content requirement for 'Class-I local supplier'.	'Local content' means the amount of value added in India which shall, unless otherwise prescribed by the Nodal Ministry, be the total value of the item procured (excluding net domestic indirect taxes) minus the value of imported content in the item (including all customs duties) as a proportion of the total value, in percent. {'Class-I local supplier' means a supplier or service provider, whose goods, services or works offered for procurement, has local content equal to or more than 50%, as defined under Public procurement order no.P-45021/2/2017-PP (BE-II) dt: 16.09.2020. In the event of any Nodal Ministry prescribing higher or lower margin of purchase preference and/or higher or lower percentage of local content in respect of this procurement, same shall be applicable}.' (Refer Clause 'A' Sl. No. 12 of Instructions to Bidders). Note: Non Local suppliers are eligible to participate in the tender			Percentage of local content : _____%  Details of the Location(s) at which the local value addition is made : _____
06	Declaration as a compliance to Rule 144(xi) of GFR, 2017 amendment dt 23.07.2020 issued by Ministry of Finance, Govt. of India.	The below declaration is to be submitted on Company Letter head duly signed and sealed by authorised signatory, for ascertaining the eligibility of offer in the tender. "I have read the clause regarding restrictions on procurement from a bidder of a country which shares a land border with India; I certify that our firm is not from such a country or, if from such a country, has been registered with the Competent Authority. I hereby certify that our firm fulfils all requirements in this regard and is eligible to be considered." (Refer Clause 'A' Sl. No. 13 of Instructions to Bidders).			

**II. Bidder to note that Deviations shall not be permitted for the below mentioned terms and are deemed to be complied. In case of non-compliance/deviation, offer shall be liable for rejection:**

- (1) **Submission of documents post PO viz., drawings /data sheet etc. as indicated in Cl: 04 of GCC:** Within \_03\_ weeks from the date of receipt of Purchase Order. Delay in submission of complete set of specified documents in NIT, will attract Penalty as per GCC Clause no.:04.a.
- (2) **Validity:** The offer will be valid for a period of \_90\_ days from the date of part-I bid opening and in case of Negotiation/ Counter-offer/RA, price validity will apply afresh for a period of \_30\_ days from the date of according final price by bidder (or) up to original validity period, whichever is later.
- (3) **Warranty:** \_24\_ months from the date of dispatch of goods (or) \_18\_ months from the date of commissioning, whichever is earlier.
- (4) **Performance Bank Guarantee (PBG):** PBG will be applicable for a period of \_24\_ months from the date of dispatch of goods + claim period of 03 months, for a value equal to 10% of the basic value of purchase order. It shall however be noted that PBG is not applicable against supply of Mandatory Spares.

Refer Clause “H” of Instructions to Bidders. Also note that PBG should be in the format specified in Annexure VII of ITB and no deviation to this format will be allowed.

Note: In case PBG is not furnished, the 10% basic amount will be withheld from the supply invoice. This withheld amount will be paid either against submission of supplementary invoice & Original PBG (or) against supplementary invoice without PBG after expiry of Warranty period.

- (5) **Despatch Documents:** Complete set of despatch documents (original + 1 photocopy set) as per Purchase Order shall be forwarded to Purchase Executive/BHEL directly. Depending upon the project/customer demands, Despatch documents may include one (or) more documents from the following:

Invoice (01 original and 01 copy with original sign & seal / digitally signed invoice), Lorry Receipt (L/R), Packing List, NIL Short-Shipment Certificate, insurance intimation letter, E-way bill, original Performance Bank Guarantee (directly from issuing bank to BHEL), Country of Origin certificate and original POD (Proof of Delivery) on L/R.

The precise list of despatch documents needed for the project will be specified in the Purchase Order.

One set of Invoice, Packing List, Lorry Receipt (or) AWB/BOL shall be e-mailed immediately to BHEL-EDN at the time of despatch.

Note: Detailed Packing List should indicate package-wise content details and also Net & Gross weight of each package.

- (6) **Freight Charges (for indigenous scope of supply):** Freight charges shall be to vendor's account. Bidder to quote reasonable Freight charges along with applicable tax, in price bid.
- (7) **Evaluation criteria to determine L1 bidder:**
  - (b) Items will not be split on item-wise lowest offer. Evaluation of the lowest bidder will be done as a combined package basis.

**(8) Erection and Commissioning charges:** Not applicable

**(9) Erection Supervision and Commissioning charges:**

In case the quoted total Erection Supervision & Commissioning value is less than \_\_5%\_\_ of the main supply value, BHEL shall evaluate Bidders Price deducting differential amount from main supply price and apportioning towards Erection Supervision & Commissioning charges.

Refer Sl. no. 'h' under Clause 'F' of Instructions to Bidders for Payment terms of Erection Supervision & Commissioning charges.

**(10) Comprehensive Annual Maintenance Contract:** Not applicable

**(11) Integrity Pact:**

Execution of Integrity Pact is applicable for this tender (Refer clause "K" of Instructions to Bidders). The IP as enclosed with the tender is to be submitted (duly signed by authorized signatory who signs in the offer) along with techno-commercial bid . Only those Bidders who have entered into such an IP with BHEL would be competent to participate in the bidding. In other words, entering into this Pact would be a preliminary qualification.

**With this, we hereby confirm that all the terms & conditions as indicated in Instructions to Bidders (Document Ref: CE: PR: 001- Rev 04) & General Commercial Conditions for Contract (Document Ref: CE: PR: 002- Rev 03) are accepted without any deviation.**

Vendor's Signature with Seal



Tender Inviting Authority: BHEL EDN BANGALORE

Name of Work: UPS for PVUNL PATRATU (3x800 MW) & NTPC MOUDA (2x500 MW) FGD PACKAGE

Contract No: SBA0000527

<div> <div>Name of the Bidder/ Bidding Firm / Company :</div> <div></div> </div>											
<div> <div>PRICE SCHEDULE</div> <div>(This BOQ template must not be modified/replaced by the bidder and the same should be uploaded after filling the relevent columns, else the bidder is liable to be rejected for this tender. Bidders are allowed to enter the Bidder Name and Values only )</div> </div>											
NUMBER #	TEXT #	NUMBER #	TEXT #	TEXT #	NUMBER #	NUMBER	NUMBER	NUMBER #	NUMBER #	NUMBER #	TEXT #
Sl. No.	Item Description	Quantity	Units	Quoted Currency in INR / Other Currency	BASIC RATE In Figures To be entered by the Bidder in Rs. P	GST (in Percentage)	Total GST Amount in Rs. P	HSN / SAC Code	TOTAL AMOUNT, It will be convert	TOTAL TAXES It will be convert only If you choose Full Conversion, Until it will be treated as INR	TOTAL AMOUNT In Words
1	2	4	5	12	7	8	9	10	11	12	13
1.1	A)PATRATU Project										
1	2 x 150 kVA UPS, 230V AC 1 Ph Output (Unit) & accessories	3	SET	INR			0.00		0.000	0.000	INR Zero Only
2	2 x 10 kVA UPS, 240V AC 1 Ph Output (Compressor House) & accessories	1	SET	INR			0.00		0.000	0.000	INR Zero Only
3	1 x 20 kVA UPS, 240V AC 1 Ph Output (AHP, WS) & accessories	2	SET	INR			0.00		0.000	0.000	INR Zero Only
4	1 x 25 kVA UPS, 240V AC 1 Ph Output (CHP) & accessories	1	SET	INR			0.00		0.000	0.000	INR Zero Only
5	1 x 45 kVA UPS, 240V AC 1 Ph Output (PADO Simulator) & accessories	1	SET	INR			0.00		0.000	0.000	INR Zero Only
6	1 x 80 kVA UPS, 240V AC 1 Ph Output (FGD) & accessories	1	SET	INR			0.00		0.000	0.000	INR Zero Only
7	CABLES FROM BATTERY TO UPS, UPS OUTPUT TO ACDB-1 & II, Size 0	420	METER	INR			0.00		0.000	0.000	INR Zero Only
8	CABLES FROM BATTERY TO UPS, UPS OUTPUT TO ACDB-1 & II, Size 4	140	METER	INR			0.00		0.000	0.000	INR Zero Only
9	CABLES FROM BATTERY TO UPS, UPS OUTPUT TO ACDB-1 & II, Size 00	140	METER	INR			0.00		0.000	0.000	INR Zero Only
10	CABLES FROM BATTERY TO UPS, UPS OUTPUT TO ACDB-1 & II, Size 0000	1920	METER	INR			0.00		0.000	0.000	INR Zero Only
11	ACDB-I & ACDB-II (143 feeders each) (Unit)	3	SET	INR			0.00		0.000	0.000	INR Zero Only
12	ACDB-I & ACDB-II (25 feeders each) (CHP, AHP)	2	SET	INR			0.00		0.000	0.000	INR Zero Only
13	ACDB-I & ACDB-II (28 feeders each) (WS)	1	SET	INR			0.00		0.000	0.000	INR Zero Only
14	ACDB-I & ACDB-II (30 feeders each) (PADO Simulator)	1	SET	INR			0.00		0.000	0.000	INR Zero Only
15	ACDB-I & ACDB-II (65 feeders each) (FGD)	1	SET	INR			0.00		0.000	0.000	INR Zero Only
16	ACDB-I & ACDB-II (5 feeders each) (Compressor House)	2	SET	INR			0.00		0.000	0.000	INR Zero Only
17	BHMS (for 287 cells)	4	SET	INR			0.00		0.000	0.000	INR Zero Only
18	BHMS (for 180 cells)	5	SET	INR			0.00		0.000	0.000	INR Zero Only
19	DISCHARGE RESISTOR BANK FOR 2x150 kVA UPS	1	SET	INR			0.00		0.000	0.000	INR Zero Only

20	DISCHARGE RESISTOR BANK FOR 1x45 kVA UPS	1	SET	INR			0.00		0.000	0.000	INR Zero Only
21	DISCHARGE RESISTOR BANK FOR 18 cells, 441 AH Ni-CD Battery	1	SET	INR			0.00		0.000	0.000	INR Zero Only
22	Wall Mounted STATIC SWITCH PANEL (8 No Static Switches for U-1)	1	SET	INR			0.00		0.000	0.000	INR Zero Only
23	Wall Mounted STATIC SWITCH PANEL (2 No Static Switches for U-1)	1	SET	INR			0.00		0.000	0.000	INR Zero Only
24	Wall Mounted STATIC SWITCH PANEL (4 No Static Switches for U-2)	1	SET	INR			0.00		0.000	0.000	INR Zero Only
25	Wall Mounted STATIC SWITCH PANEL (4 No Static Switches for U-3)	1	SET	INR			0.00		0.000	0.000	INR Zero Only
26	MANDATORY SPARES	1	SET	INR			0.00		0.000	0.000	INR Zero Only
27	Erection Supervision and Commissioning Charges of AHP UPS for Patratu	1	AU	INR			0.00		0.000	0.000	INR Zero Only
28	Erection Supervision and Commissioning Charges of CHP UPS for Patratu	1	AU	INR			0.00		0.000	0.000	INR Zero Only
29	Erection Supervision and Commissioning Charges of FGD UPS common for 3 units for Patratu	1	AU	INR			0.00		0.000	0.000	INR Zero Only
30	Erection Supervision and Commissioning Charges of Simulator UPS for Patratu	1	AU	INR			0.00		0.000	0.000	INR Zero Only
31	Erection Supervision and Commissioning Charges of UPS Compressor House for Patratu	1	AU	INR			0.00		0.000	0.000	INR Zero Only
32	Erection Supervision and Commissioning Charges of UPS Main Unit 1 for Patratu	1	AU	INR			0.00		0.000	0.000	INR Zero Only
33	Erection Supervision and Commissioning Charges of UPS Main Unit 2 for Patratu	1	AU	INR			0.00		0.000	0.000	INR Zero Only
34	Erection Supervision and Commissioning Charges of UPS Main Unit 3 for Patratu	1	AU	INR			0.00		0.000	0.000	INR Zero Only
35	Erection Supervision and Commissioning Charges of UPS Water System for Patratu	1	AU	INR			0.00		0.000	0.000	INR Zero Only
36	Training charges	1	AU	INR			0.00		0.000	0.000	INR Zero Only
37	Freight Charge for INR portion of Patratu for UPS Water System	1	AU	INR			0.00		0.000	0.000	INR Zero Only
38	Freight Charge for INR portion of Patratu for UPS Compressor House, UPS Battery Main Unit 1	1	AU	INR			0.00		0.000	0.000	INR Zero Only
39	Freight Charge for INR portion of Patratu for UPS Main Unit 2	1	AU	INR			0.00		0.000	0.000	INR Zero Only
40	Freight Charge for INR portion of Patratu for UPS Main Unit 3, FGD UPS common for 3 units, AHP UPS & CHP UPS	1	AU	INR			0.00		0.000	0.000	INR Zero Only
41	Freight Charge for INR portion of Patratu for Simulator UPS	1	AU	INR			0.00		0.000	0.000	INR Zero Only
42	Freight Charge for INR portion of Mandatory Spares	1	AU	INR			0.00		0.000	0.000	INR Zero Only
43	Type test Charges, if applicable	1	Lot	INR			0.00		0.000	0.000	INR Zero Only
2.1	B)MOUDA FGD Project										
44	1 x 50 kVA UPS, 240V AC 1 Ph Output (FGD) & accessories	1	SET	INR			0.00		0.000	0.000	INR Zero Only
45	ACDB-I & ACDB-II (41 feeders each) (FGD)	1	SET	INR			0.00		0.000	0.000	INR Zero Only
46	BHMS (for 180 cells)	1	SET	INR			0.00		0.000	0.000	INR Zero Only
47	Erection Supervision and Commissioning Charges for Mouda	1	SET	INR			0.00		0.000	0.000	INR Zero Only
48	Freight Charge for INR portion of Mouda	1	SET	INR			0.00		0.000	0.000	INR Zero Only
49	Type test Charges, if applicable	1	Lot	INR			0.00		0.000	0.000	INR Zero Only
Total in Figures									0.000	0.000	INR,USD,EUR Zero Only

Quoted Rate in Words	INR,USD,EUR Zero Only
----------------------	-----------------------

Note: Customs duty for imported quotation will be calculated by BHEL as per applicable statutory rates.



A4-10

CE/416/PAT-MOU/UPS

REV 00

PAGE 01 OF 02

PROJECT : 1) PVUNL PATRATU (3x660 MW)  
2) MOUDA STG-I (2x500 MW) FGD PACKAGE

CUSTOMER : M/s NTPC

SPECIFICATION  
FOR  
UNINTERRUPTIBLE POWER SUPPLY SYSTEM(UPS)

**PQR:**

The UPS system offered for this project, shall have at least one (1) years satisfactory operation prior to the date of 03-03-2017 in one (1) power station for a rating of 105 kVA or above.

Satisfactory Performance Certificate from End User shall be submitted for verification. In absence of this Satisfactory Performance Certificate from End-User, technical offers submitted by any vendor will get rejected.

