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

Tender Document for "UPS to Yadadri (5x800 MW) "

TENDER REFERENCE	SBA0000530
TENDER DOCUMENT AVAILABLE FROM	As per https://eprocurebhel.co.in website
LAST DATE AND TIME FOR SUBMISSION OF TENDER	
DATE AND TIME FOR TENDER OPENING	
SUBMISSION OF TENDER	The bidder should submit their offer in e-Procurement portal only : https://eprocurebhel.co.in

Note:Bidder to refer E-procurment portal(https://eprocurebhel.co.in) for any corrigendum, due date extension, etc.

This Tender Document Contains documents as per below index:

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

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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

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 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. <u>GUIDELINES FOR PREPARATION OF OFFER:</u>

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. <u>GUIDELINES FOR OFFER SUBMISSION:</u>

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. <u>PROCESSING OF OFFERS RECEIVED:</u>

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.

   Incase 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. <u>INFORMATION ON PAYMENT TERMS:</u>

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:

PURCHASE ORDERS FOR:	**SUPPLY WITH SERVICE(S)**	**SUPPLY ONLY**
INDIGENOUS PROCUREMENT	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. Note: 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 & Original PBG (or) against supplementary invoice without PBG after expiry of Warranty period.	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.
IMPORT PROCUREMENT	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. Note: 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 & Original PBG (or) against supplementary invoice without PBG after expiry of Warranty period.	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.

HIGH-SEA SALES PROCUREMENT	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 Note: 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 & Original PBG (or) against supplementary invoice without PBG after expiry of Warranty period.	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.

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. <u>Performance bank guarantee (PBG):</u>

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 MII Purchase preference clause.

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 I

Guidelines for Indian Agents

- Definition of Indian Agent: An Indian Agent of foreign prinicipal is an individual, a partnership, an association of persons, a private or pubile company, that carries our 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.

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

Annexure-A

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 (s) 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.

—x—

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 / transfering 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.	**Foreign Banks**
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.**	**Private Banks**
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 _____[1] through its Unit at.....(name of the Unit) having awarded to (Name of the Vendor / Contractor / Supplier) with its registered office at_____[2] hereinafter referred to as the ' Vendor / Contractor / Supplier ', which expression shall unless repugnant to the context or meaning thereof, include its successors and permitted assigns), a contract Ref No.....dated .....[3] valued at Rs.....[4] (Rupees ————————-)/FC.....(in words.....) for .....[5] (hereinafter called the 'Contract') and the Vendor / Contractor / Supplier having agreed to provide a Contract Performance Bank Guarantee, equivalent to .....% (.... Percent) of the said value of the Contract to the Employer for the faithful performance of the Contract,

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

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

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

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

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

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

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

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

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

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

Unless a demand or claim under this guarantee is made on us in writing on or before the .....[8]we shall be discharged from all liabilities under this guarantee thereafter.

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

Notwithstanding anything to the contrary contained hereinabove:

a) The liability of the Bank under this Guarantee shall not exceed..... [6]
b) This Guarantee shall be valid up to .....[7]
c) Unless the Bank is served a written claim or demand on or before _____[8] all rights under this guarantee shall be forfeited and the Bank shall be relieved and discharged from all liabilities under this guarantee irrespective of whether or not the original bank guarantee is returned to the Bank.

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

For and on behalf of
(Name of the Bank)

Dated.....

Place of Issue.....

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

[2] *NAME AND ADDRESS OF THE VENDOR /CONTRACTOR / SUPPLIER.*

[3] *DETAILS ABOUT THE NOTICE OF AWARD/CONTRACT REFERENCE*

[4] *CONTRACT VALUE*

[5] *PROJECT/SUPPLY DETAILS*

[6] *BG AMOUNT IN FIGURES AND WORDS*

[7] *VALIDITY DATE*

[8] *DATE OF EXPIRY OF CLAIM PERIOD*

Annexure-IX

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.SBA0000530- UPS to Yadadri (5x800 MW)

_____ . 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.
SARAVANA BABU A., DY. MANAGER/CE-MM-PR
BHEL-EDN, MYSORE ROAD, BANGALORE-560026

For & On behalf of the Principal

(Office Seal)

For & On behalf of the Bidder/ Contractor

(Office Seal)

Place: Bengaluru

Date: ----------

Witness: Padmanabha

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

Witness: ----------

(Name & 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 Phytosanitory/ 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
Bharat Heavy Electricals Ltd.,
(A Government of India undertaking)
Electronics Division
PB 2606 , Mysore Road Bangalore , 560026 INDIA

CE: PR: 003- Rev 02

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. : **SBA0000530**
RFQ Date : As per E-procurement website
RFQ Due Date : As per E-procurement website
Customer/Project : **Yadadri (5x800 MW)**
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_____ or _____padmanabha@bhel.in_____

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

Destination: For Indigenous scope of supply, items are to be directly despatched to BHEL site office/stores located at __Yadadri_____TPP in _Telangana___ 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 _16_ 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. Manufacturing clearance for Stage-II locations and Mandatory spares will be provide later as per site delivery schedule. Present delivery schedule is indicated below: Delivery schedule of Stage-II : Dec'22 Delivery schedule of spares : Dec'23	AGREE …… weeks	
04	**Terms of Payment at the time of material supply**	Refer Clause "F" of Instructions to Bidder for BHEL standard Payment terms and loading factors applicable for non-compliance against payment terms: **Indigenous Scope :** a)Supply with Service(s) **Imported Scope :** c)Supply with Service(s) **High-Sea sales :**	AGREE	

		e)Supply with Service(s) **Spares :** b) and/or d)/f) depending upon the scope		
05	**Declaration of local content :** 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

Validate Print Help **Item Wise BoQ**

Tender Inviting Authority: BHEL EDN BANGALORE

Name of Work: UPS for Yadadri (5x800 MW)

Contract No: SBA0000530

Name of the Bidder/ Bidding Firm / Company :	

PRICE SCHEDULE

(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)

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	2 x 180 kVA UPS, 240V AC 1 Ph Output (Unit-1,2,3,4,5, Common for Stage-I, Common for Stage-II)	7	SET	INR			0.00		0.000	0.000	INR Zero Only
2	2 x 10 kVA UPS, 240V AC 1 Ph Output (FOPH & FOUS, RWPH Stg-I & II each, CHP MCC-3 Stg-I & II each, CHP MCC-4 Stg-I & II each, AHP MCC-2 Stg-I & II each)	9	SET	INR			0.00		0.000	0.000	INR Zero Only
3	2 x 20 kVA UPS, 240V AC 1 Ph Output (FWPH Stg-I, AUA Stg- I & II each)	3	SET	INR			0.00		0.000	0.000	INR Zero Only
4	2 x 30 kVA UPS, 240V AC 1 Ph Output (CHP MCC-1,2 Stg-I & II each, AHP MCC-1 Stg-I & II each)	4	SET	INR			0.00		0.000	0.000	INR Zero Only
5	1 x 130 kVA UPS, 240V AC 1 Ph Output (FGD Stage-II)	1	SET	INR			0.00		0.000	0.000	INR Zero Only
6	1 x 100 kVA UPS, 240V AC 1 Ph Output (FGD Stage-I)	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 2	180	METER	INR			0.00		0.000	0.000	INR Zero Only
8	CABLES FROM BATTERY TO UPS, UPS OUTPUT TO ACDB-1 & II, Size 1	240	METER	INR			0.00		0.000	0.000	INR Zero Only
9	CABLES FROM BATTERY TO UPS, UPS OUTPUT TO ACDB-1 & II, Size 4	1980	METER	INR			0.00		0.000	0.000	INR Zero Only
10	CABLES FROM BATTERY TO UPS, UPS OUTPUT TO ACDB-1 & II, Size 00	480	METER	INR			0.00		0.000	0.000	INR Zero Only
11	CABLES FROM BATTERY TO UPS, UPS OUTPUT TO ACDB-1 & II, Size 000	120	METER	INR			0.00		0.000	0.000	INR Zero Only
12	CABLES FROM BATTERY TO UPS, UPS OUTPUT TO ACDB-1 & II, Size 0000	13940	METER	INR			0.00		0.000	0.000	INR Zero Only
13	ACDB-I & ACDB-II (176 feeders each) (Unit-1,2,3,4,5)	5	SET	INR			0.00		0.000	0.000	INR Zero Only
14	ACDB-I & ACDB-II (110 feeders each) (Common for U-1,2)	1	SET	INR			0.00		0.000	0.000	INR Zero Only
15	ACDB-I & ACDB-II (103 feeders each) (Common for U-3,4,5)	1	SET	INR			0.00		0.000	0.000	INR Zero Only
16	ACDB-I & ACDB-II (65 feeders each) (FGD Stg-I)	1	SET	INR			0.00		0.000	0.000	INR Zero Only
17	ACDB-I & ACDB-II (78 feeders each) (FGD Stg-II)	1	SET	INR			0.00		0.000	0.000	INR Zero Only
18	ACDB-I & ACDB-II (7 feeders each) (FOPH & FOUS)	1	SET	INR			0.00		0.000	0.000	INR Zero Only
19	ACDB-I & ACDB-II (9 feeders each) (RWPH Stg-I)	1	SET	INR			0.00		0.000	0.000	INR Zero Only

20	ACDB-I & ACDB-II (6 feeders each) (RWPH Stg-II)	1	SET	INR			0.00		0.000	0.000	INR Zero Only
21	ACDB-I & ACDB-II (15 feeders each) (FWPH Stg-I, AHP MCC-1,2 Stg-I & II each)	3	SET	INR			0.00		0.000	0.000	INR Zero Only
22	ACDB-I & ACDB-II (30 feeders each) (CHP MCC-1,2 Stage-I & II each)	2	SET	INR			0.00		0.000	0.000	INR Zero Only
23	ACDB-I & ACDB-II (20 feeders each) (CHP MCC-3 Stage-I & II each, AUA Stg-I & II each)	4	SET	INR			0.00		0.000	0.000	INR Zero Only
24	ACDB-I & ACDB-II (10 feeders each) (CHP MCC-4 Stg-I&II each)	2	SET	INR			0.00		0.000	0.000	INR Zero Only
25	ACDB-I & ACDB-II (35 feeders each) (AHP MCC-1 Stg-I & II each)	2	SET	INR			0.00		0.000	0.000	INR Zero Only
26	BHMS (for 180 cells)	9	SET	INR			0.00		0.000	0.000	INR Zero Only
27	BHMS (for 110 cells)	16	SET	INR			0.00		0.000	0.000	INR Zero Only
28	DISCHARGE RESISTOR BANK FOR 2x180 kVA UPS	1	SET	INR			0.00		0.000	0.000	INR Zero Only
29	DISCHARGE RESISTOR BANK FOR 2x30 kVA UPS	1	SET	INR			0.00		0.000	0.000	INR Zero Only
30	MANDATORY SPARES for Stg-I	1	LOT	INR			0.00		0.000	0.000	INR Zero Only
31	MANDATORY SPARES for Stg-II	1	LOT	INR			0.00		0.000	0.000	INR Zero Only
32	Erection Supervision and Commissioning Charges of 2 x 180 kVA UPS (Unit-1,2,3,4,5, Common for Stage-I, Common for Stage-II)	7	AU	INR			0.00		0.000	0.000	INR Zero Only
33	Erection Supervision and Commissioning Charges of 2 x 10 kVA UPS (FOPH & FOUS, RWPH Stg-I & II each, CHP MCC-3 Stg-I & II each, CHP MCC-4 Stg-I & II each, AHP MCC-2 Stg-I & II each)	9	AU	INR			0.00		0.000	0.000	INR Zero Only
34	Erection Supervision and Commissioning Charges of 2 x 20 kVA UPS (FWPH Stg-I, AUA Stg- I & II each)	3	AU	INR			0.00		0.000	0.000	INR Zero Only
35	Erection Supervision and Commissioning Charges of 2 x 30 kVA UPS (CHP MCC-1,2 Stg-I & II each, AHP MCC-1 Stg-I & II each)	4	AU	INR			0.00		0.000	0.000	INR Zero Only
36	Erection Supervision and Commissioning Charges of 1 x 130 kVA UPS (FGD Stage-II)	1	AU	INR			0.00		0.000	0.000	INR Zero Only
37	Erection Supervision and Commissioning Charges of 1 x 100 kVA UPS (FGD Stage-I)	1	AU	INR			0.00		0.000	0.000	INR Zero Only
38	Freight Charge for INR portion of Stage I	1	AU	INR			0.00		0.000	0.000	INR Zero Only
39	Freight Charge for INR portion of Stage II	1	AU	INR			0.00		0.000	0.000	INR Zero Only
40	Freight Charge for INR portion of Spares	1	AU	INR			0.00		0.000	0.000	INR Zero Only
41	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.

PROJECT : YADADRI (5x800 MW)

CUSTOMER : M/s TSGENCO

CONSULTANT : M/s TCE, HYDERABAD

SPECIFICATION

FOR

UNINTERRUPTIBLE POWER SUPPLY SYSTEM(UPS)

PQR:

The UPS system offered for this project, shall have at least one (1) year satisfactory operation prior to the date of bid opening in one (1) thermal power station for any UPS rating.

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 TSGENCO, credentials of such vendor will be sent to M/s TSGENCO for approval. Technical acceptance of vendor will be subject to vendor approval from M/s TSGENCO.

CONTENTS

PROJECT : YADADRI (5x800 MW)

CUSTOMER : M/s TSGENCO

CONSULTANT : M/s TCE, HYDERABAD

SCOPE OF SUPPLY

SCOPE_OF_SUPPLY

A. Following UPS shall be as per Technical Requirement Ref: CE/416/YADADRI/UPS/TR and detailed Scope of Supply.

S.NO	LOCATION	UPS RATING	ACDB-1 FEEDERS	ACDB-2 FEEDERS	QTY	E&C QTY
1	Unit-1 Stg-I	2 x 180 kVA	176	176	1 Set	1 AU
2	Unit-2 Stg-I	2 x 180 kVA	176	176	1 Set	1 AU
3	Unit-3 Stg-II	2 x 180 kVA	176	176	1 Set	1 AU
4	Unit-4 Stg-II	2 x 180 kVA	176	176	1 Set	1 AU
5	Unit-5 Stg -II	2 x 180 kVA	176	176	1 Set	1 AU
6	Common for unit 1&2 Stg-I	2 x 180 kVA	110	110	1 Set	1 AU
7	Common for U-3,4 & 5 Stg-II	2 x 180 kVA	103	103	1 Set	1 AU
8	FGD Stg- I	2 x 100 kVA	65	65	1 Set	1 AU
9	FGD Stg-II	2 x 130 kVA	78	78	1 Set	1 AU
10	FOPH & FOUS Stg-I	2 x 10 kVA	7	7	1 Set	1 AU
11	RWPH Stg-I	2 x 10 kVA	9	9	1 Set	1 AU
12	RWPH Stg-II	2 x 10 kVA	6	6	1 Set	1 AU
13	FWPH Stg-I	2 x 20 kVA	15	15	1 Set	1 AU
14	CHP (MCC 1&2) Stg-I #	2 x 30 kVA	30	30	1 Set	1 AU
15	CHP (MCC- 3) Stg-I #	2 x 10 kVA	20	20	1 Set	1 AU
16	CHP (MCC -4) Stg-I #	2 x 10 kVA	10	10	1 Set	1 AU
17	AHP (MCC-1) Stg-I #	2 x 30 kVA	35	35	1 Set	1 AU
18	AHP (MCC -2) Stg-I #	2 x 10 kVA	15	15	1 Set	1 AU
19	CHP (MCC 1&2) Stg-II #	2 x 30 kVA	30	30	1 Set	1 AU
20	CHP (MCC- 3) Stg-II #	2 x 10 kVA	20	20	1 Set	1 AU
21	CHP (MCC -4) Stg-II #	2 x 10 kVA	10	10	1 Set	1 AU
22	AHP (MCC-1) Stg-II #	2 x 30 kVA	35	35	1 Set	1 AU
23	AHP (MCC -2) Stg-II #	2 x 10 kVA	15	15	1 Set	1 AU
24	Ammonia Unloading Area Stg-I #	2 x 20 kVA	20	20	1 Set	1 AU
25	Ammonia Unloading Area Stg-II #	2 x 20 kVA	20	20	1 Set	1 AU

MCB/Fuse combination shall be 6A/10A for total feeders in ACDB-I & II for UPS in Sl.No 14 to 25

1 Set of UPS system comprises ⟶

01.	100% Capacity Static Inverters	2 Nos.
02.	100% Capacity Static Switches	2 Sets
03.	Manual Bypass Switch.	1 Set
04.	Input & Output Isolation Transformers	2 Nos.
05.	100% Capacity float cum boost chargers	2 Nos.
06.	UPS Battery (Lead Acid Plante Battery with accessories)	2 Sets *
07.	Step down transformer 415V, 3 Ph. to 240V, 1 Ph	1 No.
08.	Servo Controlled Voltage Stabilizer.	1 No.
09.	Non Compartmentalized AC power Distribution boards	2 Sets.
10.	Battery Junction box	2 Sets
11.	Battery Health Monitoring System (Interconnecting Cables shall be 30 meters per run and lugs shall be Considered at both BHMS and Battery side)	2 Sets
12.	Special Tools & Tackles	1 Set
13.	Tie Isolator between Battery banks	1 Set
14.	Accessories of UPS system, in line with specification including suitable interconnection cables, cable glands and lugs (for 415V AC MCC incomer, Battery, ACDB, UPS, Tie isolator, Battery Junction Box), Base Frame, Anti-Vibration Pad, Modbus(TCP/IP Connectivity with 50 meter Modbus Cable),etc	1 Set

* 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*).

B. MANDATORY SPARES for UPS System:

Quantity: **1 Lot** for Stage-I(U-1& 2) and **1 Lot** for Stage-II(U 3,4&5)

Each **Lot** comprises of the following**:**

S.NO	ITEM	QUANTITY
01)	HRC Fuse	3 (Three) sets of each rating.
02)	Semiconductor Fuse	6 (Six) sets of each rating.
03)	SCR	10% of total quantity of each type used in the system or minimum 2 (two) nos. whichever is more.
04)	Power Diode	2 (Two) Sets of each rating.
05)	IGBT	2 (Two) Nos.
06)	Electronic Module/PCB	
	a) Static Switch	1(One) no. each type of Electronic card/PCB/ modules used in the system.
	b) Inverter	1(One) no. each type of Electronic card/PCB/ modules used in the system.
	c) Servo Voltage Regulator	1(One) no. each type of Electronic card/PCB/ modules used in the system.
	d) Charger	1(One) no. each type of Electronic card/PCB/ modules used in the system.
07)	Filter Capacitors	1 (One) Set
08)	Filter Chokes	1 (One) Set
09)	Auxiliary Panel	2 (Two) nos. each rating
10)	System Control Card	1 (One) No.

