निविदा आमंत्रण सूचना
NOTICE INVITING TENDER (NIT)

Enquiry No- 77/25/6171/SUM **Date -27-Oct-25**

BHEL invites offers from reputed Suppliers as per following terms and conditions -

1. Tender Type	**Open Tender (Domestic-Indian)**		
2. Package	**DC BATTERY CHARGER**		
3. Project	**Framework Agreement (Rate Contract) of DC BATTERY CHARGER**		
4. Executing Agency	**BHEL-PEM**		
5. Mode of Enquiry	**E - PROCUREMENT**		
6. Nature of Package (Divisible/Non-Divisible)	**Divisible**		
7. Numbers of Part bid	**2-Part bid (Techno-commercial and Price bid)**		
8. Due Date & Time	**For offer submission**	**11-11-2025**	**14:00 IST**
	For P-1 bid opening	**11-11-2025**	**16:00 IST**
9. Earnest Money Deposit (EMD)	Not Applicable	EMD Amount	NA
10. Tender Cost	NIL		
11. Eligibility of Local Supplier as per MII	**Only Class I Supplier (with local content 60% and above)**		
12. Technical Scope	As per Technical specification No: PE-TS-999-508-E002, Rev 0		
13. Pre-bid Clarification	Suppliers to contact BHEL-PEM (over phone/ mail/ visit-BHEL-PEM) for any clarification (Technical or Commercial) at least 05 days before the due date of Tender opening & get it clarified well before the due date, so that offers by the Suppliers may be submitted within the due date & time.		
14. Prequalification Requirements	Financial PQR- NO	Technical PQR- YES	
15. Delivery terms for Supply	FOR Despatch Station		
16. Delivery Schedule:	Drawing/ documents submission & re-submission schedule shall be as per Technical Specification: PE-TS-999-508-E002, Rev 0		
A. Main Supply	210 days from the date of PO		
B. Mandatory Spares	90 days from BHEL clearance date		
C. Supervision of E&C	Bidder to depute its service engineer for respective site activity within 15 days from BHEL's intimation.		

Notes:

a. Supplier to start manufacturing/supply only after getting the applicable Primary engineering Drgs. /docs approved from BHEL/End Customer.

b. Drawings /documents submission/re-submission schedule shall be as per Technical specification (PE-TS-999-508-E002, Rev 0) which shall be used for progress monitoring purpose and required course correction, if any.

c. The delivery date specified is for completion of the deliveries. Deliveries to start progressively so as to meet the completion schedule.

d. The delivery conditions specified are for Contractual purposes. However, to meet project requirement, BHEL may ask for early deliveries without any compensation thereof.

2.0 Validity of Contract placed on basis of Framework Agreement (Rate Contract) for individual projects (PO rates, terms and conditions):

Vendor has to make supply of goods/services as per the delivery time mentioned above. However, due to unavoidable circumstances if delay happens in providing inputs/ clearances (inputs, Engineering approvals, deputing inspector for inspection, issuance of MDCC and any hold imposed owing to site issues etc.) for which delivery time extension is admissible as per point no.3, in such situation it shall be obligatory at vendor part to execute the Contract at PO rates, terms and conditions where inputs/ clearances has been accorded within validity of Contract. Validity period for various activities shall be as defined below or as mentioned in the NIT.

2.1 Contract for main supply shall be valid for **430** ('C') days from the PO date. However, delay at vendor's end (if any) shall be added to the validity period and Contract validity shall get extended by the delay period at vendor's end.

For example: Original Delivery period for main supply: A (in days)

Delay at vendor's end: B (in days beyond "A" days)

Contract validity: C+B (in days)

2.2 Validity of the contract for Mandatory spares and Supervision of E&C: Validity of contract for services (Supervision of E&C) shall be one year over and above contractual validity period for main supply including quantity variation (if any) as specified at point no. 2.1 above.

Notes:

a. B is the Vendor delay days beyond original Contractual delivery period for main supply /extended delivery period owing to time taken by BHEL.

b. Main supply including quantity variation, mandatory spares/ services, applicable in the Contract released/ cleared for manufacturing within Contractual validity period, to be supplied by vendor/supplier at PO rates, terms and conditions.

c. Execution of the Contract quantities released beyond Contract validity period shall be decided on mutual consent basis at PO rates, terms and conditions.

3.0 Delivery Extension: Extension of Contractual delivery time:

Delivery time mentioned in the NIT includes Engineering completion time (time for drawing/document submission/resubmission by the vendor and review/approval of the same by the BHEL/End customer), manufacturing, inspection, Packing and dispatch time. Due diligence is to be observed by the vendor to ensure timely completion of engineering and supply.

During the execution of the Contract, time loss occurred owing to the reason attributable to BHEL besides force majeure shall be considered for delivery time extension to the vendor as given below: -

i. Any Delay in providing comments/ approval on Primary drawing/documents beyond the stipulated time as specified in NIT.
ii. Time Loss in approval of the drawing/document as a result of increase in the iteration not attributable to the vendor (i.e. resubmission owing to end customer comments) as certified by BHEL. Time extension equivalent to the resubmission time noted in the tech. spec and consequential increase in the approval time in lieu of increase in iteration shall be applicable. However, for incomplete re- submission time loss shall be in vendor account.
iii. Delay in providing engineering input/material by BHEL.
iv. Delay in deputing inspector for inspection and delay in release of MDCC in line with GCC terms
v. Any hold put by BHEL for whatever reasons during execution of Contract (within Contract validity period), time extension equivalent to hold period shall be admissible. However, in the event hold period continues for

more than 30 days then, an additional fifteen days for the purposes of mobilization and demobilization of resources shall also be admissible.

Note: Extension in delivery period if any with or without imposition of LD shall be considered after detailed delay analysis based on provisions given above. However, no delay analysis will be applicable if supply is completed within delivery schedule as specified in Purchase order.

17. Liquidated Damages (LD):

i. Liquidated Damages (For Main Supply): Buyer reserves the right to recover from the Supplier, as agreed liquidated damages and not by way of penalty, a sum equivalent to half (½) percent of the total main contract price excluding GST per week or part thereof, subject to a maximum of ten (10) percent of the total main supply contract price excluding GST, if the Supplier fails to deliver any part of the ordered goods/stores within the period stipulated in the Order/ Contract.

ii. Liquidated Damages (For Mandatory Spares: Buyer reserves the right to recover from the Supplier, as agreed liquidated damages and not by way of penalty, a sum equivalent to half (½) percent of the total mandatory spares contract price excluding GST per week or part thereof, subject to a maximum of ten (10) percent of the total mandatory spares contract price excluding GST, if the Supplier fails to deliver any part of the ordered goods/stores within the period stipulated in the Order/ Contract..

iii. Liquidated Damages (on Service Portion): LD shall be applicable @ ½ percent, of the total service contract value excluding GST per week or part thereof.

Note- Total LD (Main supply+ Mandatory Spares +Supervision of E&C) shall be limiting to 10% of cumulative total contract value (Main supply +Mandatory Spares +Supervision of E&C) excluding GST.

All other terms and conditions of LD shall be as per GCC Rev. 07 and Corrigendum 01, 02 & 03 to GCC Rev. 07.

18. Guarantee Terms: As per Clause No. 12.0 except Clause no. 12.2(b) of General Commercial Terms & Condition of GCC Rev. 07.

19. Validity of offer shall be as per Clause no. 7 (Instruction to Suppliers) of GCC Rev. 07.

20. PVC (Price Variation Clause): PVC (Price Variation Clause) shall be applicable as per enclosed PVC Annexure to NIT. All Suppliers shall quote as per the Price Variation Formulae Annexure to NIT.

- For reference dates (base date and end date for PVC), please refer the Price Variation Formulae Annexure to NIT.
- The price variation shall be limited to + 20% of total ex-works and negative price variation shall be unlimited.

21.	CIF Content	Not Available
22.	Integrity Pact Applicability	Yes

23. In case of any complaints arising out of the tendering process, the matter may be referred to any of the below e-mail IDs.

iem1@bhel.in; iem2@bhel.in; iem3@bhel.in

As on date, the positions of Independent External Monitors (IEMs) are vacant in the Company. As and when the IEMs join based on due approval of the Competent Authority, any complaint(s) received will be shared with the IEMs.

24. **Tender Evaluation - Price will be finalized through RA.** The evaluation currency for this tender shall be INR. Evaluation will be done on overall L1 (Total Package Price including Freight excluding taxes) basis with necessary loading as applicable.

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

In case more than one Supplier happens to occupy the L-1 status even after soliciting discounts, the L-1 Supplier shall be decided by a toss/ draw of lots, in the presence of the respective L-1 Supplier (s) or their representative(s). Ranking will be done accordingly. BHEL's decision in such situations shall be final & binding.

25. **Payment Terms:**

Main Supply: As per clause No. 9.1 of General Commercial Terms and Conditions of GCC Rev. 07 i.e.

Payment of basic price of supplied materials (as per PO/ approved billing schedule) along with freight and taxes and duties (as applicable), shall be paid against receipt of material (receipted LR) at site on pro-rata basis. 10% of basic price of materials supplied will be retained as security deposit which will be released on pro-rata basis as below:

On receipt of Material Receipt Certificate (MRC) from project site engineer of owner/Buyer and on submission of certificate of submission of all the final documents for the package (as per Annexure IX(A) of GCC Rev. 07), duly certified by Engineering Department of Buyer.

Mandatory Spares: As per clause No. 9.1 of General Commercial Terms and Conditions of GCC Rev. 07 i.e.

Payment of basic price of supplied materials (as per PO/ approved billing schedule) along with freight and taxes and duties (as applicable), shall be paid against receipt of material (receipted LR) at site on pro-rata basis. 10% of basic price of materials supplied will be retained as security deposit which will be released on pro-rata basis as below:

On receipt of Material Receipt Certificate (MRC) from project site engineer of owner/Buyer and on submission of certificate of submission of all the final documents for the package (as per Annexure IX(A) of GCC Rev. 07), duly certified by Engineering Department of Buyer.

Supervision of E&C: As per clause No. 9.5 of General Commercial Terms and Conditions of GCC Rev. 07 i.e.

100% payment shall be released after successful completion of the activity on pro rata basis, on Site certification/ certification by engineering as applicable.

26. GST shall be payable extra at actual as per the HSN code finalized for the items during detailed BBU.

27. **Reverse Auction:**

BHEL shall be resorting to Reverse Auction (RA) (Guidelines for Reverse Auction - 2024, as available on www.bhel.com on "Supplier registration page") for this tender. RA shall be conducted among all the Techno-Commercially qualified Suppliers.

Price Bids of all the Techno-Commercially qualified Suppliers shall be opened and same shall be considered as initial bids of Suppliers in RA. In case any Supplier(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.

"The Suppliers has to quote the Single Price (i.e. Total Cost to BHEL) in Reverse Auction. Prices are to be inclusive of Packing & Forwarding charges, all as per tender scope, Freight as applicable, including loading (if any) but excluding GST. De-loading (if any) shall be done in line with NIT terms."

28. Supplier to note that this is a conditional Open Tender enquiry & Reverse Auction participation shall be subject to following condition:

a) Qualifying Technical Pre-Qualification Requirement.

b) Techno-Commercial acceptance of offer by BHEL-PEM.

c) Registration in BHEL-PEM for the Tender package

d) NTPC approval before Reverse Auction.

The Suppliers who are not registered with BHEL-PEM may apply for registration in BHEL-PEM through Registration Portal available at https://supplier.bhel.in/. All credentials and/ or documents duly signed & stamped related to registration has to be uploaded on the website & submit the application for registration. One set of hard copy filled-up SRF downloaded from Online Registration Portal duly signed & stamped has to be submitted.

29. Performance Security (PS)		No Performance Security (PS) against the current enquiry for Framework Agreement (Rate Contract) for Tender package. However, Suppliers to note that Performance Security shall be submitted for orders placed by the concerned Purchase Groups unit on the Framework Agreement (Rate Contract).
	PS Applicability	Successful Supplier/s will have to submit Performance Security for each POs (irrespective of value) which will be placed under the Framework Agreement (Rate Contract) finalized through this tender considering FA (RC) as original Contract as per the format given in GCC Rev 07. Relevant details of the PS to be submitted on the basis of Framework Agreement (Rate Contract) are as following:
	I	Initially 10% of the Contract value (total Ex-works price). However, 5% of the Contract value (as above) will be released after completion of Main Supply based on certification by Purchasing Department of BHEL unit. Balance 5% of the Contract value (excluding PVC) will be released on completion of all Contractual obligations, including guarantee/warranty obligations based on certification by Purchasing Department of BHEL unit.
		OR
	II	5% of the Contract value (total Ex-works price). Additional 5% of the Contract value will be retained from first bill & subsequent bill(s) of the same Contract. The retention amount will be released after completion of main supply based on certification by Purchasing Department of BHEL unit. Balance 5% of the Contract value (excluding PVC) will be released on completion of all Contractual obligations, including guarantee/warranty obligations based on

		certification by Purchasing Department of BHEL unit.
	Validity of PS	As per clause no. 11.0 (except 11.4) of General Commercial Terms and Conditions of GCC Rev 07.
	PS Submission	PS should be in favour of concerned BHEL unit. Supplier may opt any of the following for submission of Performance Security: -
	Modes of Deposit	Performance security may be furnished in the following forms: a) Local cheques of Scheduled Banks (subject to realization)/ Pay Order/ Demand Draft/ Electronic Fund Transfer in favour of BHEL. b) Bank Guarantee from Scheduled Banks / Public Financial Institutions as defined in the Companies Act. The Bank Guarantee format should have the approval of BHEL. c) Fixed Deposit Receipt issued by Scheduled Banks / Public Financial Institutions as defined in the Companies Act (FDR should be in the name of the Contractor, a/c BHEL). d) Securities available from Indian Post offices such as National Savings Certificates, Kisan Vikas Patras etc. (held in the name of Contractor furnishing the security and duly endorsed/ hypothecated/ pledged, as applicable, in favour of BHEL). e) Insurance Surety Bond. (Note: BHEL will not be liable or responsible in any manner for the collection of interest or renewal of the documents or in any other matter connected therewith) Performance Security is to be furnished within 14 days from the date of PO and it should remain valid for a period of 60 (sixty) days beyond the date of completion of all Contractual obligations of the Supplier, including warranty obligations.
	Remarks for PS:	a) The performance security will be forfeited and credited to BHEL's account in the event of a breach of Contract by the supplier. b) Performance security should be refunded to the Contractor without interest, after he duly performs and completes the Contract in all respects but not later than 60 (sixty) days of completion of all such obligations including the warranty under the Contract. c) However, Performance Security validity is to be extended based on the actual delivery of package.

		The Performance Security shall not carry any interest.
30. Breach of Contract, Remedies and Termination (Tenderer to note that this clause will supersede any clause regarding recovery amount from Tenderer due to Breach on Contract mentioned anywhere in GCC Rev. 07 and its Corrigendum)	In case of Breach of Contract, BHEL shall recover 10% of the Contract value from the Supplier using following instruments: (i) Encashment of security instruments like EMD, Performance Security with executing agency against the said Contract. (ii) Balance amount (if value of security instruments is less than 10% of the Contract value) from other Financial remedies i.e. available bills of the Supplier, retention amount etc. with executing agency. (iii) Balance amount from security instruments like EMD, Performance Security and other Financial remedies i.e. available bills of the Supplier, retention amount etc. with other units of BHEL. (iv) If recovery is not possible then legal remedies shall be pursued. However, Supplier shall continue performance of the Order/ Contract, under all circumstances, to the extent not cancelled.	

31. Suppliers are requested to refer clause no 26.0 (Make in India) of instructions to Supplier of GCC Rev. 07. Further, following shall be taken into consideration for submitting bids by Suppliers:

- 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 19.07.2024 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 the issue of the NIT, but before opening of Part-II bids against the NIT.
- Minimum Local Content prescribed for DC BATTERY CHARGER package by Nodal Ministry is 60% and hence for this procurement, as per Public Procurement (preference to make in India), order 2017 dtd. 15.06.17, 28.05.18, 29.05.19, 16.09.20 & 19.07.24 and subsequent orders issued by the nodal ministry, this package is reserved for only Class-I supplier having Minimum local Content 60%. Class-II and Non-Local suppliers are not eligible to quote for this enquiry.
- Suppliers are requested to go through the above-mentioned orders and submit their adherence to Public Procurement (preference to make in India), order 2017 dtd. 15.06.17, 28.05.18, 29.05.19, 16.09.20 & 19.07.24 and subsequent orders.
- Local Content certificate (Make In India Certificate), shall be essentially submitted by supplier along with their offer as per clause No. 9 of Public Procurement (Preference to Make in India), Order 2017 dated 19.07.2024

32. Purchase preference to MSE Supplier: Yes.

33. Framework Agreement (Rate Contract) Order Splitting

a. Framework Agreement (Rate Contract) is proposed for Two (02) years from placement of Framework Agreement (Rate Contract) Purchase Order with a provision for further extension after review on mutual consent.

b. Framework Agreement (Rate Contract) is to be done with 2 suppliers in ratio of 70:30 value wise at L1 FOR Site Price (Ex-works + Freight) for this package. However, Purchase orders placed by BHEL units for a project on the basis of Rate Contract shall not be split. Details of Framework Agreement (Rate Contract) order splitting shall be as per following:

- GOI circular dated 18.05.2023 for Concurrent application of Public Procurement Policy for Micro and Small Enterprises Order, 2012 and Public Procurement (Preference to Make in India) Order,2017 shall be applicable for order splitting (in the ratio of 70:30) and order finalization.
- L1 Rates (Ex-works + Freight) shall be counteroffered to all techno-commercially qualified Suppliers and

order splitting in ratio of 70:30 shall be done in line with GOI circular dated 18.05.2023 for Concurrent application of Public Procurement Policy for Micro and Small Enterprises Order, 2012 and Public Procurement (Preference to Make in India) Order,2017.

- In case acceptance of counteroffer is received from more than Supplier then acceptance shall be considered as per FINAL Reverse Auction Ranking (as applicable).
- If none of the Supplier accepts counter-offered L1 rates, then Contract shall be awarded to L1 vendor for 100% value.

c. Framework Agreement (Rate Contract) will be finalized on total lump sum basis instead of item wise evaluation so that the complete requirement against one project is not split amongst various Suppliers to minimize operational difficulty.

34. GOI circular dated 18.05.2023 for Concurrent application of Public Procurement Policy for Micro and Small Enterprises Order, 2012 and Public Procurement (Preference to Make in India) Order,2017 shall be applicable for order splitting and order finalization.

35. The quantities indicated in the tender are tentative quantities. No minimum quantity is guaranteed by BHEL.

36. Overall (%) quantity variation: The variation on overall package value shall be limited to +-30% of the Contract value.

37. Suppliers shall Quote for the entire Scope. Partial scope is not acceptable.

38. Suppliers to ensure that Third party/ Customer issued certificates being submitted as proof of PQR qualification should have verifiable details of document/ certificate issuing authority such as name & designation of Issuing Authority and its organization contact number and e - mail Id etc. Offer of only those Suppliers shall be considered further, who meets the PQR criteria. Suppliers to furnish latest verification details for checking veracity of document(s) by BHEL. In case the same found not available, Buyer has right to reject such document from evaluation. Format for the same is below: -

Sl. No.	Project Name	Customer Name, Contact Address, Phone No. & Email ID	Contract/ Order No.	Value of Contract/ Order	Brief of Work	Completion Date

39. All corrigenda, addenda, amendments, time extensions, clarifications, etc. to the tender will be hosted on BHEL website (www.bhel.com) & BHEL-PEM website (www.pem.bhel.com) and GePNIC portal. Suppliers should regularly visit websites to keep themselves updated.

40. If Supplier mentions Not Applicable/ Not required/ Not Quoted in BHEL price format, the same to be substantiated by the Supplier. If such item is required to be supplied for system completion in future, same will be supplied free of cost.

41. GeM Seller ID shall be mandatory before placement of order/award of Contract to the successful Supplier.

42. Supplier to quote non-zero Freight charges (anywhere in India) in percentage (%) of their quoted Total Ex-Works prices of Supply and Mandatory Spares.

43. At Sl.no. 17 of ITB of GCC Rev.07, “Base rate of SBI on the date of bid opening, (Techno-commercial bid, in case of 2-part bids) + 6%” may be read as "Repo Rate on the date of bid opening, (Techno-commercial bid, in case of 2-part bids) + 4%"

44. All Suppliers to comply Govt. of India, Ministry of Power, order no-25-111612018-PG dtd 02/07/2020 regarding mandatory testing of all the imported items/equipment’s/components.

45. Self-declarations/ Auditor’s/ Accountant’s Certificates submitted by the manufacturer/ supplier may be verified randomly by the committee constituted as per MoP Order 28-07-2020. In case of false documents/misrepresentation

of the facts requisite action against such manufacturer/ supplier will be taken based on the recommendation of the Committee.

46. All Suppliers to declare that they will not enter into any illegal or undisclosed agreement or understanding, whether formal or informal with other Supplier(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 Supplier is found having indulged in above activities, suitable action shall be taken by BHEL as per extant policies/ guidelines.

47. The offers of the Suppliers who are under suspension as also the offers of the Suppliers, who engage the services of the firms debarred across BHEL, shall be rejected. The list of firms debarred across BHEL is available on BHEL web site www.bhel.com.

1.0 Integrity commitment, performance of the Contract and punitive action thereof:

1.1 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 Supplier(s) in a transparent and fair manner, and with equity.

1.2 Commitment by Supplier/ Supplier/ Contractor:

1.2.1 The Supplier/ supplier/ Contractor commits to take all measures to prevent corruption and will not directly or indirectly influence any decision or benefit which he is not legally entitled to nor will act or omit in any manner which tantamount to an offence punishable under any provision of the Indian Penal Code, 1860 or any other law in force in India.

1.2.2 The Supplier/ supplier/ Contractor 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 relevant guidelines issued from time to time by Govt. of India/ BHEL.

1.2.3 The Supplier/ supplier/ Contractor will perform/ execute the Contract as per the Contract terms & conditions and will not default without any reasonable cause, which causes loss of business/ money/ reputation, to BHEL.

If any Supplier/ supplier/ Contractor during pre-tendering/ tendering/ post tendering/ award/ execution/ post-execution stage indulges in malpractices, cheating, bribery, fraud or and other misconduct or formation of cartel so as to influence the bidding process or influence the price or acts or omits in any manner which tantamount to an offence punishable under any provision of the Indian Penal Code, 1860 or any other law in force in India, then, action may be taken against such Supplier/ supplier/ Contractor as per extant guidelines of the company available on www.bhel.com and/or under applicable legal provisions".

48. Conflict of **interest:** All bidders are required to submit the declaration regarding conflict of interest in the format enclosed with the NIT signed by the authorized signatory of the bidder.

49. All the above terms and conditions, post-bid agreements/MoMs (during Techno- Commercial evaluation) shall automatically become a part of the Order/Contract after its finalisation.

50. Suppliers to note that offers shall be submitted strictly in accordance with the requirements of tender documents. Suppliers shall upload their complete offer meeting the requirements of the tender documents on e-procurement portal https://eprocurebhel.co.in/nicgep/app.

Following documents need to be uploaded:

- **Offer forwarding/ covering letter with Un-price bid, Deviation Sheet (Cost of Withdrawal)**
- **Documents required for meeting Technical PQRs (Part of Tech. Spec.)**
- **NTPC Sub Vendor Questionnaire**
- **Bank Guarantee Format**
- **Local Content Certificate in line with Make in India circular**
- **Land Border Certificate**
- **Integrity Pact**
- **Details of the company in prescribed format**
- **Price Bid on e-procurement portal - https://eprocurebhel.co.in/nicgep/app**

51. It shall be the responsibility of the Supplier to ensure that the tender complete in all respects is uploaded on or before the due date and time. Incomplete/late offers shall not be considered.

52. Grievance Redressal Mechanism

To promote transparency and ensure fair treatment of all bidders, a structured Grievance Redressal Mechanism is in place to address any concerns or issues arising during the tendering process or in subsequent business dealings with the company.

Suppliers/Contractors are requested to follow the below escalation process for grievance resolution:

1. First Level: Any grievance should initially be addressed to the designated Dealing Officer, whose contact details are provided in the Notice Inviting Tender (NIT)/Contract.

2. Second Level: If the issue remains unresolved, it may be escalated by lodging a formal grievance through the SUVIDHA Portal: https://suvidha.bhel.in/suvidha/. Responses will be provided in accordance with the defined escalation matrix.

53. All Suppliers / Contractors of BHEL are informed that the facility for **online invoice registration and document uploading** has been enabled in the **SUVIDHA Portal (https://suvidha.bhel.in/suvidha/)**. With effect from **01-October-2025**, it shall be mandatory for all Suppliers / Contractors of BHEL to **register** their invoices to be **exclusively through the system** along with the requisite documents.

54. Schedule of Pre-Bid discussion

As per Annexure for pre-bid meeting

Interested bidders are requested to confirm their participation for Pre-Bid Discussion (PBD) meeting through Video Conferencing (VC). VC Link is given below:

Through: WEBEX

Meeting ID and Passcode shall be shared as per Annexure for pre-bid meeting

All other correspondence thereof shall be addressed to the undersigned by name & designation and sent at the following address:

Kumar Suman Saurabh/ Mgr-CMM **M/s Bharat Heavy Electricals Ltd.,** Project Engineering Management, Power Project Engineering Institute, HRD & ESI Complex, Plot No 25, Sector-16 A, Noida-201301 E-mail: sumansaurabh@bhel.in Contact No.: 9718771765	**Manish Kumar Sinha / Sr. Manager-CMM** **M/s Bharat Heavy Electricals Ltd.,** Project Engineering Management, Power Project Engineering Institute, HRD & ESI Complex, Plot No 25, Sector-16 A, Noida-201301 E-mail: manish.sinha@bhel.in Contact No.: 0120-6748120

55. Terms & Conditions: - The Terms & Conditions shall be as per enclosed Special Conditions of the Contract (copy enclosed), GCC Rev. 07 and Corrigendum 01, 02 & 03 to GCC Rev. 07 which is available on www.pem.bhel.com and other Terms and Conditions included in this Enquiry Letter.

56. All other terms and conditions shall be as per Special Conditions of Framework Agreement (Rate Contract), and GCC Rev 07 & Corrigenda-01, Corrigenda-02 and Corrigenda-03 to GCC Rev 07.

In the event of any contradiction in the terms and conditions mentioned, the order of preference shall be as mentioned in clause no. 36 of GCTC of GCC Rev 07.

Note - In case you are not making an offer against this enquiry, you are requested to send a regret letter so as to reach us on or before the due date

Thanking You.

For and on behalf of BHEL

KUMAR SUMAN SAURABH
Manager/ CMM/ PEM Noida

Annexure for pre-bid meeting

PROJECT	**:**	**Framework Agreement (Rate Contract) of DC BATTERY CHARGER- NTPC VARIANT**
PACKAGE	**:**	**DC BATTERY CHARGER**
SUBJECT	**:**	**PRE-BID MEETING SCHEDULE**

Pre-Bid Meeting through webex for subject package & projects is schedule on 03.11.2025@02:30 PM.

Pre-bid meeting for PAN-BHEL Rate Contract of DC Battery Charger
Hosted by PEM Conference Room - BHEL SADAN, NOIDA

https://bhel.webex.com/bhel/j.php?MTID=mf5d1a576cec565058912e8fc95fcd745
Monday, November 3, 2025 2:30 PM | 3 hours | (UTC+05:30) Chennai, Kolkata, Mumbai, New Delhi
Meeting number: 2515 919 7106
Password: 54321 (54321 when dialing from a phone or video system)
Agenda: Pre-bid meeting for PAN-BHEL Rate Contract of DC Battery Charger

Join by video system
Dial 25159197106@bhel.webex.com
You can also dial 210.4.202.4 and enter your meeting number.

Join by phone
+65-6703-6949 Singapore Toll

Access code: 251 591 97106

PROJECT: Framework Agreement (Rate Contract) of DC BATTERY CHARGER– NTPC
PACKAGE: DC BATTERY CHARGER

Undertaking for Conflict of Interest

Treatment of cases regarding conflict of interest:

The bidder notes that a conflict of interest would said to have occurred in the tender process and execution of the resultant contract, in case of any of the following situations:

i) If its personnel have a close personal, financial, or business relationship with any personnel of BHEL who are directly or indirectly related to the procurement or
execution process of the contract, which can affect the decision of BHEL directly or indirectly;

ii) The bidder (or his allied firm) provided services for the need assessment/ procurement planning of the Tender process in which it is participating;

iii) Procurement of goods directly from the manufacturers/ suppliers shall be preferred. However, if the OEM/ Principal insists on engaging the services of an agent, such agent shall not be allowed to represent more than one manufacturer/ supplier in the same tender. Moreover, either the agent could bid on behalf of the manufacturer/ supplier or the manufacturer/ supplier could bid directly but not both. In case bids are received from both the manufacturer/ supplier and the agent, bid received from the agent shall be ignored. However, this shall not debar more than one Authorised distributor (with/ or without the OEM). from quoting equipment manufactured by an Original Equipment Manufacturer (OEM) in procurements under a Proprietary Article Certificate.

iv) A bidder participates in more than one bid in this tender process. Participation in any capacity by a Bidder (including the participation of a Bidder as a partner/ JV member or sub-contractor in another bid or vice-versa) in more than one bid shall result in the disqualification of all bids in which he is a party. However, this does not limit the participation of an entity as a sub-contractor in more than one bid if he is not bidding independently in his own name or as a member of a JV.

