Project Engineering Management

Bharat Heavy Electricals Limited

(A Govt. Of India Undertaking)

Ref. Enquiry No.: PE/PG/RES/E-6744/2021, DTD.19-08-2021

DUE DATE
30 August 2021
BY 11:00 AM

Dear Sir/ Ma'am

Subject: Open tender Enquiry for "DISTRIBUTION BOARDS" for 3 X 500MW NTPC RAMAGUNDAM STAGE-II ESP R&M(480) PROJECT as per Technical Specification No. PE-TS-480-558-E002 REV00 .
OUR REF: TENDER ENQUIRY NO: PE/PG/RES/E-6744/2021, DTD.19-08-2021

BHEL invites your offers for Design, Engineering, Manufacture, assembly, Inspection testing, packing for transportation and delivery of "**DISTRIBUTION BOARDS**" complete in all respect including all accessories, mandatory spares as specified in tender technical specification **PE-TS-480-558-E002 REV00** amendments & agreements till placement of order **for 3 X 500MW NTPC RAMAGUNDAM STAGE-II ESP R&M(480) PROJECT .**

Your offer shall be submitted in two parts strictly as per Clause-2.0 of the "**Instructions to Bidders**" of GCC Rev. 07, in sealed cover for the below mentioned equipment/system.

Item Description – DISTRIBUTION BOARDS (MAIN SUPPLY + MANDATORY SPARES SUPPLY) AS PER ANNEXURE-I and ANNEXURE- IA TO NIT : PE/PG/RES/E-6744/2021, DTD.19-08-2021			
Sl. No.	**Project**	**TECHNICAL SPECIFICATIONS**	**Delivery completion schedule**
1	**3 X 500MW NTPC RAMAGUNDAM STAGE-II ESP R&M(480) PROJECT .**	**PE-TS-480-558-E002 REV00**	**As per Annexure – B to NIT**

Your best quotation/offer for the above requirement, in line with tender terms and conditions, should be submitted **online via e-procurement system (NIC portal:** https://eprocurebhel.co.in/nicgep/app**)**. It shall be the responsibility of the bidder to ensure that the tender is submitted **on or before the due date** by **11:00 AM, 30.08.2021.** Part-I (techno-commercial) bids shall be opened at **04:00 PM.** on the due date.

Note: 1. Detailed tender documents have been uploaded on following websites: -
https://eprocurebhel.co.in/nicgep/app b) www.bhel.com c) https://pem.bhel.com/

Tender submission through e-procurement portal- https://eprocurebhel.co.in/nicgep/app (**Bidders are requested to upload their best offer on** : https://eprocurebhel.co.in/nicgep/app only) .

2. In case bidders are not interested to quote, please send us the regret by e-mail or letter.

ENQUIRY TERMS AND CONDITIONS:

1. Offers should be submitted/uploaded separately in two parts **online through e-procurement system** as follows:

   Part-I: TECHNO-COMMERCIAL BID **Part-II: PRICE BID**
   For detailed instructions, please refer GCC Rev 07- Instructions to Bidders.

2. Bidders shall submit their offers meeting the requirements of the following tender documents indicated in BHEL PEM GCC Rev- 07 and other Terms and Conditions included in this Enquiry Letter. Web link of GCC Rev 07 shall be as below, **bidders may download the GCC Rev 07 from the given web link and go through the same before quoting: -**
   https://pem.bhel.com/Documents/GCC/GCCRev07.pdf

3. Bidders to note that following form the part of tender documents:
   a. General Conditions of Contract (GCC) Rev 07 comprising of: Instructions to Bidders and General Commercial Terms & Conditions
   b. Technical Specifications
   c. Technical PQR
   d. Enquiry terms & conditions (NIT) , ANX-I, ANX-IA, ANX-II, Annexure of delivery schedule, Annexure for Packing & BOM Break-up, Annexure for Self Certificate for local content , Land Border Certificate, Inspection Guideline, & BG Format .

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4. Any hidden conditions/deviations mentioned elsewhere in offer and standard pre-printed terms & conditions of the tenderers shall not be considered valid.