In case, if any vendor is meeting the PQR and is non-approved vendor of M/s NTPC, credentials of such vendor will be sent to M/s NTPC for approval. Technical acceptance of vendor will be subject to vendor approval from M/s NTPC.

REVISION:00

APPROVED

AMIT KUMAR SHARMA

PREPARED

ISSUED

DATE

SATHISH

416

08/09/2021

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 ANY WAY DETRIMENTAL TO THE INTEREST OF THE COMPANY.





A4-11

CE/416/PAT-MOU/UPS

REV 00



PAGE 02 OF 02

## CONTENTS

Sl. No.	Description	Reference.
1.	Scope of Supply	CE/416/PAT-MOU/UPS/SOS, Rev.00 Sheets 07
2.	Technical Requirements	CE/416/PAT-MOU/UPS/TR, Rev.00 Sheets 11
3.	Feeder List	CE/416/PAT-MOU/UPS/FL, Rev.00 Sheets 04
4.	Typical Battery Sizing Calculation	CE/416/PAT-MOU/UPS/BSC, Rev.00 Sheets 03
5.	Type & Routine Acceptance Test	CE/416/PAT-MOU/UPS/TRT, Rev 00 Sheets 05

**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 ANY WAY DETRIMENTAL TO THE INTEREST OF THE COMPANY.

		<div><div><div><div><div><div></div><div>बि एच ई एल</div></div><div><div><div><div><div></div><div>A4-10</div></div></div></div></div></div></div></div></div>		<div>CE/416/PAT-MOU/UPS/SOS</div> <div>REV 00</div> <div>PAGE 01 OF 06</div>
		<div>PROJECT : 1) PVUNL PATRATU (3x660 MW) 2) MOUDA STG-I (2x500 MW) FGD PACKAGE</div> <div>CUSTOMER : M/s NTPC</div> <div>SCOPE OF SUPPLY</div>		
<div>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 ANY WAY DETRIMENTAL TO THE INTEREST OF THE COMPANY.</div>		<div>REVISION:00</div>	<div>APPROVED</div> <div></div> <div>AMIT KUMAR SHARMA</div>	
			<div>PREPARED</div> <div></div> <div>SATHISH</div>	<div>ISSUED</div> <div>416</div>



A4-11

CE/416/PAT-MOU/UPS/SOS

REV 00

PAGE 02 OF 06

SCOPE OF SUPPLY

Following UPS systems shall be as per Technical Requirement Ref: CE/416/PAT-MOU/UPS/TR and detailed Scope of Supply.

## I. PROJECT: PVUNL PATRATU (3x660 MW)

## A) BILL OF MATERIAL:

**UPS Configuration A:** UPS System shall consist of 2x100% chargers and inverters, 1x100% Ni Cd battery bank for one (1) hour backup, bypass line transformers & voltage stabilizer, manual bypass switch, 2x100% ACDB, 1x100% Microprocessor controlled Battery Health Monitoring System (BHMS), 1x100% Static Switch cubicle and other necessary protective devices and accessories.

**Accessories:** Anti-vibration Pad, Base Frame, Interconnecting cables, Cable Glands & Lugs for interconnecting cables and 415V Incoming Power Cable, Interconnecting cables (30 meters per run) along with lugs at both BHMS and Battery end for BHMS, MODBUS TCP/IP, etc.

S.NO	LOCATION	UPS RATING	ACDB-1 FEEDERS	ACDB-2 FEEDERS	STATIC SWITCH QTY	QTY	E&C QTY
1	Unit-1	2 x 150 kVA	143	143	10	1 Set	1 AU
2	Unit-2	2 x 150 kVA	143	143	4	1 Set	1 AU
3	Unit-3	2 x 150 kVA	143	143	4	1 Set	1 AU
4	Compressor House	2x10 kVA	5	5	-	1 Set	1 AU

## B) BILL OF MATERIAL:

**UPS Configuration B:** UPS System shall consist of 1x100% charger and inverter, 1x100% Ni Cd battery bank\* for one (1) hour backup, bypass line transformers & voltage stabilizer, manual bypass switch, 2x100% ACDB, 1x100% Microprocessor controlled Battery Health Monitoring System (BHMS) and other necessary protective devices and accessories.

**Accessories:** Anti-vibration Pad, Base Frame, Interconnecting cables between all panels, Cable Glands & Lugs for interconnecting cables and 415V AC incoming power cables, Interconnecting cables (30 meters per run) along with lugs at both BHMS and Battery end for BHMS, MODBUS TCP/IP, Provision for mounting smoke detectors in UPS, ACDB and Static Switch panels, etc.

S.NO	LOCATION	UPS RATING	ACDB-1 FEEDERS	ACDB-2 FEEDERS	QTY	E&C QTY
5	CHP	1x25 kVA	25	25	1 Set	1 AU
6	AHP	1x20 kVA	25	25	1 Set	1 AU
7	Water System	1x20 kVA	28	28	1 Set	1 AU
8	PADO simulator	1x45 kVA	30	30	1 Set	1 AU
9	FGD	1x80 kVA	65	65	1 Set	1 AU

\* Battery being procured by BHEL separately from Battery Manufacturer (*Battery AH rating for sizing Charger & Transformer shall be calculated as per Battery sizing methodology attached*).



A4-11

CE/416/PAT-MOU/UPS/SOS

REV 00

PAGE 03 OF 06

I. PROJECT: PVUNL PATRATU (3x660 MW)

**b) INTERCONNECTION CABLES BILL OF MATERIAL \*\***

S. NO	LOCATION	UNINYVIN CABLE TYPE		NO OF RUNS/ POLE		METERS PER RUN		TOTAL QTY (mtrs)	TOTAL MODBUS CABLE QTY (mtrs)
		UPS to BATTERY	UPS to ACDB	UPS to BATTERY	UPS to ACDB	UPS to BATTERY	UPS to ACDB		
1	Unit-1	Size 0000	Size 0000	3	2	75	15	570	100
2	Unit-2	Size 0000	Size 0000	3	2	75	15	570	100
3	Unit-3	Size 0000	Size 0000	3	2	75	15	570	100
4	CHP	Size 0	Size 0	1	1	40	15	140	50
5	AHP	Size 0	Size 0	1	1	40	15	140	50
6	Water System	Size 0	Size 0	1	1	40	15	140	50
7	Compressor House	Size 4	Size 4	1	1	40	15	140	50
8	PADO simulator	Size 00	Size 00	1	1	40	15	140	50
9	FGD	Size 0000	Size 0000	1	1	75	15	210	50

\*\* Please note that above mentioned BOQ of Uninyvin cable and MODBUS cable shall be supplied in a roll/drum (without cutting) as per maximum length required above & available with Cable Manufacturer

**c) MANDATORY SPARES FOR COMPLETE PROJECT - 1 SET****1 Set comprises of following:-**

- |        |   |                              |
|--------|---|------------------------------|
| (i)    | Silicon controlled thyristors, diodes and power transistors.        | 100 %                        |
| (ii)   | Capacitors  | 1 set                        |
| (iii)  | CT's, CVT's VT's chokes AC/DC isolators, contactors timers, relays. | 10% of each type and rating. |
| (iv)   | Fuses of each types and rating                                      | 200%                         |
| (v)    | Fuse free Circuit breakers  | 5% of each type and rating   |
| (vi)   | Electronic modules  | 10% of each type             |
| (vii)  | Indication lamps  | 100% of each type            |
| (viii) | Lamp holders with series resistor, if any                           | 10% of each type             |
| (ix)   | Cooling Fans  | 2 nos. of each type          |
| (x)    | Digital/analog panel meters/ Indicators                             | 1 no. of each type           |
| (xi)   | Relays of all types including overload relays.                      | 10%                          |
| (xii)  | Static Switch   | 10% of each type and rating. |

Please note that fuses mentioned under mandatory spares shall be provided against ACDB requirement also, apart from requirement under complete charger/inverter combinations.

d) TRAINING - 2 days training at site for M/s PVUNL & M/s NTPC personnels

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 ANY WAY DETRIMENTAL TO THE INTEREST OF THE COMPANY.



A4-11

CE/416/PAT-MOU/UPS/SOS

REV 00

PAGE 04 OF 06

SCOPE OF SUPPLY

Following UPS systems shall be as per Technical Requirement Ref: CE/416/PAT-MOU/UPS/TR and detailed Scope of Supply.

## II. PROJECT: MOUDA FGD (2x500 MW) FGD PACKAGE

## A) BILL OF MATERIAL:

**UPS Configuration B:** UPS System shall consist of 1x100% charger and inverter, 1x100% Ni Cd battery bank\* for one (1) hour backup, bypass line transformers & voltage stabilizer, manual bypass switch, 2x100% ACDB, 1x100% Microprocessor controlled Battery Health Monitoring System (BHMS) and other necessary protective devices and accessories.

**Accessories:** Anti-vibration Pad, Base Frame, Interconnecting cables between UPS & SCVS, Cable Glands & Lugs for 415V AC incoming power cables, UPS to Battery, UPS to Battery, Interconnecting cables (30 meters per run) along with lugs at both BHMS and Battery end for BHMS, MODBUS TCP/IP along with 50 meter cable, etc.


S.NO	LOCATION	UPS RATING	ACDB-1 FEEDERS	ACDB-2 FEEDERS	QTY	E&C QTY
1	FGD	1x50 kVA	41	41	1 Set	1 AU

\* Battery being procured by BHEL separately from Battery Manufacturer (*Battery AH rating for sizing Charger & Transformer shall be calculated as per Battery sizing methodology attached*).

**Note:** Interconnecting cables between UPS and Battery, UPS and ACDB in BHEL scope. Cable Glands and Lugs shall be provided by UPS Manufacturer for cables mentioned below:

- 415V AC MCC to UPS Incomer : 3C x 35 sq.mm Aluminium conductor
- UPS to Battery : 2C x 70 sq.mm Copper
- UPS to ACDB-1 & II: 2C x 70 sq.mm Copper



		 A4-11	CE/416/PAT-MOU/UPS/SOS REV 00 PAGE 05 OF 06
		<p><u>1.0 GENERAL TECHNICAL REQUIREMENTS</u></p> <p><u>1.1</u> Only the type tested (in the last 10 years), electronic modules will be acceptable unless otherwise decided by the purchaser in special circumstances.</p> <p><u>1.2</u> For UPS, the type test shall be as per IEC-146, Degree of Protection test as per IS-2147 and the same are not to be specifically conducted for the projects if conducted on similar type/rating or similar type/ higher rating UPS. If type tests are not available with supplier, then type tests has to be conducted and reports has to be submitted without any price implication to BHEL.</p> <p><u>1.3</u> Routine &amp; Acceptance tests shall be done as per relevant standards. Temperature rise test is also to be done 100% for 10-12 hours duration each time (till temperature stabilizes).</p> <p><u>1.4</u> Erection supervision &amp; commissioning of Battery with overall integration of complete system is responsibility of UPS vendor.</p>	
<p style="text-align: center;"><b>COPY RIGHT AND CONFIDENTIAL</b>  THE INFORMATION ON THIS DOCUMENT IS THE PROPERTY OF BHARAT HEAVY ELECTRICALS LIMITED . IT MUST NOT BE USED DIRECTLY OR INDIRECTLY IN ANY WAY DETRIMENTAL TO THE INTEREST OF THE COMPANY</p>		<p><u>2.0</u> DOCUMENTS TO BE FURNISHED</p> <p>2.1. After Placement of Purchase order: Vendor must submit soft copy of following documents for submission to Customer / Consultant.</p> <p>A. a) Datasheet/Drawings of UPS System:</p> <ul style="list-style-type: none"> <li>a) Covering Sheet</li> <li>b) Index Sheet</li> <li>c) Scope of Supply</li> <li>d) Charger &amp; Transformer Sizing Calculation</li> <li>e) Technical datasheets of UPS, Stabilizer, ACDB, BHMS, PDB, etc.</li> <li>f) Heat Loss Calculation</li> <li>g) Bill of Material of UPS, Stabilizer, ACBD, BHMS, Cable Glands &amp; Lugs, PDB, etc.</li> <li>h) Panel GA drawings including Internal View of UPS, Stabilizer, ACDB, BHMS, PDB, etc.</li> <li>i) Single Line Diagram</li> <li>j) Interconnection Drawing</li> <li>k) Earthing Drawing</li> <li>l) Power Circuit Drawing</li> <li>m) Analog &amp; Binary Signal List (pdf &amp; excel format)</li> <li>n) ACDB Termination drawing along with feeder termination details in Excel Sheet.</li> <li>o) UPS System Functional Description</li> <li>p) Catalog</li> </ul>	



A4-11

CE/416/PAT-MOU/UPS/SOS

REV 00

PAGE 06 OF 06

**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 ANY WAY DETRIMENTAL TO THE INTEREST OF THE COMPANY

2.2 Along with the materials being dispatched: Vendor must send the following “As Built & **Approved**” status documents one (1) in soft copy & one (1) in hard copy.

- (a) Instruction/O&M Manual
- (b) Bill of Material
- (c) Data Sheets
- (d) Technical literatures/Catalogs
- (e) Drawings GA/layout/wiring/interconnection/schematic, etc.

2.3 After dispatch of material within 1 week : Vendor must send the following “**As Built & Approved**” status documents one (1) in soft copy to BHEL-EDN.

- (a) Instruction/O&M Manual
- (b) Bill of Material
- (c) Data Sheets
- (d) Technical literatures/Catalogs
- (e) Drawings GA/layout/wiring/interconnection/schematic, etc.

NOTE: One (01) set soft copy of Final document shall also be provided to BHEL. The soft copy shall be in CD-ROM media and shall in Acrobat (pdf) formats.



A4-10

CE/416/PAT-MOU/UPS/TR

REV 00

PAGE 01 OF 10

PROJECT : 1) PVUNL PATRATU (3x660 MW)  
2) MOUDA STG-I (2x500 MW) FGD PACKAGE

CUSTOMER : M/s NTPC

## TECHNICAL REQUIREMENTS

**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 ANY WAY DETRIMENTAL TO THE INTEREST OF THE COMPANY.

REVISION:00

APPROVED

AMIT KUMAR SHARMA

PREPARED

SATHISH

ISSUED

416

DATE

08/09/2021

## Uninterruptible Power Supply (UPS) system including UPS Battery

### GENERAL

The requirements of Electrical Power Supply system are specified herein on system basis. The bidder shall be responsible for engineering and furnishing a complete and operational system fully meeting the intent and requirements of this specification including tender drawings and owner approved drawings during detailed engineering. All equipment and accessories required for completeness of this system shall be furnished by the Bidder whether these are specifically mentioned herein or not. **All the equipment's and sub systems offered shall be from reputed experienced manufacturers.** All system cabinets, enclosures & distribution boards shall be manufactured, assembled, wired and fully tested as a complete assembly as per the requirements of this specification **at the manufacturer's works.**

The Bidder shall furnish all required equipment cubicles and wiring required for conversion and/or stabilization of the power sources provided by the owner to all other levels which may be necessary for meeting the individual requirement of equipment/system furnished by him including the panel/desk mounted equipment.