The Bidder declares that they have read and understood the above aspects, and the bidder confirms that such conflict of interest does not exist and undertakes that they will not enter into any illegal or undisclosed agreement or understanding, whether formal or informal with other Bidder{s), in this regard. 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, the same will be considered as a violation of the tender conditions, and suitab1e action shall be taken by BHEL as per extant policies/ guidelines.**

Signature

RATE CONTRACT

TECHNICAL SPECIFICATION FOR

220V DC BATTERY CHARGER

BHEL DOCUMENT NO. : PE-TS-999-508-E002
ISSUE NO. : 01
REVISION NO. : 0

BHARAT HEAVY ELECTRICALS LIMITED
POWER SECTOR
PROJECT ENGINEERING MANAGEMENT
NOIDA-201301, UTTAR PRADESH, INDIA

CONTENTS

COMPLIANCE CERTIFICATE

The bidder shall confirm compliance to the following by signing/ stamping this compliance certificate and furnishing same with the offer.

1. The scope of supply, technical details, construction features, design parameters etc. shall be as per technical specification & there are no exclusion/ deviation with regard to same.

2. There are no deviation with respect to specification.

3. Only those technical submittals which are specifically asked for in NIT to be submitted at tender stage shall be considered as part of offer. Any other submission, even if made, shall not be considered as part of offer.

4. Any comments/ clarifications on technical/ inspection requirements furnished as part of bidder's covering letter shall not be considered by BHEL, and bidder's offer shall be construed to be in conformance with the specification.

5. Any changes made by the bidder in the price schedule with respect to the description/ quantities from those given in BOQ-Cum-Price schedule enclosed with NIT shall not be considered (i.e., technical description & quantities as per specification shall prevail).

BIDDER'S STAMP & SIGNATURE

SECTION –I

SPECIFIC TECHNICAL REQUIREMENTS

1.0 SCOPE OF ENQUIRY

1.1 Design, Manufacture, Inspection and Testing at Manufacturer's works, proper packing, delivery to site and Supervision of E&C of **220V DC BATTERY CHARGER** conforming to this specification.

1.2 General technical requirements of the **220V DC BATTERY CHARGER** are indicated in Section-II. Project specific technical/ quality requirements / changes are listed in Section-I & Data Sheet - A.

1.3 The stipulations of Section-I, followed by those of Data Sheet-A shall prevail in case of any conflict between the stipulations of Section-I, Data Sheet - A & Section-II.

1.4 The documents shall be in English Language and MKS system of units.

2.0 BILL OF QUANTITIES:

2.1 Quantity requirements shall be as per 'BOQ-cum-price schedule' as part of NIT.

3.0 SPECIFIC TECHNICAL REQUIREMENTS

3.1 Technical /Quality/ Inspection:

S. No.	*Reference clause No. of Section II (if any)*	*Specific Requirement/ Change*
1	Section II clause 5.11	Additionally, Margin of 10% in contactor rating selection to be considered.
2	Section II clause 10.9	All routine & acceptance test to be performed as per QAP NO 0000-999-QOE-S-005.Charges for carrying out these routine & acceptance tests are deemed to be included in the charger price.

4.0 TYPE TEST

4.1 Successful bidder shall submit the reports of all the type tests as listed in this specification and carried out within last 7 years from the date as 03.03.2023

All equipment to be supplied shall be of type tested design. During detail engineering, the contractor shall submit for Owner's approval the reports of all the type tests as listed in this specification and carried out within last 7 years from the date of bid opening (03.03.2023). These reports should be for the test conducted on the equipment similar to those proposed to be supplied under this contract and the test(s) should have been either conducted at an independent laboratory or should have been witnessed by a client.
However, if the contractor is not able to submit report of the type test(s) conducted within last 7 years from the date of bid opening, or in the case of type test report(s) are not found to be meeting the specification requirements, the contractor shall conduct all such tests under this contract at no additional cost to the owner either at third party lab or in presence of client/owner's representative and submit the reports for approval.

All acceptance and routine tests as per the specification and relevant standards shall be carried out. Charges for these shall be deemed to be included in the equipment price.

4.2 The type test reports once approved for any projects shall be treated as reference. For subsequent projects of NTPC, an endorsement sheet will be furnished by the manufacturer confirming similarity and “No design change”.
Minor changes if any shall be highlighted on the endorsement sheet.

4.3 Type test conduction required: Dynamic response test and Temperature rise test at full load shall be carried out on each charger before dispatch at manufacturer’s works.

4.4 Supplier to also give the following undertaking in the BOM:
"The BoM provided herewith completes the scope (in content and intent) of material supply under PO No. ----------, dated ------. Any additional material which may become necessary for the intended application of the supplied item(s)/package will be supplied free of cost in most reasonable time."

5.0 DRAWINGS & DOCUMENTS SUBMISSION SCHEDULE:

DRAWINGS & DOCUMENTS TO BE SUBMITTED BY ALL THE BIDDERS ALONG WITH THE BID		
Sl. No.		**DOCUMENT TITLE**
1		PQR CREDENTIALS
2		Signed & Stamped "COMPLIANCE SHEET"

DRAWINGS & DOCUMENTS TO BE SUBMITTED BY SUCCESSFUL BIDDER AFTER AWARD OF PROJECT SPECIFIC PURCHASE ORDER ALONG WITH SUBMISSION SCHEDULE

Sl. No.	*BHEL Drawing No.*	*NTPC Drawing No.*	*Drawing Title*	*Vendor Sub (Days)**	*BHEL comment (Days)*	*Vendor Sub (Days)#*	*BHEL and Customer comment/approval (Days)*
Primary Documents							
1	PE-V0-XXX-508-E002		GA OF BATTERY CHARGER	21	9	7	18
2	PE-V0-XXX-508-E003		CIRCUIT DIAGRAM AND GA OF BATTERY DISCHARGE PANEL	21	9	7	18
3	PE-V0-XXX-508-E004		CIRCUIT DIAGRAM AND GA OF BATTERY FUSE BOX	21	9	7	18
4	PE-V0-XXX-508-E005		BOM WITH MAKE OF COMPONENTS FOR BATTERY CHARGER	21	9	7	18
5	IS-4-QP-765-100-E233		QAP OF BATTERY CHARGER	21	9	7	18
6	PE-V0-XXX-508-E011		INTERNAL LAYOUT DRAWING FOR BATTERY CHARGER AND COMPONENT SIZING (TRANSFORMER, RECTIFIER, THYRISTOR, FILTER AND FUSE FOR BATTERY CHARGER)	21	9	7	18
7	PE-V0-XXX-508-E012		SCHEMATIC/ POWER CIRCUIT DIAGRAM FOR BATTERY CHARGER	21	9	7	18
Secondary Documents							
1	IS-4-TT-765-100-E192		TYPE TEST REPORT OF BATTERY CHARGER	21	9	7	18
2	PE-V0-XXX-508-E018		TYPE TEST CERTIFICATES FOR BATTERY CHARGER	21	9	7	18
3	PE-V0-XXX-508-E020		LIST OF E & C SPARES FOR BATTERY CHARGER	21	9	7	18
4	PE-V0-XXX-508-E006		FQP OF BATTERY CHARGER	21	9	7	18
5	PE-V0-XXX-508-E019		OPERATIONAL WRITE UP FOR BATTERY CHARGER	21	9	7	18
6	PE-V0-XXX-508-E007		O&M MANUAL FOR BATTERY CHARGER	within 30 days of issuance of MDCC			

NOTES:

a) * 1st submission within indicated days from date of **Project Specific purchase order**.

b) # Submission (within indicated days) after incorporating all BHEL comments

c) $$ Primary document for delivery of Mandatory Spares only and not to be linked with Charger & other supply items.

d) Primary documents shall be considered for Delay analysis from the **Project Specific Purcahse Order** and secondary documents shall be for engineering completion purpose.

DRAWINGS & DOCUMENTS TO BE SUBMITTED AS FINAL/AS-BUILT DOCUMENT		
Sl. No.		**DOCUMENT TITLE**
1		APPROVED DOCUMENTS
2		O&M MANUAL
3		ALL TEST CERTIFICATES

BATTERY CHARGER

1.00.00 CODES AND STANDARDS

ANSI-C 37.90a	Guide for surge withstand capability tests
IS:5	Colours for ready mix paints.
IS : 694	PVC Insulated Cable for working voltages upto and including 1100 V.
IS : 1248	Specification for Direct acting indicating analogue electrical measuring instruments.
IS:13947 Part-1	Degree of protection provided by enclosures for low voltage switch gear and control gear.
IS : 13947	Specification for low voltage switch gear and control gear
IS : 3231	Electrical relays for power system protection.
IS : 3842	Application guide for Electrical relays for AC System
IS : 3895	Mono-crystalline semi-conductor Rectifier Cells and Stacks
IS : 4540	Mono crystalline semi-conductor Rectifier assemblies and equipment.
IS:6005	Code of practice for phosphating of Iron and Steel.
IS:6619	Safety Code for Semi-conductor Rectifier Equipment.
IS:11171/ IS:2026	Rectifier Transformer
IS:6875	Control switches (switching devices for control and auxiliary circuits including contactor relays) for voltages upto 1000 V AC or 1200 V DC.
IS : 9000	Basic environmental testing procedures for electronic and electrical items.
IS:13703	Low voltage fuses for voltages not exceeding 1000 V AC or 1500 V DC.

EEUA-45D	Performance requirements for electrical Alarm Annunciation System
	Indian Electricity Rules
	Indian Electricity Act.

2.00.00 **Technical Parameters**

1.	**Mode of Charging**	Float cum Boost Charger (Automatic and Manual Mode)
2.	**Charger Ambient Temp**	50 deg C
3.	**Voltage Rating**	220V/110V
4.	**Trickle Charging**	1.4-1.42V per cell(Ni-Cd) 2.25V per cell(Lead-Acid)
5.	**Boost Charging Mode**	1.53-1.7V per cell(Ni-Cd) 2.3-2.7 V per cell(Lead-Acid)
6.	**Automatic Voltage regulator (rickle Mode)**	± 1% at 415 ± 10% and 0-100% Load, Automatic Controlled feeback-Closed Loop
a.	**Load Limiter current setting Range(Trickle Mode)**	80%-100%
b.	**% Stabilization of the output DC voltage**	1% for ±10% input supply variation and 0-100% DC load
c.	**Voltage Range and Stabilizing time for momentary load changes from 20%-100% and Vice versa**	+/- 6 % and less than 2 secs
d.	**Stabilizing time**	Less than 15 secs
7.	**Current setting range in Boost Charging Mode**	50-100% of rated output current
8.	**Voltage limit setting range in Boost Charging Mode**	Boost charging limit
9.	**Rectifier Type**	Full wave bridge Type
10.	**Ripple Content**	1% Peak-Peak at 0-100% of DC Load
11.	**Rectifier Transformer**	Dry and Air Cooled(AN) type Class-F Insulation with temp rise limited to Class-B at 50deg C Ambient
12.	**Charger Enclosure**	IP42

3.00.00 **EQUIPMENT DESCRIPTION**

(a.) The Battery Chargers as well as their automatic regulators shall be of static type. Battery chargers shall be capable of continuous operation at the respective rated load in Trickle mode i.e. Trickle charging the associated DC lead-acid Batteries while supplying the D.C. loads.

(b.) All Battery Chargers shall have provision to receive two input supplies along with suitable automatic changeover between the sources. Battery Chargers shall have a selector switch for selecting the battery charging mode i.e. Trickle or Boost charging and automatic/manual mode.

(c.) The chargers shall be capable of limiting the voltage or current in case DC load current exceeds the load limiter setting of the Charger. The load limiter characteristic shall be such that any sustained overload or short circuit in DC system shall neither damage the Charger nor shall it cause blowing of any of the charger fuses. The DC System shall be ungrounded and float with respect to the ground potential when healthy. An earth fault relay shall be provided by the Employer in the DC distribution board for remote annunciation.

(d.) Digital indicating instruments with built in communication port for remote data transfer shall be provided for all chargers. Ammeters & voltmeters shall have 4-20mA analog output for current and voltage respectively.

(e.) Blocking diode shall be provided in the output circuit of each Charger to prevent current flow from the D.C. Battery into the Charger.

(f.) Digital Outputs shall be configured for connection to the DC health monitoring system for real-time charger status updation.

(h.) Live busbars, parts etc shall not be accessible while the charger is in energized condition. Suitable safety interlocks to be ensured.

3.1.00 Rectifier Assembly

The rectifier cells shall be provided with their own heat dissipation arrangement along with forced air cooling for above 400A rating chargers and fan shall be temperature controlled with 100% standby redundancy. The rectifier shall utilize diodes/thyristors and heat sinks rated to carry 200% of the load current continuously and the temperature of the heat sink

shall not be permitted to exceed 85°C absolute duly considering the maximum charger panel inside temperature.

3.2.00 Annunciation System

Visual indications through indicating lamps/LEDs or annunciation fascia shall be provided in all Chargers for A.C. supply failure, Rectifier fuse failure, Surge circuit fuse failure, Filter fuse failure, Load limiter operated, Charger trip, Battery on Boost .

Potential free NO contacts of all above these conditions signals shall be provided for following remote alarms in the Employer's Unit Control Board:

(a) Battery on Boost

(b) Charger trouble (this being a group alarm initiated by any of the faults other than 'Battery on Boost')

2.00.00 TESTS

For conductance/report submission/validity of type tests, refer Sub Section-IIB, Section-VI, Part A of technical specifications.

2.01.01 LIST OF TYPE TESTS

1. The contractor shall furnish the following type tests reports for each rating of the equipment to be supplied under this contract.

a)	Complete physical examination
b)	Temperature rise test at full load. (For chargers of up to 400A rating, Temperature rise test report for rectifier assembly at 200% of full load shall also be submitted.)
c)	Insulation resistance test.
d)	High voltage (power frequency) test on power and control circuits except low voltage electronic circuits.
e) Automatic voltage regulator operation test at specified A.C. supply variations at no load, half load and full load.	
f)	Load limiter operation test
g)	Efficiency and power factor measurement.

h) Surge withstand capability test at the following points of the Charger:

i) Across each A.C. input phase

ii) Across AC input line to ground.

iii) Across D.C. output terminals.

iv) Across each D.C. output terminal to ground

The Charger shall not exhibit any component damage and there shall be no change in performance as per (g) and (h).

i) Environmental Tests

Steady state performance tests (f) and (g) shall be carried out before and after each of the following tests.

i) Soak Test

ii) Degree of protection test.

2. Dynamic response test and Temperature rise test at full load shall be carried out on each charger before dispatch at manufacturer's works.

3.00.00 COMMISSIONING TESTS

3.01.01 Bidder shall submit commissioning test procedure including details of all commissioning checks before commissioning the system at site.

DATASHEET-A

Sr. No.	PARAMETER	UNIT	VALUE
1.0	**Power Supply & fault level details**		
1.1	Rated AC voltage & variation	V, %	415 V, 3Ph, 3 Wire Systems, (-) 10% to (+) 10%
1.2	Frequency & variation	Hz, %	50 Hz, +3% to -5%
1.3	Rated DC voltage & variation	V, %	220 V, 187 V to 242V
1.4	Fault current of 415V system	kA	50 kA for 1 sec.
1.5	Fault current of DC system limited up to (max)	kA	The Charger shall be designed to restrict maximum fault level on DCDB limited to 25kA for 1 Sec.
1.6	Type/ Capacity of battery (min.)	AH	Lead acid battery: (i) Main plant: ***3640 AH*** (ii) Offsite Plant: ***150 AH*** (iii) CHP-AHP: ***225AH*** or Ni-Cd battery: (i) Main plant: ***1680 AH*** (ii) Offsite Plant: ***90 AH*** (iii) CHP-AHP: ***150 AH***
	Charger current rating		
2.1	Float-cum-boost charger	A	(i) Main plant: **550 A** (ii) Offsite Plant: ***50 A*** (iii) CHP-AHP: ***80 A***
3.0	**Ripple content of charger**		
3.1	Peak to peak	%	± 1%
4.0	**Degree of Protection (DOP)**		
4.1	Rectifier transformer cubicle		IP-42
4.2	Control cubicle		IP-42
4.3	Discharge Resistor		IP-20 (Minimum)
4.4	Battery Fuse Box		IP-42
5.0	**Constructional features**		
5.1	Panel sheet thickness/ material	mm	1.6 mm Cold rolled sheet steel for

			panel fabrication with folded type construction and 2.0mm Cold rolled sheet steel for panel frame.
5.2	Paint shade		Treatment as per IS 6005. a) RAL 9002: Front and rear- Two coats of lead oxide primer followed by powder painting. b) RAL 5012: end cover- Two coats of lead oxide primer followed by powder painting.
5.3	Cable gland plate thickness/ material	mm	3 mm / Sheet steel
5.4	Gasket thickness/ material	mm	3 mm / Rubber
5.5	**CABLE SIZES** a) Cable size from Battery TB to Fuse Box b) Cable size from Fuse Box to DCDB c) Cable size from Charger to DCDB d) Cable Size for FCB Charger AC Incomer		Actual cable size and number of runs shall be informed during detailed engineering.
6.0	**Type Tests**		
6.1	Type tests to be conducted for this contract, despite availability of valid & acceptable test certificates	Yes/ No	Refer section -I , Clause 4. Dynamic response test and Temperature rise test at full load shall be carried out on each charger before dispatch at manufacturer's works. **Heat Run test for 8 hours** : At rated voltage & current at input and output of charger. Necessary input power source of required capacity as per charger rating along with DC load bank shall be arranged by vendor during inspection / testing at works.
7.0	**EARTHING**		
7.1	Grounding terminal size/ no. for each charger		65X8 MM./ 2 nos.
7.2	Grounding terminal size/ no. for each fuse box		65X8 MM./ 2 nos.
7.3	Grounding terminal size/ no. for each discharge resistor		65X8 MM./ 2 nos.

8.0	**Mandatory Spares**		
8.1	Mandatory Spares to be quoted for this contract	Yes/ No	Yes
8.2	If yes, list of mandatory spares		Refer BOQ
9.0	**E & C Spares**		
9.1	E & C Spares to be quoted for this contract	Yes/ No	Yes
9.2	If yes, list of E & C Spares		As per NIT (BOQ cum Price Schedule)
10.0	**Special tools & tackles**		
10.1	Special tools & tackles to be quoted for this contract	Yes/ No	No
10.2	If yes, list of Special tools & tackles		
11.0	**Battery Fuse Box**	Fuses for both Positive and Negative Pole shall be provided. Also, Construction shall be same as Charger Panel. Battery Fuse Box shall be wall-mounted type. Minimum rating of Battery Fuse Box shall be as indicated in the BOQ cum price schedule. * Refer note -3	
12.0	**Discharge Resistor Panel**	a) **Main Plant**: Portable type **550A** battery discharge resistor panels shall be supplied with shunt to be used in parallel for load test for 1680AH NI-CD battery suitable for 5 hrs discharge rate or 3640AH Lead acid battery suitable for 10 hrs discharge rate. b) **Offsite** :Portable type **50A** discharge resistor with shunt suitable for 5hrs discharge rate for 90 AH ni-cd battery / 150 AH lead acid battery c) **CHP AHP**: Portable type **80A** discharge resistor with shunt suitable for 5hrs discharge rate for 150 AH ni-cd battery / 225 AH lead acid battery. d) Discharge resistor should also be suitable for conducting dynamic response test of supplied charger at full load at site. e) Cooling of discharge resistor shall be natural/ forced air cooled. DOP for load bank, shall be at least IP 20.	

		f) Construction shall be same as Charger panel. Handle and wheel arrangement shall be provided for easy movement. g) Control - Using rotary switches for step control of current against falling voltage with ON-OFF facility. h) Tapping shall be decided based upon Type of battery & rating defined above. * Refer note -3 & 4
13.0	**Portable cell booster**	(i) For charging upto 5 cells for 840 AH Ni-Cd battery or 3 cells of 1800AH lead acid battery (ii) For charging upto 5 cells for 90 AH Ni-Cd battery or 3 cells of 150AH lead acid battery Portable cell booster shall be supplied with all accessories like input & output cables, ammeter, etc. *Refer Note 4

Notes:

1) BHEL will provide 3 PH-3 wire power Supply. Further distribution for single Phase shall be created by Bidder.

2) All tests as per QP No.: 0000-999-QOE-S-005 to be carried out.

3) Actual rating of Battery fuse box shall be selected by the bidder based on load duty cycle (Annexure-I).
4) Actual battery type and size for applicable project shall be informed during detail engineering.

DATASHEET-C

Sr. No.	PARAMETER	UNIT	VALUE
1.0	Manufacturer's Name		
2.0	Design ambient temperature		
3.0	Charger Rating & Type		
4.0	Charger rated output current:		
4.1	Trickle charging mode		
4.2	Boost charging mode		
5.0	Load limiter current setting range (Trickle mode)		
6.0	Automatic voltage regulator (Trickle mode)		
6.1	Type		
6.2	% Stabilization of the output DC voltage		
6.3	Voltage setting range		
6.4	Walk in time of Automatic Voltage Regulator		
6.5	Time taken to stabilize voltage for under shoot & overshoot		
7.0	Manual voltage regulator (Trickle mode)		
7.1	Type		
7.2	Voltage setting range		
8.0	Boost charging		
8.1	Current setting range		
8.2	Voltage limit setting range		
9.0	Rectifier assembly		
9.1	Type of semi-conductor material		
9.2	Rated direct current per cell (Average)		
9.3	SCR Rating Selected		
9.4	Heat sink for SCR		
9.5	Rated direct voltage		
9.6	Rated input voltage		
9.7	Type of connections of rectifier element		
9.8	Standard applicable		
9.9	Ripple content		

DATASHEET-C

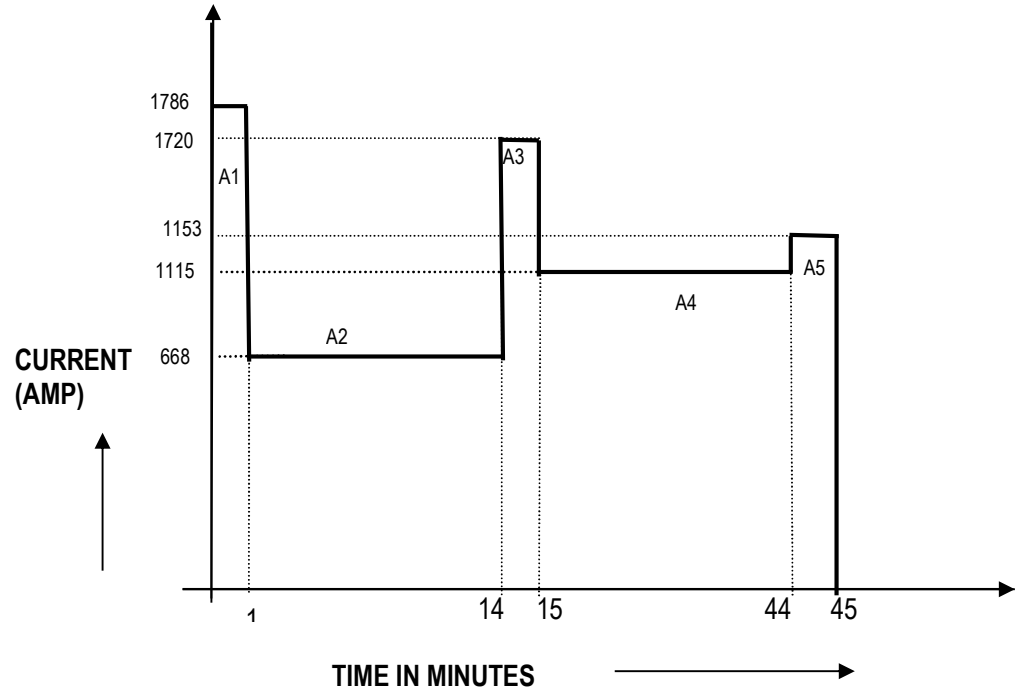
Sr. No.	PARAMETER	UNIT	VALUE
10.0	Rectifier transformer		
10.1	Type		
10.2	Rated KVA & % impedance		
10.3	Input line winding connection in vector representation		
10.4	Cell winding connection in vector representation		
10.5	1 min. power frequency withstand voltage (kV)		
10.6	Standard applicable		
11.0	Charger full load Efficiency at nominal input & output voltage & current		
12.0	Power factor at nominal input & output voltage & current		
13.0	Instrument		
13.1	Manufacturer		
13.2	Type		
13.3	AC voltmeter range		
13.4	DC voltmeter range		
13.5	DC Ammeter range		
13.6	Dial size		
13.7	Accuracy class as per IS		
14.0	Contactor		
14.1	Manufacturer		
14.2	Type		
14.3	Rated voltage		
14.4	Rated current		
14.5	No. of power contact		
14.6	No. type and rating of Aux. Contacts		
14.7	Operating coil voltage		
14.8	Drop-out voltage		
15.0	Thermal over load relay		
15.1	Manufacturer		

DATASHEET-C

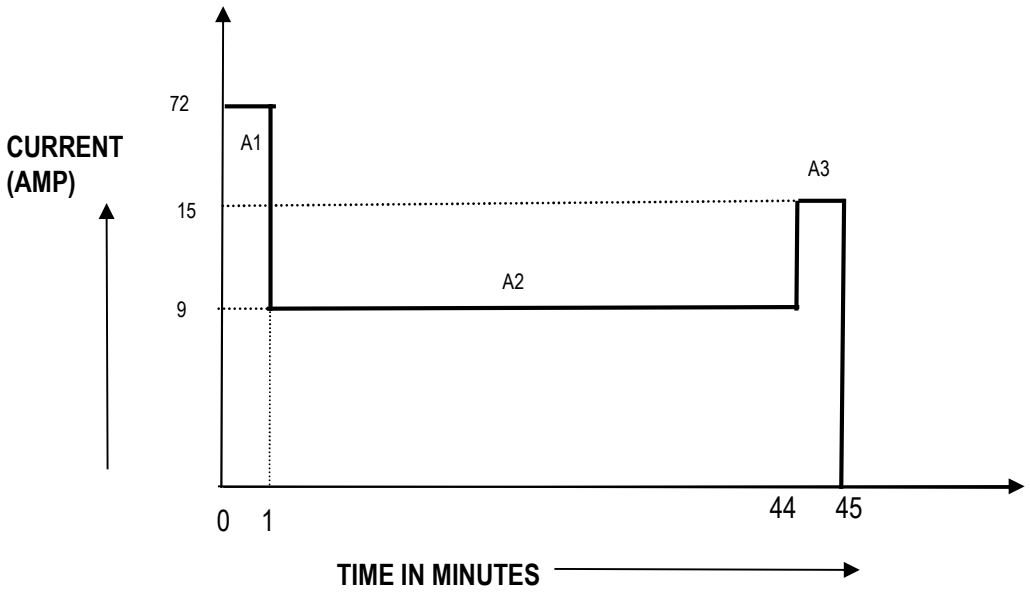
Sr. No.	PARAMETER	UNIT	VALUE
15.2	Tripping current range		
15.3	Whether single phasing protection provided		
15.4	Standard applicable		
16.0	Air - break switches (both DC & AC side)		
16.1	Manufacturer		
16.2	Type		
16.3	Rated voltage		
16.4	Rated current		
16.5	Type & material of contacts		
16.6	Standard applicable		
17.0	Output fuse		
17.1	Manufacturer		
17.2	Type		
17.3	Rupturing capacity (both AC & DC)		
17.4	Standard applicable		
18.0	Painting		
18.1	Paint shade		
18.2	Painting process		
19.0	Degree of Protection (DOP)		
19.1	Rectifier transformer cubicle		
19.2	Control cubicle		
20.0	Earthing busbar size & material		
21.0	Charger dimension: (approx.) [L x W x H]		
22.0	Sheet thickness (mm) / material		
23.0	Cable gland plate thickness		
24.0	Gasket material		
25.0	Charger weight (Kg.)		