C. INTERCONNECTION CABLES BILL OF MATERIAL BREAKUP: **

S.NO	LOCATION	UNINYVIN CABLE TYPE		NO OF RUNS/ POLE		METERS PER RUN	
		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	50	100
2	Unit-2	Size 0000	Size 0000	3	2	50	100
3	Unit-3	Size 0000	Size 0000	3	2	50	100
4	Unit-4	Size 0000	Size 0000	3	2	50	100
5	Unit-5	Size 0000	Size 0000	3	2	50	100
6	Common for Unit 1&2	Size 0000	Size 0000	3	2	50	100
7	Common for Unit 3&5	Size 0000	Size 0000	3	2	50	100
8	FGD Stg-I	Size 0000	Size 0000	2	1	40	15
9	FGD Stg-II	Size 0000	Size 000	2	2	40	15
10	FOPH & FOUS	Size 4	Size 4	1	1	40	15
11	RWPH Stg-I	Size 4	Size 4	1	1	40	15
12	RWPH Stg-II	Size 4	Size 4	1	1	40	15
13	FWPH	Size 00	Size 2	1	1	40	15
14	CHP (MCC-1&2) Stg-I	Size 0000	Size 1	1	1	40	15
15	CHP (MCC- 3) Stg-I	Size 4	Size 4	1	1	40	15
16	CHP (MCC- 4) Stg-I	Size 4	Size 4	1	1	40	15
17	AHP (MCC-1) Stg-I	Size 0000	Size1	1	1	40	15
18	AHP (MCC-2) Stg-I	Size 4	Size 4	1	1	40	15
19	CHP (MCC-1&2) Stg-II	Size 0000	Size 1	1	1	40	15
20	CHP (MCC- 3) Stg-II	Size 4	Size 4	1	1	40	15
21	CHP (MCC- 4) Stg-II	Size 4	Size 4	1	1	40	15
22	AHP (MCC-1) Stg-II	Size 0000	Size 1	1	1	40	15
23	AHP (MCC-2) Stg-II	Size 4	Size 4	1	1	40	15
24	Ammonia Unloading Area Stage-I	Size 00	Size 2	1	1	40	15
25	Ammonia Unloading Area Stage-II	Size 00	Size 2	1	1	40	15

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

D. Discharge Resistor Bank for 180 kVA UPS System – 1 Set

E. Discharge Resistor Bank for 30 kVA UPS System – 1 Set

2.0 GENERAL TECHNICAL REQUIREMENTS

2.1 The output voltage, current and frequency transducers (4-20mA DC) are to be provided (total 6 numbers) per UPS system as a standard for remote monitoring. Apart from this, transducers related to input voltage and current at charger limbs and SCVS are to be provided (total 6 Nos. per UPS). All these transducers are for remote monitoring wired to UPS. All above analog signals are apart from Binary potential free contacts provided as meaningful information to DCS. Metering & Essential Signals Exchange between UPS and DCS shall be provided as per SLD of UPS System attached.

2.2 **Mandatory Spares:** Wherever quantity has been specified as percentage (%), the quantity of mandatory spares to be provided by the Bidder shall be the specified percentage (%) of the total population required to meet specification requirements. In case, the quantity of mandatory spares so calculated happens to be a fraction, the same shall be rounded off to the next higher whole number.

2.3 Only the site-proven & type tested (in the last 4 years), electronic modules (in case of UPS System) & cell plates (in case of UPS Battery) will be acceptable unless otherwise decided by the purchaser in special circumstances.

2.4 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.

2.5 Considering the fact, separate quotations are being sent for UPS vendors and UPS battery vendors separately. Battery will be sized corresponding to the UPS manufacturer and accordingly UPS & Battery orders will be placed. Battery order will be placed after determining the UPS vendor and UPS rating. However, both UPS and battery vendors have to offer lump sum unit rates for erection supervision & commissioning of UPS, erection supervision & commissioning of Battery with overall integration of complete system being responsibility of UPS vendor.

4.1. DOCUMENTS TO BE FURNISHED

4.1.1. **After Inspection but 1 week before dispatch:** For BHEL/CUSTOMER approval, vendor must send following documents in soft copy.

01. Preliminary Instruction /O&M Manual

4.1.5. **Along with the materials being dispatched:** Vendor must send five (5) sets of the following "**As Built & Approved"** status documents four (4) in hard copies & one (1) in soft 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.)

4.1.6. **After dispatch of material within 1 week :** Vendor must send the following documents in soft copy Directly to Site.

(a) Instruction/O&M Manual
(b) "As built & approved drawings".

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 be compatible with Windows-2007/2010 with drawing/documents in AutoCad-14/MS-Word/MS-Excel/Acrobat formats. Soft copy to be provided for datasheet/document/ drawings at approval stage also.

PROJECT : YADADRI (5x800 MW)

CUSTOMER : M/s TSGENCO

CONSULTANT : M/s TCE, HYDERABAD

TECHNICAL REQUIREMENTS

Uninterruptible Power Supply (UPS) system including UPS Battery

1.0 GENERAL REQUIREMENTS

This specification covers the requirement of an Uninterruptible Power Supply (UPS) System comprising of static inverters, static switch, manual bypass switch, chargers, battery banks and DC & AC distribution boards.

The equipment covered under this specification shall meet the requirements of latest edition of all applicable codes and standards like ANSI, NEMA, IEEE, and IEC. NEC & IS. The UPS equipment and the complete system shall have surge withstand capability (SWC) to meet the requirements of ANSI C37. 90a, IEEE Standard 472. The requirements of UPS 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 and BHEL/CUSTOMER approved drawings. All equipment and accessories required for completeness of this system shall be furnished by the Bidder within the quoted price whether these are specifically mentioned herein or not.

All non-interrupting components of UPS system shall be capable of withstanding all available short circuit currents without damage. Additionally, all circuits interrupting components shall be capable of withstanding and interrupting all encountered short circuit currents without damage.

UPS provided with fuse free circuit breaker shall be preferred. However In case, it is the standard practice of manufacturer to use fast current limiting fuses at inverter output etc. to protect its power semiconductors devices, the same shall be acceptable. However, in AC distribution board either fuse-free circuit breakers shall be employed same shall be of HRC type only. In any case selective fuse(fuse free circuit breaker) coordination shall be provided by Bidder to ensure that only the fuse (fuse free circuit breaker) nearest to the fault will open and isolate the faulted circuit. Other branches of the distribution system will be unaffected and the fault will not cause more than one fuse to open . Further it will be the sole responsibility of the UPS supplier to Engineer/design this system keeping in view the basic guideline as indicated elsewhere in specification like selectivity ratios etc.

The selection and selective coordination of all the protecting devices including fuse free circuit breakers / fuses shall conform to the requirements of National Electric Code (NEC) 1984 and other applicable standards. The selectivity ratios of the fuses (fuse free breakers) shall be such that there is a sufficient margin between the total electric energy of the downstream fuse and the total melting energy of the upstream fuse. The selective ratio shall be as finalized during detailed engineering stage but the same shall be not less than 2:1 in any case.

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 UPS system shall have 2x100% parallel redundant chargers and inverters. 2x100% battery bank, bypass line transformers and voltage stabilizer, static switch, manual bypass switch, AC distribution boards, other necessary protective devices and accessories and shall meet the following requirements as a minimum. The equipment shall be self- protecting against all A.C and D.C transients, voltage surges, and steady state abnormal voltages and currents.

1.1 The KVA rating of UPS arrived at shall be guaranteed at 50°c ambient. 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 applicable ambient temperature. The UPS shall have an over load capacity of 125% rated capacity for 10 minutes and 150% rating capacity for 60 seconds and 300% for 4 m secs. The inverter shall have sufficient I^2t capability to clear fault in the maximum rated branch circuit limited to 12 percent of finally selected UPS capacity. The sizing of UPS shall be based on the power factor of loads being led subject to maximum of 0.8.

2.0 Each of the redundant chargers & batteries shall meet the specification requirements are as follows :

2.1 Float cum boost chargers

2.1.1 The charger shall be solid-state type with full wave fully controlled, bridge configurations. It shall be suitable for the inverter of IGBT type.

2.1.2 The charge shall be provided with automatic voltage regulation, current limiting, smoothing filter circuit and soft-start feature.

2.1.3 The charger shall have provision of float, equalizing and boost charging. Further the charger shall be suitable for single and parallel operation.

2.1.4 Suitable circuitry shall be provided to ensure that the charging current is voltage regulated and current limited.

2.1.5 Each charger shall be rated to meet 100% UPS load plus recharge the fully discharged UPS battery within 8 hours.

2.1.6 Voltage control shall be step less smooth and continuous. Float & equalizing control shall have an adjustable range of +/- 5 %.

3.0 BATTERIES

3.0.1 Each set of battery shall consist of number of cells assembled together on mounting racks.

3.0.2 The battery shall be flooded cell Lead Acid Plante type and shall be suitable for operating satisfactorily in humid and corrosive atmosphere. The batteries will be suitable for float/boost charging and will be suitable for continuous operation.

3.0.3 The equipment shall comply with the requirement of latest revision of Indian standards issued by BIS (Bureau of Indian Standards), IS: 1652: latest and IEEE 485 guidelines for Lead Acid Plante Battery. In case Indian standards are not available for any equipment, standards issued by IEC/BS/VDE/IEEE/NEMA or equivalent shall be applicable.

3.0.4 Autofill System: Bidder to provide complete system for automatic water filling (topping-up) of lead acid plante type batteries to avoid spillage of water and acid which spoils environment. The autofill system shall be intelligent and efficient where replenishment of water is done automatically without manual intervention. The water enters the cell through the 'autofill plug' and raises the electrolyte to a present level controlled by the float. The float raises and closes the valve in the plug by a 2:5:1 action. When the electrolyte level drops the float operated valve will open automatically. Bidder to provide the total system including necessary storage tank, pipelines, autofill plugs and all peripherals, etc. The material of all parts shall be acid proof plastic material.

Alternatively, Regeneration Vent Plug for each battery cell is also acceptable.

3.0.5 Technical Requirement:

i) The battery shall be heavy duty type suitable for power plant duty with float duty operation at constant voltage permanently applied to its terminals which is sufficient to maintain the limits of +10% and -15% of nominal system voltage at any time during the duty cycle in state close to full charge and shall be designed to supply the load in the event of normal power supply failure.

ii) The rated ampere-hour capacity of the cell/battery shall be at reference temperature of 27^{o}C, constant current discharge at 10 hours rate (C10) for Plante type battery to meet end cell voltage of 1.8V/Cell.

iii) The battery shall be suitable for being boost charged to fully charged condition from fully discharged condition within eight (8) hours.

iv) For Plante type battery, it shall be supplied uncharged for flooded cell with the electrolyte furnished in a separate non-returnable container. 10% extra electrolyte shall be furnished to cover spillage in transit or during erection.

v) Each battery set shall consist of a group of cell electrically connected in series to attend the nominal voltage level specified on the datasheet. The terminal cells shall be supplied with connectors for termination to the charger. The supplier shall provide inter-cell connectors and related hardware and accessories required for normal operation and maintenance. All cell posts shall be shrouded and connectors insulated. Nickel plated copper shall be furnished to connect up cells of Battery set. For lead acid battery to prevent corrosion, all copper/brass material shall be effectively coated with lead.

vi) Cell container shall be made of heat resistant, tough translucent polypropylene (SAN) material to make the cell mechanically sturdy and facilitate visual electrolyte level checks for ease in maintenance.

vii) The cell terminal posts shall be provided with connector bolts and nuts made of Nickel-plated steel or lead coated copper/brass material to prevent corrosion. The terminals shall be suitable for short circuit and specified discharge current without damage to cell as a result of terminal heating.

viii) Flame arresting flip-open vent cap shall be provided on the cell to avoid explosion and contamination.

ix) The following information shall be permanently marked on the cell:

- → Nominal Voltage
- ➔ Name or Manufacturer/Model reference.
- ➔ Rated capacity in ampere hour (Ah) with End Cell Voltage
- ➔ Voltage for float operation of 270 with tolerance of +/- 1%.
- ➔ Month and Year of Manufacture.

x) Battery racks shall be constructed of best teakwood with at least three (3) coats of electrolyte Resistant paint of approved shade forming a rigid structure. Cell shall be supported on PVC/porcelain/Hard Rubber insulator fixed on the rack with adequate clearance between adjacent Cells.

3.0.6 BATTERY ACCESSORIES (Set of Accessories to be provided for each battery bank)

a) One Battery Log Book
b) Two Copies of Printed Instruction Sheet.
c) One No. Cell testing voltmeter (3-0-3 volts) complete with leads.
d) Three Nos. Pocket Thermometer.
e) One No. Thermometer (0 to 100^0) with specific gravity correction scale.
f) One set cell bridging connector.
g) Battery racks suitable for accommodating the cells coated with paint.
h) Delrin Insulator (with 5% extra), rubber pad etc. for rack
i) Two nos. plastic filling bottle for filling up.
j) One pair of spanners
k) Two pair of rubber hand gloves
l) Two nos. cell lifting straps
m) One set of inter cell, inter tie and inter back connectors as required for complete installation.
n) One cell charger for each set of battery bank (of AH capacity)
o) Apron, Goggles, 'No Smoking' Notice Board – 1 No each.

4.0 BATTERY HEALTH MONITORING SYSTEM

Each set of battery shall be equipped with an automatic battery condition (Health Check) and performance monitoring system. The battery monitoring system shall compare measured figure during a partial discharge against stored characteristics for the type and capacity of the battery. The system shall be able to test, analyze and predict the battery performance, computing remaining capacity and battery efficiency. The automatic battery monitoring system shall compensate for cell temperature and discharge load current throughout the discharge cycle, premature failure of the batteries, etc. The system shall have a programmable event log shall be secured in the event of total failure for a period up to six month. In addition to local indication and control the battery monitoring system shall include an RS 232 output port to enable battery parameters and alarms to be monitored from plant DCS.

5.0 STATIC INVERTER

i.) The static inverter shall be solid state type consisting of IGBT PWM type inverter, static filters, integrated control modules including oscillations, voltage regulators, current limiting and surge suppression.

ii.) The inverter equipment shall include all necessary circuitry and devices to conform to requirements like voltage regulation, soft start, transient recovery, protection, automatic synchronization, wave shaping, etc. as specified herein.

iii.) Upon transfer of full load, the inverter output voltage shall not drop below 80% of nominal voltage during the first half cycle after transfer and 90% of nominal voltage in the next half cycle. The recovery to within ± 2 % of voltage shall be in less than 50 milli-seconds.

iv.) On occurance of a fault in branch circuit, the inverter shall be capable of clearing the highest rated branch circuit fuses in 4 milli-seconds or less.

v.) The inverter shall be protected against overload, short circuit, 100% loss of load, as well as excursions, loss of restoration of D.C input voltage and synchronizing voltage. The overload capacity shall be 125% for 10 mins., 150% for 60 secs and 300% for 4 m secs

vi.) The D.C current shall never exceed twice the full load current except for a short circuit within the inverter.

vii.) For any value of the load and load power factor drawn by the equipment served, the inverter shall not impose on D.C source any voltage oscillations in excess of 5 volts (RMS total all frequencies) or any current oscillations in excess of 3 percent (RMS total all frequencies) of the D.C current at full load.

viii.) The inverter shall be self-protecting against A.C and D.C transients, voltage surges and steady state abnormal voltage and currents likely to be encountered in the plant.

5.1 Automatic Synchronization

i.) Inverter equipment shall include stable solid-state oscillator devices designed to automatically maintain the inverter output in phase and in synchronism with the stand-by A.C source.

ii.) Facility shall be provided for automatic transfer to internal oscillator operation when the stand-by source frequency is beyond specified limits and the frequency shall be automatically controlled within 50 Hz plus or minus 0.5 Hz when the inverter operates in this mode.

iii.) Retransfer to stand-by AC source for synchronization shall be automatic after the stand-by source frequency is restored to permissible limits and remains within this limit for an adjustable time delay period (up to 5 seconds).

iv.) Provision shall be made for step less adjustments of synch-disconnect frequency range from 50 Hz +/- 0.5 Hz to 50 Hz +/- 2 Hz.

v.) Automatic adjustment of phase relationship between inverter output and stand-by AC source shall be gradual at a controlled slow rate, which shall not exceed one hertz per second.

5.2 Static Transfer Switch

i.) The static transfer switch shall be solid-state type using SCR for automatic/manual transfer of load from “inverter” to “stand-by” source and vice-versa.

ii.) Stand-by source can be either of the inverter or A.C source depending on whether both the inverters are supplying 50% load each or one of the inverter is carrying 100% load.

iii.) The transfer time including sensing shall not be more than one-fourth cycle. Further the transition shall be make before break in both directions.

iv.) The capacity of static transfer switch shall be equal to the continuous full-load capacity of the inverter. The switch shall be provided with protective devices in both normal and alternate power source.

v.) Static transfer switch shall be furnished with contact to alarm failure of the alternate source or opening of any fuse protecting the static switch.

vi.) Static transfer switch shall include all necessary circuitry and devices to meet the functional requirements of transfer initiation, transfer inhibit and re-transfer back to normal as detailed below:

vii.) Transfer Initiation

a) The transfer of static switch from normal 'inverter' position to 'stand-by' position shall be initiated by one of the following causes.
   - ➔ Inverter Failure and UPS System trouble
   - ➔ Inverter output voltage failure
   - ➔ Manual push button operation.

b) The UPS bus shall be monitored by two voltage detectors. One fast acting circuit shall be used for detecting a complete and instantaneous voltage loss while the other slower acting averaging circuit with adjustable trip level shall be employed to detect voltage deviation beyond selected limits. Both voltage detector circuits shall automatically initiate operation of transfer switch.

c) The static switch shall automatically transfer the load from inverter to stand-by source when the maximum I^2t capability of the inverter is reached and when the inverter output drops below 90%.

viii.) Transfer Inhibit

a) Automatic or manual transfer from inverter to stand-by A.C source vice versa shall be inhibited when the inverter frequency is not synchronized to the alternate source.

ix.) Retransfer to Normal

a) The return to inverter mode shall be manual in all cases.

b) Manual transfer shall be initiated by push button actuation.

6.0 Manual By-pass switch:

a) Manual by-pass switch is used to isolate any static transfer switch for maintenance or repair without interruption to the UPS load.

b) The switch has also the facility of by-passing both the static transfer switches during start-up at the option of the operator.

c) Switch contact shall be make before break type.

d) The switch shall have current rating equal to the full load inverter current and necessary short time load carrying and interrupting capacity to meet the requirement of UPS system.

7.0 STEP DOWN TRANSFORMER & VOLTAGE STABILIZER

7.0.1 A three phase to single phase transformer along with associated voltage stabilizer shall be furnished with the UPS System.

7.0.2 The transformer and stabilizer shall be sized for 100 per cent UPS load and shall coordinate with the largest branch circuit protection device for feeder short circuit current without sacrificing voltage regulation.

7.0.3 The voltage stabilizer shall employ servo-controlled circuitry and shall maintain the specified Output voltage for 0-100% load with maximum input voltage variations.

7.0.4 Provision shall be kept for dead closing of static transfer switch from stabilizer circuit to Inverter when the output of the stabilizer is zero, but at that time the inverters are running.

7.9 ACDB

7.9.1 The distribution boards shall be fixed type, non-compartmentalized in freestanding gasketted sheet steel enclosure conforming to IP-54. Sheet steel thickness shall be 2 mm minimum. 100% redundant AC distribution boards shall be provided for 2x100% UPS System.

7.9.2 Fuses shall be HRC, preferably link type, design to permit easy & safe replacement.

7.9.3 Visual indication shall be provided for indication of fuse.

7.9.4 Each ACDB shall be provided with electrolytic grade copper tinned bus bars as 3 numbers each of suitable capacity. One busbar caters to ACDB body earthing (brought out by suitable screws), another to cable shields and third one is for zero potential busbar. All these busbars will be separately connected to Earth pit/risers (Earthing arrangement alongwith cables are not in vendor scope). Neutral of both ACDBs shall also be terminated to Earth pit.

7.10 Alarms

a) Solid state audio-visual annunciation system shall be provided for inverters, static transfer switch and battery charger.

b) Alarm facia shall be provided on each charger and inverter panel, complete with proper actuating devices, circuitry and legends.

c) The arrangement shall be such that on occurrence of a fault the corresponding window will light up and stays lighted until the fault is cleared and reset button pressed.

d) Each time a window lights up a master relay will get energized to provide group alarm signals for remote DCS alarm system.

e) The following alarms through potential free contacts shall be provided:

1.) Rectifier Trip
2.) Inverter Trip
3.) UPS Battery Low
4.) Load on Static Bypass
5.) Static Bypass Failure
6.) ACDB Incomer Trip
7.) UPS Fan Trip
8.) DC Over Voltage
9.) DC Under Voltage
10.) Earth Fault on DC

f) Alarm contacts shall be rated 0.5 A at 220 V DC and 5A at 240V A.C.

g) All indicating meter shall be digital type with in-built transducers (4-20 mA) for hooking up with DDCMIS.

7.11 Lamp / Space Heaters / Receptacles

a) The panels shall be provided with :
   i) Internal illumination lamp with door switch.
   ii) Space heater with thermostat control.
   iii) 3-pin 6A receptacle with plug.

b) Lamp, heater and receptacle circuits shall have individual switch fuse units.