Bidder shall also provide local power supply distribution boxes on as required basis for sub-distribution of all 230V AC for various field mounted instruments/devices (e.g., Analyzers etc.). The power supply distribution box shall include necessary change over circuitry (as applicable), switch fuse units, MCB, terminal blocks, etc. suitable for the application. The sub distribution of feeders in a local power D.B shall be finalized during detailed engineering.

The UPS Power supply for various sub-systems shall consist of the following configuration.

Bidder shall clearly bring out in the proposal the redundancy feature along with configuration **diagram, single line diagram and data sheets etc. & this shall be finalized subject to Owner's approval during detailed engineering.**

The PDBs provided for distribution of UPS loads shall be as per following guidelines.

Each PDB shall be provided with input feeder monitoring through potential free contact wired to DCS.

The output feeders from the PDB shall be provided with separate fuse & MCB's.



A4-11

CE/416/PAT-MOU/UPS/TR

REV 00

PAGE 03 OF 10

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 ANY WAY DETRIMENTAL TO THE INTEREST OF THE COMPANY.

Following general requirements shall be met for ensuring proper branch and circuit protection.

**I.** The feeder fuse ampere rating and feeder conductor capacity must be at least 100% of the non-continuous load plus 125% of the continuous load as calculated per Article 220 (220-10G) of NEC code - 1984. The feeder conductor must be protected by a fuse not greater than the conductor capacity.

**II.** For circuit with transformers requirements for conductor protection articles 240 and 310 of NEC must be observed. If secondary fuse protection is not provided then the primary fuses must not be sized larger than 125% of the transformer primary full-load amperes.

If secondary fuses are sized not greater than 125% of transformer secondary current, individual transformer fuses are not required in the primary provided the primary feeder fuses are not larger than 250% of the transformer rated primary current.

The minimum capacity of the UPS at load factor of 0.8 lagging at 50 deg C.

The UPS System shall meet the following requirements as a minimum.

**1.0** If UPS KVA rating is applicable at a lower ambient temperature than specified 50°C the bidder shall consider a derating factor of at least 1.5%/°C for arriving at the specified UPS capacity at 50 deg C ambient. The UPS shall have an over load capacity of 125% rated capacity for 10 minutes and 150% rated capacity for 10 seconds. The inverter shall have sufficient I<sup>2</sup>t capability to clear fault in the maximum rated branch circuit limited to 8 percent of finally selected UPS capacity.

## **2.0** Chargers

**2.0.1** The 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 a close voltage stability even when AC supply voltage fluctuates, effective current limiting features and filters to minimize harmonics. The charger should be capable to fully charge the required batteries as well as supply the full rated load through inverter. Furthermore the charger should be able to re-charge the fully discharged battery within 8 hours. The charger output regulation shall be ±1% from no load to full load with an input power supply variation of ±10% in voltage and ±5% in frequency. In addition to indications/display on charger panel, alarms along with relevant analog measurements shall also be provided by employing Modbus TCP/IP Protocol for use in DDCMIS. The list of alarm output & 4-20 mA signals shall be as approved by owner during detailed engineering.

**2.0.2** The charger shall be current limited for charger circuit protection of battery from overcharge shall also be provided. The current limit shall be continuously adjustable. **The** charger shall have a slow walk-in circuit which shall prevent application of full load DC current in less than 10 seconds after AC power is energized.





A4-11

CE/416/PAT-MOU/UPS/TR

REV 00

PAGE 04 OF 10

**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 ANY WAY  
DETRIMENTAL TO THE INTEREST OF THE COMPANY.

**2.0.3** The chargers shall be served from a 415V, 50 Hz, 3 phase 3 wire system. Charger design shall ensure that there is no component failure due to fluctuations of input supply or loss of supply and restoration.

**2.0.4** The minimum full load efficiency at nominal input and output shall be 90%. The ripple content shall be limited to +/-2% of Charger Output Voltage.

2.0.5 The UPS battery shall have sufficient amp-hour capacity to supply the steady state kVA rating of the UPS specified for 60 minute, irrespective of the actual load on UPS.

2.0.6 The UPS 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.

**2.0.7** The UPS system design shall ensure that in case of failure of mains input power supply to one of the chargers, the charger whose mains input power supply is healthy, shall feed to one or **both the inverters as the case may be as per manufacturer's** standard practice & continue to charge the D.C battery at all load conditions. The Bidder should note that this situation should not in any way lead to the discharge of the D.C battery.

### 3.0 STATIC INVERTER


The static inverter shall be continuous duty, solid state type using proven pulse width modulation (PWM) / Quasi square wave /step wave technique. Ferro-resonant type 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, automatic synchronization, etc. The steady state voltage regulation shall be  $\pm 2\%$  and transient voltage regulation (on application/removal of 100% load) shall be  $\pm 20\%$ . Time to recover from transient to normal voltage shall not be more than 50 msec. Frequency regulation for all conditions of input supplies, loads and temperature occurring simultaneously or in any combination shall be better than 0.5% (automatically controlled). The total harmonic content shall be 5% maximum and content of any single harmonic shall be 3% maximum. The inverter efficiency shall be at least 85% on full load and 80% on 50% load. The synchronization limit for maintenance of synchronization between the inverter and stand by AC source shall be 48-52Hz, field adjustable in steps of 1Hz.

### 4.0 Static Switch and Manual bypass switch:

The static switch shall be provided to perform the function of transferring UPS loads automatically without any break from (i) faulty inverter to healthy inverter in case of failure of one of the two inverters and (ii) from faulty inverter to standby AC source in case of failure of both the inverters. The transfer time shall be  $\frac{1}{4}$  cycle maximum in synchronous mode.

Manual bypass switch shall be employed for isolating the UPS during maintenance

Continuous and overload capacity of the switches shall be equal to 100% of the continuous and overload rating of each inverter. Peak capacity shall be 1000% of continuous rating for 5 cycles.

		 A4-11	CE/416/PAT-MOU/UPS/TR REV 00 PAGE 05 OF 10
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 ANY WAY DETRIMENTAL TO THE INTEREST OF THE COMPANY.		5.0 STEP DOWN TRANSFORMER & VOLTAGE STABILIZER	
		<p>One 415V three phase to 230V, single phase transformer along with associated voltage stabilizer shall be furnished with each UPS system. The transformer and stabilizer combination shall convert owner furnished 415V +/- 10% three phase plant auxiliary AC supply to 230V +/- 2%, single phase standby AC power supply source.</p> <p>The transformer shall be of low impedance air-cooled type and its kVA rating and percentage impedance should be selected so that extremely fast fault clearance is achieved.</p> <p>The overload capacity of the transformer/stabilizer shall not be less than 300% for 200 ms duration. The voltage stabilizer shall employ servo controlled circuitry and shall maintain the specified output voltage for 0-100% load with maximum input voltage variations as indicated above. The efficiency of the stabilizer shall be 95% or better.</p>	
		6.0 AC Distribution Board (ACDB)	
		<p>The details of the AC distribution board i.e., exact, rating and number of feeders, etc of 2x100% ACDB shall be as per attached feeder list.</p>	
		7.0 BATTERIES	
		<p><b>7.0.1 Ni-Cd Battery Bank for 1 hour backup. Battery will be procured by BHEL separately from Battery Manufacturer.</b></p>	
		8.0 Auxiliary Equipment's	
		<p>8.0.1 All required equipment's/materials shall be furnished with each rectifier bank, UPS &amp; battery bank and shall include as a minimum various meters (AC/DC voltage/current, kVA, power factor, frequency meters etc.), circuit breakers, selector switches, push buttons indicating lights, ground detector system, battery accessories like (inter cell connectors, inter step connectors, battery racks, etc.). Isolated 4-20 mA signals for important parameters and potential free contacts for important alarms shall be provided for use in DCS.</p> <p>Manual Discharge Resistor Bank of adequate capacity shall be provided by the UPS Manufacturer for Unit (150 kVA) - 1 Set &amp; PADO Simulator (45 kVA) - 1 Set.</p> <p>1 Set DRB shall be provided for 18 cells, 441 Ah Battery.</p> <p>Total 3 Sets of DRB shall be provided.</p>	



A4-11

CE/416/PAT-MOU/UPS/TR

REV 00

PAGE 06 OF 10

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 ANY WAY DETRIMENTAL TO THE INTEREST OF THE COMPANY.

## 9.0 Battery Racks

Two tier battery racks of mild steel construction in accordance with applicable codes and standard shall be provided. AISC specification shall apply in absence of another design specification. The batteries are to be mounted on insulated sub-frames with the necessary consoles and fixing material and these battery racks shall be designed to take care of corrosive environment.

## 10.0 CABINETS / ENCLOSURES

The construction details for power supply system Cabinets/ Enclosure / Racks shall conform to the requirements of the following paragraphs.\

- (1) Equipment enclosures shall match and line up in assemblies of freestanding floor mounted cabinets designed for indoor service.
- (2) 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.
- (3) Each assembly may be shipped in sections for ease of handling and field assembly. Terminal blocks shall be furnished as required adjacent to each shipping split to facilitate field assembly. Cable bundles cut to the required length and furnished with terminal lugs tagged for identification shall be provided for the wiring between shipping sections.
- (4) Adequate ventilating louvers and enclosure top panels shall be included. All vent openings shall be covered with corrosion resistant fine screen coverings.
- (5) The temperature rise inside all the cabinets/enclosures shall not exceed 10 deg C above ambient temperature. The cabinets shall be IP-22 protection class.
- (6) The color shade of panels exterior/interior shall be as per RAL 9002, end panel color shall be as per RAL 5012.

## 11.0 Cooling System

If the equipment supplied requires forced air cooling, the cooling system furnished shall meet the following requirements:

- (a) Reserve cooling equipment shall be furnished for each switch board assembly. Reserve fan capacity shall be equal to 100 percent of cooling fan requirements for full load operation with only one bank of inverter/rectifier in service at the specified maximum ambient temperature.
- (b) Completely independent duplicate wiring and control system shall be provided for the normal cooling fan system the reserve cooling fan system.
- (c) Each cooling fan shall normally run continuously and shall be powered from the output of the inverter whose enclosure it serves (for cubicle housing inverters). Each cooling fan supply circuit shall be separately fused.
- (d) Each cooling fan shall be equipped with an air flow switch having an alarm contact that closes upon failure of air flow or rise of temperature.



A4-11

CE/416/PAT-MOU/UPS/TR

REV 00

PAGE 07 OF 10

## 12.0 BATTERY HEALTH MONITORING SYSTEM

BHMS, wherever applicable, shall include microprocessor based hardware and software to monitor the condition of each battery cell of 24V DC systems & UPS battery banks on-line. With BHMS it shall be possible to measure & analyze the minimum and maximum voltage values of each battery cell so that any damage to battery shall be prevented by pro-active maintenance. BHMS shall communicate with the DCS and provide necessary alarms.


OTHER POINTS:-

- 4-20 mA Transducers for Output Voltage, Current & Frequency Transducers shall be provided in each limb of UPS System. If these transducers are provided in ACDB panel as per manufacturer standard, then these transducers should be provided in each ACDB.
- Battery Current & Voltage transducers shall be provided.

**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 ANY WAY DETRIMENTAL TO THE INTEREST OF THE COMPANY.



<div>COPY RIGHT AND CONFIDENTIAL</div> <div>THE INFORMATION ON THIS DOCUMENT IS THE PROPERTY OF BHARAT HEAVY ELECTRICALS LIMITED. IT MUST NOT BE USED DIRECTLY OR INDIRECTLY IN ANY WAY DETRIMENTAL TO THE INTEREST OF THE COMPANY.</div>		<div><div><div>भारत भारत</div><div></div><div>A4-11</div></div></div>	CE/416/PAT-MOU/UPS/TR
			REV 00
			PAGE 09 OF 10
<div>13.0 SITE TESTS</div> <div>The Bidder shall also carry out the site tests on equipments/systems as specified below. However, these shall not be limited to this specification only and in case any other site test is required to be conducted as a standard practice of Bidder or deemed necessary by the owner and mutually agreed between bidder and owner, the same shall also be carried out.</div> <div>Functional Test</div> <div>On completion of installation and commissioning of the equipment the following tests/checks shall be carried out with the maximum available load, which does not exceed the rated continuous load. These tests/checks shall include but not limited to the tests as indicated below. The details of the tests are as indicated below:</div> <div><div>1. Light Load Test</div><div>This test is carried out to verify that the UPS 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:</div><div><div>(a)Output voltage, frequency and the correct operation of meters;</div><div>(b)Operation of all control switches and other means to put units into operation.</div><div>(c)Functioning of protective and warning devices.</div><div>(d)Operation of remote signaling and remote control devices.</div></div><div><div>2. Checking of Auxiliary Devices</div><div>The functioning of auxiliary devices, such as lighting, cooling, pumps, fans annunciation, etc., should be checked, if convenient, in conjunction with the preliminary light load test.</div></div><div><div>3. Synchronization Test</div><div>If possible, frequency variation limits should be tested by use of a variable frequency generator, otherwise, by simulation of control circuit conditions. If applicable the rate of change of frequency during synchronization shall be measured.</div></div><div><div>4. A. C Input Failure Test</div><div>The test is performed with a fully charged battery and is carried out by tripping input circuit breakers or may be simulated by switching off all UPS rectifiers and bypass feeder as at the same time. Output voltage variations are to be checked for specified limits with an oscilloscope or equivalent. Frequency variation is defined as the steady state frequency of the UPS with and without AC input. The rate of change of frequency is measured by the time it takes to reach steady-state values.</div></div><div><div>5. A. C Input Return Test</div><div>AC input return test is performed by closing AC input circuit breakers, or is simulated by energizing rectifiers and bypass feeders.</div><div>Proper operation of rectifier starting and voltage and frequency variations are to be observed.</div><div>Note: This test is normally performed with a fully or partially charged battery.</div></div></div>			



A4-11

CE/416/PAT-MOU/UPS/TR

REV 00

PAGE 10 OF 10

**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 ANY WAY DETRIMENTAL TO THE INTEREST OF THE COMPANY.

**6. Simulation of Parallel Redundant UPS Fault**

This test is applicable for UPS with parallel redundant connections. Faults of rectifier or inverter units may be carried out by simulation. Output transients are to be observed.

**7. Transfer Test**

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.

**8. Full load test**

Load tests are performed by connecting the actual load to the UPS output.

Large UPS in parallel connection may be load tested by testing the individual UPS units separately. Load tests are necessary for testing output voltage and frequency, rated stored energy, recharge time, ventilation, temperature rise and determination of efficiency. Load tests are performed to prove, transient voltage deviations specified under step load conditions.

**9. Efficiency**

Efficiency should be determined by the measurement of the active power at input and output.