ANNEXURE-I

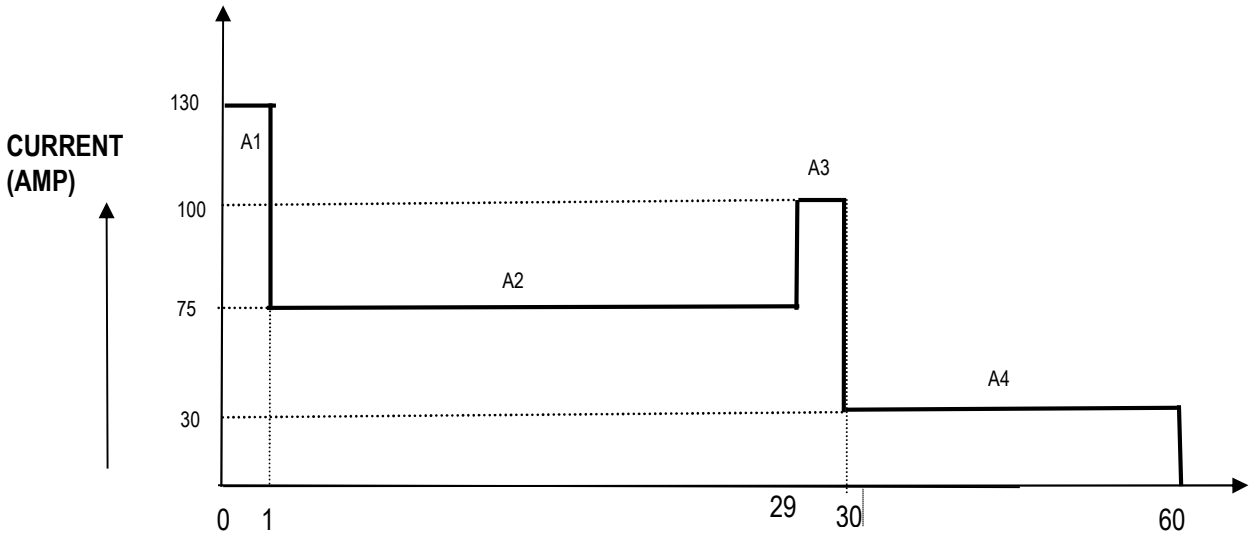
10.1 220V DC SYSTEM LOAD DUTY CYCLE (MAIN PLANT)



1. LOAD DUTY CYCLE OF OFFSITE AREA

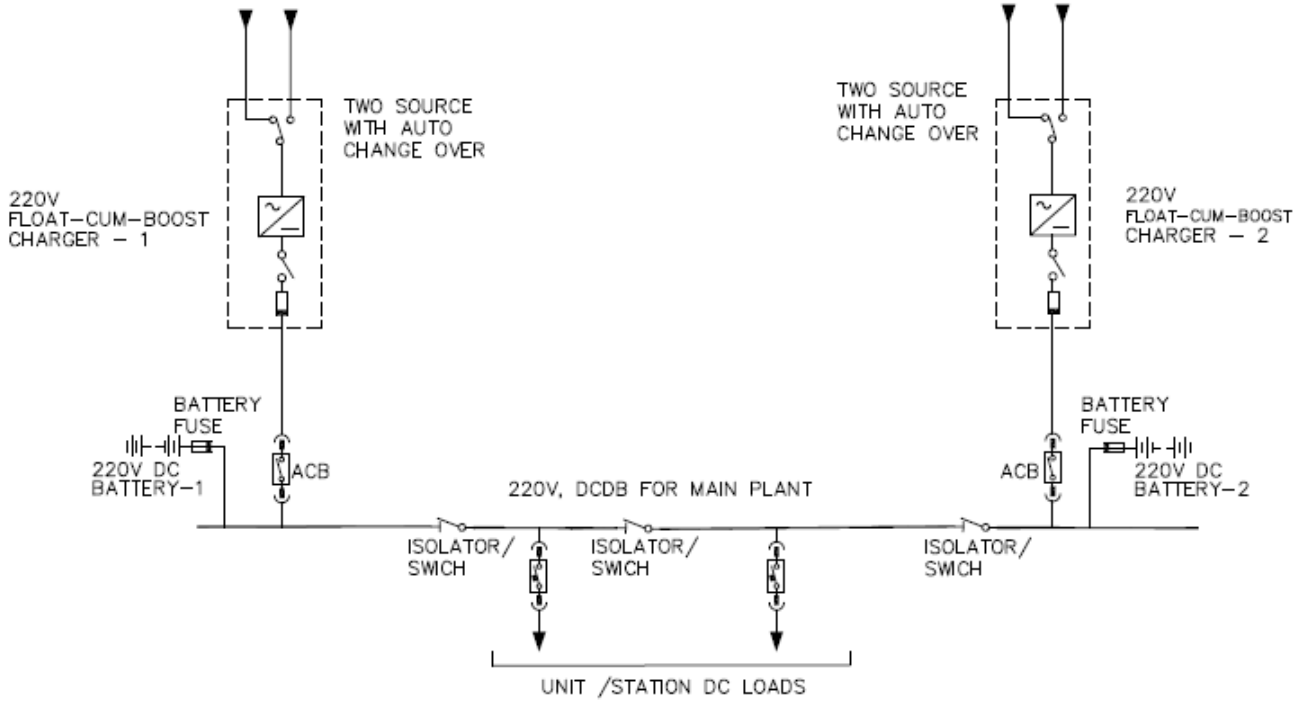


1. LOAD DUTY CYCLE FOR CHP-AHP AREA



ANNEXURE-II

SINGE LINE DIAGRAM FOR 220V DC SYSTEM



ANNEXURE-III (SUB VENDOR LIST)

ITEM CODE	ITEM/SERVICE DESCRIPTION	SL NO.	VENDOR CODE	VENDOR NAME	ADDRESS	PHONE	REMARKS
ES1	AC CONTACTORS	1	S01	SIEMENS	RC-IN I S NR DEL AREA, JIL BUILDING, TOWER-B, PLOT NO. 78, SECTOR 18, GURGAON-122015, INDIA	0124-2842000, 9873424331 amit.bhadauria@siemens.com	
	AC CONTACTORS	2	A35	GE-POWER	KAMAK TOWER, 3RD FLOOR, PLOT NO. 12-A, TVK INDUSTRIAL ESTATE, EKKADUTHANGAL, GUINDY, CHENNAI-600032	044-49681447	
	AC CONTACTORS	3	E1144	TELEMECHANIQUE/ SCHNEIDER ELECTRIC INDIA PVT. LTD.	9TH FLOOR, BLDG. NO. 10, TOWER-C, DLF CYBER CITY, PH-II, GURGAON-122002	0124-3940400	TAKEN OVER BY SCHNEIDER
	AC CONTACTORS	4	L01	LK (Formerly L&T)	Lauritz Knudsen Electrical & Automation A/600, SHIL – Mahape Road, TTC Industrial Area, MIDC Thane, Mumbai, Maharashtra 400710	Pranjal Tyagi, Pranjal.Tyagi@lk-ea.com, Mobile - 8976907537, Telephone: +91 22 69327800	
	AC CONTACTORS	5	B04	BCH	20/4, MATHURA ROAD, FARIDABAD, HARYANA-121006	0129-4293000	
ES2	AC LOAD BREAK SWITCH	1	A35	GE-POWER	KAMAK TOWER, 3RD FLOOR, PLOT NO. 12-A, TVK INDUSTRIAL ESTATE, EKKADUTHANGAL, GUINDY, CHENNAI-600032	044-49681447	
	AC LOAD BREAK SWITCH	2	L01	LK (Formerly L&T)	Lauritz Knudsen Electrical & Automation A/600, SHIL – Mahape Road, TTC Industrial Area, MIDC Thane, Mumbai, Maharashtra 400710	Pranjal Tyagi, Pranjal.Tyagi@lk-ea.com, Mobile - 8976907537, Telephone: +91 22 69327800	
	AC LOAD BREAK SWITCH	3	S01	SIEMENS	RC-IN I S NR DEL AREA, JIL BUILDING, TOWER-B, PLOT NO. 78, SECTOR 18, GURGAON-122015, INDIA	0124-2842000, 9873424331 amit.bhadauria@siemens.com	
	AC LOAD BREAK SWITCH	4	E1076	KAYCEE	KAYCEE INDUSTRIES LTD., C/O-CMS COMPUTERS LTD., 35A, REAR BLDG., KILOKARI, NEW DELH1-110014	Rajiv Sharma-9312004687	
	AC LOAD BREAK SWITCH	5	C01	C&S ELECTRIC LTD.	222, OKHLA IND. ESTATE, PH-III, NEW DELHI-110020	011-3088 7520-29	
	AC MCCB	1	C01	C&S ELECTRIC LTD.	222, OKHLA IND. ESTATE, PH-III, NEW DELHI-110020	011-3088 7520-29	
	AC MCCB	2	S03	SCHNEIDER ELECTRIC INDIA PVT. LTD.	9TH FLOOR, BLDG. NO. 10, TOWER-C, DLF CYBER CITY, PH-II, GURGAON-122002	0124-3940400	
	AC MCCB	3	S01	SIEMENS	RC-IN I S NR DEL AREA, JIL BUILDING, TOWER-B, PLOT NO. 78, SECTOR 18, GURGAON-122015, INDIA	0124-2842000, 9873424331 amit.bhadauria@siemens.com	

ITEM CODE	ITEM/SERVICE DESCRIPTION	SL NO.	VENDOR CODE	VENDOR NAME	ADDRESS	PHONE	REMARKS
ES3	AC MCCB	4	A35	GE-POWER	KAMAK TOWER, 3RD FLOOR, PLOT NO. 12-A, TVK INDUSTRIAL ESTATE, EKKADUTHANGAL, GUINDY, CHENNAI-600032	044-49681447	
	AC MCCB	5	L01	LK (Formerly L&T)	Lauritz Knudsen Electrical & Automation A/600, SHIL – Mahape Road, TTC Industrial Area, MIDC Thane, Mumbai, Maharashtra 400710	Pranjal Tyagi, Pranjal.Tyagi@lk-ea.com, Mobile - 8976907537, Telephone: +91 22 69327800	
	AC MCCB	6	C02	CROMPTON GREAVES	RAIL TRANSPORTATION SYSTEMS,VANDANA BUILDING, 11, TOLSTOY MARG, TOLSTOY MARG, NEW DELHI, DL 110001	011 3041 6300	
ES6	AIR CIRCUIT BREAKER	1	L01	LK (Formerly L&T)	Lauritz Knudsen Electrical & Automation A/600, SHIL – Mahape Road, TTC Industrial Area, MIDC Thane, Mumbai, Maharashtra 400710	Pranjal Tyagi, Pranjal.Tyagi@lk-ea.com, Mobile - 8976907537, Telephone: +91 22 69327800	
	AIR CIRCUIT BREAKER	2	S01	SIEMENS	RC-IN I S NR DEL AREA, JIL BUILDING, TOWER-B, PLOT NO. 78, SECTOR 18, GURGAON-122015,	0124-2842000, 9873424331 amit.bhadauria@siemens.com	
	AIR CIRCUIT BREAKER	3	A35	GE-POWER	KAMAK TOWER, 3RD FLOOR, PLOT NO. 12-A, TVK INDUSTRIAL ESTATE, EKKADUTHANGAL, GUINDY, CHENNAI-600032	044-49681447	
	AIR CIRCUIT BREAKER	4	S03	SCHNEIDER ELECTRIC INDIA PVT. LTD.	9TH FLOOR, BLDG. NO. 10, TOWER-C, DLF CYBER CITY, PH-II, GURGAON-122002	0124-3940400	
	AIR CIRCUIT BREAKER	5	C01	C&S ELECTRIC LTD.	222, OKHLA IND. ESTATE, PH-III, NEW DELHI-110020	011-3088 7520-29	
ES7	AUXILIARY RELAYS	1	A24	ABB	14, MATHURA ROAD, FARIDABAD, HARYANA-121003	0129-2567580, 09871799449	
	AUXILIARY RELAYS	2	G01	ALSTOM LTD	A-7, SEC-65, NOIDA	0120-479 0000	
	AUXILIARY RELAYS	3	E1075	JYOTI LTD.	JYOTI LIMITED, E&CS DIVISION,3/15, BIDC, GORWA,VADODARA - 390 016, E-MAIL ID: ECS@JYOTI.COM	Ph. No.:+91-265-2281214 , Fax No.:+91-265-2281214	
	AUXILIARY RELAYS	4	E1099	OEN INDIA LTD	29/1479, VYTILLA, COCHIN - 682 019 KERALA, INDIA	Phone : +91 484 2301132, 2303709 Fax : +91 484 2302287, 2302221 sales@oenindia.com	
	AUXILIARY RELAYS	5	S01	SIEMENS	RC-IN I S NR DEL AREA, JIL BUILDING, TOWER-B, PLOT NO. 78, SECTOR 18, GURGAON-122015, INDIA	0124-2842000, 9873424331 amit.bhadauria@siemens.com	
	BIMETAL RELAYS	1	L01	LK (Formerly L&T)	Lauritz Knudsen Electrical & Automation A/600, SHIL – Mahape Road, TTC Industrial Area, MIDC Thane, Mumbai, Maharashtra 400710	Pranjal Tyagi, Pranjal.Tyagi@lk-ea.com, Mobile - 8976907537, Telephone: +91 22 69327800	

ITEM CODE	ITEM/SERVICE DESCRIPTION	SL NO.	VENDOR CODE	VENDOR NAME	ADDRESS	PHONE	REMARKS
ES8	BIMETAL RELAYS	2	A35	GE-POWER	KAMAK TOWER, 3RD FLOOR, PLOT NO. 12-A, TVK INDUSTRIAL ESTATE, EKKADUTHANGAL, GUINDY, CHENNAI-600032	044-49681447	
	BIMETAL RELAYS	3	S01	SIEMENS	RC-IN I S NR DEL AREA, JIL BUILDING, TOWER-B, PLOT NO. 78, SECTOR 18, GURGAON-122015, INDIA	0124-2842000, 9873424331 amit.bhadauria@siemens.com	
	BIMETAL RELAYS	4	E1144	TELEMECHANIQUE/ SCHNEIDER ELECTRIC INDIA PVT. LTD.	9TH FLOOR, BLDG. NO. 10, TOWER-C, DLF CYBER CITY, PH-II, GURGAON-122002	0124-3940400	TAKEN OVER BY SCHNEIDER
ES11	CABLE GLANDS	1	E1201	ALLIED TRADERS & EXPORTERS	C-124 A, SECTOR-2, NOIDA -201 301, UTTAR PRADESH, INDIA	Mr. Vijay Mohan Sood +(91)-(120)-2525694 +(91)-(120)-3052594 +(91)-(11)-23287156 vijay_mohansood@yahoo.com	
	CABLE GLANDS	2	E1017	ARUP ENGG & FOUNDARY WORKS	391/119,PRINCE ANWAR SHAH ROAD, CALCUTTA-700068	033 2473 0850	
	CABLE GLANDS	3	E1206	BALIGA LIGHTING EQPT.PVT.LTD.	63A,CP RAMASWAMY ROAD, ALWARPET,P.B.No 6910, CHENNAI-600018	44-24995505,22680990-4	
	CABLE GLANDS	4	E1036	COMMET BRASS PRODUCTS	NUTAN CHEMICAL COMPOUND, WALBHAT ROAD, GOREGAON, MUMBAI-400063	91-022-26852961/62/63 comet@vsnl.net	
	CABLE GLANDS	5	DW08	DOWELLS	M/S. DOWELLS ELECTRICALS 47/47A, SATGURU INDUSTRIAL ESTATE. OFF AAREY ROAD, GOREGOAN (EAST). MUMBAI 400 063.	CEO : Mr. Jayantibhai S. Patel TEL: 022-32504770./022-29270876/ 022-29270878.	
	CABLE GLANDS	6	E1044	ELECTROMAC INDUSTRIES	27/28AF NEW EMPIRE IND.ESTT., R.KRISHNA MANDIR RD.JB NGR ,ANDHERI(E),MUMBAI-400059	91-22-28324829 / 66919034 devang@electromacglands.com	
	CABLE GLANDS	7	I01	INCAB	HARE STREET,KOLKATA,WEST BENGAL-700001	91-33-2480161/62/63/64 Fax : 91-33-2485766	
ES12	CABLE LUGS	1	E1040	DOWELLS	M/S. DOWELLS ELECTRICALS 47/47A, SATGURU INDUSTRIAL ESTATE. OFF AAREY ROAD, GOREGOAN (EAST).	CEO : Mr. Jayantibhai S. Patel TEL: 022-32504770./022-29270876/	
	CABLE LUGS	2	E1149	UNIVERSAL MACHINES LTD.	4,B.B.D.BAG (EAST) 90,STEPHEN HOUSE,5TH FLR CALCUTTA-700001	033 2282 2540	
	D.C. MCCB	1	C02	CROMPTON GREAVES	RAIL TRANSPORTATION SYSTEMS,VANDANA BUILDING, 11, TOLSTOY MARG, TOLSTOY MARG, NEW DELHI, DL 110001	011 3041 6300	

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ES13	D.C. MCCB	2	L01	LK (Formerly L&T)	Lauritz Knudsen Electrical & Automation A/600, SHIL – Mahape Road, TTC Industrial Area,	Pranjal Tyagi, Pranjal.Tyagi@lk-ea.com, Mobile - 8976907537,	
	D.C. MCCB	3	A35	GE-POWER	KAMAK TOWER, 3RD FLOOR, PLOT NO. 12-A, TVK INDUSTRIAL ESTATE, EKKADUTHANGAL,	044-49681447	
	D.C. MCCB	4	S01	SIEMENS	RC-IN I S NR DEL AREA, JIL BUILDING, TOWER-B, PLOT NO. 78, SECTOR 18, GURGAON-122015, INDIA	0124-2842000, 9873424331 amit.bhadauria@siemens.com	
ES14	EARTH LEAKAGE CB	1	L01	LK (Formerly L&T)	Lauritz Knudsen Electrical & Automation A/600, SHIL – Mahape Road, TTC Industrial Area, MIDC Thane, Mumbai, Maharashtra 400710	Pranjal Tyagi, Pranjal.Tyagi@lk-ea.com, Mobile - 8976907537, Telephone: +91 22 69327800	
	EARTH LEAKAGE CB	2	S01	SIEMENS	RC-IN I S NR DEL AREA, JIL BUILDING, TOWER-B, PLOT NO. 78, SECTOR 18, GURGAON-122015, INDIA	0124-2842000, 9873424331 amit.bhadauria@siemens.com	
	EARTH LEAKAGE CB	3	A35	GE-POWER	KAMAK TOWER, 3RD FLOOR, PLOT NO. 12-A, TVK INDUSTRIAL ESTATE, EKKADUTHANGAL, GUINDY, CHENNAI-600032	044-49681447	
	EARTH LEAKAGE CB	4	S03	SCHNEIDER ELECTRIC INDIA PVT. LTD.	9TH FLOOR, BLDG. NO. 10, TOWER-C, DLF CYBER CITY, PH-II, GURGAON-122002	0124-3940400	
	EARTH LEAKAGE CB	5	C01	C&S ELECTRIC LTD.	222, OKHLA IND. ESTATE, PH-III, NEW DELHI-110020	011-3088 7520-29	
	EARTH LEAKAGE CB	6	A24	ABB	14, MATHURA ROAD, FARIDABAD, HARYANA-121003	0129-2567580, 09871799449	
	EARTH LEAKAGE CB	7	E1068	INDO ASIAN	B-24, PHASE - II , NOIDA - 201305, U.P.	120-3042222	
	EARTH LEAKAGE CB	8	E1088	MDS SWITCHGEAR LTD	314-317SHAH NAHAR ESTATE	011 - 25793021	
	EARTH LEAKAGE CB	9	E1120	S&S POWER SWITCHGEAR LTD,	NEW NO. 67, OLD NO. 19, DR. RANGA ROAD, MYLAPORE, CHENNAI - 600004	044 - 24988056, 044 - 24988057, 044 - 24988058	
ES20	DC CONTACTORS	1	S03	SCHNEIDER ELECTRIC INDIA PVT. LTD.	9TH FLOOR, BLDG. NO. 10, TOWER-C, DLF CYBER CITY, PH-II, GURGAON-122002	0124-3940400	
	DC CONTACTORS	2	E1030	BHEL (BHOPAL)	HEAVY ELECTRICAL PLANT		
	DC CONTACTORS	3	E1044	ELECTROMAC INDUSTRIES	27/28AF NEW EMPIRE IND.ESTT., R.KRISHNA MANDIR RD.JB NGR ,ANDHERI(E),MUMBAI-400059	91-22-28324829 / 66919034 devang@electromacglands.com	
	DC CONTACTORS	4	L01	LK (Formerly L&T)	Lauritz Knudsen Electrical & Automation A/600, SHIL – Mahape Road, TTC Industrial Area, MIDC Thane, Mumbai, Maharashtra 400710	Pranjal Tyagi, Pranjal.Tyagi@lk-ea.com, Mobile - 8976907537, Telephone: +91 22 69327800	
	DC CONTACTORS	5	S01	SIEMENS	RC-IN I S NR DEL AREA, JIL BUILDING, TOWER-B, PLOT NO. 78, SECTOR 18, GURGAON-122015, INDIA	0124-2842000, 9873424331 amit.bhadauria@siemens.com	
	DC CONTACTORS	6	E1144	TELEMECHANIQUE/ SCHNEIDER ELECTRIC INDIA PVT. LTD.	9TH FLOOR, BLDG. NO. 10, TOWER-C, DLF CYBER CITY, PH-II, GURGAON-122002	0124-3940400	TAKEN OVER BY SCHNEIDER

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	DC CONTACTORS	7	A35	GE-POWER	KAMAK TOWER, 3RD FLOOR, PLOT NO. 12-A, TVK INDUSTRIAL ESTATE, EKKADUTHANGAL, GUINDY, CHENNAI-600032	044-49681447	
ES21	CONTROL SWITCHES/ SELECTOR SWITCH	1	E1076	KAYCEE	KAYCEE INDUSTRIES LTD., C/O-CMS COMPUTERS LTD., 35A, REAR BLDG., KILOKARI, NEW DELH1-110014	Rajiv Sharma-9312004687	
	CONTROL SWITCHES/ SELECTOR SWITCH	2	A35	GE-POWER	KAMAK TOWER, 3RD FLOOR, PLOT NO. 12-A, TVK INDUSTRIAL ESTATE, EKKADUTHANGAL, GUINDY, CHENNAI-600032	044-49681447	
	CONTROL SWITCHES/ SELECTOR SWITCH	3	G01	ALSTOM LTD	A-7, SEC-65, NOIDA	0120-479000	
	CONTROL SWITCHES/ SELECTOR SWITCH	4	S03	SCHNEIDER ELECTRIC INDIA PVT. LTD.	9TH FLOOR, BLDG. NO. 10, TOWER-C, DLF CYBER CITY, PH-II, GURGAON-122002	0124-3940400	
	CONTROL SWITCHES/ SELECTOR SWITCH	5	SRC01	M/s Shrenik & Co.	39A/3, PANCHRATNA INDUSTRIAL ESTATE, SARKHEJ-BAVLA ROAD, CHANGODAR,		
	CONTROL SWITCHES/ SELECTOR SWITCH	6	RE05	RECOM PVT. LTD.	M/S RECOM PVT. LTD.,16A , 2ND FLOOR A, WING RAJ INDUSTRIAL COMPLEX, MILITARY	Mr. Chandrashekar Kamath (MD) : 09820249503	
ES22	CONTROL TRANSFORMER/ WINDING HEATING TRANSFORMER	1	E1009	AUTOMATIC ELECTRIC LTD.	96 AB LONAVLA INDUSTRIAL ESTATE NANGARGAON, LONAVLA-410401	Phone : +91 2114323665 Fax : +91 2114273482	
	CONTROL TRANSFORMER/ WINDING HEATING TRANSFORMER	2	E1066	INDCOIL	PLOT NO. A- 150/ 151, 23RD U ROAD, WAGLE ESTATE, THANE WEST, CST RD, FRIENDS COLONY, HALLOW PUL, KURLA WEST, MUMBAI, MAHARASHTRA 400070	Phone:022 2583 8305	
	CONTROL TRANSFORMER/ WINDING HEATING TRANSFORMER	3	K18	KAPPA ELECTRICALS	KAPPA ELECTRICALS, KAPPA CONSOLIDATED PVT. LTD., 14, CART TRACK ROAD, MADUVANKARAI, CHENNAI - 600 042, INDIA.	PHONE: +91 - 44 - 22454709, 22454516, 22450794, 22450795 FAX: +91 - 44 - 22351662, 22451693 E-MAIL: mira@kappaelectricals.com sales@kappaelectricals.com	
	CONTROL TRANSFORMER/ WINDING HEATING TRANSFORMER	4	E1082	LOGICSTAT	B-160, INDUSTRIAL AREA, C BLOCK RD, OKHLA I, OKHLA INDUSTRIAL AREA, NEW DELHI, DL 110020	011 2681 0032	
	CONTROL TRANSFORMER/ WINDING HEATING TRANSFORMER	5	E1106	PRECISE ELECTRICALS	47A-49A,CHAKALA ROAD ANDHERI(E),MUMBAI-99 MUMBAI, MAHARASHTRA, INDIA PIN-400 099	022-8323402 / 022-8216433	

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	CONTROL TRANSFORMER/ WINDING HEATING TRANSFORMER	6	E1128	UNILEC ENGINEERS PVT. LTD.	PLOT NO: R-247, T.T.C. INDUSTRIAL AREA, M.I.D.C , RABALE, NAVI MUMBAI- 400 701 INDIA	+91-22- 27607787 / 27607927 +91-22- 27607997	
	CONTROL TRANSFORMER/ WINDING HEATING TRANSFORMER	7	NK09	M/s Newtek Electricals	M-90, M.I.D.C, Waluj, Aurangabad 431136, Maharashtra, India	Tel/Fax: +91 240 2551555 E-mail: mkt.north@newtekelectricals.com, sales@newtekelectricals.com Mr Sanjeev Aggarwal (9958897890)	FOR CONTROL TRANSFORMER ONLY
ES23	LT- CURRENT TRANSFORMER	1	S01	SIEMENS	RC-IN I S NR DEL AREA, JIL BUILDING, TOWER-B, PLOT NO. 78, SECTOR 18, GURGAON-122015, INDIA	0124-2842000, 9873424331 amit.bhadauria@siemens.com	
	LT- CURRENT TRANSFORMER	2	E1009	AUTOMATIC ELECTRIC LTD.	96 AB LONAVLA INDUSTRIAL ESTATE NANGARGAON, LONAVLA-410401	Phone : +91 2114323665 Fax : +91 2114273482	
	LT- CURRENT TRANSFORMER	3	E1066	INDCOIL	PLOT NO. A- 150/ 151, 23RD U ROAD, WAGLE ESTATE, THANE WEST, CST RD, FRIENDS COLONY, HALLOW PUL, KURLA WEST, MUMBAI, MAHARASHTRA 400070	Phone:022 2583 8305	
	LT- CURRENT TRANSFORMER	4	K18	KAPPA ELECTRICALS	KAPPA ELECTRICALS, KAPPA CONSOLIDATED PVT. LTD., SOUTHERN ELECTRIKS 14, CART TRACK ROAD, MADUVANKARAI, CHENNAI - 600 042, INDIA.	PHONE: +91 - 44 - 22454709, 22454516, 22450794, 22450795 FAX: +91 - 44 - 22351662, 22451693 E-MAIL: mira@kappaelectricals.com sales@kappaelectricals.com	
	LT- CURRENT TRANSFORMER	5	E1104	PRAGATI ELECTRICALS	280/3,II POKHRAN RD	5341779,5427041	
	LT- CURRENT TRANSFORMER	6	E1106	PRECISE ELECTRICALS	47A-49A,CHAKALA ROAD ANDHERI(E),MUMBAI-99 MUMBAI, MAHARASHTRA, INDIA PIN-400 099	022-8323402 / 022-8216433	
	LT- CURRENT TRANSFORMER	7	E1128	SILKAANS ELECT.MFG.CO.PVT.LTD	PLOT NO: R-247, T.T.C. INDUSTRIAL AREA, M.I.D.C , RABALE, NAVI MUMBAI- 400 701 INDIA	+91-22- 27607787 / 27607927 +91-22- 27607997	
	LT- CURRENT TRANSFORMER	8	E1111	PRAYOG ELECTRICALS PVT. LTD.	GROUND FLOOR, THAKORE INDUSTRIAL COMPUND, STATION ROAD, VIDYA VIHAR (W), NATHANI ROAD , OPP. AMIBIKA TEMPLE,MUMBAI Mumbai - 400086, Maharashtra, India	91-22-25164288/25133146 Mr. P. U. PATWARDHAN (MANAGING DIRECTOR)	
	LT- CURRENT TRANSFORMER	9	C01	C&S ELECTRIC LTD.	222, OKHLA IND. ESTATE, PH-III, NEW DELHI-110020	011-3088 7520-29	

ITEM CODE	ITEM/SERVICE DESCRIPTION	SL NO.	VENDOR CODE	VENDOR NAME	ADDRESS	PHONE	REMARKS
	LT- CURRENT TRANSFORMER	10	NK09	M/s Newtek Electricals	M-90, M.I.D.C, Waluj, Aurangabad 431136, Maharashtra, India	Tel/Fax: +91 240 2551555 E-mail: mkt.north@newtekelectricals.com, sales@newtekelectricals.com Mr Sanjeev Aggarwal (9958897890)	
ES24	LT- POTENTIAL TRANSFORMER	1	S01	SIEMENS	RC-IN I S NR DEL AREA, JIL BUILDING, TOWER-B, PLOT NO. 78, SECTOR 18, GURGAON-122015, INDIA	0124-2842000, 9873424331 amit.bhadauria@siemens.com	
	LT- POTENTIAL TRANSFORMER	2	E1009	AUTOMATIC ELECTRIC LTD.	96 AB LONAVLA INDUSTRIAL ESTATE NANGARGAON, LONAVLA-410401	Phone : +91 2114323665 Fax : +91 2114273482	
	LT- POTENTIAL TRANSFORMER	3	E1066	INDCOIL	PLOT NO. A- 150/ 151, 23RD U ROAD, WAGLE ESTATE, THANE WEST, CST RD, FRIENDS COLONY, HALLOW PUL, KURLA WEST, MUMBAI, MAHARASHTRA 400070	Phone:022 2583 8305	
	LT- POTENTIAL TRANSFORMER	4	K18	KAPPA ELECTRICALS	KAPPA ELECTRICALS, KAPPA CONSOLIDATED PVT. LTD., SOUTHERN ELECTRIKS 14, CART TRACK ROAD, MADUVANKARAI, CHENNAI - 600 042, INDIA.	PHONE: +91 - 44 - 22454709, 22454516, 22450794, 22450795 FAX: +91 - 44 - 22351662, 22451693 E-MAIL: mira@kappaelectricals.com sales@kappaelectricals.com	
	LT- POTENTIAL TRANSFORMER	5	E1104	PRAGATI ELECTRICALS	280/3,II POKHRAN RD	5341779,5427041	
	LT- POTENTIAL TRANSFORMER	6	E1106	PRECISE ELECTRICALS	47A-49A,CHAKALA ROAD ANDHERI(E),MUMBAI-99 MUMBAI, MAHARASHTRA, INDIA PIN-400 099	022-8323402 / 022-8216433	
	LT- POTENTIAL TRANSFORMER	7	E1128	SILKAANS ELECT.MFG.CO.PVT.LTD	PLOT NO: R-247, T.T.C. INDUSTRIAL AREA, M.I.D.C , RABALE, NAVI MUMBAI- 400 701 INDIA	+91-22- 27607787 / 27607927 +91-22- 27607997	
	LT- POTENTIAL TRANSFORMER	8	E1111	PRAYOG ELECTRICALS PVT. LTD.	GROUND FLOOR, THAKORE INDUSTRIAL COMPUND, STATION ROAD, VIDYA VIHAR (W), NATHANI ROAD , OPP. AMIBIKA TEMPLE,MUMBAI Mumbai - 400086, Maharashtra, India	91-22-25164288/25133146 Mr. P. U. PATWARDHAN (MANAGING DIRECTOR)	
	LT- POTENTIAL TRANSFORMER	9	NK09	M/s Newtek Electricals	M-90, M.I.D.C, Waluj, Aurangabad 431136, Maharashtra, India	Tel/Fax: +91 240 2551555 E-mail: mkt.north@newtekelectricals.com, sales@newtekelectricals.com Mr Sanjeev Aggarwal (9958897890)	