7.12 Wiring / Cabling

a) The panels shall be completely wired up. All wiring shall be done with flexible, 1100V grade, PVC insulated wires with stranded 2.5 Sq.mm copper conductors and routed through wiring troughs. Each wire shall be ferrulled by plastic tube with indelible ink print at both end having terminal block No., terminal number as per approved wiring diagram.

b) Panels shall have removable 3mm gland plate for cable entry. All incoming/outgoing cables shall be terminated in suitable terminal block.

c) Control terminal blocks shall be box-clamp type, minimum 10 Sq.mm. 20% spare terminals shall be furnished.

7.13 Nameplate

a) Engraved nameplates shall be provided for each panel and for each equipment/device mounted on it.

b) The material shall be anodized aluminium / lamicoid, 3 mm thick, with white letters on black background.

c) Nameplates shall be held by self-tapping screws. The size of nameplates shall be approximately 20 mm x 75 mm for equipment and 40 mm x 150 mm for panels.

d) Nameplates for panels shall be provided both on the front and rear.

e) Control and meter selection switches shall have integral nameplates. Nameplates for all other devices shall be located below the respective devices.

f) Instruments and devices mounted on the face of the panels shall also be identified on the rear with the instrument/device number. The number may be painted on or adjacent to the instrument or device case.

g) Caution notice on suitable metal plate shall be affixed at the back of each panel.

7.14 GROUNDING

a) Normal 3-phase A.C power supply will be grounded at the source. For grounding other than this, isolation transformer shall be furnished with the U.P.S.

b) The inverter D.C. input and A.C. output shall be electrically isolated from each other and from cabinet ground.

c) Panels shall have fully rated ground bus with two ground terminals, one at each end.

d) Each terminal shall comprise two-bolt drilling M10 G.I. bolts and nuts to receive Purchaser's ground connection of 50 x 6 mm G.S. flat.

e) Separate electronic grounding shall be provided for each UPS system.

7.15 UPS Cabinets/Enclosures

a) The UPS system components shall be housed in a sheet steel freestanding IP-42 enclosure with all access from the front. Sheet steel thickness shall be 2 mm minimum.
b) The enclosure shall consist of vertical cabinets housing modules in rack type sub-assemblies, connected mechanically and electrically to form a rigid, self-supporting, metal enclosed structure.
c) The modular units shall be mounted in pull out and/or swing tray. Each module shall be capable of being easily removed to provide for the ready inspection of major solid-state devices.
d) Vertical wiring trough shall be provided for the entire height of the UPS cabinet. Cable entry shall be from top only.
e) Adequate ventilating louvers and screens shall be provided. The top of the panel shall be protected by a suitable drip cover to prevent entrance of falling liquid and foreign material.
f) If the equipment supplied requires forced air cooling, the cooling system furnished shall meet the following requirement:
   1.) Two (2) nos. 100% cooling fans shall be provided for each vertical panel.
   2.) Completely independent duplicate protection, control and wiring systems shall be provided for the cooling fans for redundancy.
   3.) The cooling fans shall be powered from the output of the associated inverter. Normally one fan shall be running while the other is on stand-by.
   4.) Each cooling fan shall be equipped with an airflow switch having an alarm contact that closes upon failure of airflow.

7.16 Tropical Protection

a) All equipment accessories and wiring shall have fungus protection, involving special treatment of insulation and metal against fungus insects and corrosion.
b) Screens of corrosion resistant material shall be furnished on all ventilating louvers to prevent the entrance of insects.

7.17 Painting

a) The panels shall be finished in Opaline Green to Shade 275 of IS:5 (Semi-Glossy) Exterior & Brilliant White (Glossy) Interior with two coats of synthetic enamel paint. The panels shall have a matt finish to prevent any glare from surface due to illumination.

:

8.0 Tests:

8.1 All equipment and components thereof shall be subject to shop tests as per relevant IEC/BIS standards. The tests shall include, but shall not be limited to**:**

8.2 Tests on UPS System

a) Type & Routine test for various components
b) Burning test on PCBs – assembled PCBs shall be tested at 70 deg C for 72 hours in loaded condition.
c) Rapid temperature cycling test at 70 deg C and 0 deg C for 30 minutes at each temperature – 5 such cycles.
d) Functional tests to demonstrate compliance with all specified requirements and published. Specifications such as frequency regulation, voltage regulation, current limiting, fuse clearing capability of inverters, demonstration of phase and frequency control of inverter for synchronization with range of adjustments, transfer and retransfer of static switches under influence of under voltage and over current, tests on chargers, batteries and other system component to confirm compliance with specification.

PROJECT : YADADRI (5x800 MW)

CUSTOMER : M/s TSGENCO

CONSULTANT : M/s TCE, HYDERABAD

FEEDER LIST

TSGENCO YADADRI (5x800 MW), 240V AC UPS FEEDER/LOAD LIST

UNIT-1

A. SG PACKAGE R1

Sl.No	Feeder Description	No of Feeders in ACDB-1	No of Feeders in ACDB-2	kVA Rating of each feeder	Total Load in kVA	MCB rating	FUSE rating
1	FLAME SCANNER-1 (CJF75)	2	2	1.44	2.88	10A	16A
2	FLAME SCANNER-2 (CJF76)	2	2	0.48	0.96	6A	10A
3	FSSS MFT-1(CJF01)	1	1	0.72	0.72	6A	10A
4	FSSS MFT-2, MFT RELAY-1 (CJF02, 03)	1	1	0.72	0.72	6A	10A
5	FSSS MFT-3, MFT RELAY-2 (CJF04,05)	1	1	0.72	0.72	6A	10A
6	FSSS UNIT&SADC-1,2,3(CJF06,07,08)	1	1	1.2	1.2	10A	16A
7	FSSS OIL AB, COAL-A&B-1,2,3,4(CJF23,24) (CAF20,21)	1	1	1.2	1.2	10A	16A
8	FSSS OIL CD, COAL-C&D-1,2,3,4(CJF25,26) (CAF22,23)	1	1	1.2	1.2	10A	16A
9	FSSS OIL EF, COAL-E&F-1,2,3,4(CJF27,28) (CAF24,25)	1	1	1.2	1.2	10A	16A
10	FSSS OIL GH, COAL-G&H-1,2,3,4(CJF29,30) (CAF26,27)	1	1	1.2	1.2	10A	16A
11	APRDS & SBC-1,2,3,4,5(CJF58,59,60,61,62)	1	1	1.44	1.44	10A	16A
12	HPBP-1,2(CJF34,35)	1	1	1.44	1.44	10A	16A
13	SCR STREAM A-1,2,3 (CBB 01,02,03) R1	1	1	0.72	0.72	6A	10A
		1	1	0.48	0.48	6A	10A
14	SCR STREAM B-1,2,3 (CBB 04,05,06) R1	1	1	0.72	0.72	6A	10A
		1	1	0.48	0.48	6A	10A
	SUB TOTAL	**18**	**18**		**17.28**		

B. TG PACKAGE

Sl.No	Feeder Description	No of Feeders in ACDB-1	No of Feeders in ACDB-2	kVA Rating of each feeder	Total Load in kVA	MCB rating	FUSE rating
1	EHTC/TP2/AVT/OVSP2(CJJ01,02)	2	2	0.72	1.44	6A	10A
2	EHA1/TP1/OVSP1(CJJ05,06)	2	2	0.72	1.44	6A	10A
3	LPBP/EHA2/TSE/GSPC/LOPS(CJJ03,04,53)	1	1	0.72	0.72	6A	10A
4	ATRS(CCA01,02,03,04)	1	1	1.44	1.44	10A	16A
5	GAMP(CCA10,11)	1	1	0.72	0.72	6A	10A
6	LSR/LMU/AUTO SYNCH(CJJ08)	1	1	0.48	0.48	6A	10A
7	TSI FOR BFPDT-A&B(CWW01) R1	1	1	0.72	0.72	6A	10A
8	BFPDT-A(CJJ20,21,22,23)	1	1	1.44	1.44	10A	16A
9	BFPDT-B(CJJ30,31,32,33)	1	1	1.44	1.44	10A	16A
10	TSI FOR MAIN TURBINE(CJJ41) R1	1	1	0.72	0.72	6A	10A
	SUB TOTAL	**12**	**12**		**10.56**		

C. BOP PACKAGE

S.No	Feeder Description	No of Feeders in ACDB-1	No of Feeders in ACDB-2	kVA Rating of each feeder	Total Load in kVA	MCB rating	FUSE rating
1	FUNCTIONAL GROUP CONTROL(CRE01,02,03,04)	1	1	0.96	0.96	6A	10A
2	FUNCTIONAL GROUP CONTROL(CRE05,06,07,08)	1	1	0.96	0.96	6A	10A
3	FUNCTIONAL GROUP CONTROL(CRE09,10,11,12)	1	1	0.96	0.96	6A	10A
4	FUNCTIONAL GROUP CONTROL(CRE13,14,15,16)	1	1	0.96	0.96	6A	10A
5	FUNCTIONAL GROUP CONTROL(CRE17,18,19,20)	1	1	0.96	0.96	6A	10A
6	FUNCTIONAL GROUP CONTROL(CRE21,22,23,24)	1	1	0.96	0.96	6A	10A
7	FUNCTIONAL GROUP CONTROL(CRE25,26,27,28)	1	1	0.96	0.96	6A	10A
8	FUNCTIONAL GROUP CONTROL(CRE29,30,31,32)	1	1	0.96	0.96	6A	10A
9	FUNCTIONAL GROUP CONTROL(CRE33,34,35,36)	1	1	0.96	0.96	6A	10A
10	FUNCTIONAL GROUP CONTROL(CRE37,38,39,40)	1	1	0.96	0.96	6A	10A
11	FUNCTIONAL GROUP CONTROL(CRE41,42,43)	1	1	0.72	0.72	6A	10A
12	FUNCTIONAL GROUP CONTROL(CRE44,45,46,47)	1	1	0.96	0.96	6A	10A
13	FUNCTIONAL GROUP CONTROL(CRE48,49,50)	1	1	0.72	0.72	6A	10A
14	FUNCTIONAL GROUP CONTROL(CRE51,52)	1	1	0.72	0.72	6A	10A
15	FUNCTIONAL GROUP CONTROL(CRE53,54)	1	1	0.72	0.72	6A	10A
16	FUNCTIONAL GROUP CONTROL(CRE55,56)	1	1	0.72	0.72	6A	10A
17	ALARM CONTROLLERS(CRE61)	1	1	0.48	0.48	6A	10A
18	FUNCTIONAL GROUP CONTROL(CRE81,82)	1	1	0.72	0.72	6A	10A
19	FUNCTIONAL GROUP CONTROL(CRE83,84)	1	1	0.72	0.72	6A	10A
20	INTERPOSING RELAY PANEL(CTE01)	1	1	1.2	1.2	10A	16A
21	INTERPOSING RELAY PANEL(CTE02) R1	1	1	0.72	0.72	6A	10A
22	FUNCTIONAL GROUP CONTROL(CRE62,63,64)	1	1	0.72	0.72	6A	10A
23	FUNCTIONAL GROUP CONTROL(CRE65,66,67)	1	1	0.72	0.72	6A	10A
24	FUNCTIONAL GROUP CONTROL(CRE68,69,70)	1	1	0.72	0.72	6A	10A
25	INTERPOSING RELAY PANEL(CTE03)	1	1	0.72	0.72	6A	10A
26	FUNCTIONAL GROUP CONTROL(CRE96,97,98)	1	1	0.72	0.72	6A	10A
27	INTERPOSING RELAY PANEL(CTE93)	1	1	0.72	0.72	6A	10A
28	FUNCTIONAL GROUP CONTROL(CRE57,58) R1	1	1	0.72	0.72	6A	10A
29	FUNCTIONAL GROUP CONTROL(CRE59,60) R1	1	1	0.72	0.72	6A	10A
30	T&AVT PANEL(CFA01) R1	1	1	2.4	2.4	16A	20A
31	EIS PANEL(CYJ01) R1	1	1	0.96	0.96	6A	10A
32	I.P RELAY (CXA 01,02) R1	1	1	2.4	2.4	16A	20A
33	I.P RELAY (CXA 03,04) R1	1	1	2.4	2.4	16A	20A
	SUB TOTAL	**33**	**33**		**31.92**		

D. HMI SYSTEM R1							
S.No	Feeder Description	No of Feeders in ACDB-1	No of Feeders in ACDB-2	kVA Rating of each feeder	Total Load in kVA	MCB rating	FUSE rating
1	NETWORK PANEL DCS-1(CNP11)	1	1	1.2	1.2	10A	16A
2	NETWORK PANEL HMI-1(CNP21)	1	1	1.2	1.2	10A	16A
3	NETWORK PANEL PWR DISTBN-1(CNP41)	2	2	9	18	100A MCCB	
	SUB TOTAL	**4**	**4**		**20.4**		
E. BHEL TRICHY							
S.No	Feeder Description	No of Feeders in ACDB-1	No of Feeders in ACDB-2	kVA Rating of each feeder	Total Load in kVA	MCB rating	FUSE rating
1	GRAVIMETRIC FEEDER REMOTE CONTROL CABINET R1	8	8	0.5	4	4A	6A
2	BHEL SONIC TUBE LEAK DETECTION SYSTEM PANEL	1	0	0.5	0.5	4A	6A
3	FURNACE FLAME VIEWING SYSTEM- CAMERA-LOCAL UNIT	1	0	0.25	0.25	4A	6A
		0	1	0.25	0.25	4A	6A
4	FURNACE FLAME VIEWING SYSTEM- WALL MOUNTED CABINET IN CONTROL ROOM	1	0	0.5	0.5	4A	6A
5	MASS FLOW METER - LFO	0	1	0.05	0.05	4A	6A
6	MASS FLOW METER - HFO	1	0	0.05	0.05	4A	6A
7	MASS FLOW METER - HFO RETURN LINE	0	1	0.05	0.05	4A	6A
8	AH AIR MOTOR SOLENOID	2	2	0.02	0.04	4A	6A
9	AH-ROTOR STOPPAGE DEVICE	1	0	0.025	0.025	4A	6A
		0	1	0.025	0.025	4A	6A
10	HWL 1&2 AND MEF CONTROL VALVE PANEL - CONTROL SUPPLY R1	1	1	1.6	1.6	10A	16A
11	ASH LEVEL SWITCHES (ECONOMISER AREA)	4	0	0.015	0.06	4A	6A
		0	4	0.015	0.06	4A	6A
12	ASH LEVEL SWITCHES (APH Area)	6	0	0.015	0.09	4A	6A
		0	6	0.015	0.09	4A	6A
	SUB TOTAL	**26**	**25**		**7.64**		
F. BHEL HARIDWAR							
S.No	Feeder Description	No of Feeders in ACDB-1	No of Feeders in ACDB-2	kVA Rating of each feeder	Total Load in kVA	MCB rating	FUSE rating
1	GEN. INST. CABINET(CXW01B) R1	1	1	1.2	1.2	10A	16A
2	GEN END WDG. VIB SYSTEM SUPPLY-(CXW01D)	1	1	0.48	0.48	4A	6A
3	H2-GAS ANALYSER(MKG31CQ001) R1	1	1	0.23	0.23	4A	6A
4	H2-GAS ANALYSER(MKG32CQ001) R1	1	1	0.23	0.23	4A	6A
5	MOISTURE MEASURING EQUIPMENT(MKG69CM001)	1	1	0.23	0.23	4A	6A
	SUB TOTAL	**5**	**5**		**2.37**		
G.MISCELLANEOUS							
S.No	Feeder Description	No of Feeders in ACDB-1	No of Feeders in ACDB-2	kVA Rating of each feeder	Total Load in kVA	MCB rating	FUSE rating
1	PADO	1	1	3	3	16A	20A
2	MASTER CLOCK SYSTEM	1	1	1.2	1.2	10A	16A
3	WALKIE TALKIE SYSTEM	1	1	2.4	2.4	16A	20A
4	HART MANAGEMENT SYSTEM	1	1	1.2	1.2	10A	16A
5	OXYGEN ANALYSER-LOW TEMPERATURE	9	9	0.4	3.6	4A	6A
6	OXYGEN ANALYSER-HIGH TEMPERATURE R1	2	2	0.3	0.6	4A	6A
7	CO at APH INLET	6	6	0.4	2.4	4A	6A
8	RMCMAS ANALSIS SERVER AT CCR	2	2	0.5	1	4A	6A
9	RMCMAS PANEL AT MAIN UNIT EER	6	6	0.8	4.8	6A	10A
10	SWAS	1	1	11	11	63A	80A
11	FLUE GAS ANALYSER SO2/Nox/CO/CO2 AT CHIMNEY	1	1	2	2	16A	20A
12	MERCURY ANALYSER	1	1	0.8	0.8	6A	10A
13	OPACITY MONITOR AT CHIMNEY	1	1	1	1	6A	10A
14	CONDUCTIVITY TYPE LEVEL SWITCH	2	2	0.015	0.03	4A	6A
15	COAL BUNKER LEVEL MONITORING SYSTEM	2	2	0.5	1	4A	6A
16	HF ANALYSER	1	1	0.8	0.8	6A	10A
17	ELECTRICAL CONTROL PANEL (ECP)	1	1	2.4	2.4	16A	20A
18	UNIT CONTROL PANEL (UCP)	1	1	1.44	1.44	10A	16A
19	DAVR R1	2	2	1	2	10A	16A
20	LV DATA CONCENTRATOR PANEL with HMI (OWS/EWS) & Printer	1	1	1	1	10A	16A
	SUB TOTAL	**43**	**43**		**43.67**		

H. BHEL-HYDERABAD

S.No	Feeder Description	No of Feeders in ACDB-1	No of Feeders in ACDB-2	kVA Rating of each feeder	Total Load in kVA	MCB rating	FUSE rating
1	Electronic Power Positioner for Hyd Coupling of MDBFP	1	1	0.5	0.5	4A	6A
2	Reverse Rotation Monitor System (Supplied along with Hyd Coup)	0	1	0.025	0.025	4A	6A
	SUB TOTAL	**1**	**2**		**0.53**		

I. BHEL-RANIPET

S.No	Feeder Description	No of Feeders in ACDB-1	No of Feeders in ACDB-2	kVA Rating of each feeder	Total Load in kVA	MCB rating	FUSE rating
1	IOS PC & PRINTER	1	1	1.5	1.5	10A	16A
2	OPACITY MONITOR	2	0	0.25	0.5	4A	6A
		0	2	0.25	0.5	4A	6A
	SUB TOTAL	**3**	**3**		**2.50**		

J. BHEL-PEM

S.No	Feeder Description	No of Feeders in ACDB-1	No of Feeders in ACDB-2	kVA Rating of each feeder	Total Load in kVA	MCB rating	FUSE rating
1	PC, Printer for Electrical System, Data Concentrator, etc	1	0	1	1	10A	16A
		0	1	1	1	10A	16A
2	MDBFP Water Leakage Detector	1	0	0.33	0.33	4A	6A
3	ID Fan-A Water Leakage Detector	0	1	0.33	0.33	4A	6A
4	ID Fan-B Water Leakage Detector	0	1	0.33	0.33	4A	6A
5	Mass Flow Controller of Oxygen Dosing Pump	1	0	0.24	0.24	4A	6A
		0	1	0.24	0.24	4A	6A
6	CPU Vessel area	1	1	1.92	1.92	16A	20A
7	Chemical Dosing System	1	1	1	1	10A	16A
	SUB TOTAL	**5**	**6**		**6.39**		

Total UPS Load (For items A to J)	143.26
Total UPS Load (For items A to J) + 25% Spare	179.07
UPS Rating	**180 kVA**

ACDB DETAILS:

S.NO	Feeder rating MCB / Fuse	ACDB-1	ACDB-2	With 10% Spare ACDB-1	With 10% Spare ACDB-2	Rounded-off to:- ACDB-1	Rounded-off to:- ACDB-2
1	4A/6A	57	58	63	64	**65**	**65**
2	6A/10A	56	56	62	62	**64**	**64**
3	10A/16A	26	26	29	29	**30**	**30**
4	16A/20A	8	8	9	9	**10**	**10**
5	63A/80A	1	1	2	2	**3**	**3**
6	100A MCCB	2	2	3	3	**4**	**4**
	Total	**150**	**151**	**168**	**169**	**176**	**176**