**10. Actual Load Test**

Conditions under actual load may differ from those with a dummy load. Steady-state generation of current and voltage harmonics and transients at load switching conditions should be observed.

**11. Current Division in Parallel -**

Load sharing between the Modular DC power supply rectifier banks & UPS units shall be measured with actual load under conditions of parallel operation.

**12. 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, 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 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.

**13. 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.

**14. 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.



A4-11

CE/416/PAT-MOU/UPS/TR

REV 00

PAGE 11 OF 11

**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 ANY WAY DETRIMENTAL TO THE INTEREST OF THE COMPANY.

#### 15. On Site Ventilation Test

The test is performed with the actual load. Temperatures conditions of all UPS cubicles are to be observed.

#### 16. Overload Capability Test

Overload capability test is a load test. Specified values of short time overload or starting up sequences of actual load are to be applied for the time interval specified. Specified values of voltage and current are to be recorded.

#### 17. Short Circuit Current Capability

If short-circuit current capability is specified, it may be tested by applicable of a short circuit to UPS output if necessary, via suitable fuse, short circuit is to be recorded.

#### 18. Short Circuit Fuse Test

Fuse tripping capability of a UPS shall be tested, by short-circuiting the UPS output via a fuse of specified type.

The test shall be repeated to ensure against fuse non-uniformity and switching time during the cycle. The test is carried out at an appropriate UPS load, under normal operation, if not otherwise specified by Owner.

#### 19. Restart

Automatic or other restart means are to be tested after a completed shut-down of UPS as specified.

#### 20. Output over voltage

Output over voltage protection is to be checked.

#### 21. Periodic Output Voltage Modulation

When this test is specified, it may be checked by voltage recording at different loads and operating conditions.

#### 22. Harmonic Conditions

Harmonic components of output voltage shall be checked with the actual load. Methods of **specification and checking shall be subject to Owner's approval.**

#### 23. Earth Fault Test

If the UPS output is isolated from earth, then an earth fault can be applied to any output terminal. UPS output transients (if any) shall be measured.

If the battery is isolated from earth, then an earth fault can be applied to any output terminals. UPS output transient (if any) shall be measured.



A4-10

CE/416/PAT-MOU/UPS/FL

REV 00

PAGE 01 OF 04

**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 ANY WAY DETRIMENTAL TO THE INTEREST OF THE COMPANY.

PROJECT : 1) PVUNL PATRATU (3x660 MW)  
2) MOUDA STG-I (2x500 MW) FGD PACKAGE

CUSTOMER : M/s NTPC

## FEEDER LIST

Note:

- 1) For offsite locations namely **AHP, CHP, Compressor House, Hydrogen Generation Plant**, Feeder List will be provided during detailed engineering.
- 2) For the feeder quantities mentioned against above locations

REVISION:00

APPROVED

AMIT KUMAR SHARMA

PREPARED

SATHISH

ISSUED

416

DATE

08/09/2021



230V AC UPS FEEDER / LOAD LIST - PATRATU STPP EXPN Ph-I (3x800 MW)								
A)	TG C&I PACKAGE							
S.NO	FEEDER DESCRIPTION	NO. OF FEEDERS ACDB-1	NO. OF FEEDERS ACDB-2	LOAD IN AMPS	kVA RATING OF EACH FEEDER	TOTAL KVA	MCB RATING (in Amps)	FUSE RATING (in Amps)
1	TSI BFPDT - A & B (CWV01, CWV51)	1	1	6.00	1.38	1.38	10	16
	TOTAL	1	1			1.38	kVA	
B)	SG C&I PACKAGE							
S.NO	FEEDER DESCRIPTION	NO. OF FEEDERS ACDB-1	NO. OF FEEDERS ACDB-2	LOAD IN AMPS	kVA RATING OF EACH FEEDER	TOTAL KVA	MCB RATING (in Amps)	FUSE RATING (in Amps)
1	FLAME SCANNER-1 (RTP) (CJF77) R1	2	2	5.00	1.15	1.15	10	16
2	FLAME SCANNER-2 (RTP) (CJF78) R1	1	1	10.87	2.50	2.50	16	20
	TOTAL	3	3			3.65	kVA	
C)	HMI PACKAGE							
S.NO	FEEDER DESCRIPTION	NO. OF FEEDERS ACDB-1	NO. OF FEEDERS ACDB-2	LOAD IN AMPS	kVA RATING OF EACH FEEDER	TOTAL KVA	MCB RATING (in Amps)	FUSE RATING (in Amps)
1	Power Distribution Panel (PDPH01), Refer Note-2,3,4	1	1	6.26	1.44	1.44	16	20
2		1	1	6.26	1.44	1.44	16	20
3		1	1	12.36	2.84	2.84	32	36
4		1	1	9.83	2.26	2.26	32	36
5	Network Panel Station LAN-AC(A) (NWPS01) R2	1	0	19.00	4.37	4.37	32	36
6	Refer Note-2,3,4	0	1	18.00	4.14	4.14	32	36
7	Network Panel Station LAN-AC(B) (NWPS02) R2	1	0	4.00	0.92	0.92	16	20
8	Refer Note-2,3,4	0	1	3.00	0.69	0.69	16	20
9	Network Panel HMI (NWP03)	1	0	7.61	1.75	1.75	10	16
10		0	1	7.61	1.75	1.75	10	16
11	Network Panel offsite CR (NWPC02) R2	1	0	20.40	4.69	4.69	32	36
12	Refer Note-5	0	1	20.40	4.69	4.69	32	36
	TOTAL	8	8			30.99	kVA	
D)	BOP-OTHER LOADS							
S.NO	FEEDER DESCRIPTION	NO. OF FEEDERS ACDB-1	NO. OF FEEDERS ACDB-2	LOAD IN AMPS	kVA RATING OF EACH FEEDER	TOTAL KVA	MCB RATING (in Amps)	FUSE RATING (in Amps)
1	Oxygen Analyser - Low Temperature	5	0	1.30	0.3	1.5	4	6
		0	5	1.30	0.3	1.5	4	6
2	Oxygen Analyser - High Temperature	2	0	1.30	0.3	0.6	4	6
		0	2	1.30	0.3	0.6	4	6
3	Mercury Analyser	1	1	8.70	2	2	16	20
4	Opacity Monitor	1	1	4.35	1	1	6	10
5	Flue Gas Analyser SOx/NOx/CO/CO <sub>2</sub> at Chimney	1	1	6.96	1.6	1.6	10	16
6	SWAS R1	1	1	13.04	3	3	20	25
7	Level Switch Conductivity type	2	2	0.07	0.015	0.03	4	6
8	Level Switch Capacitance type	4	4	0.07	0.015	0.06	4	6
9	CCTV System R1	1	0	20.87	4.8	0.35	32	36
10	Coal Bunker Level Monitoring System Control Panel R1	1	0	2.61	0.6	0.6	4	6
		0	1	2.61	0.6	0.6	4	6
11	HART Management System R1	1	1	5.22	1.2	1.2	10	16
12	Master Slave clock system R1	1	1	5.22	1.2	1.2	10	16
13	DAVR	1	1	4.35	1	1.00	6	10
14	ECP R1	1	1	6.00	1.38	1.38	10	16
15	TRANSDUCER & AVT PANEL	1	1	5.22	1.2	1.2	10	16
16	Oxygen Analyser - Low Temperature at Aux Boiler R1	0	1	1.30	0.3	0.3	4	6
17	Ultrasonic Flue Gas Flow Meter at Chimney R1	1	0	2.17	0.5	0.5	4	6
18	Nox Analyser at SCR R1	2	0	5.22	1.2	2.4	10	16
		0	2	5.22	1.2	2.4	10	16
19	Vibration Analysis server R1	1	0	2.17	0.5	0.5	4	6
20	Printer for Vibration Analysis System R1	0	1	1.30	0.3	0.3	4	6
21	Coal Bunker Level Monitoring System Bargraph Indicator Panel R1	5	0	0.43	0.1	0.5	4	6
		0	4	0.43	0.1	0.4	4	6
22	C&I Lab (Mechanical & Electrical scope) R1	2	2	4.35	1	2	6	10
23	CCTV System - CPA R1	0	1	20.87	4.8	0.35	32	36
	TOTAL	35	34			29.07	kVA	

E)	BHEL-TRICHY R1							
S.NO	FEEDER DESCRIPTION	NO. OF FEEDERS ACDB-1	NO. OF FEEDERS ACDB-2	LOAD IN AMPS	kVA RATING OF EACH FEEDER	TOTAL KVA	MCB RATING (in Amps)	FUSE RATING (in Amps)
1	AH-Air Motor Air Solenoid	1	0	0.09	0.02	0.02	4	6
		0	1	0.09	0.02	0.02	4	6
2	SCR inlet Hopper Ash Level Switches	6	0	0.07	0.015	0.09	4	6
		0	6	0.07	0.015	0.09	4	6
3	LFO Flow Meter	0	1	0.22	0.05	0.05	4	6
4	Steam Tube Leak Detection System	1	0	2.17	0.5	0.50	4	6
5	Steam Tube Leak Detection System Workstation	0	1	1.30	0.3	0.30	4	6
6	Acoustic Pyrometer	1	0	13.04	3	3.00	20	25
		0	1	13.04	3	3.00	20	25
7	Acoustic Pyrometer Workstation	1	0	4.35	1	1.00	6	10
8	HFO Flow Meter	0	1	0.22	0.05	0.05	4	6
9	Furnace and Flame viewing system Camera	2	0	1.09	0.25	0.50	4	6
		0	2	1.09	0.25	0.50	4	6
10	Furnace and Flame viewing system Camera in CER	1	0	2.17	0.5	0.50	4	6
11	Furnace and Flame viewing system Camera in UCR	0	1	1.09	0.25	0.25	4	6
12	HWL-1&2 & MEFCV Control Cabinet - Control Supply	1	0	4.35	1	1.00	4	6
13	PDB for AH Rotor Speed Switches & AH Hopper Ash Level Switches	1	1	1.62	0.372	0.372	10	16
14	Economiser Hopper Ash Level Switches	4	0	0.07	0.015	0.06	4	6
		0	4	0.07	0.015	0.06	4	6
15	Gravimetric Feeder Remote Power Cabinet Power Supply	5	0	2.17	0.5	2.50	4	6
		0	4	2.17	0.5	2.00	4	6
TOTAL		24	23			15.86	kVA	
F)	BHEL-HARIDWAR R1							
S.NO	FEEDER DESCRIPTION	NO. OF FEEDERS ACDB-1	NO. OF FEEDERS ACDB-2	LOAD IN AMPS	kVA RATING OF EACH FEEDER	TOTAL KVA	MCB RATING (in Amps)	FUSE RATING (in Amps)
1	H2 Gas Analyser Cabinet (CXW01C)	1	1	2.50	0.575	0.575	4	6
2	LAN CAB (CRY01)	1	1	25.00	5.75	5.75	40	50
3	GEN. INST. Cabinet (CXW01B)	1	1	2.50	0.575	0.575	4	6
4	Moisture Measuring Equip	1	0	1.00	0.23	0.23	4	6
5	Gen. End Wng. Vib. System (CXW01D)	0	1	2.00	0.46	0.46	4	6
		0	1	1.00	0.23	0.23	4	6
6	OPTR ENG MON	1	0	1.00	0.23	0.23	4	6
		0	1	6.00	1.38	1.38	10	16
7	ALARM PRTR	1	0	6.00	1.38	1.38	10	16
8	COLOR PRTR	1	0	6.00	1.38	1.38	10	16
9	OPTR ENG PC	0	1	2.50	0.575	0.575	4	6
10	WIN TS PRTR	1	0	6.00	1.38	1.38	4	6
11	BVMS Local cabinet (BVMS ATC)	1	0	16.00	3.68	3.68	25	32
12	BVMS Master cabinet (BVMS MBVM)	0	1	16.00	3.68	3.68	25	32
TOTAL		8	8			20.13	kVA	
G)	BHEL-BHOPAL							
S.NO	FEEDER DESCRIPTION	NO. OF FEEDERS ACDB-1	NO. OF FEEDERS ACDB-2	LOAD IN AMPS	kVA RATING OF EACH FEEDER	TOTAL KVA	MCB RATING (in Amps)	FUSE RATING (in Amps)
1	Water Leak Detector for MDBFP	1	0	1.74	0.40	0.40	4	6
2	I/D Fan-A/B Water Leakage Detector	1	0	1.74	0.40	0.40	4	6
		0	1	1.74	0.40	0.40	4	6
3	I/D Fan-A/B Water Leakage Detector	1	0	1.74	0.40	0.40	4	6
		0	1	1.74	0.40	0.40	4	6
4	HT MOTORS SPEED SWITCH	1	1	1.30	0.30	0.30	10	16
TOTAL		4	3			2.30	kVA	
H)	BHEL-RANIPET							
S.NO	FEEDER DESCRIPTION	NO. OF FEEDERS ACDB-1	NO. OF FEEDERS ACDB-2	LOAD IN AMPS	kVA RATING OF EACH FEEDER	TOTAL KVA	MCB RATING (in Amps)	FUSE RATING (in Amps)
1	IOS PC, Data Logger & Printer	1	0	8.70	2.00	2.00	16	20
2	Opacity Monitor	2	0	1.09	0.25	0.50	4	6
		0	2	1.09	0.25	0.50	4	6
TOTAL		3	2			3.00	kVA	