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ES25	DC SWITCH	1	A35	GE-POWER	KAMAK TOWER, 3RD FLOOR, PLOT NO. 12-A, TVK INDUSTRIAL ESTATE, EKKADUTHANGAL, GUINDY, CHENNAI-600032	044-49681447	
	DC SWITCH	2	E1076	KAYCEE	KAYCEE INDUSTRIES LTD., C/O-CMS COMPUTERS LTD., 35A, REAR BLDG., KILOKARI, NEW DELH1-110014	Rajiv Sharma-9312004687	
	DC SWITCH	3	S01	SIEMENS	RC-IN I S NR DEL AREA, JIL BUILDING, TOWER-B, PLOT NO. 78, SECTOR 18, GURGAON-122015, INDIA	0124-2842000, 9873424331 amit.bhadauria@siemens.com	
ES28	FUSE BASE	1	E1068	INDO ASIAN	B-24, PHASE - II , NOIDA - 201305, U.P.	120-3042222	
	FUSE BASE	2	G01	GE-POWER	KAMAK TOWER, 3RD FLOOR, PLOT NO. 12-A, TVK INDUSTRIAL ESTATE, EKKADUTHANGAL, GUINDY, CHENNAI-600032	044-49681447	
	FUSE BASE	3	L01	LK (Formerly L&T)	Lauritz Knudsen Electrical & Automation A/600, SHIL – Mahape Road, TTC Industrial Area, MIDC Thane, Mumbai, Maharashtra 400710	Pranjal Tyagi, Pranjal.Tyagi@lk-ea.com, Mobile - 8976907537, Telephone: +91 22 69327800	
	FUSE BASE	4	C01	C&S ELECTRIC LTD.	222, OKHLA IND. ESTATE, PH-III, NEW DELHI-110020	011-3088 7520-29	
	FUSE BASE	5	S01	SIEMENS	RC-IN I S NR DEL AREA, JIL BUILDING, TOWER-B, PLOT NO. 78, SECTOR 18, GURGAON-122015, INDIA	0124-2842000, 9873424331 ;amit.bhadauria@siemens.com	
	FUSE BASE	6	A24	ABB	14, MATHURA ROAD, FARIDABAD, HARYANA-121003	0129-2567580, 09871799449	
	FUSE BASE	7	S02	SPACEAGE SWITCHGEARS LTD.	68 & 13-A INDUSTRIAL DEVELOPMENT COLONY, MEHRAULI ROAD GURGAON, HARYANA-122001	0124-2302711, 4085091	
	FUSE BASE	8	S03	SCHNEIDER ELECTRIC INDIA PVT. LTD.	9TH FLOOR, BLDG. NO. 10, TOWER-C, DLF CYBER CITY, PH-II, GURGAON-122002	0124-3940400	
	FUSE BASE	9	G01	ALSTOM LTD	A-7, SEC-65, NOIDA	0120-479 0000	
	FUSE BASE	10	E1050	ESSEN DEINKI	FLAT NO. 502, SKYLINE HOUSE 85, NEHRU PLACE NEW DELHI	011-26217060	
	HRC FUSES	1	E1068	INDO ASIAN	B-24, PHASE - II , NOIDA - 201305, U.P.	120-3042222	
	HRC FUSES	2	G01	GE-POWER	KAMAK TOWER, 3RD FLOOR, PLOT NO. 12-A, TVK INDUSTRIAL ESTATE, EKKADUTHANGAL, GUINDY, CHENNAI-600032	044-49681447	

ITEM CODE	ITEM/SERVICE DESCRIPTION	SL NO.	VENDOR CODE	VENDOR NAME	ADDRESS	PHONE	REMARKS
ES29	HRC FUSES	3	L01	LK (Formerly L&T)	Lauritz Knudsen Electrical & Automation A/600, SHIL – Mahape Road, TTC Industrial Area, MIDC Thane, Mumbai, Maharashtra 400710	Pranjal Tyagi, Pranjal.Tyagi@lk-ea.com, Mobile - 8976907537, Telephone: +91 22 69327800	
	HRC FUSES	4	C01	C&S ELECTRIC LTD.	222, OKHLA IND. ESTATE, PH-III, NEW DELHI-110020	011-3088 7520-29	
	HRC FUSES	5	S01	SIEMENS	RC-IN I S NR DEL AREA, JIL BUILDING, TOWER-B, PLOT NO. 78, SECTOR 18, GURGAON-122015, INDIA	0124-2842000, 9873424331 ;amit.bhadauria@siemens.com	
	HRC FUSES	6	A24	ABB	14, MATHURA ROAD, FARIDABAD, HARYANA-121003	0129-2567580, 09871799449	
	HRC FUSES	7	S02	SPACEAGE SWITCHGEARS LTD.	68 & 13-A INDUSTRIAL DEVELOPMENT COLONY, MEHRAULI ROAD GURGAON, HARYANA-122001	0124-2302711, 4085091	
	HRC FUSES	8	S03	SCHNEIDER ELECTRIC INDIA PVT. LTD.	9TH FLOOR, BLDG. NO. 10, TOWER-C, DLF CYBER CITY, PH-II, GURGAON-122002	0124-3940400	
	HRC FUSES	9	G01	ALSTOM LTD	A-7, SEC-65, NOIDA	0120-479 0000	
	HRC FUSES	10	E1050	ESSEN DEINKI	FLAT NO. 502, SKYLINE HOUSE 85, NEHRU PLACE NEW DELHI	011-26217060	
ES34	INTERPOSING RELAY	1	A24	ABB	14, MATHURA ROAD, FARIDABAD, HARYANA-121003	0129-2567580, 09871799449	
	INTERPOSING RELAY	2	G01	ALSTOM LTD	A-7, SEC-65, NOIDA	0120-479 0000	
	INTERPOSING RELAY	3	E1075	JYOTI LTD.	JYOTI LIMITED, E&CS DIVISION,3/15, BIDC, GORWA,VADODARA - 390 016, E-MAIL ID: ECS@JYOTI.COM	Ph. No.:+91-265-2281214 , Fax No.:+91-265-2281214	
	INTERPOSING RELAY	4	E1099	OEN INDIA LTD	29/1479, VYTILLA, COCHIN - 682 019 KERALA, INDIA	Phone : +91 484 2301132, 2303709 Fax : +91 484 2302287, 2302221 sales@oenindia.com	
	INTERPOSING RELAY	5	S01	SIEMENS	RC-IN I S NR DEL AREA, JIL BUILDING, TOWER-B, PLOT NO. 78, SECTOR 18, GURGAON-122015, INDIA	0124-2842000, 9873424331 amit.bhadauria@siemens.com	
ES35	INDICATING LAMPS	1	B04	BCH	20/4, MATHURA ROAD, FARIDABAD, HARYANA-121006	0129-4293000	
	INDICATING LAMPS	2	C01	C&S ELECTRIC LTD.	222, OKHLA IND. ESTATE, PH-III, NEW DELHI-110020	6832259,6918834-37	
	INDICATING LAMPS	3	E1050	ESSEN DEINKI	FLAT NO. 502, SKYLINE HOUSE 85, NEHRU PLACE NEW DELHI	011-26217060	
	INDICATING LAMPS	4	E1153	VAISHNO(HOTLINE SWGR.& CONTROL)	G-19, SECTOR - 11, NOIDA - 201301, UTTAR PRADESH, INDIA	8377805157 9818338922	
	INDICATING LAMPS	5	A35	GE-POWER	KAMAK TOWER, 3RD FLOOR, PLOT NO. 12-A, TVK INDUSTRIAL ESTATE, EKKADUTHANGAL, GUINDY, CHENNAI-600032	9818338922	

ITEM CODE	ITEM/SERVICE DESCRIPTION	SL NO.	VENDOR CODE	VENDOR NAME	ADDRESS	PHONE	REMARKS
	INDICATING LAMPS	6	S01	SIEMENS	RC-IN I S NR DEL AREA, JIL BUILDING, TOWER-B, PLOT NO. 78, SECTOR 18, GURGAON-122015, INDIA	0124-2842000, 9873424331 amit.bhadauria@siemens.com	
	INDICATING LAMPS	7	S03	SCHNEIDER ELECTRIC INDIA PVT. LTD.	9TH FLOOR, BLDG. NO. 10, TOWER-C, DLF CYBER CITY, PH-II, GURGAON-122002	0124-3940400	
ES51	MCB	1	E1088	MDS SWITCHGEAR LTD	314-317SHAH NAHAR ESTATE	011 - 25793021	
	MCB	2	E1068	INDO ASIAN	B-24, PHASE - II , NOIDA - 201305, U.P.	120-3042222	
	MCB	3	S03	SCHNEIDER ELECTRIC INDIA PVT. LTD.	9TH FLOOR, BLDG. NO. 10, TOWER-C, DLF CYBER CITY, PH-II, GURGAON-122002	0124-3940400	
	MCB	4	E1120	S&S POWER SWITCHGEAR LTD,	NEW NO. 67, OLD NO. 19, DR. RANGA ROAD, MYLAPORE, CHENNAI - 600004	044 - 24988056, 044 - 24988057, 044 - 24988058	
ES57	PROTECTION - RELAYS (PNUEMATIC)	1	S01	SIEMENS	RC-IN I S NR DEL AREA, JIL BUILDING, TOWER-B, PLOT NO. 78, SECTOR 18, GURGAON-122015, INDIA	0124-2842000, 9873424331 amit.bhadauria@siemens.com	
	PROTECTION - RELAYS (PNUEMATIC)	2	S03	SCHNEIDER ELECTRIC INDIA PVT. LTD.	9TH FLOOR, BLDG. NO. 10, TOWER-C, DLF CYBER CITY, PH-II, GURGAON-122002	0124-3940400	
	PROTECTION - RELAYS (PNUEMATIC)	3	A35	GE-MULTILINE, GE INDIA INDUSTRIAL PVT. LTD.	NO. 90- B, ELECTRONICS CITY, HOSUR ROAD, BENGALURU - 560016, KARNATAKA	(080) 41314617, 9945478935	
	PROTECTION - RELAYS (PNUEMATIC)	4	SC01	SCHWEITZER ENGG. LAB (SEL)	406, BHIKAJI CAMA BHAVAN, BHIKAJI CAMA PLACE, BHIKAJI CAMA PLACE, MOHAMMADPUR, RK PURAM, NEW DELHI, DL 110066	011 4152 7899	
	PROTECTION - RELAYS (PNUEMATIC)	5	C01	C&S ELECTRIC LTD.	222, OKHLA IND. ESTATE, PH-III, NEW DELHI-110020	011-3088 7520-29	
	PROTECTION - RELAYS (PNUEMATIC)	6	G01	ALSTOM LTD	A-7, SEC-65, NOIDA	0120-479 0000	
	PROTECTION - RELAYS (PNUEMATIC)	7	A24	ABB	14, MATHURA ROAD, FARIDABAD, HARYANA-121003	0129-2567580, 09871799449	
	PROTECTION - RELAYS (PNUEMATIC)	8	C01	AVK-SEG & CONTROLS(I) LTD	C-60,NOIDA PHASE-II	6918834-37	
ES58	PROTECTION - RELAYS (NUMERICAL)	1	S01	SIEMENS	RC-IN I S NR DEL AREA, JIL BUILDING, TOWER-B, PLOT NO. 78, SECTOR 18, GURGAON-122015, INDIA	0124-2842000, 9873424331 amit.bhadauria@siemens.com	
	PROTECTION - RELAYS (NUMERICAL)	2	S03	SCHNEIDER ELECTRIC INDIA PVT. LTD.	9TH FLOOR, BLDG. NO. 10, TOWER-C, DLF CYBER CITY, PH-II, GURGAON-122002	0124-3940400	
	PROTECTION - RELAYS (NUMERICAL)	3	A35	GE-MULTILINE, GE INDIA INDUSTRIAL PVT. LTD.	NO. 90- B, ELECTRONICS CITY, HOSUR ROAD, BENGALURU - 560016, KARNATAKA	(080) 41314617, 9945478935	
	PROTECTION - RELAYS (NUMERICAL)	4	SC01	SCHWEITZER ENGG. LAB (SEL)	406, BHIKAJI CAMA BHAVAN, BHIKAJI CAMA PLACE, BHIKAJI CAMA PLACE, MOHAMMADPUR, RK PURAM, NEW DELHI, DL 110066	011 4152 7899	
	TERMINAL BLOCKS	1	C01	WAGO-CONTROLS	C 27, GREATER NOIDA, SECTOR 58, C BLOCK, SECTOR 58, NOIDA, UTTAR PRADESH 201307	0120-2580409/10	

ITEM CODE	ITEM/SERVICE DESCRIPTION	SL NO.	VENDOR CODE	VENDOR NAME	ADDRESS	PHONE	REMARKS
ES62	TERMINAL BLOCKS	2	E1038	CONNECT WELL	309A/4, 3RD FLOOR, KALKAJI, OKHLA IND AREA PH-2, GOVINDPURI, NEW DELHI, DL 110019	9811881085 09871419996 011-65908877	
	TERMINAL BLOCKS	3	E1047	ELMEX CONTROLS PVT. LTD.	12,G.I.D.C.ESTATE,MUKARPURA ROAD,VADODARA-390010	9374631074	
	TERMINAL BLOCKS	4	E1050	ESSEN DEINKI	FLAT NO. 502, SKYLINE HOUSE 85, NEHRU PLACE NEW DELHI	011-26217060	
	TERMINAL BLOCKS	5	E1142	TECHNOPLAST	OPP.I.M.INTER COLLEGE, BEGUM SARAI KHURD ROAD, AMROHA - 244221, U.P.	PH:- 05922 264006 CELL NO:- 9012676000, 9319520799, 9319582467	
	TERMINAL BLOCKS	6	PME-01	M/s PHOENIX MECANO LTD.,	388 BHARE, TALUKA MULSHI, POST GHOTAWADE, PIRANGOOT, INDUSTRIAL AREA, PUNE-412115	TEL.- +912066745000 Awasthi(09971119006) Tel: ++91 20 6674 5103, Mobile: +91 90499 95985, Fax: ++91 20 6674 5126 contact person : Vishwa bandhu E-mail:d.gupta@pmipl-online.com ;admin@pmipl-online.com	
	TERMINAL BLOCKS	7	E1050	ESSEN DEINKI	FLAT NO. 502, SKYLINE HOUSE 85, NEHRU PLACE NEW DELHI	011-26217060	
ES63	TIMERS - PNEUMATIC	1	B04	BCH	20/4, MATHURA ROAD, FARIDABAD, HARYANA-121006	0129-4293000	
	TIMERS - PNEUMATIC	2	G01	ALSTOM LTD	A-7, SEC-65, NOIDA	0120-479 0000	
	TIMERS - PNEUMATIC	3	L01	LK (Formerly L&T)	Lauritz Knudsen Electrical & Automation A/600, SHIL – Mahape Road, TTC Industrial Area, MIDC Thane, Mumbai, Maharashtra 400710	Pranjal Tyagi, Pranjal.Tyagi@lk-ea.com, Mobile - 8976907537, Telephone: +91 22 69327800	
	TIMERS - PNEUMATIC	4	E1144	TELEMECHANIQUE/ SCHNEIDER ELECTRIC INDIA PVT. LTD.	9TH FLOOR, BLDG. NO. 10, TOWER-C, DLF CYBER CITY, PH-II, GURGAON-122002	0124-3940400	TAKEN OVER BY SCHNEIDER
	TIMERS - PNEUMATIC	5	S03	SCHNEIDER ELECTRIC INDIA PVT. LTD.	9TH FLOOR, BLDG. NO. 10, TOWER-C, DLF CYBER CITY, PH-II, GURGAON-122002	0124-3940400	
	TIMERS - PNEUMATIC	6	E01	ELECTRONIC AUTOMATION PVT. LTD.	20, KHB INDUSTRIAL AREA YELAHANKA BANGLORE-560064	080 -28567561 / 080 -28567562 / 080 -42802345	
ES64	TIMERS - ELECTRONIC	1	E1050	ESSEN DEINKI	FLAT NO. 502, SKYLINE HOUSE 85, NEHRU PLACE NEW DELHI	011-26217060	
ES65	TRANSDUCERS	1	E1021	AUTOMATIC ELECTRIC LTD.	ADDRESS : 96 AB LONAVLA INDUSTRIAL ESTATE NANGARGAON, LONAVLA-410401	Phone : +91 2114323665 Fax : +91 2114273482	
	TRANSDUCERS	2	E1202	SOUTHERN TRANSDUCERS	INTERTECH B-83, FLATTED FACTORY COMPLEX, NEAR MODI MILLS, OKHLA, NEW DELHI-110020	Mr. Gurmohit Singh 011-41020365 / 9891402128	

ITEM CODE	ITEM/SERVICE DESCRIPTION	SL NO.	VENDOR CODE	VENDOR NAME	ADDRESS	PHONE	REMARKS
ES72	ENERGY METER (ANALOG)	1	B07	BHEL (EDN)	MYSORE ROAD,BANGALORE-560026	080-26998500	
	ENERGY METER (ANALOG)	2	E1129	SIMCO ENGG. LTD	NO. 126, K ROAD, TIRUCHIRAPPALLI -620001, TAMIL NADU	Mr. Madaswamy Muthu +(91)-(431)-4046223 +(91)-(431)-4046210 +(91)-9786600915	
	ENERGY METER (ANALOG)	3	R01	RISHABH INST.PVT LTD	RISHABH INSTRUMENTS PVT. LTD. F-31, MIDC, SATPUR NASHIK - 422007 MAHARASHTRA INDIA	marketing@rishabh.co.in 91-253 2202202/203 Fax: 91 253 2351064	
	ENERGY METER (ANALOG)	4	E1009	AUTOMATIC ELECTRIC LTD.	96 AB LONAVLA INDUSTRIAL ESTATE NANGARGAON, LONAVLA-410401	Phone : +91 2114323665 Fax : +91 2114273482	
	ENERGY METER (ANALOG)	5	CON1	CONZERVE SYSTEMS PVT. LTD.(SCHNEIDER)	87, 1ST FLOOR INDUSTRIAL DEVELOPMENT COLONY (IDC) MEHRAULI ROAD, UGURGAON 122001 HARYANA, INDIA.	4268899, 9910695701	
ES73	ENERGY METER (DIGITAL)	1	CON1	CONZERVE SYSTEMS PVT. LTD.(SCHNEIDER)	87, 1ST FLOOR INDUSTRIAL DEVELOPMENT COLONY (IDC) MEHRAULI ROAD, UGURGAON 122001 HARYANA, INDIA.	4268899, 9910695701	
	ENERGY METER (DIGITAL)	2	NK09	M/s Newtek Electricals	M-90, M.I.D.C, Waluj, Aurangabad 431136, Maharashtra, India	Tel/Fax: +91 240 2551555 E-mail: mkt.north@newtekelectricals.com, sales@newtekelectricals.com Mr Sanjeev Aggarwal (9958897890)	
ES74	AMMETER	1	E1009	AUTOMATIC ELECTRIC LTD.	96 AB LONAVLA INDUSTRIAL ESTATE NANGARGAON, LONAVLA-410401	Phone : +91 2114323665 Fax : +91 2114273482	
	AMMETER	2	R01	RISHABH INST.PVT LTD	RISHABH INSTRUMENTS PVT. LTD. F-31, MIDC, SATPUR NASHIK - 422007 MAHARASHTRA INDIA	marketing@rishabh.co.in 91-253 2202202/203 Fax: 91 253 2351064	
	AMMETER	3	NK09	M/s Newtek Electricals	M-90, M.I.D.C, Waluj, Aurangabad 431136, Maharashtra, India	Tel/Fax: +91 240 2551555 E-mail: mkt.north@newtekelectricals.com, sales@newtekelectricals.com Mr Sanjeev Aggarwal (9958897890)	
	VOLTMETER	1	E1009	AUTOMATIC ELECTRIC LTD.	96 AB LONAVLA INDUSTRIAL ESTATE NANGARGAON, LONAVLA-410401	Phone : +91 2114323665 Fax : +91 2114273482	

ITEM CODE	ITEM/SERVICE DESCRIPTION	SL NO.	VENDOR CODE	VENDOR NAME	ADDRESS	PHONE	REMARKS
ES75	VOLTMETER	3	NK09	M/s Newtek Electricals	M-90, M.I.D.C, Waluj, Aurangabad 431136, Maharashtra, India	Tel/Fax: +91 240 2551555 E-mail: mkt.north@newtekelectricals.com, sales@newtekelectricals.com Mr Sanjeev Aggarwal (9958897890)	
ES76	MPCB	1	S03	SCHNEIDER ELECTRIC INDIA PVT. LTD.	9TH FLOOR, BLDG. NO. 10, TOWER-C, DLF CYBER CITY, PH-II, GURGAON-122002	0124-3940400	
	MPCB	2	L01	LK (Formerly L&T)	Lauritz Knudsen Electrical & Automation A/600, SHIL – Mahape Road, TTC Industrial Area, MIDC Thane, Mumbai, Maharashtra 400710	Pranjal Tyagi, Pranjal.Tyagi@lk-ea.com, Mobile - 8976907537, Telephone: +91 22 69327800	
	MPCB	3	S01	SIEMENS	RC-IN I S NR DEL AREA, JIL BUILDING, TOWER-B, PLOT NO. 78, SECTOR 18, GURGAON-122015, INDIA	0124-2842000, 9873424331 amit.bhadauria@siemens.com	
	MPCB	4	A35	GE-POWER	KAMAK TOWER, 3RD FLOOR, PLOT NO. 12-A, TVK INDUSTRIAL ESTATE, EKKADUTHANGAL, GUINDY, CHENNAI-600032	044-49681447	
	MPCB	5	S03	SCHNEIDER ELECTRIC INDIA PVT. LTD.	9TH FLOOR, BLDG. NO. 10, TOWER-C, DLF CYBER CITY, PH-II, GURGAON-122002	0124-3940400	
	MPCB	6	C01	C&S ELECTRIC LTD.	222, OKHLA IND. ESTATE, PH-III, NEW DELHI-110020	011-3088 7520-29	
ES78	MULTIFUNCTION METER	1	CON1	CONZERVE SYSTEMS PVT. LTD./ SCHNEIDER ELECTRIC INDIA PVT. LTD.	87, 1ST FLOOR INDUSTRIAL DEVELOPMENT COLONY (IDC) MEHRAULI ROAD, GURGAON 122001 HARYANA, INDIA.	4268899, 9910695701	TAKEN OVER BY SCHNEIDER
	MULTIFUNCTION METER	2	NK09	M/s Newtek Electricals	M-90, M.I.D.C, Waluj, Aurangabad 431136, Maharashtra, India	Tel/Fax: +91 240 2551555 E-mail: mkt.north@newtekelectricals.com, sales@newtekelectricals.com Mr Sanjeev Aggarwal (9958897890)	
	RCCB	1	C01	C&S ELECTRIC LTD.	222, OKHLA IND. ESTATE, PH-III, NEW DELHI-110020	011-3088 7520-29	
	RCCB	2	S03	SCHNEIDER ELECTRIC INDIA PVT. LTD.	9TH FLOOR, BLDG. NO. 10, TOWER-C, DLF CYBER CITY, PH-II, GURGAON-122002	0124-3940400	
	RCCB	3	S01	SIEMENS	RC-IN I S NR DEL AREA, JIL BUILDING, TOWER-B, PLOT NO. 78, SECTOR 18, GURGAON-122015, INDIA	0124-2842000, 9873424331 amit.bhadauria@siemens.com	

ITEM CODE	ITEM/SERVICE DESCRIPTION	SL NO.	VENDOR CODE	VENDOR NAME	ADDRESS	PHONE	REMARKS
ES79	RCCB	4	A35	GE-POWER	KAMAK TOWER, 3RD FLOOR, PLOT NO. 12-A, TVK INDUSTRIAL ESTATE, EKKADUTHANGAL, GUINDY, CHENNAI-600032	044-49681447	
	RCCB	5	L01	LK (Formerly L&T)	Lauritz Knudsen Electrical & Automation A/600, SHIL – Mahape Road, TTC Industrial Area, MIDC Thane, Mumbai, Maharashtra 400710	Pranjal Tyagi, Pranjal.Tyagi@lk-ea.com, Mobile - 8976907537, Telephone: +91 22 69327800	
	RCCB	6	C02	CROMPTON GREAVES	RAIL TRANSPORTATION SYSTEMS,VANDANA BUILDING, 11, TOLSTOY MARG, TOLSTOY MARG, NEW DELHI, DL 110001	011 3041 6300	
ES90	VAF METER (DIGITAL)	1	NK09	M/s Newtek Electricals	M-90, M.I.D.C, Waluj, Aurangabad 431136, Maharashtra, India	Tel/Fax: +91 240 2551555 E-mail: mkt.north@newtekelectricals.com, sales@newtekelectricals.com Mr Sanjeev Aggarwal (9958897890)	

Note:
In case the above make is not available; bidder can propose their alternate make, & same shall be acceptable subject to customer's (NTPC) approval.

SECTION-II

STANDARD TECHNICAL SPECIFICATION

CONTENTS

1.0 INTRODUCTION

This specification covers the design, manufacture, assembly, testing, packing and despatch of Battery charger (Float/Boost/Float cum Boost), Discharge Resistor, Battery Fuse Box complete in all respects with all components, fittings and accessories for efficient and trouble-free operation. The charger shall be connected either with Ni-Cd or Lead-acid type battery as applicable. In this specification though erection & commissioning is not included in vendor's scope, the vendor shall still not absolved of his responsibility of establishing the correctness of equipment at site.

2.0 CODES AND STANDARDS

The equipment shall generally conform to IS. Unless otherwise specified, the latest revisions of codes/ standards specified in Annexure-I enclosed are applicable.

3.0 OPERATIONAL REQUIREMENTS

3.1 Under normal conditions, when the AC supply is healthy at the battery charger input terminals, the float charger shall feed the continuous DC loads, while the boost charger shall remain off. Over and above the continuous DC loads the float charger shall also supply the necessary trickle charge to the battery, to keep the later in fully ready condition for being available during AC supply failure at charger terminals. Also some of the impulse loads of duration less than a minute for which the response of the charger is poor, shall be supplied by the associated battery in the DC system. This impulse discharge, shall, however, be continuously replenished by the float charger, unless the discharge is of considerable magnitude, in the event of which the boost charger shall be deployed.

3.2 The float charger shall withstand momentary supply failure due to changeover on AC supply feeding bus and continue to operate on float mode satisfactorily on restoration of AC supply to charger.

3.3 The DC system shall be ungrounded and shall float with respect to the ground potential when healthy.

3.4 After the batteries are boost charged and operation is changed to float mode, the voltage impressed on the loads shall not exceed float charge voltage.

3.5 The charger shall be designed to operate at an ambient air temperature of 50°C. It will be located indoor but in a hot, humid and tropical atmosphere.

3.6 The voltage at load terminal will not exceed the limits of +10% and -15% of nominal system voltage for DC system.

4.0 BATTERY CHARGERS

4.1 The battery chargers shall be self-regulating, natural/forced air cooled (as per Sec-I/Datasheet-A), static type/microprocessor based composed of silicon controlled rectifiers (SCRs) connected in three phase full wave full control bridge circuit.

4.2 Each charger circuit shall be provided with its own AC input voltmeter with voltmeter selector switch, DC voltmeter & ammeter, battery DC output ammeter & voltmeter, battery charging current ammeter, control switches, rectifiers, Auto/ Manual voltage regulators, load limiting device, etc. as required for the successful operation of the DC system.

4.3 The charger shall have auto voltage regulators to enable step less, smooth and continuous voltage control. The chargers shall have the effective current limiting feature and smoothing filters to minimise harmonics, radio frequency transients, electromagnetic transients, etc.

4.4 The battery chargers as well as their automatic regulators shall be of static type/ microprocessor based, the battery chargers shall be capable of continuous operation at the respective rated load in float charging mode i.e. trickle charging the associated DC batteries while supplying the DC loads.

4.5 The battery chargers shall have a selector switch for selecting the battery-charging mode i.e. float or boost charging.

4.6 The battery chargers shall be provided with facility for both automatic and manual control of output voltage and current. The selector switch will select the mode of output voltage/current control, whether automatic or manual. Necessary provisions shall be provided to avoid current/voltage surges of harmful magnitude/nature, which may arise during changeover from auto to manual mode or vice versa under normal operating condition.

4.7 Soft start feature shall be provided to build up the voltage to the set value slowly within 15 seconds. The chargers shall have load limiters, which shall cause, when the voltage control is in automatic mode, a gradual lowering of the output voltage when the DC load current exceeds the load limiter setting of the charger. The load limiter characteristic shall be such that any sustained overload or short circuit in DC system shall not damage the charger nor shall it cause blowing of any of the charger fuses. The charger shall not trip on overload or external short circuit. After clearance of fault, the charger voltage shall build-up automatically when working in automatic mode.