TSGENCO YADADRI (5x800 MW), 240V AC UPS FEEDER/LOAD LIST

UNIT-2

A. SG PACKAGE

Sl.No	Feeder Description	No of Feeders in ACDB-1	No of Feeders in ACDB-2	kVA Rating of each feeder	Total Load in kVA	MCB rating	FUSE rating
1	FLAME SCANNER-1 (CJF75)	2	2	1.44	2.88	10A	16A
2	FLAME SCANNER-2 (CJF76)	2	2	0.48	0.96	6A	10A
3	FSSS MFT-1(CJF01)	1	1	0.72	0.72	6A	10A
4	FSSS MFT-2, MFT RELAY-1 (CJF02, 03)	1	1	0.72	0.72	6A	10A
5	FSSS MFT-3, MFT RELAY-2 (CJF04,05)	1	1	0.72	0.72	6A	10A
6	FSSS UNIT&SADC-1,2,3(CJF06,07,08)	1	1	1.2	1.2	10A	16A
7	FSSS OIL AB, COAL-A&B-1,2,3,4(CJF23,24) (CAF20,21)	1	1	1.2	1.2	10A	16A
8	FSSS OIL CD, COAL-C&D-1,2,3,4(CJF25,26) (CAF22,23)	1	1	1.2	1.2	10A	16A
9	FSSS OIL EF, COAL-E&F-1,2,3,4(CJF27,28) (CAF24,25)	1	1	1.2	1.2	10A	16A
10	FSSS OIL GH, COAL-G&H-1,2,3,4(CJF29,30) (CAF26,27)	1	1	1.2	1.2	10A	16A
11	APRDS & SBC-1,2,3,4,5(CJF58,59,60,61,62)	1	1	1.44	1.44	10A	16A
12	HPBP-1,2(CJF34,35)	1	1	1.44	1.44	10A	16A
13	SCR STREAM A-1,2,3 (CBB 01,02,03) R1	1	1	0.72	0.72	6A	10A
		1	1	0.48	0.48	6A	10A
14	SCR STREAM B-1,2,3 (CBB 04,05,06) R1	1	1	0.72	0.72	6A	10A
		1	1	0.48	0.48	6A	10A
	SUB TOTAL	**18**	**18**		**17.28**		

B. TG PACKAGE

Sl.No	Feeder Description	No of Feeders in ACDB-1	No of Feeders in ACDB-2	kVA Rating of each feeder	Total Load in kVA	MCB rating	FUSE rating
1	EHTC/TP2/AVT/OVSP2(CJJ01.02)	2	2	0.72	1.44	6A	10A
2	EHA1/TP1/OVSP1(CJJ05,06)	2	2	0.72	1.44	6A	10A
3	LPBP/EHA2/TSE/GSPC/LOPS(CJJ03,04,53)	1	1	0.72	0.72	6A	10A
4	ATRS(CCA01,02,03,04)	1	1	1.44	1.44	10A	16A
5	GAMP(CCA10,11)	1	1	0.72	0.72	6A	10A
6	LSR/LMU/AUTO SYNCH(CJJ08)	1	1	0.48	0.48	6A	10A
7	TSI FOR BFPDT-A&B(CWW01) R1	1	1	0.72	0.72	6A	10A
8	BFPDT-A(CJJ20,21,22,23)	1	1	1.44	1.44	10A	16A
9	BFPDT-B(CJJ30,31,32,33)	1	1	1.44	1.44	10A	16A
10	TSI FOR MAIN TURBINE(CJJ41) R1	1	1	0.72	0.72	6A	10A
	SUB TOTAL	**12**	**12**		**10.56**		

C. BOP PACKAGE

S.No	Feeder Description	No of Feeders in ACDB-1	No of Feeders in ACDB-2	kVA Rating of each feeder	Total Load in kVA	MCB rating	FUSE rating
1	FUNCTIONAL GROUP CONTROL(CRE01,02,03,04)	1	1	0.96	0.96	6A	10A
2	FUNCTIONAL GROUP CONTROL(CRE05,06,07,08)	1	1	0.96	0.96	6A	10A
3	FUNCTIONAL GROUP CONTROL(CRE09,10,11,12)	1	1	0.96	0.96	6A	10A
4	FUNCTIONAL GROUP CONTROL(CRE13,14,15,16)	1	1	0.96	0.96	6A	10A
5	FUNCTIONAL GROUP CONTROL(CRE17,18,19,20)	1	1	0.96	0.96	6A	10A
6	FUNCTIONAL GROUP CONTROL(CRE21,22,23,24)	1	1	0.96	0.96	6A	10A
7	FUNCTIONAL GROUP CONTROL(CRE25,26,27,28)	1	1	0.96	0.96	6A	10A
8	FUNCTIONAL GROUP CONTROL(CRE29,30,31,32)	1	1	0.96	0.96	6A	10A
9	FUNCTIONAL GROUP CONTROL(CRE33,34,35,36)	1	1	0.96	0.96	6A	10A
10	FUNCTIONAL GROUP CONTROL(CRE37,38,39,40)	1	1	0.96	0.96	6A	10A
11	FUNCTIONAL GROUP CONTROL(CRE41,42,43)	1	1	0.72	0.72	6A	10A
12	FUNCTIONAL GROUP CONTROL(CRE44,45,46,47)	1	1	0.96	0.96	6A	10A
13	FUNCTIONAL GROUP CONTROL(CRE48,49,50)	1	1	0.72	0.72	6A	10A
14	FUNCTIONAL GROUP CONTROL(CRE51,52)	1	1	0.72	0.72	6A	10A
15	FUNCTIONAL GROUP CONTROL(CRE53,54)	1	1	0.72	0.72	6A	10A
16	FUNCTIONAL GROUP CONTROL(CRE55,56)	1	1	0.72	0.72	6A	10A
17	ALARM CONTROLLERS(CRE61)	1	1	0.48	0.48	6A	10A
18	FUNCTIONAL GROUP CONTROL(CRE81,82)	1	1	0.72	0.72	6A	10A
19	FUNCTIONAL GROUP CONTROL(CRE83,84)	1	1	0.72	0.72	6A	10A
20	INTERPOSING RELAY PANEL(CTE01)	1	1	1.2	1.2	10A	16A
21	INTERPOSING RELAY PANEL(CTE02) R1	1	1	0.72	0.72	6A	10A
22	FUNCTIONAL GROUP CONTROL(CRE62,63,64)	1	1	0.72	0.72	6A	10A
23	FUNCTIONAL GROUP CONTROL(CRE65,66,67)	1	1	0.72	0.72	6A	10A
24	FUNCTIONAL GROUP CONTROL(CRE68,69,70)	1	1	0.72	0.72	6A	10A
25	INTERPOSING RELAY PANEL(CTE03)	1	1	0.72	0.72	6A	10A
26	FUNCTIONAL GROUP CONTROL(CRE96,97,98)	1	1	0.72	0.72	6A	10A
27	INTERPOSING RELAY PANEL(CTE93)	1	1	0.72	0.72	6A	10A
28	FUNCTIONAL GROUP CONTROL(CRE57,58) R1	1	1	0.72	0.72	6A	10A
29	FUNCTIONAL GROUP CONTROL(CRE59,60) R1	1	1	0.72	0.72	6A	10A
30	T&AVT PANEL(CFA01) R1	1	1	2.4	2.4	16A	20A
31	EIS PANEL(CYJ01) R1	1	1	0.96	0.96	6A	10A
32	FUNCTIONAL GROUP CONTROL(CRE74,75) R1	1	1	0.72	0.72	6A	10A
33	LP RELAY (CXA 01,02) R1	1	1	2.4	2.4	16A	20A
34	LP RELAY (CXA 03,04) R1	1	1	2.4	2.4	16A	20A
	SUB TOTAL	**34**	**34**		**32.64**		

D. HMI SYSTEM R1

S.No	Feeder Description	No of Feeders in ACDB-1	No of Feeders in ACDB-2	kVA Rating of each feeder	Total Load in kVA	MCB rating	FUSE rating
1	NETWORK PANEL DCS-1(CNP11)	1	1	1.2	1.2	10A	16A
2	NETWORK PANEL HMI-1(CNP21)	1	1	1.2	1.2	10A	16A
3	NETWORK PANEL PWR DISTBN-1(CNP41)	2	2	9	18	100A MCCB	
	SUB TOTAL	**4**	**4**		**20.4**		

E. BHEL TRICHY							
S.No	Feeder Description	No of Feeders in ACDB-1	No of Feeders in ACDB-2	kVA Rating of each feeder	Total Load in kVA	MCB rating	FUSE rating
1	GRAVIMETRIC FEEDER REMOTE CONTROL CABINET R1	8	8	0.5	4	4A	6A
2	BHEL SONIC TUBE LEAK DETECTION SYSTEM PANEL	1	0	0.5	0.5	4A	6A
3	FURNACE FLAME VIEWING SYSTEM- CAMERA-LOCAL UNIT	1	0	0.25	0.25	4A	6A
		0	1	0.25	0.25	4A	6A
4	FURNACE FLAME VIEWING SYSTEM- WALL MOUNTED CABINET IN CONTROL ROOM	1	0	0.5	0.5	4A	6A
5	MASS FLOW METER - LFO	0	1	0.05	0.05	4A	6A
6	MASS FLOW METER - HFO	1	0	0.05	0.05	4A	6A
7	MASS FLOW METER - HFO RETURN LINE	0	1	0.05	0.05	4A	6A
8	AH AIR MOTOR SOLENOID	2	2	0.02	0.04	4A	6A
9	AH-ROTOR STOPPAGE DEVICE	1	0	0.025	0.025	4A	6A
		0	1	0.025	0.025	4A	6A
10	HWL 1&2 AND MEF CONTROL VALVE PANEL - CONTROL SUPPLY R1	1	1	1.6	1.6	10A	16A
11	ASH LEVEL SWITCHES (ECONOMISER AREA)	4	0	0.015	0.06	4A	6A
		0	4	0.015	0.06	4A	6A
12	ASH LEVEL SWITCHES (APH Area)	6	0	0.015	0.09	4A	6A
		0	6	0.015	0.09	4A	6A
	SUB TOTAL	**26**	**25**		**7.64**		
F. BHEL HARIDWAR							
S.No	Feeder Description	No of Feeders in ACDB-1	No of Feeders in ACDB-2	kVA Rating of each feeder	Total Load in kVA	MCB rating	FUSE rating
1	GEN. INST. CABINET(CXW01B) R1	1	1	1.2	1.2	10A	16A
2	GEN END WDG. VIB SYSTEM (SUPPLY-(CXW01D)	1	1	0.48	0.48	4A	6A
3	H2-GAS ANALYSER(MKG31CQ001) R1	1	1	0.23	0.23	4A	6A
4	H2-GAS ANALYSER(MKG32CQ001) R1	1	1	0.23	0.23	4A	6A
5	MOISTURE MEASURING EQUIPMENT(MKG69CM001)	1	1	0.23	0.23	4A	6A
	SUB TOTAL	**5**	**5**		**2.37**		
G.MISCELLANEOUS							
S.No	Feeder Description	No of Feeders in ACDB-1	No of Feeders in ACDB-2	kVA Rating of each feeder	Total Load in kVA	MCB rating	FUSE rating
1	PADO	1	1	3	3	16A	20A
2	MASTER CLOCK SYSTEM	1	1	1.2	1.2	10A	16A
3	WALKIE TALKIE SYSTEM	1	1	2.4	2.4	16A	20A
4	HART MANAGEMENT SYSTEM	1	1	1.2	1.2	10A	16A
5	OXYGEN ANALYSER-LOW TEMPERATURE	9	9	0.4	3.6	4A	6A
6	OXYGEN ANALYSER-HIGH TEMPERATURE R1	2	2	0.3	0.6	4A	6A
7	CO at APH INLET	6	6	0.4	2.4	4A	6A
8	RMCMAS ANALSIS SERVER AT CCR	2	2	0.5	1	4A	6A
9	RMCMAS PANEL AT MAIN UNIT EER	6	6	0.8	4.8	6A	10A
10	SWAS	1	1	11	11	63A	80A
11	FLUE GAS ANALYSER SO2/Nox/CO/CO2 AT CHIMNEY	1	1	2	2	16A	20A
12	MERCURY ANALYSER	1	1	0.8	0.8	6A	10A
13	OPACITY MONITOR AT CHIMNEY	1	1	1	1	6A	10A
14	CONDUCTIVITY TYPE LEVEL SWITCH	2	2	0.015	0.03	4A	6A
15	COAL BUNKER LEVEL MONITORING SYSTEM	2	2	0.5	1	4A	6A
16	HF ANALYSER	1	1	0.8	0.8	6A	10A
17	ELECTRICAL CONTROL PANEL (ECP)	1	1	2.4	2.4	16A	20A
18	UNIT CONTROL PANEL (UCP)	1	1	1.44	1.44	10A	16A
19	DAVR R1	2	2	1	2	10A	16A
20	LV DATA CONCENTRATOR PANEL with HMI (OWS/EWS) & Printer	1	1	1	1	10A	16A
	SUB TOTAL	**43**	**43**		**43.67**		
H. BHEL-HYDERABAD							
S.No	Feeder Description	No of Feeders in ACDB-1	No of Feeders in ACDB-2	kVA Rating of each feeder	Total Load in kVA	MCB rating	FUSE rating
1	Electronic Power Positioner for Hyd Coupling of MDBFP	1	1	0.5	0.5	4A	6A
2	Reverse Rotation Monitor System (Supplied along with Hyd Coup)	0	1	0.025	0.025	4A	6A
	SUB TOTAL	**1**	**2**		**0.53**		
I. BHEL-RANIPET							
S.No	Feeder Description	No of Feeders in ACDB-1	No of Feeders in ACDB-2	kVA Rating of each feeder	Total Load in kVA	MCB rating	FUSE rating
1	IOS PC & PRINTER	1	1	1.5	1.5	10A	16A
2	OPACITY MONITOR	2	0	0.25	0.5	4A	6A
		0	2	0.25	0.5	4A	6A
	SUB TOTAL	**3**	**3**		**2.50**		

J. BHEL-PEM

S.No	Feeder Description	No of Feeders in ACDB-1	No of Feeders in ACDB-2	kVA Rating of each feeder	Total Load in kVA	MCB rating	FUSE rating
1	PC, Printer for Electrical System, Data Concentrator, etc	1	0	1	1	10A	16A
		0	1	1	1	10A	16A
2	MDBFP Water Leakage Detector	1	0	0.33	0.33	4A	6A
3	ID Fan-A Water Leakage Detector	0	1	0.33	0.33	4A	6A
4	ID Fan-B Water Leakage Detector	0	1	0.33	0.33	4A	6A
5	Mass Flow Controller of Oxygen Dosing Pump	1	0	0.24	0.24	4A	6A
		0	1	0.24	0.24	4A	6A
6	CPU Vessel area	1	1	1.92	1.92	16A	20A
7	Chemical Dosing System	1	1	1	1	10A	16A
	SUB TOTAL	**5**	**6**		**6.39**		

Total UPS Load (For items A to J)	143.98
Total UPS Load (For items A to J) + 25% Spare	179.97
UPS Rating	**180 kVA**

ACDB DETAILS:

S.NO	Feeder rating MCB / Fuse	ACDB-1	ACDB-2	With 10% Spare ACDB-1	With 10% Spare ACDB-2	Rounded-off to:- ACDB-1	Rounded-off to:- ACDB-2
1	4A/6A	57	58	63	64	**65**	**65**
2	6A/10A	57	57	63	63	**64**	**64**
3	10A/16A	26	26	29	29	**30**	**30**
4	16A/20A	8	8	9	9	**10**	**10**
5	63A/80A	1	1	2	2	**3**	**3**
6	100A MCCB	2	2	3	3	**4**	**4**
	Total	**151**	**152**	**169**	**170**	**176**	**176**

TSGENCO YADADRI (5x800 MW), 240V AC UPS FEEDER/LOAD LIST

COMMON FOR UNIT-1&2

A. SG & FGD PACKAGE LOADS R1

Sl.No	Feeder Description	No of Feeders in ACDB-1	No of Feeders in ACDB-2	kVA Rating of each feeder	Total Load in kVA	MCB rating	FUSE rating
a) Aux Boiler Control Room							
1	AUX BLR - 1,2,3 (CAF 50,51,52)	1	1	1.2	1.2	10A	16A
2	Feeder for trip solenoid valves	1	1	0.48	0.48	6A	10A
3	Oxygen Analyser - Low Temperature	1	1	0.4	0.4	4A	6A
4	Local Drum Level gauge	1	0	1	1	6A	10A
		0	1	1	1	6A	10A
b) Ammonia Tank Farm Area Control Room							
1	SCR COMMON-1 STAGE-I (CBB11,12)	1	1	0.72	0.72	6A	10A
		1	1	0.48	0.48	6A	10A
2	SCR COMMON-2 STAGE-II (CBB13,14)	1	1	0.72	0.72	6A	10A
		1	1	0.48	0.48	6A	10A
	SUB TOTAL	**8**	**8**		**6.48**		

B. BOP PACKAGE

S.No	Feeder Description	No of Feeders in ACDB-1	No of Feeders in ACDB-2	kVA Rating of each feeder	Total Load in kVA	MCB rating	FUSE rating
1	FUNCTIONAL GROUP CONTROL(CRE71,72,73)	1	1	0.72	0.72	6A	10A
2	FUNCTIONAL GROUP CONTROL(CRE91,92)	1	1	0.48	0.48	6A	10A
3	FUNCTIONAL GROUP CONTROL(CRE93,94,95)	1	1	0.72	0.72	6A	10A
4	INTERPOSING RELAY PANEL(CTE91) R1	1	1	0.72	0.72	6A	10A
5	INTERPOSING RELAY PANEL(CTE92) R1	1	1	0.72	0.72	6A	10A
6	FUNCTIONAL GROUP CONTROL(CRW01,02,03)	1	1	0.72	0.72	6A	10A
7	FUNCTIONAL GROUP CONTROL(CRW04,05,06)	1	1	0.72	0.72	6A	10A
8	FUNCTIONAL GROUP CONTROL(CRW07,08,09,10) R1	1	1	0.96	0.96	6A	10A
9	INTERPOSING RELAY PANEL(CTE04) R1	1	1	0.72	0.72	6A	10A
10	FUNCTIONAL GROUP CONTROL(CRW11,12,13) R1	1	1	0.72	0.72	6A	10A
	SUB TOTAL	**10**	**10**		**7.2**		

C. HMI SYSTEM

S.No	Feeder Description	No of Feeders in ACDB-1	No of Feeders in ACDB-2	kVA Rating of each feeder	Total Load in kVA	MCB rating	FUSE rating
1	NETWORK PANEL COMMON-1(CNP31) R1	1	1	10.8	10.8	63A	80A
2	NETWORK PANEL STN. LAN-1(CNP51) R1	1	1	1.2	1.2	10A	16A
3	NETWORK PANEL STN.LAN-2(CNP52) R1	1	1	1.2	1.2	10A	16A
4	NETWORK PANEL COMMON-3(CNP35)	1	1	0.72	0.72	6A	10A
5	NETWORK PANEL COMMON-4(CNP36) R1	1	1	4.8	4.8	25A	32A
6	NETWORK PANEL COMMON-5(CNP37)	1	1	0.72	0.72	6A	10A
7	NETWORK ENCLOSURE (CNE 81) MRS area R1	1	1	1.68	1.68	10A	16A
8	NETWORK ENCLOSURE (CNE 82) CAS area R1	1	1	1.68	1.68	10A	16A
9	NETWORK ENCLOSURE Service Building-1 Area-1 R1	1	1	6	6	40A	50A
10	NETWORK ENCLOSURE Service Building-1 Area-2 R1	1	1	6	6	40A	50A
11	NETWORK ENCLOSURE Service Building-1 Area-3 R1	1	1	4.4	4.4	40A	50A
12	NETWORK ENCLOSURE Admin Building Area-1 R1	1	1	5.2	5.2	40A	50A
13	NETWORK ENCLOSURE Admin Building Area-2 R1	1	1	5.43	5.43	40A	50A
14	NETWORK ENCLOSURE CWPH Stg-I R1	1	1	2.4	2.4	16A	20A
15	NETWORK ENCLOSURE CLWPH Stg-I R1	1	1	1.8	1.8	10A	16A
16	NETWORK ENCLOSURE CPU Regeneration Area R1	1	1	1.44	1.44	10A	16A
	SUB TOTAL	**16**	**16**		**55.47**		