**NOTE:**

230V AC UPS - UNIT FEEDER LIST													
Sl No.	UPS ACDB FEEDER				PDB FEEDER								
	ACDB FEEDERS	FEEDER RATING IN KVA	MCB Rating IN AMPS	FUSE RATING IN AMPS	I/C MCB Rating IN AMPS	PDB	DESCRIPTION	PWR. CONS. PER UNIT IN VA	FIELD DB Feeders	ACTUAL FEEDER RATING IN AMPS	MCB RATING IN AMPS	FUSE RATING IN AMPS	REMARKS
HMIPIS DUAL POWER SUPPLY LOAD-1 (PDPH 01)													
POWERED FROM STATIC SWITCH 1 OF UNIT-1					HMI FEEDER DISTRIBUTION								
01	C1	1.44	16	20	16	STATIC SWITCH 1 16A /230V (PDPH01)	EWS1 (P)	288	F1	1.25	4	6	HMI PDPH01 PANEL LOADS IN Unit-1, STATIC SWITCH-1 OF UNIT-1 WILL BE POWERED FROM ACDB-1 & ACDB-2 OF UNIT-1. SAME IS APPLICABLE FOR UNIT-2 & 3 ALSO
02							EWS2 (P)	288	F2	1.25	4	6	
03							EWS3 (P)	288	F3	1.25	4	6	
04							STOR1 (P)	288	F4	1.25	4	6	
05							STOR2 (P)	288	F5	1.25	4	6	
06							SPARE		F6		4	6	
							TOTAL LOAD	1440		6			
HMIPIS DUAL POWER SUPPLY LOAD-2 (PDPH01)													
POWERED FROM STATIC SWITCH 2 OF UNIT-1					HMI FEEDER DISTRIBUTION								
01	C2	1.44	16	20	16	STATIC SWITCH 2 16A /230V (PDPH01)	EWS1 (S)	288	F1	1.25	4	6	HMI PDPH01 PANEL LOADS IN Unit-1, STATIC SWITCH-1 OF UNIT-1 WILL BE POWERED FROM ACDB-1 & ACDB-2 OF UNIT-1. SAME IS APPLICABLE FOR UNIT-2 & 3 ALSO
02							EWS2 (S)	288	F2	1.25	4	6	
03							EWS3 (S)	288	F3	1.25	4	6	
04							STOR1 (S)	288	F4	1.25	4	6	
05							STOR2 (S)	288	F5	1.25	4	6	
06							SPARE		F6		4	6	
							TOTAL LOAD	1440		6			
HMIPIS SINGLE POWER SUPPLY LOAD-1 (PDPH01)													
POWERED FROM STATIC SWITCH 3 of Unit-1					HMI FEEDER DISTRIBUTION								
01	C3	2.85	32	36	32	STATIC SWITCH 3 32A /230V (PDPH01)	OWS1+MONITOR	192	F7	0.83	4	6	HMI PDPH01 PANEL LOADS IN Unit-1, STATIC SWITCH-1 OF UNIT-1 WILL BE POWERED FROM ACDB-1 & ACDB-2 OF UNIT-1. SAME IS APPLICABLE FOR UNIT-2 & 3 ALSO
02							OWS2+MONITOR	192	F8	0.83	4	6	
03							OWS3+MONITOR	192	F9	0.83	4	6	
04							LVSOWS1	235	F10	1.02	4	6	
05							LVSOWS2	235	F11	1.00	4	6	
06							LVSOWS3	235	F12	1.02	4	6	
07							CLJP (A4)	588	F13	2.56	4	6	
08							LVS Screen 1	326	F14	1.42	4	6	
09							LVS Screen 2	326	F15	1.42	4	6	
10							LVS Screen 3	326	F16	1.42	4	6	
11							SPARE		F17		4	6	
							TOTAL LOAD	2849		12			
HMIPIS SINGLE POWER SUPPLY LOAD-2 (PDPH01)													
POWERED FROM STATIC SWITCH 4 of Unit-1					HMI FEEDER DISTRIBUTION								
01	C4	2.85	32	36	32	STATIC SWITCH 4 32A /230V (PDPH01)	OWS4+MONITOR	192	F18	0.83	4	6	HMI PDPH01 PANEL LOADS IN Unit-1, STATIC SWITCH-1 OF UNIT-1 WILL BE POWERED FROM ACDB-1 & ACDB-2 OF UNIT-1. SAME IS APPLICABLE FOR UNIT-2 & 3 ALSO
02							OWS5+MONITOR	192	F19	0.83	4	6	
03							OWS6+MONITOR	192	F20	0.83	4	6	
04							LVSOWS4	235	F21	1.02	4	6	
05							LVSOWS5	235	F22	1.02	4	6	
06							LVSOWS6	235	F23	1.02	4	6	
07							LVS Screen 4	326	F24	1.42	4	6	
08							LVS Screen 5	326	F25	1.42	4	6	
09							LVS Screen 6	326	F26	1.42	4	6	
10							SPARE		F27		4	6	
							TOTAL LOAD	2261		10			
HMIPIS POWER SUPPLY LOAD-1 (NWPS01)													
POWERED FROM STATIC SWITCH-5 OF UNIT-1					HMI FEEDER DISTRIBUTION								
01	C5	4.37	32	36	32	STATIC SWITCH 5 32A /230V (NWPS01)	SLANSERVER1 (P) + MONITOR	460	F1	2.00	4	6	STATION LAN RELATED LOADS STATIC SWITCH-5 OF UNIT-1 WILL BE POWERED FROM ACDB-1 OF UNIT-1 & ACDB-1 OF UNIT-2
02							SLANSERVER2 (P)	460	F2	2.00	4	6	
03							TERMINALSERVER1 (P) + MONITOR	460	F3	2.00	4	6	
04							TERMINALSERVER2 (P)	460	F4	2.00	4	6	
05							NMS (P) + MONITOR	460	F5	2.00	4	6	
06							CORESW1 (P)	690	F6	3.00	4	6	
07							GIGSW1	460	F7	2.00	4	6	
08							IPSWF1	230	F8	1.00	4	6	
09							M/C1	230	F9	1.00	4	6	
10							M/C3	230	F10	1.00	4	6	
11							M/C5	230	F11	1.00	4	6	
12							SPARE		F12		4	6	
13							SPARE		F13		6	10	
							TOTAL LOAD	4370		19			
HMIPIS POWER SUPPLY LOAD-2 (NWPS01)													
POWERED FROM STATIC SWITCH-6 OF UNIT-1					HMI FEEDER DISTRIBUTION								
01	C6	4.14	32	36	32	STATIC SWITCH 6 32A /230V (NWPS01)	SLANSERVER1 (S)	460	F14	2.00	4	6	STATION LAN RELATED LOADS STATIC SWITCH-6 OF UNIT-1 WILL BE POWERED FROM ACDB-2 OF UNIT-1 & ACDB-2 OF UNIT-2
02							SLANSERVER2 (S) + MONITOR	460	F15	2.00	4	6	
03							TERMINALSERVER1 (S)	460	F16	2.00	4	6	
04							TERMINALSERVER2 (S) + MONITOR	460	F17	2.00	4	6	
05							NMS (S)	460	F18	2.00	4	6	
06							CORESW1 (S)	690	F19	3.00	4	6	
07							COMSW1	460	F20	2.00	4	6	
08							IDFSW1	230	F21	1.00	4	6	
09							M/C2	230	F22	1.00	4	6	
10							M/C4	230	F23	1.00	4	6	
11							SPARE		F24		4	6	
							TOTAL LOAD	4140		18			



HMIPIS POWER SUPPLY LOAD-1 (NWPS02)													
POWERED FROM STATIC SWITCH-7 OF UNIT-1					HMI FEEDER DISTRIBUTION								
01	C7	2.07	16	20	16	STATIC SWITCH 7 16A /230V (NWPS02)	CORESW1 (P)	690	F1	3.00	4	6	STATION LAN RELATED LOADS
02							GIGSW2	460	F2	2.00	6	10	
03							IPSW2	230	F3	1.00	4	6	STATIC SWITCH-7 OF UNIT-1 WILL BE POWERED FROM ACDB-1 OF UNIT-1 & ACDB-1 OF UNIT-2
04							M/C 6	230	F4	1.00	4	6	
05							M/C 8	230	F5	1.00	4	6	
06							M/C 10	230	F6	1.00	4	6	
15							SPARE		F7		6	10	
							TOTAL LOAD	2070		4			
HMIPIS POWER SUPPLY LOAD-2 (NWPS02)													
POWERED FROM STATIC SWITCH-8 OF UNIT-1					HMI FEEDER DISTRIBUTION								
01	C8	1.84	16	20	16	STATIC SWITCH 8 16A /230V (NWPS02)	CORESW1 (S)	690	F8	3.00	4	6	STATION LAN RELATED LOADS
02							COMSW2	460	F9	2.00	6	10	
03							IDSW2	230	F10	1.00	4	6	STATIC SWITCH-8 OF UNIT-1 WILL BE POWERED FROM ACDB-2 OF UNIT-1 & ACDB-2 OF UNIT-2
04							M/C 7	230	F11	1.00	4	6	
05							M/C 9	230	F12	1.00	4	6	
15							SPARE		F13		6	10	
							TOTAL LOAD	1840		3			
HMIPIS POWER SUPPLY OFFSITE CR LOAD-1 (NWPC02)													
POWERED FROM STATIC SWITCH-9 OF UNIT-1					HMI FEEDER DISTRIBUTION								
01	C11	4.69	32	36	32	STATIC SWITCH 9 32A /230V (NWPC02)	BOWS8+MONITOR	230	F1	1.00	4	6	OFFSITE CONTROL ROOM LOADS
02							BOWS9+MONITOR	230	F2	1.00	4	6	
03							BLVSOWS1	230	F3	1.00	4	6	
04							BLVSOWS2	230	F4	1.00	4	6	STATIC SWITCH-9 OF UNIT-1 WILL BE POWERED FROM ACDB-2 OF UNIT-1 & ACDB-2 OF UNIT-2
05							LVS Screen 1	460	F5	2.00	4	6	
06							LVS Screen 2	460	F6	2.00	4	6	
07							COWS5+MONITOR	230	F7	1.00	4	6	
08							COWS6+MONITOR	230	F8	1.00	4	6	
09							CLVSOWS1	230	F9	1.00	4	6	
10							CLVSOWS2	230	F10	1.00	4	6	
11							LVS Screen 5	460	F11	2.00	4	6	
12							LVS Screen 6	460	F12	2.00	4	6	
13							Switch1 A (WSSW8-A)	276	F13	1.20	4	6	
14							Switch2 A (AHPSW1-A)	276	F14	1.20	4	6	
15							M / C 1,2,3,4,5	460	F15	2.00	4	6	
16							SPARE		F16		4	6	
17							SPARE		F17		4	6	
							TOTAL LOAD	4692		20			
HMIPIS POWER SUPPLY LOAD-2 (NWPC02)													
POWERED FROM STATIC SWITCH-10 OF UNIT-1					HMI FEEDER DISTRIBUTION								
01	C12	4.69	32	36	32	STATIC SWITCH 10 32A /230V (NWPC02)	BOWS10+MONITOR	230	F18	1.00	4	6	OFFSITE CONTROL ROOM LOADS
02							BOWS11+MONITOR	230	F19	1.00	4	6	
03							BLVSOWS3	230	F20	1.00	4	6	
04							BLVSOWS4	230	F21	1.00	4	6	STATIC SWITCH-10 OF UNIT-1 WILL BE POWERED FROM ACDB-2 OF UNIT-1 & ACDB-2 OF UNIT-2
05							LVS Screen 3	460	F22	2.00	4	6	
06							LVS Screen 4	460	F23	2.00	4	6	
07							COWS7+MONITOR	230	F24	1.00	4	6	
08							COWS8+MONITOR	230	F25	1.00	4	6	
09							CLVSOWS3	230	F26	1.00	4	6	
10							CLVSOWS4	230	F27	1.00	4	6	
11							LVS Screen 7	460	F28	2.00	4	6	
12							LVS Screen 8	460	F29	2.00	4	6	
13							Switch1 B (WSSW8-B)	276	F30	1.20	4	6	
14							Switch2 B (AHPSW1-B)	276	F31	1.20	4	6	
15							M / C 1,2,3,4,5,6,7,8,9,10	460	F32	2.00	4	6	
17							SPARE		F33		4	6	
19							SPARE		F34		4	6	
							TOTAL LOAD	4692		20			

PDB FOR AH ROTOR SPEED SWITCHES & AH HOPPER ASH LEVEL SWITCHES												
POWERED FROM UPS ACDB 1 &2 ON PER UNIT BASIS					AH ROTOR SPEED SWITCHES & AH HOPPER ASH LEVEL SWITCHES FEEDER DISTRIBUTION							
01	E13	0.37	10	16	6	(PDB-405-01) Auto changeover with Contactor Type	AIR HEATER ROTOR SPEED SWITCH-1	6	F1	0.026	4	6
02							AIR HEATER ROTOR SPEED SWITCH-2	6	F2	0.026	4	6
03							AIR HEATER HOPPER ASH LEVEL SWITCH-1	15	F3	0.07	4	6
04							AIR HEATER HOPPER ASH LEVEL SWITCH-2	15	F4	0.07	4	6
05							AIR HEATER HOPPER ASH LEVEL SWITCH-3	15	F5	0.07	4	6
06							AIR HEATER HOPPER ASH LEVEL SWITCH-4	15	F6	0.07	4	6
07							AIR HEATER HOPPER ASH LEVEL SWITCH-5	15	F7	0.07	4	6
08							AIR HEATER HOPPER ASH LEVEL SWITCH-6	15	F8	0.07	4	6
09							AIR HEATER HOPPER ASH LEVEL SWITCH-7	15	F9	0.07	4	6
10							AIR HEATER HOPPER ASH LEVEL SWITCH-8	15	F10	0.07	4	6
11							AIR HEATER HOPPER ASH LEVEL SWITCH-9	15	F11	0.07	4	6
12							AIR HEATER HOPPER ASH LEVEL SWITCH-10	15	F12	0.07	4	6
13							AIR HEATER HOPPER ASH LEVEL SWITCH-11	15	F13	0.07	4	6
14							AIR HEATER HOPPER ASH LEVEL SWITCH-12	15	F14	0.07	4	6
15							AIR HEATER HOPPER ASH LEVEL SWITCH-13	15	F15	0.07	4	6
16							AIR HEATER HOPPER ASH LEVEL SWITCH-14	15	F16	0.07	4	6
17							AIR HEATER HOPPER ASH LEVEL SWITCH-15	15	F17	0.07	4	6
18							AIR HEATER HOPPER ASH LEVEL SWITCH-16	15	F18	0.07	4	6
19							AIR HEATER HOPPER ASH LEVEL SWITCH-17	15	F19	0.07	4	6
20							AIR HEATER HOPPER ASH LEVEL SWITCH-18	15	F20	0.07	4	6
21							AIR HEATER HOPPER ASH LEVEL SWITCH-19	15	F21	0.07	4	6
22							AIR HEATER HOPPER ASH LEVEL SWITCH-20	15	F22	0.07	4	6
23							AIR HEATER HOPPER ASH LEVEL SWITCH-21	15	F23	0.07	4	6
24							AIR HEATER HOPPER ASH LEVEL SWITCH-22	15	F24	0.07	4	6
25							AIR HEATER HOPPER ASH LEVEL SWITCH-23	15	F25	0.07	4	6
26							AIR HEATER HOPPER ASH LEVEL SWITCH-24	15	F26	0.07	4	6
27							SPARE		F27		4	6
28							SPARE		F28		4	6
29							SPARE		F29		4	6
							TOTAL LOAD	372		2		
PDB FOR HT MOTOR SPEED SWITCH												
POWERED FROM UPS ACDB 1 &2 ON PER UNIT BASIS					HT MOTOR SPEED SWITCH FEEDER DISTRIBUTION							
01	G4	0.30	10	16	6	(PDB-405-02) Auto changeover with Contactor Type	HT MOTOR SPEED SWITCH-1	10	F1	0.04	4	6
02							HT MOTOR SPEED SWITCH-2	10	F2	0.04	4	6
03							HT MOTOR SPEED SWITCH-3	10	F3	0.04	4	6
04							HT MOTOR SPEED SWITCH-4	10	F4	0.04	4	6
05							HT MOTOR SPEED SWITCH-5	10	F5	0.04	4	6
06							HT MOTOR SPEED SWITCH-6	10	F6	0.04	4	6
07							HT MOTOR SPEED SWITCH-7	10	F7	0.04	4	6
08							HT MOTOR SPEED SWITCH-8	10	F8	0.04	4	6
09							HT MOTOR SPEED SWITCH-9	10	F9	0.04	4	6
10							HT MOTOR SPEED SWITCH-10	10	F10	0.04	4	6
11							HT MOTOR SPEED SWITCH-11	10	F11	0.04	4	6
12							HT MOTOR SPEED SWITCH-12	10	F12	0.04	4	6
13							HT MOTOR SPEED SWITCH-13	10	F13	0.04	4	6
14							HT MOTOR SPEED SWITCH-14	10	F14	0.04	4	6
15							HT MOTOR SPEED SWITCH-15	10	F15	0.04	4	6
16							HT MOTOR SPEED SWITCH-16	10	F16	0.04	4	6
17							HT MOTOR SPEED SWITCH-17	10	F17	0.04	4	6
18							HT MOTOR SPEED SWITCH-18	10	F18	0.04	4	6
19							HT MOTOR SPEED SWITCH-19	10	F19	0.04	4	6
20							HT MOTOR SPEED SWITCH-20	10	F20	0.04	4	6
21							HT MOTOR SPEED SWITCH-21	10	F21	0.04	4	6
22							HT MOTOR SPEED SWITCH-22	10	F22	0.04	4	6
23							HT MOTOR SPEED SWITCH-23	10	F23	0.04	4	6
24							HT MOTOR SPEED SWITCH-24	10	F24	0.04	4	6
25							HT MOTOR SPEED SWITCH-25	10	F25	0.04	4	6
26							HT MOTOR SPEED SWITCH-26	10	F26	0.04	4	6
27							HT MOTOR SPEED SWITCH-27	10	F27	0.04	4	6
28							HT MOTOR SPEED SWITCH-28	10	F28	0.04	4	6
29							HT MOTOR SPEED SWITCH-29	10	F29	0.04	4	6
30							HT MOTOR SPEED SWITCH-30	10	F30	0.04	4	6
31							SPARE		F31		4	6
32							SPARE		F32		4	6
33							SPARE		F33		4	6