4.8 When on automatic control mode during float charging, the charger output voltage shall remain within $\pm$1% of the set value for AC input voltage variation of $\pm$10% and a continuous DC load variation from zero to full load. Uniform and step less adjustment of voltage setting (in both auto/manual modes) shall be provided on the front of the charger panel covering the entire float charging output range specified. Step less adjustment of the load limiter setting shall also be provided from 80% to 100% of the rated output current for float charging mode.

4.9 During boost charging, the battery chargers shall operate on constant current mode (when automatic regulator is in service). The boost charging current can be adjusted continuously over a range of 50% to 100% of the rated output current for boost charging mode. The charger output voltage shall automatically go on rising, when operating in boost mode, as the battery charges up. For limiting the output voltage of charger, a potentiometer shall be provided on the front of the panel, whereby it shall be possible to set the upper limit of this voltage anywhere in the output range specified for boost charging mode. All voltage and current setting potentiometers shall be Vernier type/screw type. If setting of the upper limit in the output range is possible manually via the controller interface as per bidder's design, then separate potentiometer is not required.

4.10 Energising the charger with fully charged battery connected plus 10% load shall not result in output voltage greater than 110% of voltage setting. The time taken to stabilise within specified limits shall be less than 15 seconds.

4.11 Momentary output voltage of the Charger, without the Battery connected shall be within 94% to 106% of the voltage setting during sudden load Change from 100% to 20% of full load or vice versa. Output voltage shall return to, and remain, within the limits specified as mentioned elsewhere in less than 2 seconds after the above mentioned change.

4.12 In case of float-cum-boost charger, manufacturer shall offer an arrangement in which the voltage setting device for float charging mode is also used as output voltage limit setting device for boost charging mode, and the load limiter of the float charging mode is also used as boost charging current setting device.

4.13 Suitable filter circuits shall be provided in all the chargers to limit the ripple content (peak to peak) in the output voltage to 1%, irrespective of the DC load fluctuation even when they are not connected to a battery.

4.14 Wherever two incoming AC power source for particular charger (if applicable as per project specific requirement) is envisaged then suitable automatic changeover arrangement/scheme shall be provided between two AC power source.

4.15 Ni-Cd Batteries shall be Trickle charged at 1.4 to 1.42 Volts per cell. Chargers shall be capable of boost charging the associated D.C. Battery at 1.53 to 1.7 Volts per cell in 8-10 hours. Lead Acid Batteries shall be Trickle charged at 2.23 to 2.25 Volts per cell. Chargers shall also be capable of boost charging the associated D.C. Battery at 2.3 to 2.89 Volts per cell in 8-10 hours. The Chargers shall be designed to operate, as mentioned above, at an ambient air temperature of 50°C. For the type of battery for the project, kindly refer Datasheet-A.

5.0 DESCRIPTION OF EQUIPMENT

5.1 Rectifier assembly

Rectifier assembly shall be full wave bridge, twelve (12) pulse type (for charger rating 300A and above) and designed to meet the duty as required by the respective charger. The rectifier cells shall be provided with their own heat dissipation arrangement with natural air-cooling for upto 400A rating chargers. However, the rectifier cells shall be provided with their own heat dissipation arrangement with forced air-cooling for above 400A rating chargers and fan shall be temperature rise controlled with 100% standby redundancy. The rectifier shall utilise diodes / thyristors and heat sinks to carry 200% of the load current continuously and the temperature of the heat sink shall not be permitted to exceed 85°C absolute, duly considering the maximum charger panel inside temperature. Adequate snubber circuit shall be provided for the safety of thyristors, etc. The successful bidder shall furnish calculations to show what maximum junction temperature will be and what the heat sink temperature will be when operating at 200% and 100% load current continuously duly considering the maximum surrounding air temperature for these devices inside the charger panel at air ambient temperature of 50°C outside the panel. Necessary surge protection devices and rectifier type fast acting HRC/Semiconductor fuses shall be provided in each arm of the rectifier connections. Heat run test for other charger components shall be carried out at 100% of rated current.

5.2 Rectifier transformer and Chokes

The rectifier transformer & chokes shall be dry and air cooled (AN) type. The rating of the rectifier transformers & chokes shall correspond to the rating of the associated rectifier assembly and shall be **copper** wound. The rectifier transformers & chokes shall have Class-F insulation with temperature rise limited to Class-B insulation value. The rectifier transformer sizing shall be done considering suitable factors for voltage drop, regulation, effect of harmonics, conversion factors etc. to arrive final selected rating of rectifier transformer. The successful bidder shall furnish calculations for rectifier transformer sizing for approval.

5.3 Blocking Diode

Blocking Diode shall be provided in the output circuit of each charger to prevent current flow from the DC battery into the charger. The successful bidder shall furnish calculations to show what

maximum heat sink temperature will be when operating at 100% load current continuously duly considering the maximum surrounding air temperature for these devices inside the charger panel at air ambient temperature of 50°C outside the panel.

5.4 Voltage regulators

5.4.1 The float charger shall have both auto and manual voltage regulation arrangements. The voltage regulator shall have auto/manual option and be of static type. A selector switch for selection of the mode of voltage regulation shall be provided. AVR time constant shall not exceed 0.5.

5.4.2 The boost charger shall have auto/manual voltage regulation arrangement. The voltage adjustment shall be uniform and step less throughout the voltage variation range. The regulator shall be of static type. The boost charger shall be designed to charge the fully discharged battery to fully charged condition in 8 hrs.

Voltage regulators of Float/Boost Charger as part of controller are also acceptable. However, end user/customer requirement as specified in Sec-I will prevail.

5.5 Printed Circuit Boards (PCB)

PCB shall be made of glass epoxy of 1.6 mm thick, fire resistant, bonded with 99.8% pure copper foil, free of wrinkles, blisters, scratches and pinholes. The contact surface of the edge connectors of PCBs shall be plated with hard gold to a minimum thickness of 5 microns. The component identification shall be printed on PCB by Silk screen method. All PCBs shall be tropicalized and masked. The above requirement is indicative. Manufacturer standard design meeting high quality standards and performance are also acceptable.

5.6 Control and Selector Switches

The control and selector switches shall be of rotary stay put type with escutcheon plates showing functions and positions. The switches shall be of sturdy construction and suitable for mounting on panel front. The switches shall have shrouded live parts and sealed contacts against dust ingress. Auto/normal switch shall be of lockable type in either position. The contact ratings shall be at least the following:

- Make and carry continuously 10A
- Breaking current at 220V DC 0.5A (inductive)
- Breaking current at 240V AC 5.0A at 0.3 p.f.

5.7 Indicating Lamps

To indicate AC supply availability, three indicating lamps shall be provided. The indicating lamp shall be suitable for panel mounting, cluster type LED and capable of clear status indication under normal room illumination. The lamp covers shall be preferably screw type, unbreakable and moulded from heat resistant material.

5.8 Instruments

For all chargers, DC ammeter, DC voltmeter and AC voltmeter shall be provided in 96 x 96 mm^2 size with 0.5 accuracy class conforming to IS-1248. The instruments shall be flush mounted type, dust proof, moisture resistant and have easy accessible means for zero adjustment. Meters shall have 4 digit-7 segment LED/LCD display and RS 485 Serial Bus port for remote communication.

5.9 Relays

The relays shall be enclosed in flush or semi flush dust tight cases finished with dull black enamel paint. Relays shall have self-contained test facilities and provisions for removing relay mechanism for inspection and maintenance.

5.10 Transducers

Transducers shall be panel-mounting type and suitable for operating temperatures from 0 to 55°C. Transducer output shall be used for remote display at DDCMIS. Transducers shall be provided in charger panel for DC battery voltage, charger output voltage and charger output current. The transducer shall have the following features:

- Input/ output with galvanic isolation
- Auxiliary voltage – 220V DC
- 4-20 mA independent dual output
- Accuracy class 0.5 or better
- Short circuit and over current protection

5.11 Contactors

All battery chargers shall have an AC contactor on the input side. It shall be of air break type and suitable for continuous duty. The operating coil shall be rated for 415 V/400V/380V as per project requirement. The DC contactors shall be single/double pole air break type and suitable for continuous duty.

5.12 Thermal overload relay

A thermal overload relay with single phasing protection (using differential movement of bimetal strips) shall also be provided for the AC input, which will trip the contactor. Thermal overload relay part of controller/designed with control cards are also acceptable.

5.13 Air break switches / MCCB

All chargers shall have AC input and DC output switches of air break, single throw, load break and fault make type or MCCB type as per project requirement. The contacts of the switches shall open and close with a snap action. The switches/MCCB shall be rated for 120% of the maximum continuous load. The 'ON' and 'OFF' position of the switch/MCCB shall be clearly indicated. The operating handle of the switches/MCCB shall be fully insulated from circuit and shall be effectively earthed.

Incoming/outgoing supply shall be MCCB or SFU as per project specific requirement specified in Section-I/datasheet-A of the specification.

5.14 Fuses

Incoming/outgoing power supply fuses shall be of HRC cartridge fuse link type. Fuses shall be mounted on fuse carriers, which are mounted on fuse base. Wherever, it is not possible to mount fuses on fuse carriers, fuses shall be directly mounted on plug-in type bases. In such cases one insulated fuse pulling handle shall be supplied for each charger. Kick-off fuses (trip fuses) with alarm contacts shall be provided for all DC fuses. The fuses shall be suitable for applicable fault level. For electronic circuits, high speed semiconductor fuses may be used.

5.15 Variable Metallic Resistor (Discharge Resistor)

Variable metallic resistors and shunt suitable for carrying out discharge tests (5-hour discharge rate for Ni-Cd battery and 10-hour discharge rate for Lead Acid battery) on the batteries shall be supplied. The Discharge resistor unit shall be of robust assembly consisting of Copper-Nickel Alloy /FeCrAl/ Ni-chrome /Punched Steel Grid elements as per project specific requirement. The Discharge Resistor fan shall be designed to allow rapid, forced cooling of resistor bank.

5.16 Battery fuse box / MCCB Box

Battery fuse / MCCB of adequate rating meeting the load duty cycle shall be supplied. Suppliers have to furnish DC fuse/MCCB characteristics in support of the rating selected for the Battery

Fuse Box. Battery fuse box / MCCB Box shall have suitable termination arrangement for terminating the incoming & outgoing cables informed during detailed engineering stage. Suitable cable lugs & glands have to be supplied with the equipment which shall be in Battery Charger Vendor scope.
MCCB or SFU as per project specific requirement specified in Section-I/Datasheet-A of the specification.

5.17 Panel Construction

The charger panels housing all the equipment shall be indoor, floor mounting, air natural cooled, self-supporting sheet metal enclosed cubicle type. The charger panel and its frame shall be fabricated from 1.6 and 2.0 mm cold rolled sheet steel respectively and have folded type construction. The bidder shall also supply necessary base frames, anchor bolts and hardware. Removable undrilled gland plates of at least 3.0 mm thick sheet steel and lugs for all cables shall be provided. The lugs for cables shall be made of electrolytic tinned copper. The gland plate shall be of adequate size for accommodating requisite number of cable glands for power and control cables. The charger shall be tropicalized and vermin proof. Ventilation louvers shall be backed with fine brass wire mesh. All door and covers shall be fitted with synthetic rubber/Neoprene gaskets. The panels shall have hinged double leaf doors provided on front and backside for adequate access of charger terminals. All the charger cubicle doors shall be properly earthed. The panels shall comply with at least degree of protection IP-42. Incoming and outgoing cables shall enter from bottom. Suitable cable terminal board with copper cable lugs and double compression brass nickel-plated cable glands shall be provided (which shall be in Battery Charger Vendor scope) in each panel for incoming and outgoing cables.

5.18 Electronic equipment shall be of modular design consisting of plug-in modules in standard 19 inches' metallic racks with metallic card guides. The card should be provided with proper handles. Card to card wiring shall be through mother board. Unplanned jumpering and track modifications shall not be allowed. Mechanical interlocks to prevent wrong insertion of cards shall be provided. Each card shall have its junction and test points identified. Maintenance aids such as extension printed wiring boards and jumper leads shall be provided. Non modular design is also acceptable.

5.19 The layout of charger components shall be such that their heat losses do not give rise to excessive temperature within the charger panel surface. Location of the electronic modules will be such that temperature rise of the location, in no case, shall exceed 10°C over ambient air temperature outside the charger.

5.20 All the charger panels shall be provided with an illuminating lamp, a 5 Amp socket and space heaters with thermostat. Toggle switches and fuses shall be provided separately for each of the above fittings. Space heaters "ON" indication shall be provided. Two separate grounding pads shall be provided for each panel.

5.21 Locking facility

Locking facility shall be provided as follows:

For locking float/boost selector switch in the float position only. This shall be used for having key mechanical interlock between float/boost selector switch and isolator in DCDB.

The charger enclosure door-locking requirement shall be met by the application of padlocks. Padlocking arrangement shall allow ready insertion of the padlock shackle but shall not permit excessive movement of the locked parts with the padlock in position.

5.22 Control wiring

Each panel shall be furnished completely factory wired upto power cable lugs and terminal blocks ready for external connections. The power wiring shall be carried out with 1.1kV grade, PVC insulated cables conforming to IS-1554 (Part-1). The control wiring shall be of 1.1kV grade, 1 core stranded copper wire with colour coded PVC insulation having identification ferrules at both terminal and device end for each wire. Wires shall conform to IS-694 and minimum size of the wire shall not be less than 2.5 mm^2. The control wiring terminating at electronic card shall not be less than 1.0 mm^2. The control terminal shall be suitable for connecting two wires with 2.5 mm^2 stranded copper conductors. All terminals shall be numbered for ease of connections and identification.

Power & control wiring within the panel shall be kept separate. Any terminal or metal work, which remains alive at greater than 415V, when panel door is opened, shall be fully protected by shrouding.

An air clearance of at least 10mm shall be maintained throughout all circuits, except low voltage electronic circuits, right upto the terminal lugs. Whenever this clearance is not available, the live parts shall be insulated or shrouded.

5.23 Terminal Blocks

Terminal blocks for all the chargers shall meet the following requirements:

a) Terminal block shall be 1.1kV grade, minimum 10A rated, one piece moulded complete with insulating barrier, clip on type terminals, washers, nuts and identification strip etc. It shall be similar to Klippon type RSF with insulating material of melamine or equivalent. Marking on terminal strips shall correspond to the terminal numbering on wiring diagrams. Terminal blocks for CT & VT secondary leads shall be provided with links to facilitate testing, isolation, star/delta and earthing. Terminal blocks for CT secondary shall have the short-circuiting facility.

b) At least 20% spare terminals for external connections shall be provided on each panel and these spare terminals shall be uniformly distributed on all terminal blocks.

c) There shall be minimum clearance of 250mm between the terminal blocks and the cable gland plate and 150mm between two rows of terminal blocks.

5.24 Cable Lugs

Heavy duty bolt-on termination tinned copper lugs of compression type shall be used in the Charger for power cable termination. The supply of tinned copper cable lugs for power cables forms part of the supply of equipment. Cable lugs shall comply with IS-8309.

5.25 Cable Glands

The supply of cable glands forms part of the supply of equipment. Cable glands shall conform to BS-6121. Cable glands shall be of double compression type.

5.26 Panel Earthing

Charger panels shall have fully rated GI ground bus with two ground terminals, one at each end of the panel. Each ground terminal shall have two bolt drillings with GI bolts and nuts suitable for connection to purchaser's ground conductor.

6.0 ANNUNCIATION SYSTEM

6.1 Visual indication shall be provided to indicate the operating conditions of the charger by the means of indicating lamps/LED or annunciation facia windows as per EEUA-45D, arranged on the top of the charger panels for following faults:

a) AC supply failure
b) AC input fuse failure (separate for FCBC/Float/Boost)
c) AC Under voltage/Overvoltage
d) Rectifier fuse failure
e) Charger failure
f) Surge circuit fuse failure
g) Filter fuse failure
h) Blocking Diode failure
i) Load limiter operated
j) Charger trip/over loaded
k) Battery on boost
l) Charger earth fault
m) Battery fuse blown
n) Boost Bus Overvoltage
o) DC system under voltage/over voltage

Potential free 'NO' contacts of all above conditions shall be provided for following remote alarms in the DDCMIS:

q) Battery fuse fails
r) Battery on boost
s) Charger over load
t) Charger trouble (this being a group alarm initiated by any of the faults of charger other than charger over load).

6.2 Suitable potential free contacts for remote indication of above abnormal conditions shall be provided. Multiplication relays, if required, shall be included in the panel. Indications for charger input supply healthy, charger in FLOAT mode and charger in BOOST mode shall be provided.

7.0 NAME PLATE AND MARKING

The name plates shall be made of non-rusting metal / 3 ply Lamicoid and shall have black back ground with white engraved letters and secured by screws. These shall be provided near top edge on the front as well as on rear side of charger. Name plates with full and clear inscriptions shall also be provided on and inside the panels for identification of the various equipment.

8.0 PAINTING

After fabrication, all surfaces shall be cleaned and pre-treated as per IS:6005. Two coats of lead oxide primer (anti-corrosive) shall be applied after the pre-treatment. Two coats of powder painting with shade no. RAL-7032 or paint shade approved by customer shall be applied for complete panel. Thickness of paint shall be min. 40-50 microns. Protecting peelable compound shall be provided on outside finished surface to protect the painted surface during transportation and site handling.

9.0 PERFORMANCE GUARANTEE

The bidder shall guarantee that chargers offered shall meet the ratings and performance requirements stipulated for various equipment covered in this specification. If the equipment fails to meet the requirement, the supplier shall replace it with appropriate equipment free of cost without affecting the schedule.

10.0 INSPECTION & TESTING

10.1 The bidder shall confirm compliance to Quality plan enclosed with Section-I of specification. The Quality plan shall be subject to BHEL/ customer approval after award of contract without any commercial or delivery implication. Inspection shall be carried out as per BHEL/ customer approved Quality plan.

10.2 All equipment to be supplied shall be of type-tested quality. The bidder shall furnish all type test reports for BHEL/ customer approval. The Type tests should have been carried out within last seven years on the equipment similar to those proposed to be supplied under this contract and the tests should have been either conducted at an independent laboratory or should have been witnessed by a client/ government agency. In absence of such type tests reports or in case such reports are not found to be meeting the specification/ standards requirements, vendor shall conduct all such type tests without any commercial/ delivery implication to BHEL according to the relevant standards and reports shall be submitted to the owner for approval. Charges for carrying out all type tests are deemed to be included in the charger price.

10.3 The details of additional Type Tests to be conducted (as per project specific requirement) shall be as per Section-I/BOQ-Cum-Price Schedule of specification.

10.4 The bidder shall furnish following Type Tests reports for each type & rating of battery charger:

i) Temperature rise test for 8 Hrs at rated voltage and current at input and output of charger. Necessary input power source of required capacity as per charger rating along with DC load bank shall be arranged by vendor during Inspection/testing at works.

ii) Insulation resistance test

iii) High voltage test on power & control circuits except low voltage electronic circuit

iv) Ripple content test at no load, half and full load

v) Automatic voltage regulation operation test at specified AC supply variations at no load, half and full load

vi) Load limiter operation test.

vii) Efficiency and power factor measurement.

viii) Input and output surge withstand capacity test.

a) Across each AC input phases
b) Across AC input line to ground

c) Across DC output terminals
d) Across each DC output terminal to ground

The charger shall not exhibit any component damage and there shall be no deterioration in performance of the charger.

ix) Environmental Tests: Steady state performance tests (temperature rise test at full load & load limiter operation test) shall be carried out before & after the following tests.

a) Soak test: The electronic modules shall be subject to continuous operation for a minimum period of 72 hours. During last 48 hours, the ambient temperature shall be maintained at 50°C. The 48-hour test period shall be divided into 4 equal 12 hour segments. The input voltage during each 12 hours shall be nominal voltage for 11 hours followed by 110% of nominal voltage for 30 minutes, followed by 90% of nominal voltage for 30 minutes.

b) Degree of protection test

x) Complete physical examination

xi) Dynamic response test
Overshoot / undershoot in output voltage of the charger corresponding to sudden change in load from 100% to 20% and from 20% to 100%.

10.5 Rectifier transformers shall be subjected to following routine test as per IS: 11171:

a) Measurement of DC winding resistance

b) Measurement of voltage ratio and check of voltage vector relationship

c) Measurement of impedance of voltage , short-circuit impedance and load loss

d) Measurement of no-load loss (iron loss) and current

e) Separate-source voltage withstand test

f) Insulation resistance test

g) Induced overvoltage withstand test

h) High voltage Test

10.6 Following routine tests are to be performed on all battery chargers:

i) Complete physical examination.

ii) Insulation resistance test.

iii) High voltage (power frequency) test.

iv) Ripple content test at no load, half and full load.

v) AVR operation test at specified AC supply variation at no load, half and full load.

vi) Load limiter operation test.

vii) Checking of proper operation of annunciation system.

viii) Dynamic response test
Overshoot / undershoot in output voltage of the charger corresponding to sudden change in load from 100% to 20% and from 20% to 100%.

ix) Burn in test shall be carried out on all electronic modules or panels with modules. During the test the panel / module shall be subjected to ambient temperature of 50°C for 48 hours in energised condition. The temperature rise inside the cubicle shall not exceed 10°C during the test.

x) Degree of protection test
The charger shall be checked for gasket arrangement as per the drawings.

xi) Efficiency and power factor measurement.

10.7 Following routine tests shall be carried out on annunciation system:

i) Annunciation assembly and module shall be functionally tested as per EEUA-45D.

ii) Burn in test as specified above in cl. No. 10.5 (ix) above.

10.8 All material used for the construction of the equipment / items shall be new and shall be in accordance with the requirements of this specification. Materials utilised shall be those, which have established themselves for use in such applications.

10.9 All acceptance and routine tests as per relevant standards and specification, shall be carried out by the manufacturer. Charges for all these routine and acceptance tests for all the materials shall be deemed to be included in the charger price.

11.0 DOCUMENTATION

11.1 Documents to be submitted by the Bidder along with the bid:

1) Clause wise deviation if any in the enclosed format as per NIT.

2) Unpriced Price Schedule (as per NIT) with “quoted” word against line item with bidder’s signature and company stamp.

3) Compliance Sheet(Sec-I) with bidder’s signature and company stamp.

11.2 Over and above the documents mentioned in 11.1, the following minimum documents are to be submitted after the award of the contract for purchaser’s approval:

1) Brief write-up on the working of the system offered along with Installation, operation and maintenance manual for the battery charger, battery fuse and variable metallic resistor and shunt.
2) Data Sheet-C
3) General arrangement drawing showing the battery charger, Fuse Box & discharge resistor.
4) Wiring diagram.
5) Quality plan.

6) Transformers KVA and voltage rating calculation.

7) Thyristors rating, heat sink and fuse co-ordination calculation.

8) Blocking Diode rating & heat sink calculation.

9) Filter circuit calculation.

10) AC power consumption in float mode & boost mode.

11) List of make of major components.

12) Test certificates as required/ type test procedures

13) Field quality plan. Bidder shall furnish field quality plan detailing out the specific quality control procedure covering receipt of material/equipment and handling at site, storage, erection, commissioning, post commissioning etc.

14) List of E&C Spares

15) List of Mandatory Spares (If Applicable)

11.3 Instruction Manuals

Instruction manuals for the installation, operation and maintenance of battery charger, battery fuse and variable metallic resistor and shunt to be supplied at least two months before the date of despatch of equipment.

The installation and maintenance manual of battery charger, battery fuse and variable metallic resistor and shunt shall contain the following.

A) General description giving type and rating of equipment.

B) Technical data.

C) Salient constructional details.

D) Instruction to be followed on receipt at site.

E) Erection procedures and checks (handling at site, erection, pre-commissioning).

F) Commissioning procedures and site tests.

G) Routine, periodic and preventive inspection and maintenance procedures.

H) Safety rules.

J) Possible faults, their causes and remedies.

K) Catalogues, literature and drawings.

L) Outline dimension drawings showing constructional features, relevant cross sectional views and earthing details, operator oriented description of equipment and accessories.

M) Operating procedures, maintenance procedures & precautions to be taken during operation and maintenance work.

12.0 SPARES

12.1 Bidder to furnish the E & C spares as per BOQ-Cum-Price Schedule.

13.0 TOOLS AND TACKLE

Not applicable

14.0 AS-BUILT DRAWINGS

Though only supply of equipment is under bidder's scope, bidder may note that all as-built correction (as given by purchaser to vendor) shall have to be incorporated in the originals by the vendor and copies of the as-built corrected drawings / documents as per requirement shall be submitted by the vendor.

15.0 STATUTORY AND REGULATORY REQUIREMENTS

Statutory and regulatory requirements as per IE rule 1956 with amendment-3 rule 1986, rules Nos. 35, 42, 50 & 51 shall be adhered to.

16.0 PACKING:

Refer ANN-III for standard packing specification. However, manufacturer’s standard packing method equivalent/superior to as mentioned in Ann-III are also acceptable.

ANNEXURE-A

LIST OF APPLICABLE STANDARDS

1.	GUIDE FOR SURGE WITHSTAND CAPABILITY TESTS	ANSI-C 37.90a
2.	COLOURS FOR READY MIX PAINTS	IS-5
3.	PVC INSULATED CABLE FOR WORKING VOLTAGE 1100V	IS-694
4.	INDICATING ANALOGUE ELECTRICAL MEASURING INSTRUMENTS	IS-1248
5.	DOP FOR LV SWITCHGEAR AND CONTROL GEAR	IS-13947 PART-1
6.	SPECIFICATION FOR LV SWITCHGEAR AND CONTROL GEAR	IS-13947
7.	ELECTRICAL RELAYS FOR POWER SYSTEM PROTECTION	IS-3231
8.	APPLICATION GUIDE FOR ELECTRICAL RELAYS FOR AC SYSTEM	IS-3842
9.	MONO CRYSTALLINE SEMICONDUCTOR RECTIFIER CELLS & STACKS	IS-3895
10.	MONO CRYSTALLINE SEMICONDUCTOR RECTIFIER ASSEMBLIES & EQUIPMENT	IS-4540
11.	CODE OF PRACTICE FOR PHOSPHATING OF IRON & STEEL	IS-6005
12.	SAFETY CODE FOR SEMICONDUCTOR RECTIFIER EQUIPMENT	IS-6619
13.	CONTROL SWITCHES (SWITCHING DEVICES FOR CONTROL AND AUXILIARY CIRCUITS INCLUDING CONTACTOR RELAYS) FOR VOLTAGE UPTO 1000V AC OR 1200V DC	IS-6875
14.	ENVIRONMENTAL TESTING FOR ELECTRONIC & ELECTRICAL ITEMS	IS-9000
15.	LV FUSE FOR VOLTAGES BELOW 1000V AC OR 1500V DC	IS-13703
16.	PERFORMANCE REQUIREMENT FOR ALARM ANNUNCIATION SYSTEM	EEUA-45D
17.	POWER TRANSFORMERS	IS-2026
18.	DRY TYPE TRANSFORMER	IS-11171
19.	INDIAN ELECTRICITY RULES & INDIAN ELECTRICITY ACTS	

NOTE: Equipment complying to other internationally accepted standards such as IEC, BS, VDE etc. will also be considered if they ensure performance and constructional features equivalent or superior to standards listed above. In such a case, the bidder shall clearly indicate the standards adopted, furnish a copy in English of the latest revision of the standards along with copy of all official amendments and revisions and shall clearly bring out the salient features for comparison.

ANNEXURE-B

PACKING SPECIFICATION

CHARGER shall be despatched in “Crate Packing” using wood.

1.0 PREPARATION OF PACKING CASES:

1.1 DIMENSIONS:

1.1.1 Minimum number of planks shall be used for a shook.
1.1.2 Thickness of planks for Front, rear, top and bottom sides and binding, jointing battens shall be 25/20mm +2/-3 mm
1.1.3 Horizontal, vertical, diagonal planks shall be given for binding
1.1.4 Width of binding planks shall be minimum 100mm
1.1.5 Distance between any 2 binding planks shall be less than 750mm
1.1.6 Diagonal planks shall be used in between vertical binding planks when distance between inner to inner of vertical planks is more than 750mm
1.1.7 Distance of the outer edges of these planks from the edge of case shall be less than 250mm.
1.1.8 Diagonal planks are not required for top planks and width side, if the width of pallet is less than 750mm.

1.2 JOINTING OF PLANKS:

Single length planks shall be used for cubicles whose overall length is less than 2400 mm. For cubicles of length more than 2400 mm, jointing is permitted. The jointing shall be done with one single or maximum of 2 planks of wood same as other planks of width 250 mm (minimum) with two rows of nails on either side of the joint in zigzag manner. From the joint along height side, it shall be of lap joint with overlap of at least the width of plank.

1.3 PERMISSIBLE DEFECTS

Wood shall be free from knots, bows, visible sign of infection and any kind of decay caused by insects, fungus, etc.

End splits: Longest end splits at each end shall be measured and lengths added together. The added length shall not exceed 60mm per meter run of shook’s. Wood pins shall be used to prevent further development of split.

Surface cracks: Surface cracks with a maximum depth of 3mm are permissible. A continuous crack of any depth all along the length is not allowed.

1.4 OTHER MATERIALS

1.4.1 NAILS

Nils of suitable dia and length shall be used for joining the planks.

1.4.2 BLUE NAILS

If applicable, these shall be used for nailing bituminized Kraft paper/hessian cloth to the planks.

1.4.3 HOOP IRON STRIPS

These are used for strapping the boxes. The material shall be free from rust. If sufficient nailing is done for bigger boxes, strapping need not be done.

1.4.4 CLIPS

These shall be used for strapping the hoop iron strips on the boxes.