D.MISCELLANEOUS

S.No	Feeder Description	No of Feeders in ACDB-1	No of Feeders in ACDB-2	kVA Rating of each feeder	Total Load in kVA	MCB rating	FUSE rating
1	CCTV UNIT-1 R1	1	1	2.4	2.4	16A	20A
2	CCTV UNIT-2 R1	1	1	2.4	2.4	16A	20A
3	CCTV Common Plant Area -1,2 R1	1	1	2.4	2.4	16A	20A
4	PA System Unit-1 R1	1	1	2.4	2.4	16A	20A
5	PA System Unit-2 R1	1	1	2.4	2.4	16A	20A
6	C&I LABORATORY INSTRUMENTS-MECHANICAL	2	2	2	4	16A	20A
7	C&I LABORATORY INSTRUMENTS-ELECTRICAL	2	2	2	4	16A	20A
8	RMCMAS FOR CWPH R1	1	1	0.3	0.3	4A	6A
9	RMCMAS FOR CLWPH R1	1	1	0.3	0.3	4A	6A
10	EPABX R1	1	1	1	1	6A	10A
11	LV DATA CONCENTRATOR PANEL with HMI (OWS/EWS) & Printer	1	1	1	1	10A	16A
	SUB TOTAL	**13**	**13**		**22.60**		

E. BHEL-BHOPAL R1

S.No	Feeder Description	No of Feeders in ACDB-1	No of Feeders in ACDB-2	kVA Rating of each feeder	Total Load in kVA	MCB rating	FUSE rating
1	DATA CONCENTRATOR PANEL incl HMI (OWS/EWS) & Printer at EL 3.5M & 12.5M U-1&2	3	3	1.3	3.9	10A	16A
2	DATA CONCENTRATOR PANEL BOP Stage-I	1	1	1.3	1.3	10A	16A
3	BTS Panels Stage-I	2	0	0.1	0.2	4A	6A
		0	2	0.1	0.2	4A	6A
	SUB TOTAL	**6**	**6**		**5.60**		

F. BHEL-PEM R1

S.No	Feeder Description	No of Feeders in ACDB-1	No of Feeders in ACDB-2	kVA Rating of each feeder	Total Load in kVA	MCB rating	FUSE rating
1	Air Compressor Panel	4	4	0.75	3	6A	10A
2	MRS Compressor	2	2	0.75	1.5	6A	10A
3	OWS/OWES/Printer/Backup Panel (Compressor Room)	1	1	2.1	2.1	16A	20A
4	Bag Filter/Silo (MRS)	1	1	1	1	10A	16A
5	CPU Regenration Area	1	1	1.92	1.92	16A	20A
6	HV AC System Stage-I	1	1	6	6	40A	50A
7	HV AC System DM Control Room	1	1	2	2	16A	20A
8	HV AC System Service Building Stage-I	1	1	1	1	10A	16A
9	HV AC System ESP Stage-I	1	1	2	2	16A	20A
10	Air Dryer Panel Stage-I	1	1	0.5	0.5	4A	6A
11	Self Cleaner Strainer Panel	1	1	1	1	10A	16A
12	Auto Drain Trap	2	0	0.375	0.75	4A	6A
		0	3	0.375	1.125	4A	6A
	SUB TOTAL	**17**	**18**		**23.90**		

G. FIRE DETECTION & ALARM SYSTEM R1

S.No	Feeder Description	No of Feeders in ACDB-1	No of Feeders in ACDB-2	kVA Rating of each feeder	Total Load in kVA	MCB rating	FUSE rating
1	Fire Alarm Panel - 1 (CCR-1&2)	1	0	0.6	0.6	4A	6A
2	Fire Alarm Panel - 13 (CWPH-1)	0	1	0.6	0.6	4A	6A
3	RIO Panel - 10 (ESP CR-1)	1	0	0.6	0.6	4A	6A
4	Fire Alarm Panel - 15 (ESP CR-2)	0	1	0.6	0.6	4A	6A
5	RIO Panel - 1 (PT Plant Control Room)	1	0	0.6	0.6	4A	6A
6	RIO Panel - 3 (CW Chlorination Building-1)	0	1	0.6	0.6	4A	6A
7	OLHS Controller -1 TG Building El 8.5M U 1&2	1	0	0.12	0.12	4A	6A
8	Optical LHS Controller-4 (TG Building El. 13.5 M Unit-1&2)	0	1	0.12	0.12	4A	6A
9	Optical LHS Controller-16 (TG Building El. 13.5 M Unit-1&2)	1	0	0.12	0.12	4A	6A
10	Fire Alarm Panel - 12 (DM Plant CR)	0	1	0.6	0.6	4A	6A
11	Fire Alarm Panel - 10 (Admin Building)	1	0	0.6	0.6	4A	6A
12	Fire Alarm Panel - 8 (Service Building-1)	0	1	0.6	0.6	4A	6A
13	RIO Panel - 5 (STP Control Room)	1	0	0.6	0.6	4A	6A
14	RIO Panel - 6 (ETP Control Room)	0	1	0.6	0.6	4A	6A
15	RIO Panel - 9 (Stores)	1	0	0.6	0.6	4A	6A
16	PLC Printer (CCR-1&2)	0	1	0.35	0.35	4A	6A
17	FDA OWS (CCR-1&2)	1	0	0.35	0.35	4A	6A
18	FDA Printer (CCR-1&2)	0	1	0.35	0.35	4A	6A
19	PLC OWS-1 (CCR-1&2)	1	0	0.35	0.35	4A	6A
20	Inert Gas Control Panel-1 (TG Building El. 0.0 M Unit-1&2)	0	1	1	1	10A	16A
	SUB TOTAL	**10**	**10**		**9.96**		

H.BHEL-BAP, RANIPET R1

S.No	Feeder Description	No of Feeders in ACDB-1	No of Feeders in ACDB-2	kVA Rating of each feeder	Total Load in kVA	MCB rating	FUSE rating
1	CW Gas Chlorination PLC Stage-I **Note:** Local PDB is provided. Kindly refer PDB details	1	1	2.201	2.201	16A	20A
2	RW Chlorination RIO	1	1	0.6	0.6	4A	6A
		1	0	0.001	0.001	4A	6A
3	PW Chlorination RIO	1	1	0.6	0.6	4A	6A
		0	1	0.001	0.001	4A	6A
4	STP RIO Panel-2	1	1	0.4	0.4	4A	6A
5	ETP RIO Panel-1	1	1	1	1	6A	10A
	SUB TOTAL	**6**	**6**		**4.80**		

I.BHEL-TRICHY R1

S.No	Feeder Description	No of Feeders in ACDB-1	No of Feeders in ACDB-2	kVA Rating of each feeder	Total Load in kVA	MCB rating	FUSE rating
1	Ash Level Switches (SCR Area)	3	0	0.015	0.045	4A	6A
		0	3	0.015	0.045	4A	6A
	SUB TOTAL	**3**	**3**		**0.09**		

Total UPS Load (For items A to I)	136.10
Total UPS Load (For items A to I) + 25% Spare	170.1225
UPS Rating	**180 kVA**

ACDB DETAILS:

S.NO	Feeder rating MCB / Fuse	ACDB-1	ACDB-2	With 10% Spare ACDB-1	 ACDB-2	Rounded-off to:- ACDB-1	 ACDB-2
1	4A/6A	25	25	28	28	**29**	**29**
2	6A/10A	26	26	29	29	**30**	**30**
3	10A/16A	15	16	17	18	**19**	**19**
4	16A/20A	15	15	17	17	**18**	**18**
5	25A/32A	1	1	2	2	**3**	**3**
6	40A/50A	6	6	7	7	**8**	**8**
7	63A/80A	1	1	2	2	**3**	**3**
	Total	**89**	**90**	**102**	**103**	**110**	**110**

TSGENCO YADADRI (5x800 MW), 240V AC UPS FEEDER/LOAD LIST

UNIT-3

A. SG PACKAGE

Sl.No	Feeder Description	No of Feeders in ACDB-1	No of Feeders in ACDB-2	kVA Rating of each feeder	Total Load in kVA	MCB rating	FUSE rating
1	FLAME SCANNER-1 (CJF75)	2	2	1.44	2.88	10A	16A
2	FLAME SCANNER-2 (CJF76)	2	2	0.48	0.96	6A	10A
3	FSSS MFT-1(CJF01)	1	1	0.72	0.72	6A	10A
4	FSSS MFT-2, MFT RELAY-1 (CJF02, 03)	1	1	0.72	0.72	6A	10A
5	FSSS MFT-3, MFT RELAY-2 (CJF04,05)	1	1	0.72	0.72	6A	10A
6	FSSS UNIT&SADC-1,2,3(CJF06,07,08)	1	1	1.2	1.2	10A	16A
7	FSSS OIL AB, COAL-A&B-1,2,3,4(CJF23,24) (CAF20,21)	1	1	1.2	1.2	10A	16A
8	FSSS OIL CD, COAL-C&D-1,2,3,4(CJF25,26) (CAF22,23)	1	1	1.2	1.2	10A	16A
9	FSSS OIL EF, COAL-E&F-1,2,3,4(CJF27,28) (CAF24,25)	1	1	1.2	1.2	10A	16A
10	FSSS OIL GH, COAL-G&H-1,2,3,4(CJF29,30) (CAF26,27)	1	1	1.2	1.2	10A	16A
11	APRDS & SBC-1,2,3,4,5(CJF58,59,60,61,62)	1	1	1.44	1.44	10A	16A
12	HPBP-1,2(CJF34,35)	1	1	1.44	1.44	10A	16A
13	SCR STREAM A-1,2,3 (CBB 01,02,03) **R1**	1	1	0.72	0.72	6A	10A
		1	1	0.48	0.48	6A	10A
14	SCR STREAM B-1,2,3 (CBB 04,05,06) **R1**	1	1	0.72	0.72	6A	10A
		1	1	0.48	0.48	6A	10A
	SUB TOTAL	**18**	**18**		**17.28**		

B. TG PACKAGE

Sl.No	Feeder Description	No of Feeders in ACDB-1	No of Feeders in ACDB-2	kVA Rating of each feeder	Total Load in kVA	MCB rating	FUSE rating
1	EHTC/TP2/AVT/OVSP2(CJJ01.02)	2	2	0.72	1.44	6A	10A
2	EHA1/TP1/OVSP1(CJJ05,06)	2	2	0.72	1.44	6A	10A
3	LPBP/EHA2/TSE/GSPC/LOPS(CJJ03,04,53)	1	1	0.72	0.72	6A	10A
4	ATRS(CCA01,02,03,04)	1	1	1.44	1.44	10A	16A
5	GAMP(CCA10,11)	1	1	0.72	0.72	6A	10A
6	LSR/LMU/AUTO SYNCH(CJJ08)	1	1	0.48	0.48	6A	10A
7	TSI FOR BFPDT-A&B(CWW01) **R1**	1	1	0.72	0.72	6A	10A
8	BFPDT-A(CJJ20,21,22,23)	1	1	1.44	1.44	10A	16A
9	BFPDT-B(CJJ30,31,32,33)	1	1	1.44	1.44	10A	16A
10	TSI FOR MAIN TURBINE(CJJ41) **R1**	1	1	0.72	0.72	6A	10A
	SUB TOTAL	**12**	**12**		**10.56**		

C. BOP PACKAGE

S.No	Feeder Description	No of Feeders in ACDB-1	No of Feeders in ACDB-2	kVA Rating of each feeder	Total Load in kVA	MCB rating	FUSE rating
1	FUNCTIONAL GROUP CONTROL(CRE01,02,03,04)	1	1	0.96	0.96	6A	10A
2	FUNCTIONAL GROUP CONTROL(CRE05,06,07,08)	1	1	0.96	0.96	6A	10A
3	FUNCTIONAL GROUP CONTROL(CRE09,10,11,12)	1	1	0.96	0.96	6A	10A
4	FUNCTIONAL GROUP CONTROL(CRE13,14,15,16)	1	1	0.96	0.96	6A	10A
5	FUNCTIONAL GROUP CONTROL(CRE17,18,19,20)	1	1	0.96	0.96	6A	10A
6	FUNCTIONAL GROUP CONTROL(CRE21,22,23,24)	1	1	0.96	0.96	6A	10A
7	FUNCTIONAL GROUP CONTROL(CRE25,26,27,28)	1	1	0.96	0.96	6A	10A
8	FUNCTIONAL GROUP CONTROL(CRE29,30,31,32)	1	1	0.96	0.96	6A	10A
9	FUNCTIONAL GROUP CONTROL(CRE33,34,35,36)	1	1	0.96	0.96	6A	10A
10	FUNCTIONAL GROUP CONTROL(CRE37,38,39,40)	1	1	0.96	0.96	6A	10A
11	FUNCTIONAL GROUP CONTROL(CRE41,42,43)	1	1	0.72	0.72	6A	10A
12	FUNCTIONAL GROUP CONTROL(CRE44,45,46,47)	1	1	0.96	0.96	6A	10A
13	FUNCTIONAL GROUP CONTROL(CRE48,49,50)	1	1	0.72	0.72	6A	10A
14	FUNCTIONAL GROUP CONTROL(CRE51,52)	1	1	0.72	0.72	6A	10A
15	FUNCTIONAL GROUP CONTROL(CRE53,54)	1	1	0.72	0.72	6A	10A
16	FUNCTIONAL GROUP CONTROL(CRE55,56)	1	1	0.72	0.72	6A	10A
17	ALARM CONTROLLERS(CRE61)	1	1	0.48	0.48	6A	10A
18	FUNCTIONAL GROUP CONTROL(CRE81,82)	1	1	0.72	0.72	6A	10A
19	FUNCTIONAL GROUP CONTROL(CRE83,84)	1	1	0.72	0.72	6A	10A
20	INTERPOSING RELAY PANEL(CTE01)	1	1	1.2	1.2	10A	16A
21	INTERPOSING RELAY PANEL(CTE02) **R1**	1	1	0.72	0.72	6A	10A
22	FUNCTIONAL GROUP CONTROL(CRE62,63,64)	1	1	0.72	0.72	6A	10A
23	FUNCTIONAL GROUP CONTROL(CRE65,66,67)	1	1	0.72	0.72	6A	10A
24	FUNCTIONAL GROUP CONTROL(CRE68,69,70)	1	1	0.72	0.72	6A	10A
25	INTERPOSING RELAY PANEL(CTE03)	1	1	0.72	0.72	6A	10A
26	FUNCTIONAL GROUP CONTROL(CRE96,97,98)	1	1	0.72	0.72	6A	10A
27	INTERPOSING RELAY PANEL(CTE93)	1	1	0.72	0.72	6A	10A
28	FUNCTIONAL GROUP CONTROL(CRE57,58) **R1**	1	1	0.72	0.72	6A	10A
29	FUNCTIONAL GROUP CONTROL(CRE59,60) **R1**	1	1	0.72	0.72	6A	10A
30	T&AVT PANEL(CFA01) **R1**	1	1	2.4	2.4	16A	20A
31	EIS PANEL(CYJ01) **R1**	1	1	0.96	0.96	6A	10A
32	I.P RELAY (CXA 01,02) **R1**	1	1	2.4	2.4	16A	20A
33	I.P RELAY (CXA 03,04) **R1**	1	1	2.4	2.4	16A	20A
	SUB TOTAL	**33**	**33**		**31.92**		

D. HMI SYSTEM R1							
S.No	Feeder Description	No of Feeders in ACDB-1	No of Feeders in ACDB-2	kVA Rating of each feeder	Total Load in kVA	MCB rating	FUSE rating
1	NETWORK PANEL DCS-1(CNP11)	1	1	1.2	1.2	10A	16A
2	NETWORK PANEL HMI-1(CNP21)	1	1	1.2	1.2	10A	16A
3	NETWORK PANEL PWR DISTBN-1(CNP41)	2	2	9	18	100A MCCB	
	SUB TOTAL	**4**	**4**		**20.4**		
E. BHEL TRICHY							
S.No	Feeder Description	No of Feeders in ACDB-1	No of Feeders in ACDB-2	kVA Rating of each feeder	Total Load in kVA	MCB rating	FUSE rating
1	GRAVIMETRIC FEEDER REMOTE CONTROL CABINET R1	8	8	0.5	4	4A	6A
2	BHEL SONIC TUBE LEAK DETECTION SYSTEM PANEL	1	0	0.5	0.5	4A	6A
3	FURNACE FLAME VIEWING SYSTEM- CAMERA-LOCAL UNIT	1	0	0.25	0.25	4A	6A
		0	1	0.25	0.25	4A	6A
4	FURNACE FLAME VIEWING SYSTEM- WALL MOUNTED CABINET IN CONTROL ROOM	1	0	0.5	0.5	4A	6A
5	MASS FLOW METER - LFO	0	1	0.05	0.05	4A	6A
6	MASS FLOW METER - HFO	1	0	0.05	0.05	4A	6A
7	MASS FLOW METER - HFO RETURN LINE	0	1	0.05	0.05	4A	6A
8	AH AIR MOTOR SOLENOID	2	2	0.02	0.04	4A	6A
9	AH-ROTOR STOPPAGE DEVICE	1	0	0.025	0.025	4A	6A
		0	1	0.025	0.025	4A	6A
10	HWL 1&2 AND MEF CONTROL VALVE PANEL - CONTROL SUPPLY R1	1	1	1.6	1.6	10A	16A
11	ASH LEVEL SWITCHES (ECONOMISER AREA)	4	0	0.015	0.06	4A	6A
		0	4	0.015	0.06	4A	6A
12	ASH LEVEL SWITCHES (APH Area)	6	0	0.015	0.09	4A	6A
		0	6	0.015	0.09	4A	6A
	SUB TOTAL	**26**	**25**		**7.64**		
F. BHEL HARIDWAR							
S.No	Feeder Description	No of Feeders in ACDB-1	No of Feeders in ACDB-2	kVA Rating of each feeder	Total Load in kVA	MCB rating	FUSE rating
1	GEN. INST. CABINET(CXW01B) R1	1	1	1.2	1.2	10A	16A
2	GEN END WDG. VIB SYSTEM (SUPPLY-(CXW01D)	1	1	0.48	0.48	4A	6A
3	H2-GAS ANALYSER(MKG31CQ001) R1	1	1	0.23	0.23	4A	6A
4	H2-GAS ANALYSER(MKG32CQ001) R1	1	1	0.23	0.23	4A	6A
5	MOISTURE MEASURING EQUIPMENT(MKG69CM001)	1	1	0.23	0.23	4A	6A
	SUB TOTAL	**5**	**5**		**2.37**		
G.MISCELLANEOUS							
S.No	Feeder Description	No of Feeders in ACDB-1	No of Feeders in ACDB-2	kVA Rating of each feeder	Total Load in kVA	MCB rating	FUSE rating
1	PADO	1	1	3	3	16A	20A
2	MASTER CLOCK SYSTEM	1	1	1.2	1.2	10A	16A
3	WALKIE TALKIE SYSTEM	1	1	2.4	2.4	16A	20A
4	HART MANAGEMENT SYSTEM	1	1	1.2	1.2	10A	16A
5	OXYGEN ANALYSER-LOW TEMPERATURE	9	9	0.4	3.6	4A	6A
6	OXYGEN ANALYSER-HIGH TEMPERATURE R1	2	2	0.3	0.6	4A	6A
7	CO at APH INLET	6	6	0.4	2.4	4A	6A
8	RMCMAS ANALSIS SERVER AT CCR	2	2	0.5	1	4A	6A
9	RMCMAS PANEL AT MAIN UNIT EER	6	6	0.8	4.8	6A	10A
10	SWAS	1	1	11	11	63A	80A
11	FLUE GAS ANALYSER SO2/Nox/CO/CO2 AT CHIMNEY	1	1	2	2	16A	20A
12	MERCURY ANALYSER	1	1	0.8	0.8	6A	10A
13	OPACITY MONITOR AT CHIMNEY	1	1	1	1	6A	10A
14	CONDUCTIVITY TYPE LEVEL SWITCH	2	2	0.015	0.03	4A	6A
15	COAL BUNKER LEVEL MONITORING SYSTEM	2	2	0.5	1	4A	6A
16	HF ANALYSER	1	1	0.8	0.8	6A	10A
17	ELECTRICAL CONTROL PANEL (ECP)	1	1	2.4	2.4	16A	20A
18	UNIT CONTROL PANEL (UCP)	1	1	1.44	1.44	10A	16A
19	DAVR R1	2	2	1	2	10A	16A
20	LV DATA CONCENTRATOR PANEL with HMI (OWS/EWS) & Printer	1	1	1	1	10A	16A
	SUB TOTAL	**43**	**43**		**43.67**		