ANNEXURE-I (Sheet 01 of 04)

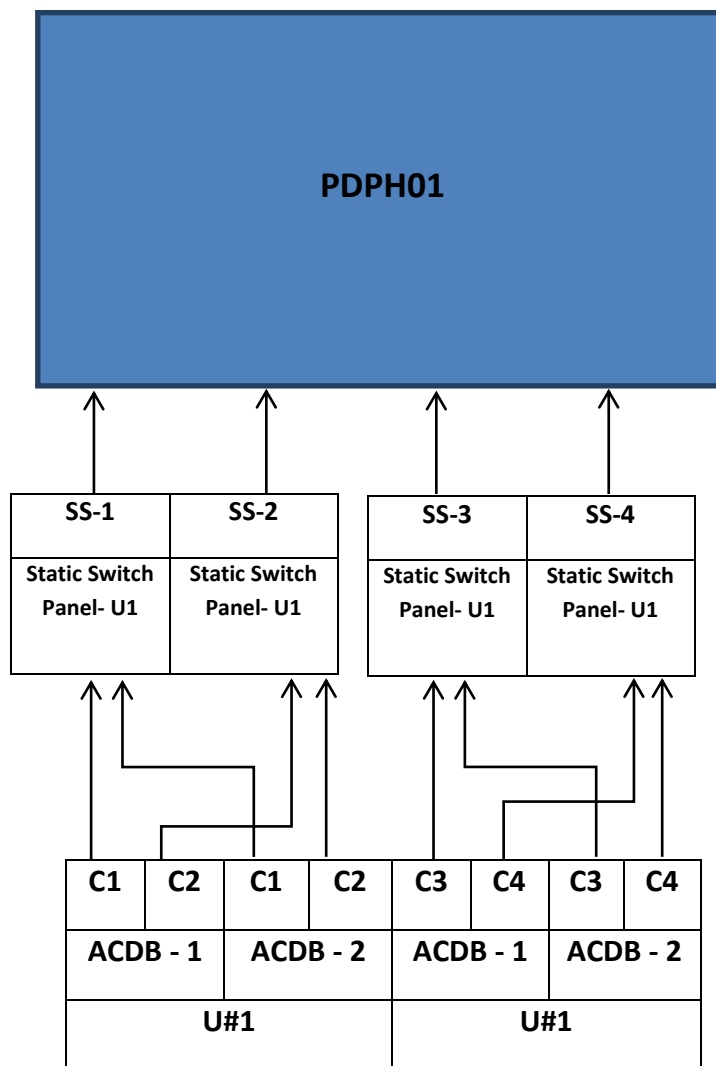
**PDPH 01 PANEL:**

**C1:** HMIPIS DUAL POWER SUPPLY LOAD-1 (PDPH 01)

**C2:** HMIPIS DUAL POWER SUPPLY LOAD-2 (PDPH 01)

**C3:** HMIPIS SINGLE POWER SUPPLY LOAD-3 (PDPH 01)

**C4:** SG HMIPIS SINGLE POWER SUPPLY LOAD-4 (PDNL 01)



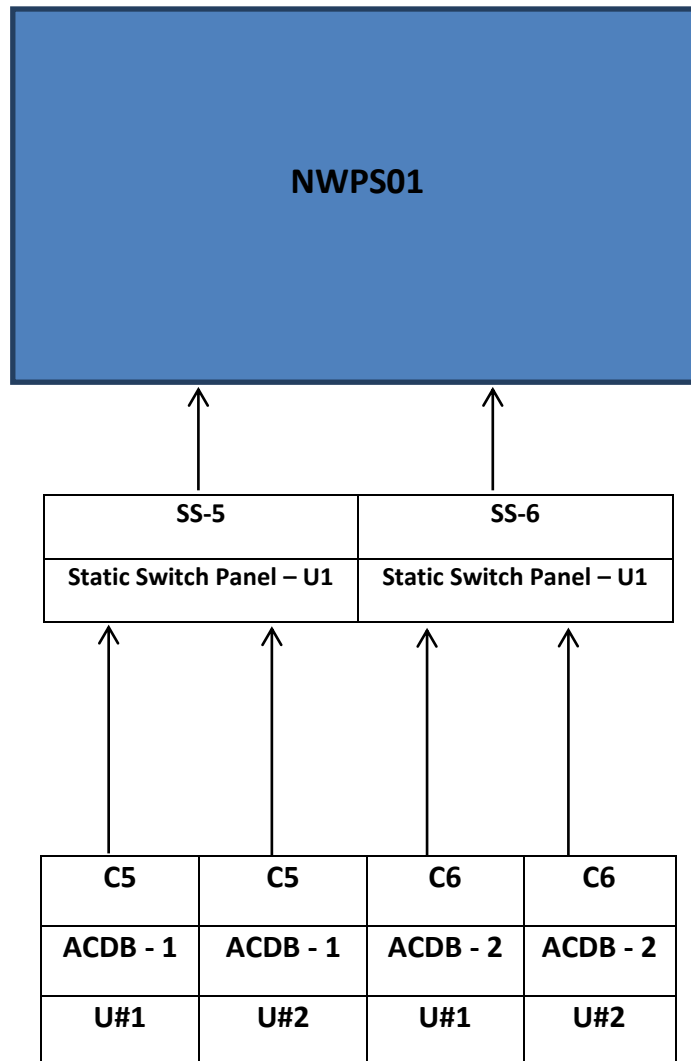
**Note:** Same Philosophy will be followed for U-2 & U-3 also

**ANNEXURE-I (Sheet 02 of 03)**

**NWPS01 PANEL (Common for three units):**

**C5:** HMIPIS POWER SUPPLY LOAD-1 (NWPS01)

**C6:** HMIPIS POWER SUPPLY LOAD-2 (NWPS01)

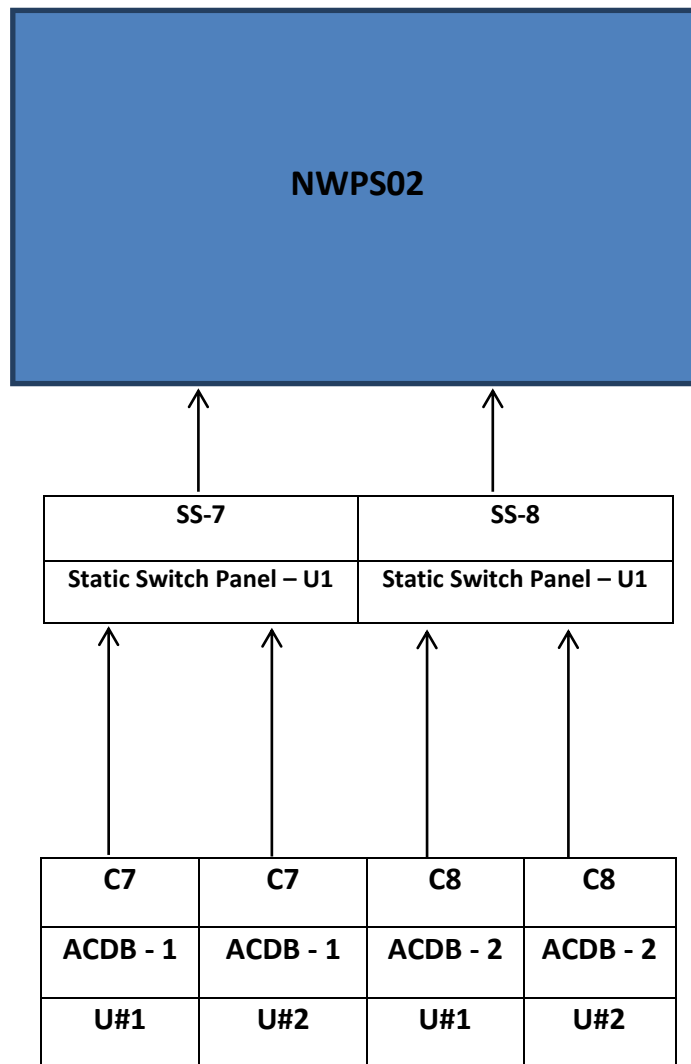


**ANNEXURE-I (Sheet 03 of 03)**

**NWPS02 PANEL (Common for three units):**

**C7:** SG HMIPIS POWER SUPPLY LOAD-1 (NWPS02)

**C8:** SG HMIPIS POWER SUPPLY LOAD-2 (NWPS02)





WATER SYSTEM DDCMIS - NTPC PATRATU (3x800 MW) -- UPS-WS-01								
S.NO	FEEDER DESCRIPTION	NO. OF FEEDERS ACDB-1	NO. OF FEEDERS ACDB-2	FEEDER RATING IN AMPS	kVA RATING OF EACH FEEDER	TOTAL KVA	MCB RATING (in Amps)	FUSE RATING (in Amps)
A. WS CR near PT Plant								
1	STORIAN1 + MONITOR	1	1	1.38	0.3174	0.3174	4	6
2	EWS/STORIAN2 + MONITOR	1	1	1.2	0.276	0.276	4	6
3	OWS1 + MONITOR	0	1	1	0.23	0.23	4	6
4	OWS2 + MONITOR	1	0	1	0.23	0.23	4	6
5	OWS3 + MONITOR	0	1	1	0.23	0.23	4	6
6	CLJP (A4)	1	0	2.45	0.5635	0.5635	4	6
7	CCTV SYSTEM	1	1	4.34	1	1	6	10
8	PA SYSTEM	1	1	4.34	1	1	6	10
9	Electronic Flow Meter	6	0	0.21	0.05	0.3	4	6
		0	6	0.21	0.05	0.3	4	6
10	PT Plant area	1	1	0.86	0.2	0.2	4	6
B. STP I/O Room								
1	OWS + MONITOR	1	0	1	0.23	0.23	4	6
2	pH analyser, turbidity meter, conductivity analyser, Electromagnetic flow meter	0	1	3.26	0.75	0.75	6	10
C. CLo2 I/O Room								
1	OWS + MONITOR	0	1	1	0.23	0.23	4	6
2	pH analyser, turbidity meter, conductivity analyser	0	1	8.69	2	2	16	20
D. DM & CPU REGN I/O ROOM								
6	OWS + MONITOR (DM & CPU REGN I/O ROOM AT DM PLANT)	1	0	1	0.23	0.23	4	6
1	Analysers (pH,Sodium,Conductivity), etc Location: CPU Regeneration Area	1	0	2.17	0.5	0.5	4	6
		0	1	2.17	0.5	0.5	4	6
3	pH analyser, Conductivity analyser, Silica analyser Location: DM Plant	1	1	4.34	1	1	6	10
E. CSSP I/O ROOM								
1	OWS + MONITOR	0	1	1	0.23	0.23	4	6
2	Analysers, EQMS	1	0	4.34	1	1	6	10
F. CWT Plant								
1	pH Analyser, ORP Meter, Deposit Monitor, Biofouling monitor	1	1	6.52	1.5	1.5	10	16
G. ETP area								
1	pH analyser, turbidity meter, conductivity analyser, Electromagnetic flow meter, EQMS	1	0	4.34	1	1	6	10
		20	20			13.82	kVA	
a.) Total Load = 13.82 kVA								
b.) Total Load + 10% spare = 15.20 kVA								
UPS Rating as per manufacturer catalog = 20 kVA								
S.NO	FEEDER RATING	TOTAL		CONSIDERING 10% SPARE		ROUNDED OFF-TO:-		
	MCB / FUSE	ACDB-1	ACDB-2	ACDB-1	ACDB-2	ACDB-1	ACDB-2	
1	4A/6A	14	14	16	16	17	17	
2	6A/10A	5	4	6	5	6	6	
3	10A/16A	1	1	2	2	3	3	
4	16A/20A	0	1	0	2	2	2	
	TOTAL	20	20	24	25	28	28	
Note:								
1.) 10% spare feeders of each rating are been provided in each ACDB further rounded off to 28 feeders cummulatively in ACDB-1 and ACDB-2 for any future exigencies which may creep in later.								
2.) UPS rating is 20 kVA at 50 deg C and each UPS System is being provided with 1 Set of Ni-Cd Battery for 1 hr back-up suiting 20 kVA Load ( this is UPS load at 50 deg C). Battery is temperature derated at 4 deg C.								
3.) In case, if there is any exigency in load/feeder during commissioning at site, BHEL will make necessary arrangements at site without any additional price implication to M/s NTPC.								