1.4.5 BRACKETS

Brackets of suitable dimension shall be used for nailing to the corners of cubicle boxes. The brackets shall be of mild steel of suitable thickness. The brackets shall be of “L" shape. Two holes shall be provided towards the end of each side for screwing /nailing.

1.4.6 MULTI LAYERED CROSS LAMINATED POLYTHELENE FILM

100GSM(colourless) Multi Layered Cross Laminated Polyethylene Film shall be used to make covers to the jobs individually. The cross lamination gives qualities of extra toughness, together with flexibility and lightness coupled with good weather resistance to ultra violet rays.

1.4.6 RUBBERISED COIR:

The rubberized coir is used as cushioning material. For the packing of loose items, items are to be arrested by using rubberized coir.

1.4.7 FASTENERS

Bolts, double nuts, spring washers will have to be used to hold the job to the bottom plank of the box so that there shall be no jerk on the CHARGER during transit.

1.4.8 PACKING SLIP:

Packing slip kept in the polyethylene bag shall be placed in the box at appropriate place. In addition, one more packing slip covered in polyethylene cover and packing slip holder shall be nailed to front / rear of case.

1.4.9 MARKING PLATE:

Marking on the packing case shall be done as per the manufacturer standard.

	ITEM (MATERIAL, CLASS, GRADE, RATING, RANGE, SIZE ETC.) : मद (सामग्री, वर्ग, ग्रेड, रैंटिंग, रेंज, आकार आदि): 220 V / 110 V BATTERY CHARGER (FLOAT CUM BOOST CHARGER)	STANDARD QUALITY PLAN स्टैण्डर्ड क़्वालिटी प्लान	QP NO / क्यूपी सं..:	0000-999-QOE– S-005A	REVIEWED BY: द्वारा समीक्षा की गई:	APPROVED BY: द्वारा अनुमोदित:
		CONFORMING TO CODE: कोड के अनुरूप: IS/IEC / NTPC TECHNICAL SPECIFICATION	REV NO / संशोधित सं..:	01	S.N. TRIPATHI SHAKTI NATH TRIPATHI	S S MISHRA SUDHANSHU SEKHAR MISHRA
			DATE/ तिथि	30.08.2022	S.K. LAL SUNIL KUMAR LAL Digitally signed by SUNIL KUMAR LAL Date: 2022.09.01 22:29:05 +05'30'	
			PAGE// पृष्ठ	Page 1 of 15		

SL. NO क्र.सं.	COMPONENT & OPERATIONS अवयव व संचालन	CHARACTERISTICS / विशेषताएं	CLASS वर्ग	TYPE OF CHECK जांच के प्रकार	QUANTUM OF CHECK जांच के परिमाण		REFERENCE DOCUMENT संदर्भ दस्तावेज#	ACCEPTANCE NORMS/ स्वीकृत मानदंड	FORMAT OF RECORD/ रिकॉर्ड का प्रारूप		AGENCY/ एजेंसी			REMARKS/टिप्पणियां
					M एम	C/ N सी/एन					M	C	N	
1.	2.	3.	4.	5.	6.		7.	8.	9.	D*	** 10			11

Note	
	1. A list of major components / bought out items is indicated at Appendix A. Makes for these will be proposed by the manufacturer along with the Endorsement Sheet for NTPC acceptance. 2. Documents identified in the SQP for NTPC verification will be maintained. However, other documents i.e. IR, In process Inspection Report & Mfr's TCs mentioned in the QP will also be maintained by the Manufacturer, which NTPC may verify on surveillance basis at the time of final inspection. QC Records in soft form are also acceptable.

1.0	**RAW MATERIAL**													
1.1	M.S. Sheet (CRCA)	1. Grade	Major	Visual	100%	-	Mfr drg	Mfr drg	IR		P	-	-	IR=Inspection record
		2.Thickness & Finish	Major	Physical	Sample/lot	-	NTPC Specification	NTPC Specification	-do-		P	-	-	
1.2	Powder Coating Paint	Shade	Major	Visual	Sample/Lot	-	IS-5(1994) SHADE CARD	NTPC appd drg / data sheet	-do-		P	-	-	
2.0	**MAJOR BOUGHT OUT ITEMS (REFER NOTE 1 ALSO)**													
2.1	Power Switches, MCCB Contactor & Relay	1)Type, Rating	Major	Physical	100%	100%	NTPC appd drg / data sheet	NTPC appd drg / data sheet	IR		P	V	V	
		2)Mechanical Operation/functional check	Major	Visual	100%	-	Mfr. Std.	Mfr std.	-do-		P	-	-	

LEGEND:/ संकेतिका: * RECORDS, INDENTIFIED WITH "TICK" (√) SHALL BE ESSENTIALLY INCLUDED BY SUPPLIER IN QA DOCUMENTATION./ * "टिक" (..) के साथ प्रमाणित रिकॉर्ड, क्यूए दस्तावेजीकरण में आपूर्तिकर्ता द्वारा अनिवार्य रूप से शामिल किया जाएगा।

** **M:** MANUFACTURER / SUB-SUPPLIER /निर्माता / उप-आपूर्तिकर्ता **C:** MAIN CONTRACTOR / मुख्य संविदाकार, **N**: NTPC/ एनटीपीसी **P:** PERFORM/ निष्पादन **W**: WITNESS/ गवाह AND **V:** VERIFICATION. AS APPROPRIATE/ सत्यापन (जैसा उपयुक्त हो), **CHP**/ सीएचपी: NTPC SHALL IDENTIFY IN COLUM "N" AS 'W'.: एनटीपीसी खंड "N" में **"W'** के रूप में करेगा ।

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1.	2.	3.	4.	5.	6.		7.	8.	9.		** 10			11
2.2	MCB, Push Buttons HRC fuse, terminal blocks, control & selector switches, Semiconductor Fuses, Heaters, Thermostat, Lamps, Plug in socket, Neutral Link, Lamp holders and Exhaust Fan, Heat sink	1)Type, Rating	Major	Visual	100%	-	NTPC appd drg / data sheet	NTPC appd drg / data sheet	-do-		P	-	-	
		2)Continuity Test	Major	Electrical	100%	-	Mfr std.	Mfr std.	-do-		P	-	-	
2.3	Rectifier bridge Elements	Type, Rating	Major	Visual	100%	100%	NTPC appd drg / data sheet	NTPC appd drg / data sheet	IR	√	P	V	V	
	SMPS based Rectifier	Make, Type, Rating & Model	Major	Visual	100%	100%	NTPC appd drg / data sheet	NTPC appd drg / data sheet	IR	√	P	V	V	In case of SMPS based rectifier, OEM MTC/COC is to be verified.
2.4	Digital Multi Function Meters	1)Type & Rating	Major	Visual	100%	100%	NTPC appd drg / data sheet	NTPC appd drg / data sheet	-do-		P	V	V	
		2)Calibration Certificate	Major	Visual	100%	100%	-do-	-do-	Mfr TC	√	V	V	V	
		3)Routine TC	Major	Electrical	100%	100%	-do-	-do-	-do-		V	V	V	

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	220 V / 110 V BATTERY CHARGER (FLOAT CUM BOOST CHARGER)	CONFORMING TO CODE: कोड के अनुरूप: IS/IEC / NTPC TECHNICAL SPECIFICATION	REV NO / संशोधित सं..:	01	S.N. TRIPATHI SHAKTI NATH TRIPATHI	S S MISHRA SUDHANSHU SEKHAR MISHRA
			DATE/ तिथि	30.08.2022	S.K. LAL SUNIL KUMAR LAL Digitally signed by SUNIL KUMAR LAL Date: 2022.09.01 22:30:04 +05'30'	
			PAGE// पृष्ठ	Page 3 of 15		

SL. NO क्र.सं.	COMPONENT & OPERATIONS अवयव व संचालन	CHARACTERISTICS / विशेषताएं	CLASS वर्ग	TYPE OF CHECK जांच के प्रकार	QUANTUM OF CHECK जांच के परिमाण		REFERENCE DOCUMENT संदर्भ दस्तावेज#	ACCEPTANCE NORMS/ स्वीकृत मानदंड	FORMAT OF RECORD/ रिकॉर्ड का प्रारूप		AGENCY/ एजेंसी			REMARKS/टिप्पणियां
					M एम	C/ N सी/एन					M	C	N	
1.	2.	3.	4.	5.	6.		7.	8.	9.	D*	** 10			11
2.5	PVC/XLPE Insulated Electric Cable	1)Make, Type & rating	Major	Visual	100%	At random	NTPC Specification / Data Sheet	NTPC Specification / Data Sheet	IR		P	V	V	All power cables to conform to IS:1554 and Control wires to conform to IS:694.
		2)Routine Test	Major	Electrical	Sample/lot	-	-do-	-do-	-do-		P	V	-	
2.6	Transducer	1)Routine TC & calibration report	Major	Electrical	100%	100%	NTPC Specification / Data Sheet / IS 12784	NTPC Specification / Data Sheet / IS 12784	Mfr TC	√	P	V	V	
		2)Type, Rating	Major	Visual	100%	100%	-do-	-do-	-do-		P	V	V	
2.7	Current Transformer, Dimmerstat Control Transformer	1)Routine Tests	Major	Electrical	100%	10%	NTPC appd drg / Data Sheet / IS 2705	NTPC appd drg / Data Sheet / IS 2705	Mfr TC	√	V	V	V	
		2)Type, Rating	Major	Visual	100%	10%	-do-	-do-	IR		P	V	V	
2.8	Busbar	1)Dimensional check	Major	Physical	100%	-	NTPC appd drg / Data Sheet	NTPC appd drg / Data Sheet	-do-		P	-	-	

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1.	2.	3.	4.	5.	6.		7.	8.	9.		** 10			11
		2)Conductivity Test	Major	Electrical	Sample/lot	-	-do-	-do-	-do-		P	-	-	
2.9	Annunciation facia (If Applicable)	All routine tests as per EEUA-45D	Major	Electrical	100%	100%	NTPC Specification / appd drg / data	NTPC Specification /	Mfr TC		P	V	V	
2.10	Visual Indications for charger status using LED /indicating lamps (if annunciation facia not used)	Electronic card used for indication (Refer Electronic card assembly & location at cl. No. 3.4, for checks)	Major	Electrical	100%	100%	NTPC Specification / appd drg / data sheet	NTPC Specification / appd drg / data sheet			P	V	V	
2.11	Rectifier transformer	1)Rating	Major	Visual	100%	100%	NTPC approved data sheet	NTPC approved data	IR	√	P	V	V	
		2)Dimensional check	Major	Physical	100%	100%	Mfr drg.	Mfr drg.	-do-	√	P	V	V	
		a)Overall size	Major	Physical	100%	100%	-do-	-do-	-do-	√	P	V	V	
		b)Mounting details	Major	Physical	100%	100%	-do-	-do-	-do-	√	P	V	V	
		3)Terminal Board	Major	Physical	100%	100%	-do-	-do-	-do-	√	P	V	V	

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			DATE/ तिथि	30.08.2022		
			PAGE// पृष्ठ	Page **5** of **15**	S.K. LAL SUNIL KUMAR LAL Digitally signed by SUNIL KUMAR LAL Date: 2022.09.01 22:30:51 +05'30'	S S MISHRA SUDHANSHU SEKHAR MISHRA

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					M एम	C/ N सी/एन				M	C	N	
1.	2.	3.	4.	5.	6.		7.	8.	9. D*	** 10			11
		4)Polarity Test	Major	Electrical	100%	100%	-do-	-do-	-do-	√ P	V	V	
		5)I.R. Test	Major	Electrical	100%	100%	-do-	-do-	-do-	√ P	V	V	
		6)Routine Tests											
		a)Voltage Ratio Test	Major	Electrical	100%	100%	NTPC approved data sheet / NTPC spec./IEC 146	NTPC approved data sheet / NTPC spec./IEC 146	IR / Mfr TC	√ P/V	V	V	
		b)DC Resistance Test	Major	Electrical	100%	100%	-do-	-do-	-do-	√ P/V	V	V	
		c)No Load Test & Measurement of iron losses	Major	Electrical	100%	100%	-do-	-do-	-do-	√ P/V	V	V	
		d)Measurement of Tap Voltages	Major	Electrical	100%	100%	-do-	-do-	-do-	√ P/V	V	V	
		e)Measurement of Cu. Losses	Major	Electrical	100%	100%	-do-	-do-	-do-	√ P/V	V	V	
		f)High voltage test	Major	Electrical	100%	100%	-do-	-do-	-do-	√ P/V	V	V	
		g)Induced High Voltage	Major	Electrical	100%	100%	-do-	-do-	-do-	√ P/V	V	V	

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			DATE/ तिथि	30.08.2022	S.K. LAL SUNIL KUMAR LAL Digitally signed by SUNIL KUMAR LAL Date: 2022.09.01 22:31:23 +05'30'	
			PAGE// पृष्ठ	Page 6 of 15		

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					M एम	C/ N सी/एन					M	C	N	
1.	2.	3.	4.	5.	6.		7.	8.	9.	D*	** 10			11
		h)Heat run Test	Major	Electrical	100%	100%	-do-	-do-	-do-	√	P/V	V	V	Temp. rise limited to approved datasheet insulation class value.
2.12	Choke	1)Rating	Major	Physical	100%	100%	NTPC approved data sheet	NTPC approved data	IR	√	P	V	V	
		2)Dimentional check	Major	Physical	100%	100%	Mfr drg.	Mfr drg.	-do-	√	P	V	V	
		a)Overall Size			100%	100%	-do-	-do-	-do-	√	P	V	V	
		b)Mounting details			100%	100%	-do-	-do-	-do-	√	P	V	V	
		3)Terminal Board / Bakelite plate and busbar size	Major	Physical	100%	100%	-do-	-do-	-do-	√	P	V	V	
		4)Terminal rating	Major	Physical	100%	100%	-do-	-do-	-do-	√	P	V	V	
		5)Air Gap Measurement	Major	Physical	100%	100%	-do-	-do-	-do-	√	P	V	V	
		6)Continuity test	Major	Elec.	100%	100%	-do-	-do-	-do-	√	P	V	V	

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** **M:** MANUFACTURER / SUB-SUPPLIER /निर्माता / उप-आपूर्तिकर्ता **C:** MAIN CONTRACTOR / मुख्य संविदाकार, **N**: NTPC/ एनटीपीसी **P:** PERFORM/ निष्पादन **W**: WITNESS/ गवाह AND **V:** VERIFICATION. AS APPROPRIATE/ सत्यापन (जैसा उपयुक्त हो), **CHP**/ सीएचपी: NTPC SHALL IDENTIFY IN COLUM "N" AS 'W'.: एनटीपीसी खंड "N" में **"W'** के रूप में करेगा ।

SL. NO क्र.सं.	COMPONENT & OPERATIONS अवयव व संचालन	CHARACTERISTICS / विशेषताएं	CLASS वर्ग	TYPE OF CHECK जांच के प्रकार	QUANTUM OF CHECK जांच के परिमाण M एम	QUANTUM OF CHECK जांच के परिमाण C/ N सी/एन	REFERENCE DOCUMENT संदर्भ दस्तावेज#	ACCEPTANCE NORMS/ स्वीकृत मानदंड	FORMAT OF RECORD/ रिकॉर्ड का प्रारूप	D*	AGENCY/ एजेंसी M	AGENCY/ एजेंसी C	AGENCY/ एजेंसी N	REMARKS/टिप्पणियां
1.	2.	3.	4.	5.	6.		7.	8.	9.		** 10			11
		7)Insulation Resistance	Major	Elec.	100%	100%	NTPC approved data sheet / NTPC spec./IEC 146	NTPC approved data sheet / NTPC spec./IEC 146	IR / Mfr TC	√	P/V	V	V	
		8)High Voltage test	Major	Elec.	100%	100%	-do-	-do-	-do-	√	P/V	V	V	
		9)DC resistance test	Major	Elec.	100%	100%	-do-	-do-	-do-	√	P/V	V	V	
		10)Heat run Test	Major	Electrical	100%	100%	-do-	-do-	-do-	√	P/V	V	V	Temp. rise limited to approved datasheet insulation class value.
2.12	Printed Circuit Boards	1)Visual Checks	Major	Physical	100%	-	Mfr drg & NTPC spec.	Mfr deg & NTPC spec.	IR		P	-	-	
		2)Compliance report	Major	-	100%	-	NTPC spec. req. for PCB	NTPC spec. req. for PCB	-do-		P	-	-	
3.0	**IN PROCESS INSPECTION**													
3.1	Enclosure fabrication	1)Dimensional checks	Major	Physical	100%	-	Mfr Fabrication Drawing	Mfr Fabrication Drawing	IPIR		P	-	-	IPIR = In Process Inspection Report

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1.	2.	3.	4.	5.	6.		7.	8.	9.		** 10			11
		2)Diagonal (Skewness)	Major	Physical	-do-	-	-do-	-do-	-do-		P	-	-	
		3)Straightness	Major	Physical	-do-	-	-do-	-do-	-do-		P	-	-	
		4)Welded Joints	Major	Visual	-do-	-	-do-	-do-	-do-		P	-	-	
		5)Deburring & Finishing of welded joints	Major	Visual	-do-	-	-do-	-do-	-do-		P	-	-	
3.2	Pre treatment of enclosure	1)Degreasing	Major	Physical	-do-	-	IS 6005 / Mfr Std Practice	IS 6005 / Mfr Std Practice	-do-		P	-	-	
		2)Water rinsing	Major	Physical	-do-	-	-do-	-do-	-do-		P	-	-	
		3)Derusting	Major	Physical	-do-	-	-do-	-do-	-do-		P	-	-	
		4)Water rinsing	Major	Physical	-do-	-	-do-	-do-	-do-		P	-	-	
		5)Phosphating	Major	Physical	-do-	-	-do-	-do-	-do-		P	-	-	
		6)Water Rinsing	Major	Physical	-do-	-	-do-	-do-	IPIR		P	-	-	
		7)Hot-Chromating	Major	Physical	-do-	-	-do-	-do-	-do-		P	-	-	

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	ITEM (MATERIAL, CLASS, GRADE, RATING, RANGE, SIZE ETC.) : मद (सामग्री, वर्ग, ग्रेड, रैंटिंग, रेंज, आकार आदि): 220 V / 110 V BATTERY CHARGER (FLOAT CUM BOOST CHARGER)	STANDARD QUALITY PLAN स्टैण्डर्ड क़्वालिटी प्लान	QP NO / क्यूपी सं..:	0000-999-QOE– S-005A	REVIEWED BY: द्वारा समीक्षा की गई:	APPROVED BY: द्वारा अनुमोदित:
		CONFORMING TO CODE: कोड के अनुरूप: IS/IEC / NTPC TECHNICAL SPECIFICATION	REV NO / संशोधित सं..:	01	S.N. TRIPATHI SHAKTI NATH TRIPATHI	
			DATE/ तिथि	30.08.2022	S.K. LAL SUNIL KUMAR LAL Digitally signed by SUNIL KUMAR LAL Date: 2022.09.01 22:32:44 +05'30'	S S MISHRA SUDHANSHU SEKHAR MISHRA
			PAGE// पृष्ठ	Page 9 of 15		

SL. NO क्र.सं.	COMPONENT & OPERATIONS अवयव व संचालन	CHARACTERISTICS / विशेषताएं	CLASS वर्ग	TYPE OF CHECK जांच के प्रकार	QUANTUM OF CHECK जांच के परिमाण M एम	QUANTUM OF CHECK जांच के परिमाण C/ N सी/एन	REFERENCE DOCUMENT संदर्भ दस्तावेज#	ACCEPTANCE NORMS/ स्वीकृत मानदंड	FORMAT OF RECORD/ रिकॉर्ड का प्रारूप	D*	AGENCY/ एजेंसी M	AGENCY/ एजेंसी C	AGENCY/ एजेंसी N	REMARKS/टिप्पणियां
1.	2.	3.	4.	5.	6.		7.	8.	9.		** 10			11
		8)Sealing (If used)	Major	Physical	-do-	-	-do-	-do-	-do-		P	-	-	
3.3	Powder Coating	1)Shade, thickness & finish	Major	Cross Hatch	Random	-	-do-	-do-	-do-		P	-	-	
		2)Adhesion check by cross hatch method	Major	Visual	100%	-	-do-	-do-	-do-		P	-	-	
3.4	Electronic card assembly & location	1)Check electronic cards are modular fitted in standard 19" metal racks with guides	Major	Visual	100%	100%	NTPC spec.	NTPC spec.	-do-		P	V	V	
		2)Check for mechanical interlock to avoid wrong insertion of cards	Major	Visual	100%	100%	NTPC spec.	NTPC spec.	-do-		P	V	V	
		3)Check for correct electronic components	Major	Visual	100%	-	Mfr drg.	Mfr drg.	-do-		P	-	-	
		4)Check for jumpers / track modifications	Major	Visual	100%	random	NTPC spec.	No unplanned jumpers / track modifications	-do-		P	V	V	

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1.	2.	3.	4.	5.	6.		7.	8.	9.		** 10			11
		5)Check finish of electronic cards	Major	Visual	100%	-	Mfr drg.	No dry soldering	-do-		P	-	-	
		6)Environmental check on cards to remove cards with infant mortal components	Major	Visual	100%	-	Mfr drg.	Mfr drg.	-do-		P	-	-	
3.5	Assembly of components & Modules	1.Transformer & choke	Major	Visual	100%	-	Mfr drg.	Mfr drg.	-do-		P	-	-	
		2.Mounting of components such as switches rectifiers stack, fuses, meter and contractor	Major	Visual	100%	-	-do-	-do-	-do-		P	-	-	
		3.Minimum clearance between busbar	Major	Visual	100%	-	-do-	-do-	-do-		P	-	-	

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1.	2.	3.	4.	5.	6.		7.	8.	9.		** 10			11
		4.Electronic cards location inside panels	Major	Visual	100%	100%	NTPC spec.	Temp. rise of the location should not exceed 10^c over ambient during heat run test	-do-		P	V	V	
3.6	Wiring	1.Bunching	Major	Visual	100%	-	-do-	-do-	-do-		P	-	-	
		2.Marking	Major	Visual	100%	-	-do-	-do-	-do-		P	-	-	
		3.Ferruling	Major	Visual	100%	-	-do-	-do-	-do-		P	-	-	
		4.Lugs crimping	Major	Physical	100%	-	-do-	-do-	-do-		P	-	-	
		5.Continuity	Major	Electrical	100%	-	-do-	-do-	-do-		P	-	-	
		6.Identification labels	Major	Visual	100%	-	-do-	-do-	-do-		P	-	-	
3.7	Finishing of Equipment	1.Proper pasting of gasket	Major	Visual	100%	-	-do-	-do-	-do-		P	-	-	
		2.Earthing busbar	Major	Physical	100%	-	-do-	-do-	-do-		P	-	-	
	Note : Review of type test clearance from NTPC Engineering													

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		CONFORMING TO CODE: कोड के अनुरूप: IS/IEC / NTPC TECHNICAL SPECIFICATION	REV NO / संशोधित सं..:	01	S.N. TRIPATHI SHAKTI NATH TRIPATHI	
			DATE/ तिथि	30.08.2022		
			PAGE// पृष्ठ	Page 12 of 15	S.K. LAL SUNIL KUMAR LAL Digitally signed by SUNIL KUMAR LAL Date: 2022.09.01 22:33:57 +05'30'	S S MISHRA SUDHANSHU SEKHAR MISHRA

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					M एम	C/ N सी/एन					M	C	N	
1.	2.	3.	4.	5.	6.		7.	8.	9.	D*	** 10			11
4.0	**Final Inspection**													
4.1	**Overall**	1.Dimensional & Sheet Thickness	Major	Physical	100%	Random	NTPC approved drawings & data sheet	NTPC approved drawings & data sheet	IR	√	P	W	W	
		2.Gen.Arr. & B.O.M.	Major	Visual	100%	100%	-do-	-do-	-do-	√	P	W	W	
		3.Aesthetic Look, Straightness, Skewness, Door Alignment, Labels etc.	Major	Visual	100%	Random	-do-	-do-	-do-	√	P	W	W	
		4.Provision of lifting arrangement	Major	Visual	100%	-do-	-do-	-do-	-do-	√	P	W	W	
		5.Proper earthing	Major	Visual	100%	-do-	-do-	-do-	-do-	√	P	W	W	
		6.Gasketing (Check with 1mm wire)	Major	Visual	100%	-do-	-do-	-do-	-do-	√	P	W	W	
		7.Gland Plat arrangement	Major	Visual	100%	-do-	-do-	-do-	-do-	√	P	W	W	
		8.Mounting arrangement	Major	Visual	100%	-do-	-do-	-do-	-do-	√	P	W	W	
		9.Wiring quality	Major	Visual	100%	-do-	-do-	-do-	-do-	√	P	W	W	

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	220 V / 110 V BATTERY CHARGER (FLOAT CUM BOOST CHARGER)	CONFORMING TO CODE: कोड के अनुरूप: IS/IEC / NTPC TECHNICAL SPECIFICATION	REV NO / संशोधित सं..:	01	S.N. TRIPATHI SHAKTI NATH TRIPATHI	S S MISHRA SUDHANSHU SEKHAR MISHRA
			DATE/ तिथि	30.08.2022	S.K. LAL SUNIL KUMAR LAL Digitally signed by SUNIL KUMAR LAL Date: 2022.09.01 22:34:19 +05'30'	
			PAGE// पृष्ठ	Page 13 of 15		

SL. NO क्र.सं.	COMPONENT & OPERATIONS अवयव व संचालन	CHARACTERISTICS / विशेषताएं	CLASS वर्ग	TYPE OF CHECK जांच के प्रकार	QUANTUM OF CHECK जांच के परिमाण		REFERENCE DOCUMENT संदर्भ दस्तावेज#	ACCEPTANCE NORMS/ स्वीकृत मानदंड	FORMAT OF RECORD/ रिकॉर्ड का प्रारूप	AGENCY/ एजेंसी			REMARKS/टिप्पणियां
					M एम	C/ N सी/एन				M	C	N	
1.	2.	3.	4.	5.	6.		7.	8.	9. D*	** 10			11
		10.Paint shade, Adhesion and Thickness check	Major	Visual	100%	-do-	-do-	-do-	-do-	√	P	W	W	
4.2	Electrical Testing	1)Burn in check at 50^C for 48 hrs in energized condition	Major	Electrical	100%	100%	NTPC specification & appd Data sheet	NTPC specification & appd Data sheet	IR	√	P	V	V	Burn In test to be performed before offering for NTPC Inspection.
		2)AVR operation Test with input voltage variation of +/- 10%	Major	Electrical	100%	100%	-do-	-do-	-do-	√	P	W	W	
		a)No Load					-do-	-do-	-do-	√	P	W	W	
		b)Half Load					-do-	-do-	-do-	√	P	W	W	
		c)Full Load					-do-	-do-	-do-	√	P	W	W	
		3)Ripple Test	Major	Electrical	100%	100%	-do-	-do-	-do-	√	P	W	W	
		a)No Load					-do-	-do-	-do-	√	P	W	W	
		b)Half Load					-do-	-do-	-do-	√	P	W	W	
		c)Full Load					-do-	-do-	-do-	√	P	W	W	

LEGEND:/ संकेतिका: * RECORDS, INDENTIFIED WITH "TICK" (√) SHALL BE ESSENTIALLY INCLUDED BY SUPPLIER IN QA DOCUMENTATION./ * "टिक" (..) के साथ प्रमाणित रिकॉर्ड, क्यूए दस्तावेजीकरण में आपूर्तिकर्ता द्वारा अनिवार्य रूप से शामिल किया जाएगा।

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	ITEM (MATERIAL, CLASS, GRADE, RATING, RANGE, SIZE ETC.) : मद (सामग्री, वर्ग, ग्रेड, रैंटिंग, रेंज, आकार आदि): **220 V / 110 V BATTERY CHARGER (FLOAT CUM BOOST CHARGER)**	**STANDARD QUALITY PLAN** स्टैण्डर्ड क़्वालिटी प्लान	QP NO / क्यूपी सं..:	0000-999-QOE– S-005A	REVIEWED BY: द्वारा समीक्षा की गई:	APPROVED BY: द्वारा अनुमोदित:
		CONFORMING TO CODE: कोड के अनुरूप: IS/IEC / NTPC TECHNICAL SPECIFICATION	REV NO / संशोधित सं..:	01	S.N. TRIPATHI SHAKTI NATH TRIPATHI	S S MISHRA SUDHANSHU SEKHAR MISHRA
			DATE/ तिथि	30.08.2022	S.K. LAL SUNIL KUMAR LAL Digitally signed by SUNIL KUMAR LAL Date: 2022.09.01 22:34:57 +05'30'	
			PAGE// पृष्ठ	Page **14** of **15**		

SL. NO क्र.सं.	COMPONENT & OPERATIONS अवयव व संचालन	CHARACTERISTICS / विशेषताएं	CLASS वर्ग	TYPE OF CHECK जांच के प्रकार	QUANTUM OF CHECK जांच के परिमाण		REFERENCE DOCUMENT संदर्भ दस्तावेज#	ACCEPTANCE NORMS/ स्वीकृत मानदंड	FORMAT OF RECORD/ रिकॉर्ड का प्रारूप		AGENCY/ एजेंसी			REMARKS/टिप्पणियां
					M एम	C/ N सी/एन					M	C	N	
1.	2.	3.	4.	5.	6.		7.	8.	9.	D*	** 10			11
		4)Logic simulation / interlocks / General Operation test	Major	Electrical	100%	100%	-do-	-do-	-do-	√	P	W	W	
		a)Trickle / boost mode selector switch operation	Major	Electrical	100%	100%	-do-	-do-	-do-	√	P	W	W	
		b)Auto / manual selector switch operation	Major	Electrical	100%	100%	-do-	-do-	-do-	√	P	W	W	
		c)Soft start feature check	Major	Electrical	100%	100%	-do-	-do-	-do-	√	P	W	W	
		d)Uniform step-less trickle mode voltage adjustment in auto / manual operation	Major	Electrical	100%	100%	-do-	-do-	-do-	√	P	W	W	
		e)Boost charge mode current adjustment from 50% to 100% continuously	Major	Electrical	100%	100%	-do-	-do-	-do-	√	P	W	W	
		5)Control Circuit and Charger status indication test	Major	Electrical	100%	100%	-do-	-do-	-do-	√	P	W	W	
		6)Load Limiter Operation	Major	Electrical	100%	100%	-do-	-do-	-do-	√	P	W	W	