H. BHEL-HYDERABAD

S.No	Feeder Description	No of Feeders in ACDB-1	No of Feeders in ACDB-2	kVA Rating of each feeder	Total Load in kVA	MCB rating	FUSE rating
1	Electronic Power Positioner for Hyd Coupling of MDBFP	1	1	0.5	0.5	4A	6A
2	Reverse Rotation Monitor System (Supplied along with Hyd Coup)	0	1	0.025	0.025	4A	6A
	SUB TOTAL	**1**	**2**		**0.53**		

I. BHEL-RANIPET

S.No	Feeder Description	No of Feeders in ACDB-1	No of Feeders in ACDB-2	kVA Rating of each feeder	Total Load in kVA	MCB rating	FUSE rating
1	IOS PC & PRINTER	1	1	1.5	1.5	10A	16A
2	OPACITY MONITOR	2	0	0.25	0.5	4A	6A
		0	2	0.25	0.5	4A	6A
	SUB TOTAL	**3**	**3**		**2.50**		

J. BHEL-PEM

S.No	Feeder Description	No of Feeders in ACDB-1	No of Feeders in ACDB-2	kVA Rating of each feeder	Total Load in kVA	MCB rating	FUSE rating
1	PC, Printer for Electrical System, Data Concentrator, etc	1	0	1	1	10A	16A
		0	1	1	1	10A	16A
2	MDBFP Water Leakage Detector	1	0	0.33	0.33	4A	6A
3	ID Fan-A Water Leakage Detector	0	1	0.33	0.33	4A	6A
4	ID Fan-B Water Leakage Detector	0	1	0.33	0.33	4A	6A
5	Mass Flow Controller of Oxygen Dosing Pump	1	0	0.24	0.24	4A	6A
		0	1	0.24	0.24	4A	6A
6	CPU Vessel area	1	1	1.92	1.92	16A	20A
7	Chemical Dosing System	1	1	1	1	10A	16A
	SUB TOTAL	**5**	**6**		**6.39**		

Total UPS Load (For items A to J)	143.26
Total UPS Load (For items A to J) + 25% Spare	179.07
UPS Rating	**180 kVA**

ACDB DETAILS:

S.NO	Feeder rating MCB / Fuse	ACDB-1	ACDB-2	With 10% Spare ACDB-1	With 10% Spare ACDB-2	Rounded-off to:- ACDB-1	Rounded-off to:- ACDB-2
1	4A/6A	57	58	63	64	**65**	**65**
2	6A/10A	56	56	62	62	**64**	**64**
3	10A/16A	26	26	29	29	**30**	**30**
4	16A/20A	8	8	9	9	**10**	**10**
5	63A/80A	1	1	2	2	**3**	**3**
6	100A MCCB	2	2	3	3	**4**	**4**
	Total	**150**	**151**	**168**	**169**	**176**	**176**

TSGENCO YADADRI (5x800 MW), 240V AC UPS FEEDER/LOAD LIST

UNIT-4

A. SG PACKAGE

Sl.No	Feeder Description	No of Feeders in ACDB-1	No of Feeders in ACDB-2	kVA Rating of each feeder	Total Load in kVA	MCB rating	FUSE rating
1	FLAME SCANNER-1 (CJF75)	2	2	1.44	2.88	10A	16A
2	FLAME SCANNER-2 (CJF76)	2	2	0.48	0.96	6A	10A
3	FSSS MFT-1(CJF01)	1	1	0.72	0.72	6A	10A
4	FSSS MFT-2, MFT RELAY-1 (CJF02, 03)	1	1	0.72	0.72	6A	10A
5	FSSS MFT-3, MFT RELAY-2 (CJF04,05)	1	1	0.72	0.72	6A	10A
6	FSSS UNIT&SADC-1,2,3(CJF06,07,08)	1	1	1.2	1.2	10A	16A
7	FSSS OIL AB, COAL-A&B-1,2,3,4(CJF23,24) (CAF20,21)	1	1	1.2	1.2	10A	16A
8	FSSS OIL CD, COAL-C&D-1,2,3,4(CJF25,26) (CAF22,23)	1	1	1.2	1.2	10A	16A
9	FSSS OIL EF, COAL-E&F-1,2,3,4(CJF27,28) (CAF24,25)	1	1	1.2	1.2	10A	16A
10	FSSS OIL GH, COAL-G&H-1,2,3,4(CJF29,30) (CAF26,27)	1	1	1.2	1.2	10A	16A
11	APRDS & SBC-1,2,3,4,5(CJF58,59,60,61,62)	1	1	1.44	1.44	10A	16A
12	HPBP-1,2(CJF34,35)	1	1	1.44	1.44	10A	16A
13	SCR STREAM A-1,2,3 (CBB 01,02,03) **R1**	1	1	0.72	0.72	6A	10A
		1	1	0.48	0.48	6A	10A
14	SCR STREAM B-1,2,3 (CBB 04,05,06) **R1**	1	1	0.72	0.72	6A	10A
		1	1	0.48	0.48	6A	10A
	SUB TOTAL	**18**	**18**		**17.28**		

B. TG PACKAGE

Sl.No	Feeder Description	No of Feeders in ACDB-1	No of Feeders in ACDB-2	kVA Rating of each feeder	Total Load in kVA	MCB rating	FUSE rating
1	EHTC/TP2/AVT/OVSP2(CJJ01.02)	2	2	0.72	1.44	6A	10A
2	EHA1/TP1/OVSP1(CJJ05,06)	2	2	0.72	1.44	6A	10A
3	LPBP/EHA2/TSE/GSPC/LOPS(CJJ03,04,53)	1	1	0.72	0.72	6A	10A
4	ATRS(CCA01,02,03,04)	1	1	1.44	1.44	10A	16A
5	GAMP(CCA10,11)	1	1	0.72	0.72	6A	10A
6	LSR/LMU/AUTO SYNCH(CJJ08)	1	1	0.48	0.48	6A	10A
7	TSI FOR BFPDT-A&B(CWW01) **R1**	1	1	0.72	0.72	6A	10A
8	BFPDT-A(CJJ20,21,22,23)	1	1	1.44	1.44	10A	16A
9	BFPDT-B(CJJ30,31,32,33)	1	1	1.44	1.44	10A	16A
10	TSI FOR MAIN TURBINE(CJJ41) **R1**	1	1	0.72	0.72	6A	10A
	SUB TOTAL	**12**	**12**		**10.56**		

C. BOP PACKAGE

S.No	Feeder Description	No of Feeders in ACDB-1	No of Feeders in ACDB-2	kVA Rating of each feeder	Total Load in kVA	MCB rating	FUSE rating
1	FUNCTIONAL GROUP CONTROL(CRE01,02,03,04)	1	1	0.96	0.96	6A	10A
2	FUNCTIONAL GROUP CONTROL(CRE05,06,07,08)	1	1	0.96	0.96	6A	10A
3	FUNCTIONAL GROUP CONTROL(CRE09,10,11,12)	1	1	0.96	0.96	6A	10A
4	FUNCTIONAL GROUP CONTROL(CRE13,14,15,16)	1	1	0.96	0.96	6A	10A
5	FUNCTIONAL GROUP CONTROL(CRE17,18,19,20)	1	1	0.96	0.96	6A	10A
6	FUNCTIONAL GROUP CONTROL(CRE21,22,23,24)	1	1	0.96	0.96	6A	10A
7	FUNCTIONAL GROUP CONTROL(CRE25,26,27,28)	1	1	0.96	0.96	6A	10A
8	FUNCTIONAL GROUP CONTROL(CRE29,30,31,32)	1	1	0.96	0.96	6A	10A
9	FUNCTIONAL GROUP CONTROL(CRE33,34,35,36)	1	1	0.96	0.96	6A	10A
10	FUNCTIONAL GROUP CONTROL(CRE37,38,39,40)	1	1	0.96	0.96	6A	10A
11	FUNCTIONAL GROUP CONTROL(CRE41,42,43)	1	1	0.72	0.72	6A	10A
12	FUNCTIONAL GROUP CONTROL(CRE44,45,46,47)	1	1	0.96	0.96	6A	10A
13	FUNCTIONAL GROUP CONTROL(CRE48,49,50)	1	1	0.72	0.72	6A	10A
14	FUNCTIONAL GROUP CONTROL(CRE51,52)	1	1	0.72	0.72	6A	10A
15	FUNCTIONAL GROUP CONTROL(CRE53,54)	1	1	0.72	0.72	6A	10A
16	FUNCTIONAL GROUP CONTROL(CRE55,56)	1	1	0.72	0.72	6A	10A
17	ALARM CONTROLLERS(CRE61)	1	1	0.48	0.48	6A	10A
18	FUNCTIONAL GROUP CONTROL(CRE81,82)	1	1	0.72	0.72	6A	10A
19	FUNCTIONAL GROUP CONTROL(CRE83,84)	1	1	0.72	0.72	6A	10A
20	INTERPOSING RELAY PANEL(CTE01)	1	1	1.2	1.2	10A	16A
21	INTERPOSING RELAY PANEL(CTE02) **R1**	1	1	0.72	0.72	6A	10A
22	FUNCTIONAL GROUP CONTROL(CRE62,63,64)	1	1	0.72	0.72	6A	10A
23	FUNCTIONAL GROUP CONTROL(CRE65,66,67)	1	1	0.72	0.72	6A	10A
24	FUNCTIONAL GROUP CONTROL(CRE68,69,70)	1	1	0.72	0.72	6A	10A
25	INTERPOSING RELAY PANEL(CTE03)	1	1	0.72	0.72	6A	10A
26	FUNCTIONAL GROUP CONTROL(CRE96,97,98)	1	1	0.72	0.72	6A	10A
27	INTERPOSING RELAY PANEL(CTE93)	1	1	0.72	0.72	6A	10A
28	FUNCTIONAL GROUP CONTROL(CRE57,58) **R1**	1	1	0.72	0.72	6A	10A
29	FUNCTIONAL GROUP CONTROL(CRE59,60) **R1**	1	1	0.72	0.72	6A	10A
30	T&AVT PANEL(CFA01) **R1**	1	1	2.4	2.4	16A	20A
31	EIS PANEL(CYJ01) **R1**	1	1	0.96	0.96	6A	10A
32	I.P RELAY (CXA 01,02) **R1**	1	1	2.4	2.4	16A	20A
33	I.P RELAY (CXA 03,04) **R1**	1	1	2.4	2.4	16A	20A
	SUB TOTAL	**33**	**33**		**31.92**		

D. HMI SYSTEM R1							
S.No	Feeder Description	No of Feeders in ACDB-1	No of Feeders in ACDB-2	kVA Rating of each feeder	Total Load in kVA	MCB rating	FUSE rating
1	NETWORK PANEL DCS-1(CNP11)	1	1	1.2	1.2	10A	16A
2	NETWORK PANEL HMI-1(CNP21)	1	1	1.2	1.2	10A	16A
3	NETWORK PANEL PWR DISTBN-1(CNP41)	2	2	9	18	100A MCCB	
	SUB TOTAL	**4**	**4**		**20.4**		
E. BHEL TRICHY							
S.No	Feeder Description	No of Feeders in ACDB-1	No of Feeders in ACDB-2	kVA Rating of each feeder	Total Load in kVA	MCB rating	FUSE rating
1	GRAVIMETRIC FEEDER REMOTE CONTROL CABINET R1	8	8	0.5	4	4A	6A
2	BHEL SONIC TUBE LEAK DETECTION SYSTEM PANEL	1	0	0.5	0.5	4A	6A
3	FURNACE FLAME VIEWING SYSTEM- CAMERA-LOCAL UNIT	1	0	0.25	0.25	4A	6A
		0	1	0.25	0.25	4A	6A
4	FURNACE FLAME VIEWING SYSTEM- WALL MOUNTED CABINET IN CONTROL ROOM	1	0	0.5	0.5	4A	6A
5	MASS FLOW METER - LFO	0	1	0.05	0.05	4A	6A
6	MASS FLOW METER - HFO	1	0	0.05	0.05	4A	6A
7	MASS FLOW METER - HFO RETURN LINE	0	1	0.05	0.05	4A	6A
8	AH AIR MOTOR SOLENOID	2	2	0.02	0.04	4A	6A
9	AH-ROTOR STOPPAGE DEVICE	1	0	0.025	0.025	4A	6A
		0	1	0.025	0.025	4A	6A
10	HWL 1&2 AND MEF CONTROL VALVE PANEL - CONTROL SUPPLY R1	1	1	1.6	1.6	10A	16A
11	ASH LEVEL SWITCHES (ECONOMISER AREA)	4	0	0.015	0.06	4A	6A
		0	4	0.015	0.06	4A	6A
12	ASH LEVEL SWITCHES (APH Area)	6	0	0.015	0.09	4A	6A
		0	6	0.015	0.09	4A	6A
	SUB TOTAL	**26**	**25**		**7.64**		
F. BHEL HARIDWAR							
S.No	Feeder Description	No of Feeders in ACDB-1	No of Feeders in ACDB-2	kVA Rating of each feeder	Total Load in kVA	MCB rating	FUSE rating
1	GEN. INST. CABINET(CXW01B) R1	1	1	1.2	1.2	10A	16A
2	GEN END WDG. VIB SYSTEM (SUPPLY-(CXW01D)	1	1	0.48	0.48	4A	6A
3	H2-GAS ANALYSER(MKG31CQ001) R1	1	1	0.23	0.23	4A	6A
4	H2-GAS ANALYSER(MKG32CQ001) R1	1	1	0.23	0.23	4A	6A
5	MOISTURE MEASURING EQUIPMENT(MKG69CM001)	1	1	0.23	0.23	4A	6A
	SUB TOTAL	**5**	**5**		**2.37**		
G.MISCELLANEOUS							
S.No	Feeder Description	No of Feeders in ACDB-1	No of Feeders in ACDB-2	kVA Rating of each feeder	Total Load in kVA	MCB rating	FUSE rating
1	PADO	1	1	3	3	16A	20A
2	MASTER CLOCK SYSTEM	1	1	1.2	1.2	10A	16A
3	WALKIE TALKIE SYSTEM	1	1	2.4	2.4	16A	20A
4	HART MANAGEMENT SYSTEM	1	1	1.2	1.2	10A	16A
5	OXYGEN ANALYSER-LOW TEMPERATURE	9	9	0.4	3.6	4A	6A
6	OXYGEN ANALYSER-HIGH TEMPERATURE R1	2	2	0.3	0.6	4A	6A
7	CO at APH INLET	6	6	0.4	2.4	4A	6A
8	RMCMAS ANALSIS SERVER AT CCR	2	2	0.5	1	4A	6A
9	RMCMAS PANEL AT MAIN UNIT EER	6	6	0.8	4.8	6A	10A
10	SWAS	1	1	11	11	63A	80A
11	FLUE GAS ANALYSER SO2/Nox/CO/CO2 AT CHIMNEY	1	1	2	2	16A	20A
12	MERCURY ANALYSER	1	1	0.8	0.8	6A	10A
13	OPACITY MONITOR AT CHIMNEY	1	1	1	1	6A	10A
14	CONDUCTIVITY TYPE LEVEL SWITCH	2	2	0.015	0.03	4A	6A
15	COAL BUNKER LEVEL MONITORING SYSTEM	2	2	0.5	1	4A	6A
16	HF ANALYSER	1	1	0.8	0.8	6A	10A
17	ELECTRICAL CONTROL PANEL (ECP)	1	1	2.4	2.4	16A	20A
18	UNIT CONTROL PANEL (UCP)	1	1	1.44	1.44	10A	16A
19	DAVR R1	2	2	1	2	10A	16A
20	LV DATA CONCENTRATOR PANEL with HMI (OWS/EWS) & Printer	1	1	1	1	10A	16A
	SUB TOTAL	**43**	**43**		**43.67**		

H. BHEL-HYDERABAD

S.No	Feeder Description	No of Feeders in ACDB-1	No of Feeders in ACDB-2	kVA Rating of each feeder	Total Load in kVA	MCB rating	FUSE rating
1	Electronic Power Positioner for Hyd Coupling of MDBFP	1	1	0.5	0.5	4A	6A
2	Reverse Rotation Monitor System (Supplied along with Hyd Coup)	0	1	0.025	0.025	4A	6A
	SUB TOTAL	**1**	**2**		**0.53**		

I. BHEL-RANIPET

S.No	Feeder Description	No of Feeders in ACDB-1	No of Feeders in ACDB-2	kVA Rating of each feeder	Total Load in kVA	MCB rating	FUSE rating
1	IOS PC & PRINTER	1	1	1.5	1.5	10A	16A
2	OPACITY MONITOR	2	0	0.25	0.5	4A	6A
		0	2	0.25	0.5	4A	6A
	SUB TOTAL	**3**	**3**		**2.50**		

J. BHEL-PEM

S.No	Feeder Description	No of Feeders in ACDB-1	No of Feeders in ACDB-2	kVA Rating of each feeder	Total Load in kVA	MCB rating	FUSE rating
1	PC, Printer for Electrical System, Data Concentrator, etc	1	0	1	1	10A	16A
		0	1	1	1	10A	16A
2	MDBFP Water Leakage Detector	1	0	0.33	0.33	4A	6A
3	ID Fan-A Water Leakage Detector	0	1	0.33	0.33	4A	6A
4	ID Fan-B Water Leakage Detector	0	1	0.33	0.33	4A	6A
5	Mass Flow Controller of Oxygen Dosing Pump	1	0	0.24	0.24	4A	6A
		0	1	0.24	0.24	4A	6A
6	CPU Vessel area	1	1	1.92	1.92	16A	20A
7	Chemical Dosing System	1	1	1	1	10A	16A
	SUB TOTAL	**5**	**6**		**6.39**		

Total UPS Load (For items A to J)	143.26
Total UPS Load (For items A to J) + 25% Spare	179.07
UPS Rating	**180 kVA**

ACDB DETAILS:

S.NO	Feeder rating MCB / Fuse	ACDB-1	ACDB-2	With 10% Spare ACDB-1	With 10% Spare ACDB-2	Rounded-off to:- ACDB-1	Rounded-off to:- ACDB-2
1	4A/6A	57	58	63	64	**65**	**65**
2	6A/10A	56	56	62	62	**64**	**64**
3	10A/16A	26	26	29	29	**30**	**30**
4	16A/20A	8	8	9	9	**10**	**10**
5	63A/80A	1	1	2	2	**3**	**3**
6	100A MCCB	2	2	3	3	**4**	**4**
	Total	**150**	**151**	**168**	**169**	**176**	**176**