**SIMULATOR - NTPC PATRATU (3x800 MW) -- UPS**

S.NO	FEEDER DESCRIPTION	NO. OF FEEDERS ACDB-1	NO. OF FEEDERS ACDB-2	FEEDER RATING IN AMPS	KVA RATING OF EACH FEEDER	TOTAL KVA	MCB RATING (in Amps)	FUSE RATING (in Amps)
<b>A. BHEL-EDN-SIMULATOR LOADS</b>								
1	SIMULATION COMPUTER SERVER1 + MONITOR	1	1	4.13	0.95	0.95	6	10
2	SIMULATION COMPUTER SERVER2 + MONITOR	1	1	4.13	0.95	0.95	6	10
3	SIMULATOR PROGRAMMER STATION + MONITOR	1	0	1.2	0.276	0.276	4	6
4	LAPTOP COMPUTER	0	1	1.2	0.276	0.276	4	6
5	A3 SIZE COLOUR LASER PRINTER	1	0	2.83	0.65	0.65	6	10
6	INSTRUCTOR STATION 1 + MONITOR	1	0	1.2	0.276	0.276	4	6
7	INSTRUCTOR STATION 2 + MONITOR	1	0	1.2	0.276	0.276	4	6
8	A4 SIZE COLOUR LASER PRINTER	0	1	1.22	0.28	0.28	4	6
9	HMI SERVER1 + MONITOR	1	1	4.13	0.95	0.95	6	10
10	HMI SERVER2 + MONITOR	1	1	4.13	0.95	0.95	6	10
11	HMI PROGRAMMER STATION + MONITOR	1	0	1.2	0.276	0.276	4	6
12	OWS1 + MONITOR	0	1	1	0.23	0.23	4	6
13	OWS2 + MONITOR	1	0	1	0.23	0.23	4	6
14	OWS3 + MONITOR	0	1	1	0.23	0.23	4	6
12	OWS4 + MONITOR	0	1	1	0.23	0.23	4	6
13	OWS5 + MONITOR	1	0	1	0.23	0.23	4	6
14	OWS6 + MONITOR	0	1	1	0.23	0.23	4	6
15	LVS SCREEN1	1	0	1.36	0.3128	0.3128	4	6
16	LVS SCREEN2	0	1	1.36	0.3128	0.3128	4	6
17	LVS SCREEN3	1	0	1.36	0.3128	0.3128	4	6
18	LVS SCREEN4	0	1	1.36	0.3128	0.3128	4	6
19	LVS SCREEN5	1	0	1.36	0.3128	0.3128	4	6
20	LVSOWS1	0	1	0.8	0.184	0.184	4	6
21	LVSOWS2	1	0	0.8	0.184	0.184	4	6
22	LVSOWS3	0	1	0.8	0.184	0.184	4	6
23	LVSOWS4	1	0	0.8	0.184	0.184	4	6
24	LVSOWS5	0	1	0.8	0.184	0.184	4	6
25	PROJECTOR WITH SCREEN	0	1	1.95	0.45	0.45	6	10
<b>B. BHEL EDN DCS LOADS</b>								
1	FUNCTIONAL GROUP CONTROL (CRA 14,15, CVP 58)	1	1	5	1.15	1.15	10	16
2	FUNCTIONAL GROUP CONTROL (CRA 18,19,20, CVP 60)	1	1	5	1.15	1.15	10	16
3	FUNCTIONAL GROUP CONTROL (CRA 21, CVP 61)	1	1	5	1.15	1.15	10	16
4	FUNCTIONAL GROUP CONTROL (CRA 22, CVP 62)	1	1	5	1.15	1.15	10	16
5	FUNCTIONAL GROUP CONTROL (CRA 23, CVP 63)	1	1	5	1.15	1.15	10	16
6	IP RELAY (CTE 44)	1	1	5	1.15	1.15	10	16
		<b>22</b>	<b>22</b>			<b>17.32</b>	<b>kVA</b>	

a.)	Total Load(A+B) =	17.32 kVA
b.)	Total Load(A+B) + 10% spare =	19.06 kVA
	UPS Rating proposed =	20 kVA

S.NO	FEEDER RATING	TOTAL		CONSIDERING 10%		ROUNDED OFF-TO:-	
	MCB / FUSE	ACDB-1	ACDB-2	ACDB-1	ACDB-2	ACDB-1	ACDB-2
1	4A/6A	11	11	13	13	15	15
2	6A/10A	5	5	6	6	7	7
3	10A/16A	6	6	7	7	8	8
	<b>TOTAL</b>	<b>22</b>	<b>22</b>	<b>26</b>	<b>26</b>	<b>30</b>	<b>30</b>

**Note:**

- 1.) 10% spare feeders of each rating are being provided in each ACDB further rounded off to 30 feeders cummulatively in ACDB-1 and ACDB-2 for any future exigencies which may creep in later.
- 2.) UPS rating is 20 kVA at 50 deg C and each UPS System is being provided with 1 Set of Ni-Cd Battery for 1 hr back-up suiting 20 kVA Load ( this is UPS load at 50 deg C). Battery is temperature derated at 4 deg C.

FGD - NTPC PATRATU (3x800 MW)
-------------------------------

S.NO	FEEDER DESCRIPTION	NO. OF FEEDERS ACDB-1	NO. OF FEEDERS ACDB-2	FEEDER RATING IN AMPS	KVA RATING OF EACH FEEDER	TOTAL KVA	MCB RATING (in Amps)	FUSE RATING (in Amps)
1	HMI Network Enclosure (NWEN01 - Common) a) AEAS1(Primary & Secondary Supply + Monitor) - 1 No b) AH01 (Primary & Secondary Supply + Monitor) - 1 No c) AH02 (Primary & Secondary Supply + Monitor) - 1 No d) A101 + Monitor - 1 No e) A102 + Monitor - 1 No f) A103 + Monitor - 1 No g) A104 + Monitor - 1 No h) A105 + Monitor - 1 No i) CLSR - A4 - 1 No j) Firewall-1 - 1 No k)Firewall-2 - 1 No	1	1	10	2.30	2.30	16	20
2	U-1 MCCB (to be provided in ACDB)	1	1	82.22		19.91	110 Amps MCCB	
a	OXYGEN ANALYSER - LT	2	2	1.3	0.3	0.6	4	6
b	Flue Gas Analyser SO <sub>x</sub> /NO <sub>x</sub> /CO/CO <sub>2</sub> at Chimney	1	1	8.69	2	2	16	20
c	Mercury Analyzer	1	1	15.21	3.5	3.5	20	25
d	SO2 Analyzer	2	2	8.69	2	4	16	20
e	Opacity Monitor (Extractive Type) at Chimney	1	1	15.21	3.5	3.5	20	25
f	PH Analyzer - Ranipet scope	0	1	0.1	0.025	0.025	4	6
g	PH Analyzer - PEM Scope	1	0	0.1	0.025	0.025	4	6
h	Air Compressor-1 Aux Supply (Compressor controller, control relays)	0	1	0.1	0.025	0.025	4	6
i	Air Compressor-1 Aux Supply (Compressor controller, control relays)	1	0	1.41	0.325	0.325	4	6
j	FO Converter JB	1	0	0.92	0.2125	0.2125	4	6
k	Operator WorkStation & Printer - Fire Detection System	0	1	8.15	1.875	1.875	16	20
l	Feeders for LHP, GHP	1	1	10.86	2.5	2.5	16	20
m	RCP-1 R1	1	0	4.34	1	1	6	10
n	Spare (4 Amps MCB & 6 Amps Fuse)	2	2				4	6
o	Spare (6 Amps MCB & 10 Amps Fuse)	1	1				6	10
p	Spare (16 Amps MCB & 20 Amps Fuse)	2	2				16	20
q	Spare (20 Amps MCB & 25 Amps Fuse)	1	1				20	25
3	U-2 MCCB (to be provided in ACDB)	1	1	82.22		19.91	110 Amps MCCB	
a	OXYGEN ANALYSER - LT	2	2	1.3	0.3	0.6	4	6
b	Flue Gas Analyser SO <sub>x</sub> /NO <sub>x</sub> /CO/CO <sub>2</sub> at Chimney	1	1	8.69	2	2	16	20
c	Mercury Analyzer	1	1	15.21	3.5	3.5	20	25
d	SO2 Analyzer	2	2	8.69	2	4	16	20
e	Opacity Monitor (Extractive Type) at Chimney	1	1	15.21	3.5	3.5	20	25
f	PH Analyzer - Ranipet scope	0	1	0.1	0.025	0.025	4	6
g	PH Analyzer - Ranipet scope	1	0	0.1	0.025	0.025	4	6
h	PH Analyzer - PEM Scope	0	1	0.1	0.025	0.025	4	6
i	Air Compressor-1 Aux Supply (Compressor controller, control relays)	1	0	1.41	0.325	0.325	4	6
j	Air Compressor-1 Aux Supply (Compressor controller, control relays)	0	1	1.41	0.325	0.325	4	6
k	FO Converter JB	1	0	0.92	0.2125	0.2125	4	6
l	Operator WorkStation & Printer - Fire Detection System	1	0	8.15	1.875	1.875	16	20
m	Feeders for LHP, GHP	1	1	10.86	2.5	2.5	16	20
n	RCP-2 R1	0	1	4.34	1	1	6	10
o	Spare (4 Amps MCB & 6 Amps Fuse)	2	2				4	6
p	Spare (6 Amps MCB & 10 Amps Fuse)	1	1				6	10
q	Spare (16 Amps MCB & 20 Amps Fuse)	2	2				16	20
q	Spare (20 Amps MCB & 25 Amps Fuse)	1	1				20	25
4	U-3 MCCB (to be provided in ACDB)	1	1	82.22		19.91	110 Amps MCCB	
a	OXYGEN ANALYSER - LT	2	2	1.3	0.3	0.6	4	6
b	Flue Gas Analyser SO <sub>x</sub> /NO <sub>x</sub> /CO/CO <sub>2</sub> at Chimney	1	1	8.69	2	2	16	20
c	Mercury Analyzer	1	1	15.21	3.5	3.5	20	25
d	SO2 Analyzer	2	2	8.69	2	4	16	20
e	Opacity Monitor (Extractive Type) at Chimney	1	1	15.21	3.5	3.5	20	25
f	PH Analyzer - Ranipet scope	0	1	0.1	0.025	0.025	4	6
g	PH Analyzer - Ranipet scope	1	0	0.1	0.025	0.025	4	6
g	PH Analyzer - PEM Scope	0	1	0.1	0.025	0.025	4	6
h	Air Compressor-1 Aux Supply (Compressor controller, control relays)	1	0	1.41	0.325	0.325	4	6
i	Air Compressor-1 Aux Supply (Compressor controller, control relays)	0	1	1.41	0.325	0.325	4	6
j	FO Converter JB	1	0	0.92	0.2125	0.2125	4	6
k	Operator WorkStation & Printer - Fire Detection System	0	1	8.15	1.875	1.875	16	20
l	Feeders for LHP, GHP	1	1	10.86	2.5	2.5	16	20
m	RCP-3 R1	1	0	4.34	1	1	6	10
n	Spare (4 Amps MCB & 6 Amps Fuse)	2	2				4	6
o	Spare (6 Amps MCB & 10 Amps Fuse)	1	1				6	10
p	Spare (16 Amps MCB & 20 Amps Fuse)	2	2				16	20
q	Spare (20 Amps MCB & 25 Amps Fuse)	1	1				20	25
	TOTAL LOAD					62.04		

R1

S.NO	FEEDER RATING	TOTAL <span style="color: green;">R1</span> incl. 25% SPARE	
	MCB / FUSE	ACDB-1	ACDB-2
1	4A/6A	23	23
2	6A/10A	7	7
3	16A/20A	22	22
4	20A/25A	9	9
5	110 Amps MCCB	4	4
	<b>TOTAL</b>	<b>65</b>	<b>65</b>

**Note:**

1.) UPS rating is 80 kVA at 50 deg C and each UPS System is being provided with 1 Set of Ni-Cd Battery for 1 hr back-up suiting 80 kVA Load ( this is UPS load at 50 deg C). Battery is temperature derated at 4 deg C.

**FGD - NTPC MOUDA STPP (2x500 MW)**

S.NO	FEEDER DESCRIPTION	NO. OF FEEDERS ACDB-1	NO. OF FEEDERS ACDB-2	FEEDER RATING IN AMPS	kVA RATING OF EACH FEEDER	TOTAL KVA	MCB RATING (in Amps)	FUSE RATING (in Amps)
1a	<b>HMI Network Enclosure (NWEN01 - Common)</b> a) AEAS1(Primary & Secondary Supply + Monitor) - 1 No b) AH01 (Primary & Secondary Supply + Monitor) - 1 No c) AH02 (Primary & Secondary Supply + Monitor) - 1 No d) A101 + Monitor - 1 No e) A102 + Monitor - 1 No f) A103 + Monitor - 1 No g) A104 + Monitor - 1 No h) A105 + Monitor - 1 No i) CLSR - A4 - 1 No j) Firewall-1 - 1 No k) Firewall-2 - 1 No	1	1	10	2.30	2.30	16	20
1b	Spare	1	1				16	20
<b>2</b>	<b>U-1 MCCB</b>	<b>1</b>	<b>1</b>	<b>82.22</b>		<b>19.91</b>	<b>110 Amps MCCB</b>	
a	OXYGEN ANALYSER - LT	2	2	1.3	0.3	0.6	4	6
b	Flue Gas Analyser SOx /NOx/CO/CO <sub>2</sub> at Chimney	1	1	8.69	2	2	16	20
c	Mercury Analyzer	1	1	15.21	3.5	3.5	20	25
d	SO2 Analyzer	2	2	8.69	2	4	16	20
e	Opacity Monitor (Extractive Type) at Chimney	1	1	15.21	3.5	3.5	20	25
f	PH Analyzer - (Ranipet)	0	1	0.1	0.025	0.025	4	6
		1	0	0.1	0.025	0.025	4	6
g	PH Analyzer - (PEM)	0	1	0.1	0.025	0.025	4	6
h	Air Compressor-1 Aux Supply (Compressor controller, control relays)	1	0	1.41	0.325	0.325	4	6
i	Air Compressor-1 Aux Supply (Compressor controller, control relays)	0	1	1.41	0.325	0.325	4	6
j	FO Converter JB	1	0	0.92	0.2125	0.2125	4	6
k	Operator WorkStation & Printer - Fire Detection System	0	1	8.15	1.875	1.875	16	20
l	Feeders for LHP, GHP	1	1	10.86	2.5	2.5	16	20
m	RCP-2 <b>R1</b>	1	0	4.34	1	1	6	10
n	Spare (4 Amps MCB & 6 Amps Fuse)	2	2				4	6
o	Spare (6 Amps MCB & 10 Amps Fuse)	1	1				6	10
p	Spare (16 Amps MCB & 20 Amps Fuse)	2	2				16	20
q	Spare (20 Amps MCB & 25 Amps Fuse)	1	1				20	25
<b>3</b>	<b>U-2 MCCB</b>	<b>1</b>	<b>1</b>	<b>82.22</b>		<b>19.91</b>	<b>110 Amps MCCB</b>	
a	OXYGEN ANALYSER - LT	2	2	1.3	0.3	0.6	4	6
b	Flue Gas Analyser SOx /NOx/CO/CO <sub>2</sub> at Chimney	1	1	8.69	2	2	16	20
c	Mercury Analyzer	1	1	15.21	3.5	3.5	20	25
d	SO2 Analyzer	2	2	8.69	2	4	16	20
e	Opacity Monitor (Extractive Type) at Chimney	1	1	15.21	3.5	3.5	20	25
f	PH Analyzer - Ranipet scope	0	1	0.1	0.025	0.025	4	6
		1	0	0.1	0.025	0.025	4	6
g	PH Analyzer - PEM Scope	0	1	0.1	0.025	0.025	4	6
h	Air Compressor-1 Aux Supply (Compressor controller, control relays)	1	0	1.41	0.325	0.325	4	6
i	Air Compressor-1 Aux Supply (Compressor controller, control relays)	0	1	1.41	0.325	0.325	4	6
j	FO Converter JB	1	0	0.92	0.2125	0.2125	4	6
k	Operator WorkStation & Printer - Fire Detection System	1	0	8.15	1.875	1.875	16	20
l	Feeders for LHP, GHP	1	1	10.86	2.5	2.5	16	20
m	RCP-2 <b>R1</b>	0	1	4.34	1	1	6	10
n	Spare (4 Amps MCB & 6 Amps Fuse)	2	2				4	6
o	Spare (6 Amps MCB & 10 Amps Fuse)	1	1				6	10
p	Spare (16 Amps MCB & 20 Amps Fuse)	2	2				16	20
q	Spare (20 Amps MCB & 25 Amps Fuse)	1	1				20	25
	<b>TOTAL LOAD</b>					<b>42.13</b>		