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	ITEM (MATERIAL, CLASS, GRADE, RATING, RANGE, SIZE ETC.) : मद (सामग्री, वर्ग, ग्रेड, रैंटिंग, रेंज, आकार आदि): 220 V / 110 V BATTERY CHARGER (FLOAT CUM BOOST CHARGER)	STANDARD QUALITY PLAN स्टैण्डर्ड क़्वालिटी प्लान	QP NO / क्यूपी सं..:	0000-999-QOE– S-005A	REVIEWED BY: द्वारा समीक्षा की गई:	APPROVED BY: द्वारा अनुमोदित:
		CONFORMING TO CODE: कोड के अनुरूप: IS/IEC / NTPC TECHNICAL SPECIFICATION	REV NO / संशोधित सं..:	01	S.N. TRIPATHI SHAKTI NATH TRIPATHI	S S MISHRA SUDHANSHU SEKHAR MISHRA
			DATE/ तिथि	30.08.2022	S.K. LAL SUNIL KUMAR LAL Digitally signed by SUNIL KUMAR LAL Date: 2022.09.01 22:35:41 +05'30'	
			PAGE// पृष्ठ	Page 15 of 15		

SL. NO क्र.सं.	COMPONENT & OPERATIONS अवयव व संचालन	CHARACTERISTICS / विशेषताएं	CLASS वर्ग	TYPE OF CHECK जांच के प्रकार	QUANTUM OF CHECK जांच के परिमाण		REFERENCE DOCUMENT संदर्भ दस्तावेज#	ACCEPTANCE NORMS/ स्वीकृत मानदंड	FORMAT OF RECORD/ रिकॉर्ड का प्रारूप		AGENCY/ एजेंसी			REMARKS/टिप्पणियां
					M एम	C/ N सी/एन					M	C	N	
1.	2.	3.	4.	5.	6.		7.	8.	9.	D*	** 10			11
		7)Heat Run Test	Major	Electrical	One unit	One unit	-do-	-do-	-do-	√	P	*	*	* Witness on one unit if temperature rise test as a type test is waived off.
		8)Dynamic response test	Major	Electrical	100%	100%	-do-	-do-	-do-	√	P	W	W	
		9)Input AC current measurement Test	Major	Electrical	100%	100%	-do-	-do-	-do-	√	P	W	W	
		10)Degree of protection check for IP 4X	Major	Electrical	100%	100%	-do-	-do-	-do-	√	P	W	W	
		11)I.R. Test	Major	Electrical	100%	100%	-do-	-do-	-do-	√	P	W	W	
		12)H.V. Test	Major	Electrical	100%	100%	-do-	-do-	-do-	√	P	W	W	

APPENDIX A :- List of Components / Bought Out Items for which makes have to be identified at the time of Endorsement

Sl. No.	Name of Components / Items	Sl. No.	Name of Components / Items	SL. No.	Name of Components / Items	Sl. No.	Name of Components / Items
1.	Power Switches AC	6.	MCB	11.	Semiconductor Fuses	16.	Current Transformer, Voltage Transformer, Control Transformer
2.	Power Switches DC	7.	Push Buttons	12.	Rectifier Bridge Elements (Diodes, SCRs, IGBT)	17.	Annunciation facia (If Applicable)
3.	MCCB	8.	HRC Fuse	13.	SMPS	18.	Rectifier Transformer
4.	Contactors	9.	Terminal Blocks	14.	Digital Multi Function Meters	19.	Choke
5.	Relay	10.	Control & Selector Switches	15.	Transducer	20.	Filter Condenser

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** **M:** MANUFACTURER / SUB-SUPPLIER /निर्माता / उप-आपूर्तिकर्ता **C:** MAIN CONTRACTOR / मुख्य संविदाकार, **N**: NTPC/ एनटीपीसी **P:** PERFORM/ निष्पादन **W**: WITNESS/ गवाह AND **V:** VERIFICATION. AS APPROPRIATE/ सत्यापन (जैसा उपयुक्त हो), **CHP**/ सीएचपी: NTPC SHALL IDENTIFY IN COLUM "N" AS 'W'.: एनटीपीसी खंड "N" में **"W'** के रूप में करेगा ।

	MANUFACTURER/ BIDDER/ SUPPLIER NAME & ADDRESS	STANDARD QUALITY PLAN			SPEC NO.:-PE-TS-XXX-508-E002	DATE:-
		CUSTOMER			QP NO.:-PE-QP-999-508-E003, REV.03	DATE:- 27/02/2024
		PROJECT			P.O NO.:-	DATE:-
		ITEM:- BATTERY CHARGER(SCR BASED)	SYSTEM:- DC SYSTEM		SECTION:-	SHEET 8 OF 9

SL. NO.	COMPONENT & OPERATIONS	CHARACTERISTIC CHECK	CLASS	TYPE OF CHECK	QUANTUM OF CHECK		REFERENCE DOCUMENT	ACCEPTANCE NORM	FORMAT OF RECORD		AGENCY			REMARKS
1	2	3	4	5	6		7	8	9	D *	10			11
					M	B/C					**			
											M	B	C	
5	Battery Fuse/MCCB Box	1) Dimensional check & Sheet Thickness	MA	Physical	100%	100%	Approved drg/ doc	Approved drg/ doc	Inspection Report	√	P	W	W	
		2) Fuse/MCCB Rating	MA	Visual	100%	100%	-do-	-do-	-do-	√	P	W	W	
		3) Insulation Resistance (I.R) Test	MA	Electrical	100%	100%	IS-13947	IS-13947	-do-	√	P	W	W	
		4) Paint shade, Adhesion & thickness check	MA	Visual	100%	Random	Approved drg/ doc & Shade Card(IS-5)	Approved drg/ doc & Shade Card(IS-5)	-do-	√	P	W	W	
		5) Functional Test (operation check of fuse fail relay / card) for fuse box	MA	Electrical	100%	100%	Approved drg/ doc	Approved drg/ doc	Inspection Report	√	P	W	W	
6	Discharge Resistor	1) Dimensional check & Sheet Thickness	MA	Physical	100%	100%	Approved drg/ doc	Approved drg/ doc	Inspection Report	√	P	W	W	
		2) Resistance rating	MA	Electrical	100%	100%	-do-	-do-	-do-	√	P	W	W	
		3) Insulation Resistance (I.R) Test	MA	Electrical	100%	100%	IS-13947	IS-13947	-do-	√	P	W	W	
		4) Paint shade, Adhesion & thickness check	MA	Visual	100%	Random	Approved drg/ doc & Shade Card(IS-5)	Approved drg/ doc & Shade Card(IS-5)	-do-	√	P	W	W	

BHEL						BIDDER/SUPPLIER		FOR CUSTOMER REVIEW & APPROVAL			
ENGGINEERING			QUALITY			Sign & Date		Doc No.			
	Sign & Date	Name		Sign & Date	Name				Sign & Date	Name	Seal
Prepared By	KANHAIYA KUMAR	Kanhaiya Kumar	Prepared By	04/03/24	Mintoo	Seal		Reviewed By			
Checked By	Ayan Saha	Ayan Saha	Checked By	4/3/24	Harish Kumar			Checked By			

	MANUFACTURER/ BIDDER/ SUPPLIER NAME & ADDRESS	STANDARD QUALITY PLAN			SPEC NO.:-PE-TS-XXX-508-E002	DATE:-
		CUSTOMER			QP NO.:-PE-QP-999-508-E003, REV.03	DATE:- 27/02/2024
		PROJECT			P.O NO.:-	DATE:-
		ITEM:- BATTERY CHARGER(SCR BASED)	SYSTEM:- DC SYSTEM		SECTION:-	SHEET 9 OF 9

SL. NO.	COMPONENT & OPERATIONS	CHARACTERISTIC CHECK	CLASS	TYPE OF CHECK	QUANTUM OF CHECK		REFERENCE DOCUMENT	ACCEPTANCE NORM	FORMAT OF RECORD		AGENCY			REMARKS
1	2	3	4	5	6		7	8	9	D *	10			11
					M	B/C					**			
											M	B	C	
		5) Functional Test	MA	Electrical	100%	100%	Approved drg/ doc	Approved drg/ doc	Inspection Report	√	P	W	W	
7	Cable Lugs and Glands	1) Visual	MA	Visual	100%	100%	Approved drg/ doc	Approved drg/ doc	Inspection Report	√	P	W	-	
8	Packing	1) Surface Finish & Completeness	MA	Visual	100%	100%	Approved drg/ doc/ As Per Manufacturer Std./ Approved Packing drg/ doc(^^)	Approved drg/ doc/ As Per Manufacturer Std./ Approved Packing drg/ doc(^^)	-do-	√	P	W	-	(^^)- Approved Packing Drg./ Doc Applicable for Export Job/Projects

LEGENDS :

* RECORDS, INDENTIFIED WITH "TICK"(√) SHALL BE ESSENTIALLY INCLUDED BY SUPPLIER IN QA DOCUMENTATION,

** **M:** SUPPLIER/ MANUFACTURER/ SUB-SUPPLIER, **B:** MAIN SUPPLIER/ BHEL/ THIRD PARTY INSPECTION AGENCY, **C:** CUSTOMER

P: PERFORM, **W:** WITNESS, **V:** VERIFICATION, AS APPROPRIATE

MA: MAJOR, **MI:** MINOR, **CR:** CRITICAL, **D:** DOCUMENTATION

BHEL						BIDDER/SUPPLIER		FOR CUSTOMER REVIEW & APPROVAL			
ENGGINEERING			QUALITY			Sign & Date		Doc No.			
	Sign & Date	Name		Sign & Date	Name	Seal			Sign & Date	Name	Seal
Prepared By	KANHAIYA KUMAR	Kanhaiya Kumar	Prepared By	04/03/24	Mintoo			Reviewed By			
Checked By	Ayan Saha	Ayan Saha	Checked By	4/3/24	Harish Kumar			Checked By			

BHEL	**PRE-QUALIFICATION REQUIRMENTS FOR DC BATTERY CHARGER RATE CONTRACT (NTPC Varient)**	PE-RC-999-508-E002 REVISION NO. 0 DATE 09.09.2025 SHEET NO. 1 OF 1

ITEMS:
220V DC, SCR based full wave fully Controlled Battery Charger, Battery Fuse Box and Discharge Resistor.

SCOPE: Supply : YES; Erection & Commissioning : NO; Supervision of Erection & Commissioning : YES;

1	Vendor should be designer & manufacturer of the applicable type of Battery charger.
2	Availability of type test certificates conducted at independent Lab or witnessed by third party as per IS/ International standards for the applicable type of Battery charger.
3	In-house capability to carry out all routine and acceptance tests as per IS/ International standards for the applicable type of Battery charger.
4	Bidder/ Sub Vendor should have manufactured and supplied at least one (1) number of static automatic voltage regulator type Battery Chargers of highest required rating or above, in at least one (1) industrial installation, which should have been in successful operation for at least one (1) year.
5	Minimum two (2) nos. purchase orders for the applicable type of battery charger shall be submitted which should not be more than five (5) years old from the date of date of techno- commercial bid opening for establishing continuity in business.

Notes:

1. Consideration of offer shall be subject to customer's approval of bidders, if applicable.
2. Bidder to submit all supporting documents in English. If documents submitted by bidder are in language other than English, a self-attested English translated document should also be submitted.
3. Notwithstanding anything stated above, BHEL reserves the right to assess the capabilities and capacity of the bidder to perform the contract, should the circumstances warrant such assessment in the overall interest of BHEL.
4. After satisfactory fulfillment of all the above criteria/ requirement, offer shall be considered for further evaluation as per NIT and all the other terms of the tender.
5. Attached annexure (Annexure-I) to be filled by the bidder on quality & general terms. Requisite documents (like factory registration certificate, R&D set-up details etc.) asked in Annexure-I, shall also be attached as Annexure-F2.1 to Annexure-F2.17 along with the filed response in Annexure-I.

PREPARED BY	CHECKED BY	REVIEWED BY	APPROVED BY
09/09/25	09/09/25	09/9/25	

ANNEXURE-1

SUB-VENDOR QUESTIONNAIRE

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

ANNEXURE-1

SUB-VENDOR QUESTIONNAIRE

12.	*Manufacturing facilities* *(List of machines, special process facilities, material handling etc.)*	*Details attached at Annexure – F2.8*
13.	*Testing facilities* *(List of testing equipment)*	*Details attached at Annexure – F2.9*
14.	*If manufacturing process involves fabrication then-* *List of qualified Welders* *List of qualified NDT personnel with area of specialization*	*Applicable / Not applicable* *Details attached at Annexure – F2.10* *(if applicable)*
15.	*List of out-sourced manufacturing processes with Sub-Vendors' names & addresses*	*Applicable / Not applicable* *Details attached at Annexure. –F2.11* *(if applicable)*
16.	*Supply reference list including recent supplies*	*Details attached at Annexure – F2.12* *(as per format given below)*

Project/ package	*Customer Name*	*Supplied Item (Type/Rating/Model /Capacity/Size etc)*	*PO ref no/date*	*Supplied Quantity*	*Date of Supply*

17.	*Product satisfactory performance feedback letter/certificates/End User Feedback*	*Attached at annexure - F2.13*
18.	*Summary of Type Test Report (Type Test Details, Report No, Agency, Date of testing) for the proposed product (similar or higher rating)* *Note:- Reports need not to be submitted*	*Applicable / Not applicable* *Details attached at Annexure – F2.14* *(if applicable)*
19.	*Statutory / mandatory certification for the proposed product*	*Applicable / Not applicable* *Details attached at Annexure – F2.15* *(if applicable)*
20.	*Copy of ISO 9001 certificate* *(if available)*	*Attached at Annexure – F2.16*
21.	*Product technical catalogues for proposed item (if available)*	*Details attached at Annexure – F2.17*

Name:		*Desig:*		*Sign:*		*Date:*	

Company's Seal/Stamp:-

22.00.00

Sub QR Data to be filled in to meet the provenness requirements (Refer Clause No. 5.4.0 of Sub-Section-I intent of specification, Part-A, Section-VI) **for Battery Charger**

S.No.	Item Description
1.1	Numbers and Rating of static automatic voltage regulator type battery chargers manufactured and supplied and installed at two (2) different industrial installations and which are in successful operation for at least two (2) years.
1.01.00	Name & address of Manufacturer
1.02.00	Name of the plant(s) and its location(s)
1.03.00	Client(s) name and its address, Fax and Tel. No.
1.04.00	Name and designation of the responsible person in client's organisation
1.05.00	Contract No. & Date
1.06.00	Date of commissioning
1.07.00	No. of years in successful operation for above Battery chargers
1.08.00	Certificate from client(s) in support of the above stated experience has been enclosed at Annexure.....

Note : 1) Certificates from the client for the successful operation for each of the above shall be Submitted.

2) Supporting documents/ reference data as applicable shall be submitted.

Date :

Place :

(Signature).....

(Printed Name).....

(Designation).....

(Common seal).....

Signature of authorized signatory.....

PACKAGE: DC BATTERY CHARGER
PROJECT: FRAMEWORK AGREEMENT (RATE CONTRACT)
ENQUIRY NO.:77/25/6171/SUM dated 27.10.2025
SUPPLIER NAME:

PRICE SCHEDULE

S. No.	ITEM DESCRIPTION	Unit	Total Quantity	UNIT PRICE (EX-WORKS) (INR)	TOTAL PRICE (EX-WORKS) (INR)	FREIGHT CHARGES (EXCLUDING GST) @ ____% OF TOTAL EX-WORKS	FREIGHT CHARGES EXCLUDING GST (INR)	Applicable GST @___% (on "Total EX-WORKS + FREIGHT")	GST (INR)	TOTAL F.O.R. SITE PRICE (INR)
1	220V FLOAT-CUM-BOOST CHARGER1, 220V DC, 550A (MAIN PLANT)	NOS	22	#VALUE!	#VALUE!		#VALUE!		#VALUE!	#VALUE!
2	220V FLOAT-CUM-BOOST CHARGER2, 220V DC, 50A (OFFSITE)	NOS	22	#VALUE!	#VALUE!		#VALUE!		#VALUE!	#VALUE!
3	220V FLOAT-CUM-BOOST CHARGER1, 220V DC, 80A (CHP AHP)	NOS	8	#VALUE!	#VALUE!		#VALUE!		#VALUE!	#VALUE!
4	**BATTERY FUSE BOX**									
4.1	BATTERY FUSE BOX FOR 550A CHARGER (BATTERY FUSE BOX OF ADEQUATE RATING AS PER LOAD DUTY CYCLE - ANNEXURE-I OF TECHNICAL SPECIFICATION, MINIMUM RATING 1250A)	NOS	22	#VALUE!	#VALUE!		#VALUE!		#VALUE!	#VALUE!
4.2	BATTERY FUSE BOX FOR 50A CHARGER (BATTERY FUSE BOX OF ADEQUATE RATING AS PER LOAD DUTY CYCLE - ANNEXURE-I OF TECHNICAL SPECIFICATION, MINIMUM RATING 50A)	NOS	22	#VALUE!	#VALUE!		#VALUE!		#VALUE!	#VALUE!
4.3	BATTERY FUSE BOX FOR 80A CHARGER (BATTERY FUSE BOX OF ADEQUATE RATING AS PER LOAD DUTY CYCLE - ANNEXURE-I OF TECHNICAL SPECIFICATION, MINIMUM RATING 100A)	NOS	8	#VALUE!	#VALUE!		#VALUE!		#VALUE!	#VALUE!
	TOTAL OF 4 i.e. (4.1+4.2+4.3)									
5	**DISCHARGE RESISTOR**									
5.1	**DISCHARGE RESISTOR -1** {DISCHARGE RESISTOR WITH SHUNT SUITABLE FOR (1) 5 HRS DISCHARGE RATE FOR 1680 AH NI-CD BATTERY (TWO BANKS OF 840 AH IN PARALLEL)/ 10 HRS DISCHARGE RATE 3640AH LEAD ACID BATTERY (TWO BANKS OF 1820AH IN PARALLEL). (2) HEAT RUN TEST & DYNAMIC RESPONSE TEST OF CHARGER}	NOS	7	#VALUE!	#VALUE!		#VALUE!		#VALUE!	#VALUE!
5.2	**DISCHARGE RESISTOR -2** {DISCHARGE RESISTOR WITH SHUNT SUITABLE FOR (1) 5HRS DISCHARGE RATE FOR 90AH NI-CD BATTERY (SINGLE STRING)/ 10 HRS DISCHARGE RATE / 150AH LEAD ACID BATTERY (2) HEAT RUN TEST & DYNAMIC RESPONSE TEST OF CHARGER}	NOS	7	#VALUE!	#VALUE!		#VALUE!		#VALUE!	#VALUE!
5.3	**DISCHARGE RESISTOR -3** {DISCHARGE RESISTOR WITH SHUNT SUITABLE FOR (1) 5 HRS DISCHARGE RATE FOR 150 AH NI-CD BATTERY / 10 HRS DISCHARGE RATE / 225 AH LEAD ACID BATTERY. (2) HEAT RUN TEST & DYNAMIC RESPONSE TEST OF	NOS	5	#VALUE!	#VALUE!		#VALUE!		#VALUE!	#VALUE!
6	**SINGLE CELL BOOST CHARGER**									
6.1	SINGLE CELL BOOST CHARGER (MAIN PLANT) AT BOQ SL. NO. 1	NOS	7	#VALUE!	#VALUE!		#VALUE!		#VALUE!	#VALUE!
6.2	SINGLE CELL BOOST CHARGER (OFFSITE) AT BOQ SL. NO. 2	NOS	7	#VALUE!	#VALUE!		#VALUE!		#VALUE!	#VALUE!

PACKAGE: DC BATTERY CHARGER
PROJECT: FRAMEWORK AGREEMENT (RATE CONTRACT)
ENQUIRY NO.:77/25/6171/SUM dated 27.10.2025
SUPPLIER NAME:

PRICE SCHEDULE

S. No.	ITEM DESCRIPTION	Unit	Total Quantity	UNIT PRICE (EX-WORKS) (INR)	TOTAL PRICE (EX-WORKS) (INR)	FREIGHT CHARGES (EXCLUDING GST) @ ____% OF TOTAL EX-WORKS	FREIGHT CHARGES EXCLUDING GST (INR)	Applicable GST @___% (on "Total EX-WORKS + FREIGHT")	GST (INR)	TOTAL F.O.R. SITE PRICE (INR)
7	**E & C SPARES**									
7.1	**E & C SPARES FOR FLOAT CUM BOOST CHARGER (MAIN PLANT) AT BOQ SL. NO. 1**	SET	7							
7.1.1	**FUSE LINK WITHOUT HOLDER**									
a	AC I/P HRC FUSE LINK	NOS	66	#VALUE!	#VALUE!		#VALUE!		#VALUE!	#VALUE!
b	GLASS FUSE	NOS	66	#VALUE!	#VALUE!		#VALUE!		#VALUE!	#VALUE!
c	CONTROL HRC FUSE LINK	NOS	66	#VALUE!	#VALUE!		#VALUE!		#VALUE!	#VALUE!
d	RECTIFIER FUSE LINK	NOS	66	#VALUE!	#VALUE!		#VALUE!		#VALUE!	#VALUE!
e	FILTER CAPACITOR FUSE LINK	NOS	66	#VALUE!	#VALUE!		#VALUE!		#VALUE!	#VALUE!
f	DC O/P FUSE LINK	NOS	66	#VALUE!	#VALUE!		#VALUE!		#VALUE!	#VALUE!
7.1.2	**INDICATING LAMP**									
a	AC I/P LAMP RED COLOR	NOS	66	#VALUE!	#VALUE!		#VALUE!		#VALUE!	#VALUE!
b	AC I/P LAMP YELLOW COLOR	NOS	66	#VALUE!	#VALUE!		#VALUE!		#VALUE!	#VALUE!
c	AC I/P LAMP BLUE COLOR	NOS	66	#VALUE!	#VALUE!		#VALUE!		#VALUE!	#VALUE!
d	DC O/P LAMP	NOS	66	#VALUE!	#VALUE!		#VALUE!		#VALUE!	#VALUE!
7.1.3	**SET OF ELECTRONIC CARDS/ MODULES (1 SET EACH TYPE & RATING)**	SET	7	#VALUE!	#VALUE!		#VALUE!		#VALUE!	#VALUE!
7.2	**E & C SPARES FOR FLOAT CUM BOOST CHARGER (OFFSITE) AT BOQ SL. NO. 2**	SET	7							
7.2.1	**FUSE LINK WITHOUT HOLDER**									
a	AC I/P HRC FUSE LINK	NOS	48	#VALUE!	#VALUE!		#VALUE!		#VALUE!	#VALUE!
b	GLASS FUSE	NOS	48	#VALUE!	#VALUE!		#VALUE!		#VALUE!	#VALUE!
c	CONTROL HRC FUSE LINK	NOS	48	#VALUE!	#VALUE!		#VALUE!		#VALUE!	#VALUE!
d	RECTIFIER FUSE LINK	NOS	48	#VALUE!	#VALUE!		#VALUE!		#VALUE!	#VALUE!
e	FILTER CAPACITOR FUSE LINK	NOS	48	#VALUE!	#VALUE!		#VALUE!		#VALUE!	#VALUE!
f	DC O/P FUSE LINK	NOS	48	#VALUE!	#VALUE!		#VALUE!		#VALUE!	#VALUE!
7.2.2	**INDICATING LAMP**									
a	AC I/P LAMP RED COLOR	NOS	48	#VALUE!	#VALUE!		#VALUE!		#VALUE!	#VALUE!
b	AC I/P LAMP YELLOW COLOR	NOS	48	#VALUE!	#VALUE!		#VALUE!		#VALUE!	#VALUE!
c	AC I/P LAMP BLUE COLOR	NOS	48	#VALUE!	#VALUE!		#VALUE!		#VALUE!	#VALUE!
d	DC O/P LAMP	NOS	48	#VALUE!	#VALUE!		#VALUE!		#VALUE!	#VALUE!
7.2.3	**SET OF ELECTRONIC CARDS/ MODULES (1 SET EACH TYPE & RATING)**	SET	7	#VALUE!	#VALUE!		#VALUE!		#VALUE!	#VALUE!
7.3	**E & C SPARES FOR FLOAT CUM BOOST CHARGER (CHP AHP) AT BOQ SL. NO. 3**	SET	2							
7.3.1	**FUSE LINK WITHOUT HOLDER**									
a	AC I/P HRC FUSE LINK	NOS	12	#VALUE!	#VALUE!		#VALUE!		#VALUE!	#VALUE!
b	GLASS FUSE	NOS	12	#VALUE!	#VALUE!		#VALUE!		#VALUE!	#VALUE!
c	CONTROL HRC FUSE LINK	NOS	12	#VALUE!	#VALUE!		#VALUE!		#VALUE!	#VALUE!
d	RECTIFIER FUSE LINK	NOS	12	#VALUE!	#VALUE!		#VALUE!		#VALUE!	#VALUE!
e	FILTER CAPACITOR FUSE LINK	NOS	12	#VALUE!	#VALUE!		#VALUE!		#VALUE!	#VALUE!
f	DC O/P FUSE LINK	NOS	12	#VALUE!	#VALUE!		#VALUE!		#VALUE!	#VALUE!
7.3.2	**INDICATING LAMP**									
a	AC I/P LAMP RED COLOR	NOS	12	#VALUE!	#VALUE!		#VALUE!		#VALUE!	#VALUE!
b	AC I/P LAMP YELLOW COLOR	NOS	12	#VALUE!	#VALUE!		#VALUE!		#VALUE!	#VALUE!
c	AC I/P LAMP BLUE COLOR	NOS	12	#VALUE!	#VALUE!		#VALUE!		#VALUE!	#VALUE!
d	DC O/P LAMP	NOS	12	#VALUE!	#VALUE!		#VALUE!		#VALUE!	#VALUE!

PACKAGE: DC BATTERY CHARGER
PROJECT: FRAMEWORK AGREEMENT (RATE CONTRACT)
ENQUIRY NO.:77/25/6171/SUM dated 27.10.2025
SUPPLIER NAME:

PRICE SCHEDULE

S. No.	ITEM DESCRIPTION	Unit	Total Quantity	UNIT PRICE (EX-WORKS) (INR)	TOTAL PRICE (EX-WORKS) (INR)	FREIGHT CHARGES (EXCLUDING GST) @ ____% OF TOTAL EX-WORKS	FREIGHT CHARGES EXCLUDING GST (INR)	Applicable GST @___% (on "Total EX-WORKS + FREIGHT")	GST (INR)	TOTAL F.O.R. SITE PRICE (INR)
8	**SUPERVISION OF E&C (Including Tests on all battery chargers to be carried out at Site on completion of E & C and immediately prior to putting in Service)**									
8.1	LUMP SUM CHARGES PER VISIT FOR ENGINEER (EXCEPT DAILY CHARGES)-550A	VISIT	55	#VALUE!	#VALUE!	0.00000	0.00000		#VALUE!	#VALUE!
8.2	LUMP SUM DAILY CHARGES FOR ENGINEER-550A	DAYS	189	#VALUE!	#VALUE!		0.00000		#VALUE!	#VALUE!
8.3	LUMP SUM CHARGES PER VISIT FOR ENGINEER (EXCEPT DAILY CHARGES)-50A	VISIT	43	#VALUE!	#VALUE!		0.00000		#VALUE!	#VALUE!
8.4	LUMP SUM DAILY CHARGES FOR ENGINEER-50A	DAYS	147	#VALUE!	#VALUE!		0.00000		#VALUE!	#VALUE!
8.5	LUMP SUM CHARGES PER VISIT FOR ENGINEER (EXCEPT DAILY CHARGES)-80A	VISIT	8	#VALUE!	#VALUE!		0.00000		#VALUE!	#VALUE!
8.6	LUMP SUM DAILY CHARGES FOR ENGINEER-80A	DAYS	28	#VALUE!	#VALUE!		0.00000		#VALUE!	#VALUE!
9	**MANDATORY SPARES**									
9.1	**MANDATORY SPARES FOR FLOAT CUM BOOST CHARGER (MAIN PLANT-550A) AT BOQ SL. NO. 1**	SET	7							
a	SET OF ELECTRONIC CARDS/ MODULES (1 SET OF EACH TYPE AND RATING)	SET	7	#VALUE!	#VALUE!	0.00000	#VALUE!	0.00000	#VALUE!	#VALUE!
b	SET OF AUXILIARY RELAYS (1 SET OF EACH TYPE AND RATING)	SET	7	#VALUE!	#VALUE!		#VALUE!		#VALUE!	#VALUE!
c	SET OF FUSE LINKS & GLASS FUSES (3 SET OF EACH TYPE AND RATING)	SET	21	#VALUE!	#VALUE!		#VALUE!		#VALUE!	#VALUE!
d	3 PHASE RECTIFIER BRIDGE COMPLETE ASSEMBLY (1 SET OF EACH TYPE AND RATING)	SET	6	#VALUE!	#VALUE!		#VALUE!		#VALUE!	#VALUE!
e	RECTIFIER TRANSFORMER (1 NO. OF EACH TYPE AND RATING)	NOS	7	#VALUE!	#VALUE!		#VALUE!		#VALUE!	#VALUE!
f	CONTROL TRANSFORMER (1 NO. OF EACH TYPE AND RATING)	NOS	7	#VALUE!	#VALUE!		#VALUE!		#VALUE!	#VALUE!