TSGENCO YADADRI (5x800 MW), 240V AC UPS FEEDER/LOAD LIST

UNIT-5

A. SG PACKAGE

Sl.No	Feeder Description	No of Feeders in ACDB-1	No of Feeders in ACDB-2	kVA Rating of each feeder	Total Load in kVA	MCB rating	FUSE rating
1	FLAME SCANNER-1 (CJF75)	2	2	1.44	2.88	10A	16A
2	FLAME SCANNER-2 (CJF76)	2	2	0.48	0.96	6A	10A
3	FSSS MFT-1(CJF01)	1	1	0.72	0.72	6A	10A
4	FSSS MFT-2, MFT RELAY-1 (CJF02, 03)	1	1	0.72	0.72	6A	10A
5	FSSS MFT-3, MFT RELAY-2 (CJF04,05)	1	1	0.72	0.72	6A	10A
6	FSSS UNIT&SADC-1,2,3(CJF06,07,08)	1	1	1.2	1.2	10A	16A
7	FSSS OIL AB, COAL-A&B-1,2,3,4(CJF23,24) (CAF20,21)	1	1	1.2	1.2	10A	16A
8	FSSS OIL CD, COAL-C&D-1,2,3,4(CJF25,26) (CAF22,23)	1	1	1.2	1.2	10A	16A
9	FSSS OIL EF, COAL-E&F-1,2,3,4(CJF27,28) (CAF24,25)	1	1	1.2	1.2	10A	16A
10	FSSS OIL GH, COAL-G&H-1,2,3,4(CJF29,30) (CAF26,27)	1	1	1.2	1.2	10A	16A
11	APRDS & SBC-1,2,3,4,5(CJF58,59,60,61,62)	1	1	1.44	1.44	10A	16A
12	HPBP-1,2(CJF34,35)	1	1	1.44	1.44	10A	16A
13	SCR STREAM A-1,2,3 (CBB 01,02,03) R1	1	1	0.72	0.72	6A	10A
		1	1	0.48	0.48	6A	10A
14	SCR STREAM B-1,2,3 (CBB 04,05,06) R1	1	1	0.72	0.72	6A	10A
		1	1	0.48	0.48	6A	10A
	SUB TOTAL	**18**	**18**		**17.28**		

B. TG PACKAGE

Sl.No	Feeder Description	No of Feeders in ACDB-1	No of Feeders in ACDB-2	kVA Rating of each feeder	Total Load in kVA	MCB rating	FUSE rating
1	EHTC/TP2/AVT/OVSP2(CJJ01.02)	2	2	0.72	1.44	6A	10A
2	EHA1/TP1/OVSP1(CJJ05,06)	2	2	0.72	1.44	6A	10A
3	LPBP/EHA2/TSE/GSPC/LOPS(CJJ03,04,53)	1	1	0.72	0.72	6A	10A
4	ATRS(CCA01,02,03,04)	1	1	1.44	1.44	10A	16A
5	GAMP(CCA10,11)	1	1	0.72	0.72	6A	10A
6	LSR/LMU/AUTO SYNCH(CJJ08)	1	1	0.48	0.48	6A	10A
7	TSI FOR BFPDT-A&B(CWW01) R1	1	1	0.72	0.72	6A	10A
8	BFPDT-A(CJJ20,21,22,23)	1	1	1.44	1.44	10A	16A
9	BFPDT-B(CJJ30,31,32,33)	1	1	1.44	1.44	10A	16A
10	TSI FOR MAIN TURBINE(CJJ41) R1	1	1	0.72	0.72	6A	10A
	SUB TOTAL	**12**	**12**		**10.56**		

C. BOP PACKAGE

S.No	Feeder Description	No of Feeders in ACDB-1	No of Feeders in ACDB-2	kVA Rating of each feeder	Total Load in kVA	MCB rating	FUSE rating
1	FUNCTIONAL GROUP CONTROL(CRE01,02,03,04)	1	1	0.96	0.96	6A	10A
2	FUNCTIONAL GROUP CONTROL(CRE05,06,07,08)	1	1	0.96	0.96	6A	10A
3	FUNCTIONAL GROUP CONTROL(CRE09,10,11,12)	1	1	0.96	0.96	6A	10A
4	FUNCTIONAL GROUP CONTROL(CRE13,14,15,16)	1	1	0.96	0.96	6A	10A
5	FUNCTIONAL GROUP CONTROL(CRE17,18,19,20)	1	1	0.96	0.96	6A	10A
6	FUNCTIONAL GROUP CONTROL(CRE21,22,23,24)	1	1	0.96	0.96	6A	10A
7	FUNCTIONAL GROUP CONTROL(CRE25,26,27,28)	1	1	0.96	0.96	6A	10A
8	FUNCTIONAL GROUP CONTROL(CRE29,30,31,32)	1	1	0.96	0.96	6A	10A
9	FUNCTIONAL GROUP CONTROL(CRE33,34,35,36)	1	1	0.96	0.96	6A	10A
10	FUNCTIONAL GROUP CONTROL(CRE37,38,39,40)	1	1	0.96	0.96	6A	10A
11	FUNCTIONAL GROUP CONTROL(CRE41,42,43)	1	1	0.72	0.72	6A	10A
12	FUNCTIONAL GROUP CONTROL(CRE44,45,46,47)	1	1	0.96	0.96	6A	10A
13	FUNCTIONAL GROUP CONTROL(CRE48,49,50)	1	1	0.72	0.72	6A	10A
14	FUNCTIONAL GROUP CONTROL(CRE51,52)	1	1	0.72	0.72	6A	10A
15	FUNCTIONAL GROUP CONTROL(CRE53,54)	1	1	0.72	0.72	6A	10A
16	FUNCTIONAL GROUP CONTROL(CRE55,56)	1	1	0.72	0.72	6A	10A
17	ALARM CONTROLLERS(CRE61)	1	1	0.48	0.48	6A	10A
18	FUNCTIONAL GROUP CONTROL(CRE81,82)	1	1	0.72	0.72	6A	10A
19	FUNCTIONAL GROUP CONTROL(CRE83,84)	1	1	0.72	0.72	6A	10A
20	INTERPOSING RELAY PANEL(CTE01)	1	1	1.2	1.2	10A	16A
21	INTERPOSING RELAY PANEL(CTE02) R1	1	1	0.72	0.72	6A	10A
22	FUNCTIONAL GROUP CONTROL(CRE62,63,64)	1	1	0.72	0.72	6A	10A
23	FUNCTIONAL GROUP CONTROL(CRE65,66,67)	1	1	0.72	0.72	6A	10A
24	FUNCTIONAL GROUP CONTROL(CRE68,69,70)	1	1	0.72	0.72	6A	10A
25	INTERPOSING RELAY PANEL(CTE03)	1	1	0.72	0.72	6A	10A
26	FUNCTIONAL GROUP CONTROL(CRE96,97,98)	1	1	0.72	0.72	6A	10A
27	INTERPOSING RELAY PANEL(CTE93)	1	1	0.72	0.72	6A	10A
28	FUNCTIONAL GROUP CONTROL(CRE57,58) R1	1	1	0.72	0.72	6A	10A
29	FUNCTIONAL GROUP CONTROL(CRE59,60) R1	1	1	0.72	0.72	6A	10A
30	T&AVT PANEL(CFA01) R1	1	1	2.4	2.4	16A	20A
31	EIS PANEL(CYJ01) R1	1	1	0.96	0.96	6A	10A
32	LP RELAY (CXA 01,02) R1	1	1	2.4	2.4	16A	20A
33	LP RELAY (CXA 03,04) R1	1	1	2.4	2.4	16A	20A
	SUB TOTAL	**33**	**33**		**31.92**		

D. HMI SYSTEM R1

S.No	Feeder Description	No of Feeders in ACDB-1	No of Feeders in ACDB-2	kVA Rating of each feeder	Total Load in kVA	MCB rating	FUSE rating
1	NETWORK PANEL DCS-1(CNP11)	1	1	1.2	1.2	10A	16A
2	NETWORK PANEL HMI-1(CNP21)	1	1	1.2	1.2	10A	16A
3	NETWORK PANEL PWR DISTBN-1(CNP41)	2	2	9	18	100A MCCB	
	SUB TOTAL	**4**	**4**		**20.4**		

E. BHEL TRICHY							
S.No	Feeder Description	No of Feeders in ACDB-1	No of Feeders in ACDB-2	kVA Rating of each feeder	Total Load in kVA	MCB rating	FUSE rating
1	GRAVIMETRIC FEEDER REMOTE CONTROL CABINET R1	8	8	0.5	4	4A	6A
2	BHEL SONIC TUBE LEAK DETECTION SYSTEM PANEL	1	0	0.5	0.5	4A	6A
3	FURNACE FLAME VIEWING SYSTEM- CAMERA-LOCAL UNIT	1	0	0.25	0.25	4A	6A
		0	1	0.25	0.25	4A	6A
4	FURNACE FLAME VIEWING SYSTEM- WALL MOUNTED CABINET IN CONTROL ROOM	1	0	0.5	0.5	4A	6A
5	MASS FLOW METER - LFO	0	1	0.05	0.05	4A	6A
6	MASS FLOW METER - HFO	1	0	0.05	0.05	4A	6A
7	MASS FLOW METER - HFO RETURN LINE	0	1	0.05	0.05	4A	6A
8	AH AIR MOTOR SOLENOID	2	2	0.02	0.04	4A	6A
9	AH-ROTOR STOPPAGE DEVICE	1	0	0.025	0.025	4A	6A
		0	1	0.025	0.025	4A	6A
10	HWL 1&2 AND MEF CONTROL VALVE PANEL - CONTROL SUPPLY R1	1	1	1.6	1.6	10A	16A
11	ASH LEVEL SWITCHES (ECONOMISER AREA)	4	0	0.015	0.06	4A	6A
		0	4	0.015	0.06	4A	6A
12	ASH LEVEL SWITCHES (APH Area)	6	0	0.015	0.09	4A	6A
		0	6	0.015	0.09	4A	6A
	SUB TOTAL	**26**	**25**		**7.64**		
F. BHEL HARIDWAR							
S.No	Feeder Description	No of Feeders in ACDB-1	No of Feeders in ACDB-2	kVA Rating of each feeder	Total Load in kVA	MCB rating	FUSE rating
1	GEN. INST. CABINET(CXW01B) R1	1	1	1.2	1.2	10A	16A
2	GEN END WDG. VIB SYSTEM (SUPPLY-(CXW01D)	1	1	0.48	0.48	4A	6A
3	H2-GAS ANALYSER(MKG31CQ001) R1	1	1	0.23	0.23	4A	6A
4	H2-GAS ANALYSER(MKG32CQ001) R1	1	1	0.23	0.23	4A	6A
5	MOISTURE MEASURING EQUIPMENT(MKG69CM001)	1	1	0.23	0.23	4A	6A
	SUB TOTAL	**5**	**5**		**2.37**		
G.MISCELLANEOUS							
S.No	Feeder Description	No of Feeders in ACDB-1	No of Feeders in ACDB-2	kVA Rating of each feeder	Total Load in kVA	MCB rating	FUSE rating
1	PADO	1	1	3	3	16A	20A
2	MASTER CLOCK SYSTEM	1	1	1.2	1.2	10A	16A
3	WALKIE TALKIE SYSTEM	1	1	2.4	2.4	16A	20A
4	HART MANAGEMENT SYSTEM	1	1	1.2	1.2	10A	16A
5	OXYGEN ANALYSER-LOW TEMPERATURE	9	9	0.4	3.6	4A	6A
6	OXYGEN ANALYSER-HIGH TEMPERATURE R1	2	2	0.3	0.6	4A	6A
7	CO at APH INLET	6	6	0.4	2.4	4A	6A
8	RMCMAS ANALSIS SERVER AT CCR	2	2	0.5	1	4A	6A
9	RMCMAS PANEL AT MAIN UNIT EER	6	6	0.8	4.8	6A	10A
10	SWAS	1	1	11	11	63A	80A
11	FLUE GAS ANALYSER SO2/Nox/CO/CO2 AT CHIMNEY	1	1	2	2	16A	20A
12	MERCURY ANALYSER	1	1	0.8	0.8	6A	10A
13	OPACITY MONITOR AT CHIMNEY	1	1	1	1	6A	10A
14	CONDUCTIVITY TYPE LEVEL SWITCH	2	2	0.015	0.03	4A	6A
15	COAL BUNKER LEVEL MONITORING SYSTEM	2	2	0.5	1	4A	6A
16	HF ANALYSER	1	1	0.8	0.8	6A	10A
17	ELECTRICAL CONTROL PANEL (ECP)	1	1	2.4	2.4	16A	20A
18	UNIT CONTROL PANEL (UCP)	1	1	1.44	1.44	10A	16A
19	DAVR R1	2	2	1	2	10A	16A
20	LV DATA CONCENTRATOR PANEL with HMI (OWS/EWS) & Printer	1	1	1	1	10A	16A
	SUB TOTAL	**43**	**43**		**43.67**		

H. BHEL-HYDERABAD

S.No	Feeder Description	No of Feeders in ACDB-1	No of Feeders in ACDB-2	kVA Rating of each feeder	Total Load in kVA	MCB rating	FUSE rating
1	Electronic Power Positioner for Hyd Coupling of MDBFP	1	1	0.5	0.5	4A	6A
2	Reverse Rotation Monitor System (Supplied along with Hyd Coup)	0	1	0.025	0.025	4A	6A
	SUB TOTAL	**1**	**2**		**0.53**		

I. BHEL-RANIPET

S.No	Feeder Description	No of Feeders in ACDB-1	No of Feeders in ACDB-2	kVA Rating of each feeder	Total Load in kVA	MCB rating	FUSE rating
1	IOS PC & PRINTER	1	1	1.5	1.5	10A	16A
2	OPACITY MONITOR	2	0	0.25	0.5	4A	6A
		0	2	0.25	0.5	4A	6A
	SUB TOTAL	**3**	**3**		**2.50**		

J. BHEL-PEM

S.No	Feeder Description	No of Feeders in ACDB-1	No of Feeders in ACDB-2	kVA Rating of each feeder	Total Load in kVA	MCB rating	FUSE rating
1	PC, Printer for Electrical System, Data Concentrator, etc	1	0	1	1	10A	16A
		0	1	1	1	10A	16A
2	MDBFP Water Leakage Detector	1	0	0.33	0.33	4A	6A
3	ID Fan-A Water Leakage Detector	0	1	0.33	0.33	4A	6A
4	ID Fan-B Water Leakage Detector	0	1	0.33	0.33	4A	6A
5	Mass Flow Controller of Oxygen Dosing Pump	1	0	0.24	0.24	4A	6A
		0	1	0.24	0.24	4A	6A
6	CPU Vessel area	1	1	1.92	1.92	16A	20A
7	Chemical Dosing System	1	1	1	1	10A	16A
	SUB TOTAL	**5**	**6**		**6.39**		

Total UPS Load (For items A to J)	143.26
Total UPS Load (For items A to J) + 25% Spare	179.07
UPS Rating	**180 kVA**

ACDB DETAILS:

S.NO	Feeder rating MCB / Fuse	ACDB-1	ACDB-2	With 10% Spare ACDB-1	With 10% Spare ACDB-2	Rounded-off to:- ACDB-1	Rounded-off to:- ACDB-2
1	4A/6A	57	58	63	64	**65**	**65**
2	6A/10A	56	56	62	62	**64**	**64**
3	10A/16A	26	26	29	29	**30**	**30**
4	16A/20A	8	8	9	9	**10**	**10**
5	63A/80A	1	1	2	2	**3**	**3**
6	100A MCCB	2	2	3	3	**4**	**4**
	Total	**150**	**151**	**168**	**169**	**176**	**176**

TSGENCO YADADRI (5x800 MW), 240V AC UPS FEEDER/LOAD LIST

COMMON FOR UNIT-3, 4 & 5

A. BOP PACKAGE

S.No	Feeder Description	No of Feeders in ACDB-1	No of Feeders in ACDB-2	kVA Rating of each feeder	Total Load in kVA	MCB rating	FUSE rating
1	INTERPOSING RELAY PANEL(CTE04) **R1**	1	1	0.72	0.72	6A	10A
2	FUNCTIONAL GROUP CONTROL(CRE71,72,73)	1	1	0.72	0.72	6A	10A
3	FUNCTIONAL GROUP CONTROL(CRE91,92)	1	1	0.48	0.48	6A	10A
4	FUNCTIONAL GROUP CONTROL(CRE93,94,95)	1	1	0.72	0.72	6A	10A
5	INTERPOSING RELAY PANEL(CTE91) **R1**	1	1	0.72	0.72	6A	10A
6	INTERPOSING RELAY PANEL(CTE92) **R1**	1	1	0.72	0.72	6A	10A
7	FUNCTIONAL GROUP CONTROL(CRW01,02,03)	1	1	0.72	0.72	6A	10A
8	FUNCTIONAL GROUP CONTROL(CRW04,05,06)	1	1	0.72	0.72	6A	10A
9	FUNCTIONAL GROUP CONTROL(CRW07,08,09,10) **R1**	1	1	0.72	0.72	6A	10A
10	FUNCTIONAL GROUP CONTROL(CRW11,12,13) **R1**	1	1	0.72	0.72	6A	10A
	SUB TOTAL	**10**	**10**		**6.96**		

B. HMI SYSTEM R1

S.No	Feeder Description	No of Feeders in ACDB-1	No of Feeders in ACDB-2	kVA Rating of each feeder	Total Load in kVA	MCB rating	FUSE rating
1	NETWORK PANEL COMMON-1(CNP32)	1	1	10.8	13.2	63A	80A
2	NETWORK PANEL COMMON-2(CNP33)	1	1	10.8	13.2	63A	80A
3	NETWORK ENCLOSURE (CNE 81) MRS area **R1**	1	1	1.68	1.68	10A	16A
4	NETWORK ENCLOSURE (CNE 82) CAS area **R1**	1	1	1.68	1.68	10A	16A
5	NETWORK ENCLOSURE Service Building-2 Area-1 **R1**	1	1	6.23	6.23	40A	50A
6	NETWORK ENCLOSURE Service Building-2 Area-2 **R1**	1	1	6.23	6.23	40A	50A
7	NETWORK ENCLOSURE Service Building-2 Area-3 **R1**	1	1	6.23	6.23	40A	50A
8	NETWORK ENCLOSURE Service Building-2 Area-4 **R1**	1	1	5	5	40A	50A
9	NETWORK ENCLOSURE CWPH Stg-II **R1**	1	1	2.4	2.4	16A	20A
10	NETWORK ENCLOSURE CLWPH Stg-III **R1**	1	1	1.8	1.8	10A	16A
	SUB TOTAL	**10**	**10**		**57.65**		

C.MISCELLANEOUS

S.No	Feeder Description	No of Feeders in ACDB-1	No of Feeders in ACDB-2	kVA Rating of each feeder	Total Load in kVA	MCB rating	FUSE rating
1	CCTV UNIT-3 **R1**	1	1	2.4	2.4	16A	20A
2	CCTV UNIT-4 **R1**	1	1	2.4	2.4	16A	20A
3	CCTV UNIT-5 **R1**	1	1	2.4	2.4	16A	20A
4	CCTV Common Plant Area -3,4,5 **R1**	1	1	2.4	2.4	16A	20A
5	PA System Unit-3 **R1**	1	1	2.4	2.4	16A	20A
6	PA System Unit-4 **R1**	1	1	2.4	2.4	16A	20A
7	PA System Unit-5 **R1**	1	1	2.4	2.4	16A	20A
8	C&I LABORATORY INSTRUMENTS-MECHANICAL	2	2	2	4	16A	20A
9	C&I LABORATORY INSTRUMENTS-ELECTRICAL	2	2	2	4	16A	20A
10	RMCMAS FOR CWPH **R1**	1	1	0.3	0.3	4A	6A
11	RMCMAS FOR CLWPH **R1**	1	1	0.3	0.3	4A	6A
12	EPABX **R1**	1	1	1	1	6A	10A
	SUB TOTAL	**14**	**14**		**26.40**		

D. BHEL-BHOPAL R1

S.No	Feeder Description	No of Feeders in ACDB-1	No of Feeders in ACDB-2	kVA Rating of each feeder	Total Load in kVA	MCB rating	FUSE rating
1	DATA CONCENTRATOR PANEL incl HMI (OWS/EWS) & Printer at EL 3.5M & 12.5M - U3&4	3	3	1.3	3.9	10A	16A
2	DATA CONCENTRATOR PANEL BOP Stage-II	1	1	1.3	1.3	10A	16A
3	BTS Panels U3&4	2	0	0.1	0.2	4A	6A
		0	2	0.1	0.2	4A	6A
4	DATA CONCENTRATOR PANEL incl HMI (OWS/EWS) & Printer at EL 3.5M & 12.5M - U5	2	2	1.3	2.6	10A	16A
5	BTS Panels U-5	1	0	0.1	0.1	4A	6A
		0	1	0.1	0.1	4A	6A
	SUB TOTAL	**9**	**9**		**8.40**		