Total Load = 42.13 kVA  
 Total Load + 10% spare = 46.34 kVA  
 UPS Rating = 50 kVA ~ 50 kVA for Battery Sizing

**R1**

S.NO	FEEDER RATING	TOTAL <b>R1</b> incl. 25% SPARE	
	MCB / FUSE	ACDB-1	ACDB-2
1	4A/6A	14	14
2	6A/10A	3	3
3	16A/20A	15	15
4	20A/25A	6	6
5	110 Amps MCCB	3	3
	<b>TOTAL</b>	<b>41</b>	<b>41</b>

**Note:**

1.) UPS rating is 50 kVA at 50 deg C and each UPS System is being provided with 1 Set of Ni-Cd Battery for 1 hr back-up suiting 50 kVA Load ( this is UPS load at 50 deg C). Battery is temperature derated at 4 deg C.



A4-10

CE/416/PAT-MOU/UPS/BSC

REV 00

PAGE 01 OF 02

PROJECT : 1) PVUNL PATRATU (3x660 MW)  
2) MOUDA STG-I (2x500 MW) FGD PACKAGE

CUSTOMER : M/s NTPC

## TYPICAL BATTERY SIZING CALCULATION FOR UPS

**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 ANY WAY DETRIMENTAL TO THE INTEREST OF THE COMPANY.

REVISION:00

APPROVED

AMIT KUMAR SHARMA

PREPARED

SATHISH

ISSUED

416

DATE

08/09/2021





A4-11

CE/416/PAT-MOU/UPS/BSC

REV 00

PAGE 02 OF 02

**Typical Battery sizing calculation for Sl.No 1, 2, 3 & 9 in Scope of Supply of Patraru project:**

UPS full load considered = 'A' kVA

Max. Output load on UPS in watts = 'A' x 1000 x 0.8 (P.F)  
= 'B' Watts

Inverter efficiency = 90% = 0.9

Type of Battery and Back up Time required = Ni-Cd, *60 mins backup at 100% load.*

End cell voltage (ECV) = 1.1 Volts/cell.

Number of cells 'C' = 287 cells

Ageing factor = 1.25

Design Margin = 1.0

Temperature correction factor (at 4 deg. C. electrolyte temp.) = 'E' say

Based on manufacturer's curves, state of charge factor for H-type Battery

for 8 hour Charging at maximum per cell boost voltage 1.68V

(considering upper voltage window of inverter) = 1.0

Float charge correction factor at ECV of 1.1V for 1 Hr. Back-up = 'F' say

Then Battery Discharge Current required = 
$$\frac{B}{1.1 \times C \times 0.9} = 'X' \text{ say}$$

I<sub>DC</sub> with float charge correction factors, temperature correction factor, ageing factor,  
State of charge factor & design margin is

$$= \frac{'X' \times 1.25 \times 1.0}{E \times F} = 'Z' \text{ say}$$

'Z' is Discharge Current (minimum) which is to be fitted in to High Discharge H-Type Battery.

Battery AH to an end cell voltage of 1.1 volts/ cell and = 'Y' say.

Suiting the above discharge current

Hence, Battery selected = 'D' cells 'Y' "H type Battery" which can deliver 'Z' for 1 Hr. back-up  
at ECV=1.1V

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 ANY WAY  
DETRIMENTAL TO THE INTEREST OF THE COMPANY.



A4-11

CE/416/PAT-MOU/UPS/BSC

REV 00

PAGE 02 OF 02

**Typical Battery sizing calculation for SI.No 4, 5, 6, 7, 8 & 10 in Scope of Supply of Patratu Project & SI.No 1 in Scope of Supply of Mouda project:**

UPS full load considered = 'A' kVA

Max. Output load on UPS in watts = 'A' x 1000 x 0.8 (P.F)  
= 'B' Watts

Inverter efficiency = 90% = 0.9

Type of Battery and Back up Time required = Ni-Cd, *60 mins backup at 100% load.*

End cell voltage (ECV) = 1.1 Volts/cell.

Number of cells 'C' = 180 cells

Ageing factor = 1.25

Design Margin = 1.0

Temperature correction factor (at 4 deg. C. electrolyte temp.) = 'E' say

Based on manufacturer's curves, state of charge factor for H-type Battery  
for 8 hour Charging at maximum per cell boost voltage 1.68V  
(considering upper voltage window of inverter) = 1.0

Float charge correction factor at ECV of 1.1V for 1 Hr. Back-up = 'F' say

Then Battery Discharge Current required = 
$$\frac{B}{1.1 \times C \times 0.9} = 'X' \text{ say}$$

I<sub>DC</sub> with float charge correction factors, temperature correction factor, ageing factor,  
State of charge factor & design margin is

$$= \frac{'X' \times 1.25 \times 1.0}{E \times F} = 'Z' \text{ say}$$




'Z' is Discharge Current (minimum) which is to be fitted in to High Discharge H-Type Battery.

Battery AH to an end cell voltage of 1.1 volts/ cell and = 'Y' say.  
Suiting the above discharge current

Hence, Battery selected = 'C' cells 'Y' "H type Battery" which can deliver 'Z' for 1 Hr. back-up  
at ECV=1.1V

**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 ANY WAY  
DETRIMENTAL TO THE INTEREST OF THE COMPANY.

		<div><div><div>बि एच ई एल</div><div></div><div>A4-10</div></div></div>		<div>CE/416/PAT-MOU/UPS/TRT</div> <div>REV 00</div> <div>PAGE 01 OF 05</div>
		<div>PROJECT : 1) PVUNL PATRATU (3x660 MW) 2) MOUDA STG-I (2x500 MW) FGD PACKAGE</div> <div>CUSTOMER : M/s NTPC</div> <div>TYPE &amp; ROUTINE ACCEPTANCE TEST</div>		
		REVISION:00	<div>APPROVED</div> <div></div> <div>AMIT KUMAR SHARMA</div>	
			<div>PREPARED</div> <div></div> <div>SATHISH</div>	<div>ISSUED</div> <div>416</div>

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 ANY WAY DETRIMENTAL TO THE INTEREST OF THE COMPANY.

SUBJECT NO.	TECHNICAL REQUIREMENTS
	<b>TYPE TEST REQUIREMENTS</b>
1.00.00	<b>TYPE TEST REQUIREMENTS</b>
1.01.00	General Requirements
1.01.01	<p>The Contractor shall furnish the type test reports of all type tests as per relevant standards and codes as well as other specific tests indicated in this specification. A list of such tests are given for various equipment in table titled 'TYPE TEST REQUIREMENT FOR C&amp;I SYSTEMS' at the end of this chapter and under the item Special Requirement for Solid State Equipments/Systems. For the balance equipment instrument, type tests may be conducted as per manufactures standard or if required by relevant standard.</p> <p>(a) Out of the tests listed, the Bidder/ sub-vendor/ manufacturer is required to conduct certain type tests specifically for this contract (and witnessed by Employer or his authorized representative) even if the same had been conducted earlier, as clearly indicated subsequently against such tests.</p> <p>(b) For the rest, submission of type test results and certificate shall be acceptable provided.</p> <p>i. The same has been carried out by the Bidder/ sub-vendor on exactly the same model /rating of equipment.</p> <p>ii. There has been no change in the components from the offered equipment &amp; tested equipment.</p> <p>iii. The test has been carried out as per the latest standards alongwith amendments as on the date of Bid opening.</p> <p>(c) In case the approved equipment is different from the one on which the type test had been conducted earlier or any of the above grounds, then the tests have to be repeated and the cost of such tests shall be borne by the Bidder/ sub-vendor within the quoted price and no extra cost will be payable by the Employer on this account.</p>
1.01.02	As mentioned against certain items, the test certificates for some of the items shall be reviewed and approved by the main Bidder or his authorized representative and the balance have to be approved by the Employer.
1.01.03	The schedule of conduction of type tests/ submission of reports shall be submitted and finalized during pre-award discussion.
1.01.04	For the type tests to be conducted, Contractor shall submit detailed test procedure for approval by Employer. This shall clearly specify test setup, instruments to be used, procedure, acceptance norms (wherever applicable), recording of different parameters, interval of recording precautions to be taken etc. for the tests to be carried out.
1.01.05	The Bidder shall indicate in the relevant BPS schedule, the cost of the type test for each item only for which type tests are to be conducted specifically for this project.

The cost shall only be payable after conduction of the respective type test in presence of authorize representative of Employer. If a test is waived off, then the cost shall not be payable.

**2.00.00**

**SPECIAL REQUIREMENT FOR SOLID STATE EQUIPMENTS/ SYSTEMS**

**2.01.00**

The minimum type test reports, over and above the requirements of above clause, which are to be submitted for each of the major C&I systems shall be as indicated below:

i) Surge Withstand Capability ( SWC) for Solid State Equipments/ Systems

All solid state systems/ equipments shall be able to withstand the electrical noise and surges as encountered in actual service conditions and inherent in a power plant. All the solid state systems/ equipments shall be provided with all required protections that needs the surge withstand capability as defined in ANSI 37.90.1/ IEEE-472. Hence, all front end cards which receive external signals like Analog input & output modules, Binary input & output modules etc. including power supply, data highway, data links shall be provided with protections that meets the surge withstand capability as defined in ANSI 37.90.1/ IEEE-472. Complete details of the features incorporated in electronics systems to meet this requirement, the relevant tests carried out, the test certificates etc. shall be submitted along with the proposal. As an alternative to above, suitable class of EN 61000-4-12 which is equivalent to ANSI 37.90.1/ IEEE-472 may also be adopted for SWC test.

ii) Dry Heat test as per IEC-68-2-2 or equivalent.

iii) Damp Heat test as per IEC-68-2-3 or equivalent.

iv) Vibration test as per IEC-68-2-6 or equivalent.

v) Electrostatic discharge tests as per EN 61000-4-2 or equivalent.

vi) Radio frequency immunity test as per EN 61000-4-6 or equivalent.

vii) Electromagnetic Field immunity as per EN 61000-4-3 or equivalent.

Test listed at item no. v, vi, vii, above are applicable for electronic cards only as defined under item (i) above.



<b>TECHNICAL REQUIREMENTS</b>					
<b>S. NO.</b>	<b>ITEM</b>	<b>TYPE TEST REQUIREMENT</b>	<b>STANDARD</b>	<b>TEST TO BE SPECIFICALLY CONDUCTED</b>	<b>NTPC'S APPROVAL REQD. ON TEST CERTIFICATE</b>
1	Battery	As per Standard	IS-10918	NO	YES
2	UPS(Applicable for each model and rating)	Degree of Protection Test	IS-2147	NO	YES
		Power Efficiency	IEC 146-2, IEC 146	NO	YES
		Load test	Approved Procedure	YES	YES
		Audible Noise Test	IEC 146- 2	NO	YES
		Fuse Cleaning Capability	Approved Procedure	YES	YES
		Relative harmonic content	Approved Procedure	NO	YES
		Radio interference	IEC 146 - 4	NO	YES
		Synchronous transfer test	IEC 146 - 4	NO	YES
		Temperature rise test without redundant fans	Approved Procedure	NO	YES
		Input voltage variation test	Approved Procedure	NO	YES
		Over load Test	Approved Procedure	NO	YES
		Insulation test	IEC 146	NO	YES
		Restart Test	IEC 146 - 2	NO	YES
		Short circuit current capability	IEC 146 - 2	NO	YES
		Output voltage & frequency Tolerance	IEC 146 - 2	NO	YES
		Voltage/current Division	IEC 146 - 2	NO	YES
		Relative Harmonic Content	IEC 146 - 2	NO	YES

## QUALITY ASSURANCE

## POWER SUPPLY SYSTEM

POWER SUPPLY SYSTEM

ITEMS	TESTS	Visual/dimension/rating/	Paint Adhesion/	Thickness	General	arrangement/BOM/make	of components	Efficiency	,regulation(R)	Input	voltage variation	(A)	Out put	voltage and frequency adj.range(A)	Preliminary	light load test(R)	Load	transfer retransfer test (R) *	AC	input failiure and return test (R)	Parrallel	operation and current divison(R)	Relative	harmonic content(R)	Restart	with PRI A.C and battery (separately)(R)	System	transfer and retransfer (R)*	Asynchronous	transfer(R)	Ripple	content(R)	Load	limiter operation (R)	IR/HV(R)	Tests	as per standard &specification (R)&(A)
		(R)	(R)	(R)	/Mimic ®	(R)	(A)	(A)	(R)	(R)	(R)	(R)	(R)	(R)	(R)	(R)	(R)	(R)	(R)	(R)	(R)	(R)	(R)	(R)	(R)	(R)	(R)	(R)	(R)	(R)	(R)	(R)	(R)	(R)	(R)	(R)	(R)
UPS/CONVERTER (IEC-146 PT-4)		Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
VOLTAGE STABILISER		Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
LEAD ACID BATTERY(TUBLAR )-IS-1651																																					Y
LEAD ACID BATTERY (PLANTE)-IS-1652																																					Y
NICKEL CADMIUM BATTERY(IS- 10918/IEC-623)																																					Y
R-Routine Test		A- Acceptance Test														Y – Test applicable																					
* Transfer time and Over shoot /under shoot during load & system transfer shall be recorded .																																					
Note: 1) Detailed procedure of Burn-in and Elevated Temperature test shall be as per Quality Assurance Programme in General Technical Conditions																																					
2) This is an indicative list of tests/checks. The manufacturer is to furnish a detailed quality plan indicating the Practices and Procedure adopted alongwith relevant supporting documents.																																					