PACKAGE: DC BATTERY CHARGER
PROJECT: FRAMEWORK AGREEMENT (RATE CONTRACT)
ENQUIRY NO.:77/25/6171/SUM dated 27.10.2025
SUPPLIER NAME:

PRICE SCHEDULE

S. No.	ITEM DESCRIPTION	Unit	Total Quantity	UNIT PRICE (EX-WORKS) (INR)	TOTAL PRICE (EX-WORKS) (INR)	FREIGHT CHARGES (EXCLUDING GST) @ ____% OF TOTAL EX-WORKS	FREIGHT CHARGES EXCLUDING GST (INR)	Applicable GST @___% (on "Total EX-WORKS + FREIGHT")	GST (INR)	TOTAL F.O.R. SITE PRICE (INR)
9.2	**MANDATORY SPARES FOR FLOAT CUM BOOST CHARGER (OFFSITE - 50A) AT BOQ SL. NO. 2**	SET	7							
a	SET OF ELECTRONIC CARDS/ MODULES (1 SET OF EACH TYPE AND RATING)	SET	7	#VALUE!	#VALUE!		#VALUE!		#VALUE!	#VALUE!
b	SET OF AUXILIARY RELAYS (1 SET OF EACH TYPE AND RATING)	SET	7	#VALUE!	#VALUE!		#VALUE!		#VALUE!	#VALUE!
c	SET OF FUSE LINKS & GLASS FUSES (3 SET OF EACH TYPE AND RATING)	SET	21	#VALUE!	#VALUE!		#VALUE!		#VALUE!	#VALUE!
d	3 PHASE RECTIFIER BRIDGE COMPLETE ASSEMBLY (1 SET OF EACH TYPE AND RATING)	SET	6	#VALUE!	#VALUE!		#VALUE!		#VALUE!	#VALUE!
e	RECTIFIER TRANSFORMER (1 NO. OF EACH TYPE AND RATING)	NOS	7	#VALUE!	#VALUE!		#VALUE!		#VALUE!	#VALUE!
f	CONTROL TRANSFORMER (1 NO. OF EACH TYPE AND RATING)	NOS	7	#VALUE!	#VALUE!		#VALUE!		#VALUE!	#VALUE!
9.3	**MANDATORY SPARES FOR FLOAT CUM BOOST CHARGER (CHP-AHP - 80A) AT BOQ SL. NO. 3**	SET	2							
a	SET OF ELECTRONIC CARDS/ MODULES (1 SET OF EACH TYPE AND RATING)	SET	2	#VALUE!	#VALUE!		#VALUE!		#VALUE!	#VALUE!
b	SET OF AUXILIARY RELAYS (1 SET OF EACH TYPE AND RATING)	SET	2	#VALUE!	#VALUE!		#VALUE!		#VALUE!	#VALUE!
c	SET OF FUSE LINKS & GLASS FUSES (3 SET OF EACH TYPE AND RATING)	SET	6	#VALUE!	#VALUE!		#VALUE!		#VALUE!	#VALUE!
d	3 PHASE RECTIFIER BRIDGE COMPLETE ASSEMBLY (1 SET OF EACH TYPE AND RATING)	SET	2	#VALUE!	#VALUE!		#VALUE!		#VALUE!	#VALUE!
e	RECTIFIER TRANSFORMER (1 NO. OF EACH TYPE AND RATING)	NOS	2	#VALUE!	#VALUE!		#VALUE!		#VALUE!	#VALUE!
f	CONTROL TRANSFORMER (1 NO. OF EACH TYPE AND RATING)	NOS	2	#VALUE!	#VALUE!		#VALUE!		#VALUE!	#VALUE!
					X		#VALUE!		#VALUE!	#VALUE!

NOTES :

1) Supplier to quote grand total value of the complete package (Rs X) only as per the BOQ above. The item wise break-up of total price and unit price shall be derived as per the formulae indicated above.

2) Supplier to quote freight charges in percentage of their quoted Total Ex-works Prices. Supplier to give single % of freight charges considering delivery anywhere in India in the freight column.Suppliers have to give same % of freight for each line item. Further, Supplier to quote non-zero freight %.

3) Amount payable for engineer per visit to site = visit charges as per sl. no. 7.1 above + (daily charges as per sl. no. 7.2 above x No. of days at site) (to be certified by BHEL site).

4) The visit charges shall be inclusive of charges of air fare/train fare, boarding/lodging, local conveyance, medical, insurance etc.

5) Site visit charges shall be applicable for any visit made by Supplier at site after receiving the instruction from BHEL for deputation of Supplier representative. The visit can be called for supervision of commissioning & testing etc.

6) All cable glands & lugs at charger, fuse box & discharge resistor & cell booster end are in the Supplier's scope.

7) For the purpose of payment terms and Liquidated damages, Float Cum Boost Chargers, Discharge resistors, Fuse boxes and Portable Single Cell Chargers shall be considered as main supply.

8) E & C spares shall be supplied along with main supplies.

9) PVC shall be applicable as per PVC formula & factors mentioned in Annexure - B.

COST OF WITHDRAWAL									
PROJECT:-						Framework Agreement (Rate Contract)			
PACKAGE :-						DC BATTERY CHARGER- NTPC VARIANT			
TENDER ENQUIRY :-						77/25/6171/SUM dated 27.10.2025			
NAME OF THE BIDDER									
Sl. No.	Volume/ Section	Page No.	Clause No.	Technical Specification/Tender Document No	Complete Description of Deviation	Cost of withdrawal of deviation to be entered by the bidder in	Reference of price Schedule of which Cost of Withdrawal of Deviation is applicable	Nature of cost of withdrawal of deviation (Positive/Negative)	Reasons for quoting deviation
1	TECHNICAL DEVIATION								
1.01									
1.02									
1.03									
1.04									
1.05									
2	COMMERCIAL DEVIATION								
2.01									
2.02									
2.03									
2.04									
2.05									

ANNEXURE-B

PVC ANNEXURE

CIN No. U99999MH1970GAPO14629

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IEEMA/PVC/BTR-CHRG/2023 **Effective from: 1st January 2023**

PRICE VARIATION CLAUSE FOR BATTERY CHARGER EQUIPMENT

The price quoted/confirmed is based on the cost of raw materials/components, the wholesale price index numbers and labour cost as on the date of quotation and the same is deemed to be related to prices of raw materials, index numbers for wholesale prices and all India average consumer price index number for industrial workers as specified in the price variation clause given below. In case of any variation in these prices and Index numbers, the price payable shall be subject to adjustment up or down in accordance with the following formulae:

(A) Conventional Battery Charger

$$P = \frac{P_o}{100}\left(12 + 28\,\frac{C}{C_o} + 25\,\frac{ES}{ES_o} + 8\,\frac{AL}{AL_o} + 8\,\frac{ER}{ER_o} + 7\,\frac{EP}{EP_o} + 12\,\frac{W}{W_o}\right)$$

(B) Modular Battery Charger

$$P = \frac{P_o}{100}\left(11 + 15\,\frac{C}{C_o} + 17\,\frac{ES}{ES_o} + 4\,\frac{AL}{AL_o} + 32\,\frac{ER}{ER_o} + 8\,\frac{EP}{EP_o} + 13\,\frac{W}{W_o}\right)$$

(C) Electric Vehicle Charger

$$P = \frac{P_o}{100}\left(11 + 14\,\frac{C}{C_o} + 12\,\frac{ES}{ES_o} + 2\,\frac{AL}{AL_o} + 35\,\frac{ER}{ER_o} + 12\,\frac{EP}{EP_o} + 14\,\frac{W}{W_o}\right)$$

Wherein,

P = Price payable as adjusted in accordance with the above formula.

P_0 = Price quoted/confirmed.

C_0 = Price of CC copper rods (refer notes)
This price is as applicable for the month, **ONE** month prior to the date of tendering.

ES_0 = Price of CRGO Electrical Steel Lamination (refer note)
This price is as applicable for the month, **ONE** month prior to the date of tendering.

AL_0 = LME CSP Average of Aluminium (refer notes)
This price is as applicable for the month, **ONE** month prior to the date of tendering.

ER_0 = IEEMA's Banker's selling rate of exchange between foreign currency prevailing on the Banker's first working day, **ONE** month prior to the date of tendering (refer notes)

EP_0 = Wholesale Price Index Number (WPI) of Electronic PCB/ Micro Circuits (refer notes)
This price is as applicable for the month, **THREE** months prior to the date of tendering.

CIN No. U99999MH1970GAPO14629

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W_0 = All India average consumer price index number for industrial workers, as published by the Labour Bureau, Ministry of Labour, Govt. of India (Base: 2016 = 100)

This index number is as applicable for the month, **THREE** months prior to the date of tendering.

For example, if the date of tendering falls in June 2023, the applicable price of Copper (C_o), Aluminium (AL_0), CRGO Electrical Steel Lamination (ES_0) and Exchange Rate (ER_0) should be for the month of May 2023, and wholesale price index numbers for 'Electronic PCB/ Micro Circuits' (EP_o) and all India average consumer price index number (W_o) should be for the month of March 2023.

The above prices and indices are as published by IEEMA vide circular reference number IEEMA(PVC)/ BTR/(R-1)/_/_ **ONE** month prior to the date of tendering.

C = Price of CC copper rods (refer notes)
This price is as applicable for the month, **ONE** month prior to the date of delivery.

ES = Price of CRGO Electrical Steel Lamination (refer note)
This price is as applicable for the month, **ONE** month prior to the date of delivery.

AL = LME CSP Average of Aluminium (refer notes)
This price is as applicable for the month, **ONE** month prior to the date of delivery.

ER = IEEMA's Banker's selling rate of exchange between foreign currency prevailing on the Banker's first working day, **TWO** month prior to the date of delivery (refer note)

EP = Wholesale Price Index Number (WPI) of Electronic PCB/ Micro Circuits
This price is as applicable for the month, **THREE** months prior to the delivery (refer note)

W = All India average consumer price index number for industrial workers, as published by the Labour Bureau, Ministry of Labour, Govt. of India (Base: 2016 = 100)

This index number is as applicable for the month, **THREE** months prior to the date of tendering.

For example, if the date of delivery falls in August 2023, the applicable price of Copper (C), Aluminium (AL) and CRGO Electrical Steel Lamination (ES) should be for the month of Jul 2023 and Exchange Rate (ER) should be for the month of Jun 2023, and wholesale price index numbers for 'Electronic PCB/ Micro Circuits' (EP) and all India average consumer price index number (W) should be for the month of May 2023.

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IEEMA/PVC/BTR-CHRG/2023 **Effective from: 1st January 2023**

For example, if the date of delivery falls in August 2023, the applicable price of Copper (C), Aluminium (AL) and CRGO Electrical Steel Lamination (ES) should be for the month of Jul 2023 and Exchange Rate (ER) should be for the month of Jun 2023, and wholesale price index numbers for 'Electronic PCB/ Micro Circuits' (EP) and all India average consumer price index number (W) should be for the month of May 2023.

The "date of delivery" is the date on which the Battery Charger equipment is notified as being ready for inspection/despatch. (In the absence of such notification the date of manufacturer's despatch note is to be considered as the date of delivery) or the contracted delivery date (including any agreed extension thereto), whichever is earlier.

Notes:

(a) All prices are exclusive of GST amount and exclusive of any other central, state or local taxes etc.

(b) Date of Tendering is the due date of tender submission or date of tender opening whichever is earlier

(c) The details of prices are as under:

1. Price of LME average Cash SELLER Settlement price of Primary Aluminium in US$ per MT as published by London Metal Bulletin (LME) including Premium for Aluminium Ingot in US$ per MT is converted in Indian Rs./MT using exchange rate and adding appropriate customs duty.

2. Price of 8 mm CC copper rod (in Rs/MT) is ex-works price as quoted by the primary producer.

3. The price of CRGO Electrical Steel Lamination is the average price as quoted by processing centres of overseas mills and lamination suppliers

4. The wholesale price index number for 'Electronic PCB/ Micro Circuits' is as published by the Office of Economic Advisor, Ministry of Industry, Govt. of India, New Delhi with base 2011-12=100.

5. The exchange rates that would be published by IEEMA would be for the following currencies only.
   1) US Dollars 2) pound Sterling 3) Japanese Yen 4) Euro

Authorised Signatory

Tentative List of projects for Framework Agreement (Rate Contract) of DC BATTERY CHARGER

1. 2X800 MW LARA
2. 2X800 MW Singrauli STPP (NTPC)
3. 2X800 MW KODERMA
4. 1X800 MW SIPAT
5. 1X800 MW DARLIPALI
6. 1X800 MW SINGARENI
7. 2X660 MW KORBA WEST

BHEL / PEM / CMM

SPECIAL CONDITIONS OF CONTRACT OF FRAMEWORK AGREEMENT (RATE CONTRACT) FOR DC BATTERY CHARGER

1. This tender is issued by BHEL PEM for Framework Agreement (Rate Contract) of DC BATTERY CHARGER required at various BHEL project sites on behalf of various BHEL units. Framework Agreement (Rate Contract) validity for ordering shall be two years from the purchase order for Rate Contract.

2. Framework Agreement (Rate Contract) shall be finalized only with suppliers who are registered with BHEL-PEM. Bidders who are not registered with BHEL-PEM (suppliers already registered with other BHEL Units shall also be required to apply registration in BHEL PEM) needs to apply & get registered for subject package with PEM before Reverse Auction & hence they need to apply online for registration on PEM web portal & have to enclose acknowledgement with the bid documents else their bid may not be considered for evaluation.

The bidders who are not registered with BHEL-PEM may apply for registration in BHEL-PEM through Registration Portal available at https://bhel.com/supplier-registration .
All credentials and/ or documents duly signed & stamped related to registration has to be uploaded on the website & submit the application for registration. One set of hard copy filled-up SRF downloaded from Online Registration Portal duly signed & stamped has to be submitted.

3. Framework Agreement (Rate contract) is proposed to be done with2 suppliers in ratio of 70:30 value wise at L1 FOR site price (Ex-works + freight) for this package. However, order for a project shall not be split.

4. Quantity variation shall be applicable as +/- 30 % of the contract value. Bidder shall note that the quantities indicated in the tender are tentative quantities. No minimum quantity is guaranteed by BHEL.

5. This tender is issued by BHEL PEM for Framework Agreement (Rate Contract) of DC BATTERY CHARGER required at various BHEL project sites on behalf of various BHEL units. All bidders shall note the following: –

a) As and when requirement arises, the concerned Purchase Department of respective BHEL unit will place order directly on the supplier against the Framework Agreement (Rate Contract).

b) The drawings/ documents submission & approval, submission of Performance Security/ Performance Bank Guarantee, submission of invoices, processing and release of payment after supply of material, contractual dispute & commercial matters shall be dealt as per Framework Agreement (Rate Contract) contract terms & conditions directly by Purchase Department of respective BHEL unit which has placed purchase order against the Rate Contract.

6. Details of consignee and project site information for dispatch of material shall be intimated at the time of placement of PO for specific project after finalization of RC.

7. The items will be required against respective projects. Exact quantities and Project information shall be intimated while placing Purchase Order for a specific project based on the Rate Contract.

8. Price Variation shall be applicable for the subject package. All bidders shall quote as per the Price Variation Formulae Annexure provided in NIT.

9. Inspection of materials shall be carried out by BHEL/ CQA and or by Customer or by an Authorized Agency at manufacture's works before dispatch, if required. Dispatch of material to be done, only after receipt of BHEL/ Customer MDCC. It is responsibility of vendor to obtain Material Dispatch Clearance Certificate (MDCC) from BHEL or Customer as required before dispatch of material.

10. Vendor shall give inspection call on BHEL-CQS web site to applicable inspection agency with a copy of inspection call to BHEL for arranging Customer participation (if applicable) in inspection / Joint inspection on the proposed date with an advance notice of 15 working days. Inspection charges shall be paid by BHEL.

11. Items have to be manufactured as per specification and supplied strictly in accordance with the approved BHEL/ Customer's Drawings & Quality Plan. The items/ test certificate of items, which for any reason are not acceptable to BHEL/ Customer, shall be required to be retested. No extra charge shall be payable on those account by BHEL.

12. Other terms and conditions shall be as per Standard Technical specification No. PE-TS-999-508-E002 Rev 00, GCC Rev 07, Corrigenda 01 & Corrigenda 02 to GCC Rev 07 and Enquiry letter.

13. This Enquiry is subject to Conditions/ limits if any imposed in in BHEL-PEM PMD/ Vendor registration.

14. Tentative quantity is given in Enquiry.

15. Bidders to submit offer for RC of said items ONLINE via BHEL-GePNIC Portal only. Bidders to upload tender documents complete in all respects duly signed & stamped on each and every page by the authorized signatory of the bidder as a token of acceptance of all the terms and conditions of tender.

16. The Bidder along with its associate/ collaborators/ sub-contractors/ sub-vendor/ consultants/ service providers shall strictly adhere to BHEL Fraud Prevention Policy displayed on BHEL web site http://www.bhel.com and shall immediately bring to the notice of BHEL Management about any fraud as soon as it comes to their notice.

Declaration by MSE bidders regarding ownership structure along with UDYAM certificate

Any Bidder falling under MSE category shall furnish the following details & submit documentary evidence/ Govt. Certificate etc. in support of the same along with their techno-commercial offer.

Type under MSE	SC/ST Owned	Women Owned	Others (excluding SC/ST & Women Owned)
Micro			
Small			

Note: If the bidder does not furnish the above in the tender, offer shall be processed construing that the bidder is not falling under MSE category.

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 _____ through its Unit at……..(name of the Unit) having awarded to (Name of the Vendor / Contractor / Supplier) with its registered office at_____ 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 …… valued at Rs…… (Rupees ----------)/FC……(in words……) for …… (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 ---------- (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…… 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 ……we shall be discharged from all liabilities under this guarantee thereafter.

This Bank Guarantee shall be governed, construed and interpreted in accordance with the laws of India.

Courts at …… shall alone have exclusive jurisdiction over any matter arising out of or in connection with this Bank Guarantee

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

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

For and on behalf of
(Name of the Bank)

Dated……

Place of Issue…….

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

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

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

[4] *CONTRACT VALUE*

[5] *PROJECT/SUPPLY DETAILS*
[6] *BG AMOUNT IN FIGURES AND WORDS*

[7] *VALIDITY DATE*

[8] *DATE OF EXPIRY OF CLAIM PERIOD*

Note:

1. Bank Guarantee should be refunded to the contractor without interest, after he duly performs and completes the contract in all respects but not later than 60 (sixty) days of completion of all such obligations including the warranty under the contract.

2. The BG should be on Non-Judicial Stamp paper/e-stamp paper of appropriate value as per Stamp Act prevailing in the State(s) where the BG is submitted or is to be acted upon or the rate prevailing in the State where the BG was executed, whichever is higher. The Stamp Paper/e-stamp paper shall be purchased in the name of Vendor/Contractor/Supplier /Bank issuing the guarantee.

3. From Nationalized/Public Sector / Private Sector/ Foreign Banks can be accepted subject to the condition that the Bank Guarantee should be enforceable in the town/city or at nearest branch where the Unit is located i.e. Demand can be presented at the Branch located in the town/city or at nearest branch where the Unit is located.

Format for Local Content Certificate as per MII order

Ref: …… Date: …….

To,

Bharat Heavy Electricals Limited

PEM, PPEI Building,

Plot No 25, Sector -16A

Noida (U.P)-201301

Reference: Tender Enquiry No-……

Name of Package: …….

Dear Sir,

We hereby certify that items of ……..(Package name)

for……(Project Name) offered by M/s ……(bidder's name)

having its works/office at …… has local content of ……..%. Further,

it is also certified that the local content percentage (%) certified above is in line with definition of local content given in point no 2 of Public Procurement (Preference to Make in India), Order 2017- revision, having ref. no. P-45021/2/2017-PP(BE-II)-Part(4) Vol.II dated 04.06.2020 & 19.07.2024 an

M/s…….. qualifies as Class-I local supplier.

Further, cost of locally imported items (inclusive of taxes) sourced locally from resellers/ distributors

is Rs …… and cost of licence/royalty paid/technical expertise cost etc. source from outside of India

is Rs…….

Details of the location(s) at which the local value addition-

Yours very truly

……. (Signing Authority Name & Sign)

…… (Firm Name)

Land Border Certificate

Dated:

Tender Title:

This has reference to order no. F.No.7/10/2021-PPD, Ministry of Finance, Department of Expenditure, Public Procurement Division. We, M/s _____**,** confirm the following:

I have read the clause regarding restrictions on procurement from a bidder of a country which shares a land border with India and on sub-contracting to contractors from such countries; I certify that this M/s _____ *is not from such a country.*

I hereby certify that this M/s _____ *fulfills all requirements in this regard and is eligible to be considered.*

Signature with Company seal

Annexure-1

INTEGRITY PACT

Between

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

and

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

Preamble

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

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

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

Section 1- Commitments of the Principal

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

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

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

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

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

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

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

2.1.1 The Bidder(s)/ Contractor(s) will not, directly or through any other person or firm, offer, promise or give to the Principal or to any of the Principal's employees involved in the tender process or the execution of the contract or to any third person any material, immaterial or any other benefit which he/ she is not legally entitled to, in order to obtain in exchange any advantage of any kind whatsoever during the tender process or during the execution of the contract.

2.1.2 The Bidder(s)/ Contractor(s) will not enter with other Bidder(s) into any illegal or undisclosed agreement or understanding, whether formal or informal. This applies in particular to prices, specifications, certifications, subsidiary contracts, submission or non-submission of bids or any other actions to restrict competitiveness or to introduce cartelization in the bidding process.

2.1.3 The Bidder(s)/ Contractor(s) will not commit any penal offence under the relevant Indian Penal Code (IPC) and Prevention of Corruption Act; further the Bidder(s)/ Contractor(s) will not use improperly, for purposes of competition or personal gain, or pass on to others, any information or document provided by the Principal as part of the business relationship, regarding plans, technical proposals and business details, including information contained or transmitted electronically.

2.1.4 Foreign Bidder(s)/ Contractor(s) shall disclose the name and address of agents and representatives in India and Indian Bidder(s)/ Contractor(s) to disclose their foreign principals or associates. The Bidder(s)/ Contractor(s) will, when presenting his bid, disclose any and all payments he has made, and is committed to or intends to make to agents, brokers or any other intermediaries in connection with the award of the contract.

2.2 The Bidder(s)/ Contractor(s) will not instigate third persons to commit offences outlined above or be an accessory to such offences.

2.3 The Bidder(s)/ Contractor(s) shall not approach the Courts while representing the matters to IEMs and shall await their decision in the matter.

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

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

Section 4 - Compensation for Damages

4.1 If the Principal has disqualified the Bidder (s) from the tender process before award / order acceptance according to Section 3, the Principal is entitled to demand and recover the damages equivalent to Earnest Money Deposit/ Bid Security.

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

Section 5 - Previous Transgression

5.1 The Bidder declares that no previous transgressions occurred in the last 3 (three) years with any other company in any country conforming to the anti-corruption approach or with any other Public Sector Enterprise in India that could justify his exclusion from the tender process.

5.2 If the Bidder makes incorrect statement on this subject, he can be disqualified from the tender process or the contract, if already awarded, can be terminated for such reason or action can be taken as per the separate "Guidelines on Banning of Business dealings with Suppliers/ Contractors", framed by the Principal.

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

6.1 The Principal will enter into Integrity Pacts with identical conditions as this Integrity Pact with all Bidders and Contractors.

6.2 In case of Sub-contracting, the Principal Contractor shall take the responsibility of the adoption of Integrity Pact by the Sub-contractor(s) and ensure that all Sub-contractors also sign the Integrity Pact.

6.3 The Principal will disqualify from the tender process all Bidders who do not sign this Integrity Pact or violate its provisions.

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

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

Section 8 -Independent External Monitor(s)

8.1 The Principal appoints competent and credible panel of Independent External Monitor (s) (IEMs) for this Integrity Pact. The task of the IEMs is to review independently and objectively, whether and to what extent the parties comply with the obligations under this Integrity Pact.

8.2 The IEMs are not subject to instructions by the representatives of the parties and performs his functions neutrally and independently. He reports to the CMD, BHEL.

8.3 The IEMs shall be provided access to all documents/ records pertaining to the Contract, for which a complaint or issue is raised before them as and when warranted. However, the documents/records/information having National Security implications and those documents which have been classified as Secret/Top Secret are not to be disclosed.

8.4 The Principal will provide to the IEMs sufficient information about all meetings among the parties related to the Contract provided such meetings could have an impact on the contractual relations between the Principal and the Contractor. The parties offer to the IEMs the option to participate in such meetings.

8.5 The advisory role of IEMs is envisaged as that of a friend, philosopher and guide. The advice of IEMs would not be legally binding and it is restricted to resolving issues raised by a Bidder regarding any aspect of the tender which allegedly restricts competition or bias towards some Bidders. At the same time, it must be understood that IEMs are not consultants to the Management. Their role is independent in nature and the advice once tendered would not be subject to review at the request of the organization.

8.6 For ensuring the desired transparency and objectivity in dealing with the complaints arising out of any tendering process or during execution of Contract, the matter should be examined by the full panel of IEMs jointly, who would look into the records, conduct an investigation, and submit their joint recommendations to the Management.

8.7 The IEMs would examine all complaints received by them and give their recommendations/ views to the CMD, BHEL at the earliest. They may also send their report directly to the CVO, in case of suspicion of serious irregularities requiring legal/ administrative action. Only in case of very serious issue having a specific, verifiable Vigilance angle, the matter should be reported directly to the Commission. IEMs will tender their advice on the complaints within 30 days.

8.8 The CMD, BHEL shall decide the compensation to be paid to the IEMs and its terms and conditions.

8.9 IEMs should examine the process integrity, they are not expected to concern themselves with fixing of responsibility of officers. Complaints alleging mala fide on the part of any officer of the Prinicpal should be looked into by the CVO of the Principal.

8.10 If the IEMs have reported to the CMD, BHEL, a substantiated suspicion of an offence under relevant Indian Penal Code / Prevention of Corruption Act, and the CMD, BHEL has not, within reasonable time, taken visible action to proceed against such offence or reported it to the Vigilance Office, the IEMs may also transmit this information directly to the Central Vigilance Commissioner, Government of India.

8.11 After award of work, the IEMs shall look into any issue relating to execution of Contract, if specifically raised before them. As an illustrative example, if a Contractor who has been awarded the Contract, during the execution of Contract, raises issue of delayed payment etc. before the IEMs, the same shall be examined by the panel of IEMs. Issues like warranty/ guarantee etc. shall be outside the purview of IEMs.

8.12 However, the IEMs may suggest systemic improvements to the management of the Principal, if considered necessary, to bring about transparency, equity and fairness in the system of procurement.

8.13 The word `Monitor' would include both singular and plural.

Section 9 - Pact Duration

9.1 This Integrity Pact shall be operative from the date this Integrity Pact is signed by both the parties till the final completion of contract for successful Bidder, and for all other Bidders 6 months after the Contract has been awarded. Any violation of the same would entail disqualification of the bidders and exclusion from future business dealings.

9.2 If any claim is made/ lodged during currency of this Integrity Pact, the same shall be binding and continue to be valid despite the lapse of this Pact as specified above, unless it is discharged/ determined by the CMD, BHEL.

Section 10 - Other Provisions

10.1 This Integrity Pact is subject to Indian Laws and exclusive jurisdiction shall be of the competent Courts as indicated in the Tender or Contract, as the case may be.

10.2 Changes and supplements as well as termination notices need to be made in writing.

10.3 If the Bidder(s)/ Contractor(s) is a partnership or a consortium or a joint venture, this Integrity Pact shall be signed by all partners of the partnership or joint venture or all consortium members.

10.4 Should one or several provisions of this Integrity Pact turn out to be invalid, the remainder of this Integrity Pact remains valid. In this case, the parties will strive to come to an agreement to their original intentions.

10.5 Only those bidders / contractors who have entered into this Integrity Pact with the Principal would be competent to participate in the bidding. In other words, entering into this Integrity Pact would be a preliminary qualification.

10.6 In the event of any dispute between the Principal and Bidder(s)/ Contractor(s) relating to the Contract, in case, both the parties are agreeable, they may try to settle dispute through Mediation before the panel of IEMs in a time bound manner. In case, the dispute remains unresolved even after mediation by the panel of IEMs, either party may take further action as the terms & conditions of the Contract. The fees/expenses on dispute resolution through mediation shall be shared by both the parties. Further, the mediation proceedings shall be confidential in nature and the parties shall keep confidential all matters relating to the mediation proceedings including any settlement agreement arrived at between the parties as outcome of mediation. Any views expressed, suggestions, admissions or proposals etc. made by either party in the course of mediation shall not be relied upon or introduced as evidence in any further arbitral or judicial proceedings, whether or not such proceedings relate to the dispute that is the subject of mediation proceedings. Neither of the parties shall present IEMs as witness in any Alternative Dispute Resolution or judicial proceedings in respect of the dispute that was subject of mediation.

For & On behalf of the Principal
(Office Seal)

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

Place _____
Date _____

Witness:_____
(Name & Address) _____
_____

Witness:_____
(Name & Address) _____
_____

Signature Not Verified
Digitally signed by NITIN KUMAR
Date: 2025.10.27 17:42:03 IST
Location: BHEL