E. BHEL-PEM R1

S.No	Feeder Description	No of Feeders in ACDB-1	No of Feeders in ACDB-2	kVA Rating of each feeder	Total Load in kVA	MCB rating	FUSE rating
1	Air Compressor Panel	6	6	0.75	4.5	6A	10A
2	MRS Compressor	2	2	0.75	1.5	6A	10A
3	OWS/OWES/Printer/Backup Panel (Compressor Room)	1	1	2.1	2.1	16A	20A
4	Bag Filter/Silo (MRS)	1	1	1	1	10A	16A
5	CPU Regenration Area	1	1	1.92	1.92	16A	20A
6	HV AC System Stage-II	1	1	6	6	40A	50A
7	HV AC System Service Building Stage-II	1	1	1	1	10A	16A
8	HV AC System ESP Stage-II	1	1	3	3	20A	25A
9	Air Dryer Panel Stage-II	1	1	0.5	0.5	4A	6A
10	Self Cleaner Strainer Panel	1	1	1	1	10A	16A
11	Auto Drain Trap	6	0	0.375	2.25	4A	6A
		0	6	0.375	2.25	4A	6A
	SUB TOTAL	**22**	**22**		**27.02**		

F. FIRE DETECTION & ALARM SYSTEM R1

S.No	Feeder Description	No of Feeders in ACDB-1	No of Feeders in ACDB-2	kVA Rating of each feeder	Total Load in kVA	MCB rating	FUSE rating
1	Fire Alarm Panel -2 (CCR 3&4)	1	0	0.6	0.6	4A	6A
2	Fire Alarm Panel -3 (CCR 5)	0	1	0.6	0.6	4A	6A
3	Fire Alarm Panel - 9 (Service Building-2)	1	0	0.6	0.6	4A	6A
4	Fire Alarm Panel - 16 (ESP CR-3)	0	1	0.6	0.6	4A	6A
5	RIO Panel - 2 (CWPH CR-2)	1	0	0.6	0.6	4A	6A
6	RIO Panel - 4 (CW Chlorination Building-2)	0	1	0.6	0.6	4A	6A
7	FDA OWS (CCR-3&4)	1	0	0.35	0.35	4A	6A
8	FDA Printer (CCR-3&4)	0	1	0.35	0.35	4A	6A
9	FDA OWS (CCR-5)	1	0	0.35	0.35	4A	6A
10	FDA Printer (CCR5)	0	1	0.35	0.35	4A	6A
11	RIO panel (Booster Pump House)	1	0	0.6	0.6	4A	6A
12	Inert Gas Control Panel-2 (TG Building El. 0.0 M Unit-3&4)	0	1	1	1	10A	16A
13	Inert Gas Control Panel-3 (TG Building El. 0.0 M Unit-5)	1	0	1	1	10A	16A
14	PLC OWS-2 (CCR-3&4)	0	1	0.35	0.35	4A	6A
15	PLC OWS-3 (CCR-5)	1	0	0.35	0.35	4A	6A
16	PLC Printer (CCR-3&4)	0	1	0.35	0.35	4A	6A
17	PLC Printer (CCR-5)	1	0	0.35	0.35	4A	6A
18	Optical LHS Controller-3 (TG Building El. 13.5 M Unit-3&4)	0	1	0.12	0.12	4A	6A
19	Optical LHS Controller-2 (TG Building El. 0.0 M Unit-3&4)	1	0	0.12	0.12	4A	6A
20	Optical LHS Controller-14 (TG Building El. 0.0 M Unit-3&4)	0	1	0.12	0.12	4A	6A
21	Optical LHS Controller-15 (TG Building El. 13.5 M Unit-3&4)	1	0	0.12	0.12	4A	6A
22	Optical LHS Controller-17 (ESP U-4)	0	1	0.5	0.5	4A	6A
23	RIO Panel - 11 (ESP CR-4)	1	0	0.6	0.6	4A	6A
24	RIO Panel - 12 (ESP CR-5)	0	1	0.6	0.6	4A	6A
25	Optical LHS Controller-5 (ESP U-4)	1	0	0.12	0.12	4A	6A
	SUB TOTAL	**13**	**12**		**11.3**		

G.BHEL-BAP, RANIPET R1

S.No	Feeder Description	No of Feeders in ACDB-1	No of Feeders in ACDB-2	kVA Rating of each feeder	Total Load in kVA	MCB rating	FUSE rating
1	CW Gas Chlorination PLC Stage-II **Note:** Local PDB is provided. Kindly refer PDB details	1	1	2.201	2.201	16A	20A
2	STP RIO Panel-3	1	1	0.4	0.4	4A	6A
3	ETP RIO Panel-2	1	1	1	1	6A	10A
	SUB TOTAL	**3**	**3**		**3.60**		

H.BHEL-TRICHY R1

S.No	Feeder Description	No of Feeders in ACDB-1	No of Feeders in ACDB-2	kVA Rating of each feeder	Total Load in kVA	MCB rating	FUSE rating
1	Ash Level Switches (SCR Area)	3	0	0.015	0.045	4A	6A
		0	3	0.015	0.045	4A	6A
	SUB TOTAL	**3**	**3**		**0.09**		

Total UPS Load (For items A to H)	141.42
Total UPS Load (For items A to H) + 25% Spare	176.77625
UPS Rating	**180 kVA**

ACDB DETAILS:

S.NO	Feeder rating MCB / Fuse	ACDB-1	ACDB-2	With 10% Spare ACDB-1	With 10% Spare ACDB-2	Rounded-off to:- ACDB-1	Rounded-off to:- ACDB-2
1	4A/6A	28	27	31	30	**32**	**32**
2	6A/10A	20	20	22	22	**23**	**23**
3	10A/16A	13	13	15	15	**16**	**16**
4	16A/20A	15	15	17	17	**18**	**18**
5	20A/25A	1	1	2	2	**3**	**3**
6	40A/50A	5	5	6	6	**7**	**7**
7	63A/80A	2	2	3	3	**4**	**4**
	Total	**84**	**83**	**96**	**95**	**103**	**103**

TSGENCO YADADRI (5x800 MW), 240V AC UPS FEEDER/LOAD LIST

FOPH & FOUS AREA R1

S.No	Feeder Description	No of Feeders in ACDB-1	No of Feeders in ACDB-2	kVA Rating of each feeder	Total Load in kVA	MCB rating	FUSE rating
1	FOPH - 1,2 (CAF41,42) Common for U-1,2	1	1	0.96	0.96	6A	10A
2	FOPH - 1,2 (CAF41,42) Common for U-3,4,5	1	1	0.96	0.96	6A	10A
3	FOUS-1,2,3,4 (CAF 43,44,45,46)	1	1	0.48	0.48	6A	10A
4	RIO Panel (Foam Pump House)	1	0	0.6	0.6	4A	6A
	SUB TOTAL	**4**	**3**		**3**		

Total UPS Load	3.00
Total UPS Load + 25% Spare	3.75
UPS Rating	**10 kVA**

ACDB DETAILS:

S.NO	Feeder rating MCB / Fuse	ACDB-1	ACDB-2	With 10% Spare ACDB-1	With 10% Spare ACDB-2	Rounded-off to:- ACDB-1	Rounded-off to:- ACDB-2
1	4A/6A	1	0	2	0	**2**	**2**
1	6A/10A	3	3	4	4	**5**	**5**
	Total	**4**	**3**	**6**	**4**	**7**	**7**

TSGENCO YADADRI (5x800 MW), 240V AC UPS FEEDER/LOAD LIST

RWPH AREA STAGE-I R1

S.No	Feeder Description	No of Feeders in ACDB-1	No of Feeders in ACDB-2	kVA Rating of each feeder	Total Load in kVA	MCB rating	FUSE rating
1	FUNCTIONAL GROUP CONTROL(CRW04,05,06)	1	1	0.72	0.72	6A	10A
2	NETWORK ENCLOSURE RWPH Stage-I	1	1	2.4	2.4	16A	20A
3	Fire Alarm Panel - 11 (Fire Station)	1	0	0.6	0.6	4A	6A
4	RMCMAS RWPH Stage-I	1	1	0.3	0.3	6A	10A
	SUB TOTAL	**4**	**6**		**4.02**		

Total UPS Load	4.02
Total UPS Load + 25% Spare	5.025
UPS Rating	**10 kVA**

ACDB DETAILS:

S.NO	Feeder rating MCB / Fuse	ACDB-1	ACDB-2	With 10% Spare ACDB-1	With 10% Spare ACDB-2	Rounded-off to:- ACDB-1	Rounded-off to:- ACDB-2
1	4A/6A	1	0	2	0	**3**	**3**
2	6A/10A	2	2	3	3	**4**	**4**
3	16A/20A	1	1	2	2	**2**	**2**
	Total	**4**	**3**	**7**	**5**	**9**	**9**

TSGENCO YADADRI (5x800 MW), 240V AC UPS FEEDER/LOAD LIST

RWPH AREA STAGE-II R1

S.No	Feeder Description	No of Feeders in ACDB-1	No of Feeders in ACDB-2	kVA Rating of each feeder	Total Load in kVA	MCB rating	FUSE rating
1	FUNCTIONAL GROUP CONTROL(CRW04,05,06)	1	1	0.72	0.72	6A	10A
2	NETWORK ENCLOSURE RWPH Stage-II	1	1	2.4	2.4	16A	20A
3	RMCMAS RWPH Stage-II	1	1	0.3	0.3	4A	6A
	SUB TOTAL	**3**	**3**		**3.42**		

Total UPS Load	3.42
Total UPS Load + 25% Spare	4.275
UPS Rating	**10 kVA**

ACDB DETAILS:

S.NO	Feeder rating MCB / Fuse	ACDB-1	ACDB-2	With 10% Spare ACDB-1	With 10% Spare ACDB-2	Rounded-off to:- ACDB-1	Rounded-off to:- ACDB-2
2	6A/10A	2	2	3	3	**4**	**4**
3	16A/20A	1	1	2	2	**2**	**2**
	Total	**3**	**3**	**5**	**5**	**6**	**6**

TSGENCO YADADRI (5x800 MW), PDB DETAILS

A) CW Gas Chlorination PLC Stage-I R1

S.No	Feeder Description	No of Feeders in PDB-1	No of Feeders in PDB-2	kVA Rating of each feeder	Total Load in kVA	MCB rating	FUSE rating
1	Load - 1	1	1	1.36	1.36	10A	16A
2	Load - 2	2	2	0.26	0.52	4A	6A
3	Load - 3	1	0	0.001	0.001	4A	6A
4	Load - 4	0	1	0.32	0.32	4A	6A
	SUB TOTAL	**4**	**4**		**2.201**		

PDB DETAILS:

S.NO	Feeder rating MCB / Fuse	PDB-1	PDB-2	With 10% Spare PDB-1	With 10% Spare PDB-2	Rounded-off to:- PDB-1	Rounded-off to:- PDB-2
1	4A/6A	3	3	4	4	**5**	**5**
2	10A/16A	1	1	2	2	**3**	**3**
	Total	**4**	**4**	**6**	**6**	**8**	**8**

B) CW Gas Chlorination PLC Stage-II R1

S.No	Feeder Description	No of Feeders in PDB-1	No of Feeders in PDB-2	kVA Rating of each feeder	Total Load in kVA	MCB rating	FUSE rating
1	Load - 1	1	1	1.36	1.36	10A	16A
2	Load - 2	2	2	0.26	0.52	4A	6A
3	Load - 3	1	0	0.001	0.001	4A	6A
4	Load - 4	0	1	0.32	0.32	4A	6A
	SUB TOTAL	**4**	**4**		**2.201**		

PDB DETAILS:

S.NO	Feeder rating MCB / Fuse	PDB-1	PDB-2	With 10% Spare PDB-1	With 10% Spare PDB-2	Rounded-off to:- PDB-1	Rounded-off to:- PDB-2
1	4A/6A	3	3	4	4	**5**	**5**
2	10A/16A	1	1	2	2	**3**	**3**
	Total	**4**	**4**	**6**	**6**	**8**	**8**

PROJECT : YADADRI (5x800 MW)

CUSTOMER : M/s TSGENCO

CONSULTANT : M/s TCE, HYDERABAD

TYPICAL BATTERY SIZING CALCULATION FOR UPS

REVISION:00

APPROVED

AMIT KUMAR SHARMA

PREPARED	ISSUED	DATE
SATHISH	416	18/09/2021

Typical Battery sizing calculation:

UPS full load considered = '**M**' say

Max. Output load on UPS in watts = **N** x 1000 x 0.8 (P.F)

= '**P**' Watts

Inverter efficiency = '**A**' say
Type of Battery and Back up Time required = Lead Acid Plante, 100% load for 30 min & 60% load for 30 min
End cell voltage (ECV) = 1.8 Volts/cell.
Number of cells = 180 cells for rating higher than 50 kVA
= 110 cells for UPS rating less than 50 kVA
Ageing factor = 1.25
Design Margin = 1.20

Temperature correction factor (at 8 deg. C. based on IEEE 485: latest standard) = '**C**' say

Capacity Factor at ECV of 1.8V for 1 Hr. Back-up, K = '**D**' say

Then Battery Discharge Current required = $\frac{\mathbf{P}}{1.8 \times \mathbf{A} \times \mathbf{B}}$ = '**E**' say

AH required = '**E**' x '**D**' = '**F**' say

Total Discharge Current considering the factors such as temperature correction factor, design margin & ageing factor is

= '**F**' x '**C**' 1.25 x 1.2 = 'Z' say

Battery AH to an End Cell Voltage of 1.8V/cell and suiting the above discharge current = '**Y**' say

Hence, Battery selected = **'B' cells of 'Y' "H type Battery" which can deliver 'Z' for 1 Hr. back-up at ECV=1.8V/cell.**

PROJECT : YADADRI (5x800 MW)

CUSTOMER : M/s TSGENCO

CONSULTANT : M/s TCE, HYDERABAD

SINGLE LINE DIAGRAM

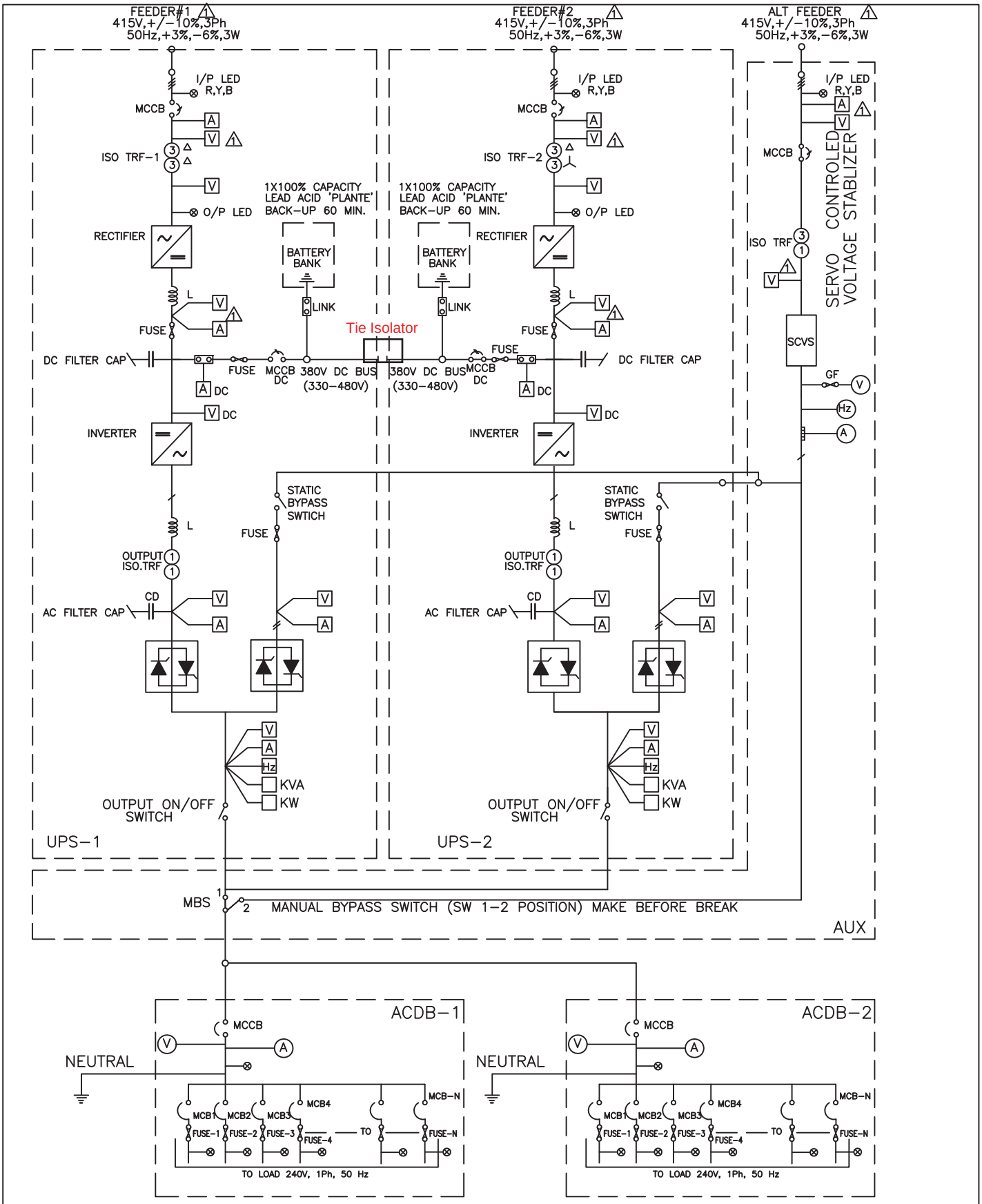
REVISION:00

APPROVED

AMIT KUMAR SHARMA

PREPARED	ISSUED	DATE
SATHISH	416	18/09/2021

Typical



BHEL	1 X 800 MW KOTHAGUDEM TPS	DRG. No.	PE−DG−410−145−I004		
	TITLE:− UPS SINGLE LINE DIAGRAM	REV. No.	01	DATE	09.06.2015
		SHEET	2	OF	3

L1

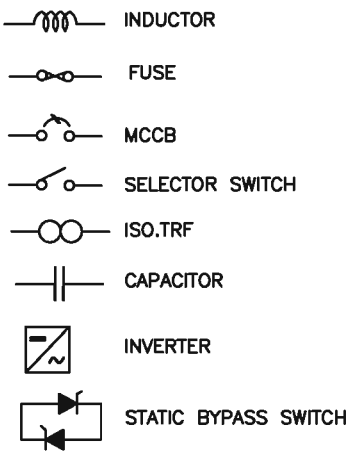
NOTES:

1. ACDB–1&2 NEUTRAL TO BE GROUNDED TO A DEDICATED GROUND.
2. ALL OUTPUT FEEDERS OF ACDB SHALL BE PROVIDED WITH AN LED AFTER THE FUSE FOR FEEDER ON INDICATION WITH FEEDER DESCRIPTION.
3. REDUNDANT FEEDERS SHALL BE LOCATED IN DIFFERENT ACDBs.
4. SINCE, THIS DIAGRAM IS AN SLD FOR UPS, DETAILS REGARDING SIZING HAVE NOT BEEN SHOWN. BHEL–EDN SHALL DO THE SIZING AND PREPARE TECHNICAL SPECIFICATION FOR PROCURING THE UPS.
5. THIS IS LIST OF ESSENTIAL SIGNALS EXCHANGE BETWEEN UPS AND PLC THAT MAY BE EITHER THROUGH HARDWIRE OR THROUGH SOFT LINK.

01

a. Main I/P 1, 2 alternate I/P voltage, currents.
b. After line transformer –1&2 voltages
c. DC O/P VOLTAGE, current and battery charging , discharging currents,
d. Inverter o/p voltage, current.
e. Static switch main I/P, alternate i/p voltage.
f. SCVS O/P VOLTAGE, CURRENT, HZ
g. UPS–1 & 2– KVA, KW o/ps
h. ACDB –1&2 VOLTAGE, CURRENT
i. UPS–1,2– POWER FACTOR

LEGEND:



BHEL	1 X 800 MW KOTHAGUDEM TPS	DRG. No.	PE–DG–410–145–I004		
	TITLE:– UPS SINGLE LINE DIAGRAM	REV. No.	01	DATE	09.06.2015
		SHEET	3 OF 3		