5. Tenders shall be submitted strictly in accordance with the requirements of the above-mentioned tender documents. Bidders to submit their offers strictly in line with the form available at e-procurement portal. Deviations (Technical as well as Commercial), if any, shall be listed out separately in Annexure-II of GCC Rev-07 along with reasons for taking such deviations in the bidding format in E-Procurement portal (NIC portal). Any deviations (Technical as well as Commercial) not mentioned in the Annexure-II shall not be considered. Bidders to note all the points mentioned in "Notes" of Annexure-II of GCC Rev.07.

6. Bidder has to submit "NO DEVIATION CERTIFICATE FOR COMMERCIAL TERMS AND CONDITIONS as per General Conditions of Contracts (GCC, Rev.07), Special Conditions of Contract and Notice Inviting Tender (NIT)" **in case of no deviations.**

7. Unsolicited fresh/revised bids shall not be entertained.

8. If any bidder has mentioned the term "Not Applicable" / "not required" / "not quoted" in BHEL price format, the same to be substantiated by the bidder. If such item is required to be supplied for system completion in future, same will be supplied free of cost by the successful bidder.

9. Purchaser shall be under no obligation to accept the lowest or any other tender and shall be entitled to accept or reject any/all tender(s) in part or full without assigning any reason whatsoever.

10. Tenderers must enclose the Quality Plan in the prescribed format, for approval. Equipment will be dispatched only after Purchaser's/Owner's inspection of the hold points specified in the approved Quality Plan and issue of Material Dispatch Clearance Certificate (MDCC).

11. Offers should be submitted separately in two parts online through e-procurement system only (NIC portal), Offers should be uploaded in two parts online at https://eprocurebhel.co.in/nicgep/app in as follows:

    a) Part-I Bid: - Documents and Credential as per Technical PQR and Techno-Commercial offer (along with un-priced copy of un-priced bid and un-priced schedule of Technical-Commercial Deviation, Annexure I , IA , & II)
    b) Part II Bid: - Price Bid (Annexure-I & IA) and Priced schedule of Technical-Commercial Deviation(Annexure-II)

    Terms and conditions: -

    a) Part I bid will be opened on date & time mentioned in the NIT or subsequent corrigenda/amendments, if any.
    b) **Techno-commercial offer of only those bidders shall be evaluated who will meet the Technical pre-qualifying requirement of the tender.**

however, all correspondence thereof, shall be addressed to the following persons and sent at the following address:

Mr. Deepak Kumar **Dy. Engineer, PG-III** **E-mail: dkgangwal@bhel.in** **Ph. +91-120-4368708;**	**Mr. Hemant Kr. Kaushik** **Mgr. PG-III** **E-Mail: hkkaushik@bhel.in** **Ph. No. +91-120-4213549;** **Mob: 9540180895**
M/s. Bharat Heavy Electricals Ltd., **Project Engineering Management,** PPEI Building, Plot No 25, Sector-16A, Noida-201301, U.P., INDIA	

12. Evaluation will be done on L1 (Total cost to BHEL excluding GST) basis. Incomplete offer or part offer of NIT BOM/BOQ shall be summarily rejected.

13. **Evaluation Conditions: (Reverse Auction) -** Guidelines for Reverse Auction 2021 Amendment 1 dated-10.03.2021 shall be applicable for this tender and same is available at

    a) https://www.bhel.com/supplier-registration
    b) https://pem.bhel.com/Current_Tender.aspx

    Bidders to note following point before quoting-
    "BHEL shall be resorting to Reverse Auction (RA) (Guidelines as available on www.bhel.com) for this tender. RA shall be conducted among the techno-commercially qualified bidders. Price bids of all techno-commercially qualified bidders shall be opened and same shall be considered for RA. In case any bidder(s) do(es) not participate in online Reverse Auction, their sealed envelope price bid along with applicable loading, if any, shall be considered for ranking."
    In case of enquiry through e-Procurement, the sealed electronic price bid (e-bid) is to be treated as sealed envelope price bid.
    BHEL will inform bidders the details of service provider who will provide business rules, all necessary training and assistance before commencement of online bidding.
    Bidders will be advised to read the 'Business Rules' indicating details of RA event carefully, before reverse auction event.
    "The Bidders has to quote the Single Price (i.e. Total Cost to BHEL) (excl. GST) in Reverse Auction. Price are to be inclusive of Packing & Forwarding charges, all the routine & type tests 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."

14. **Govt. of India's Public Procurement Policy – Preference to Make in India Clause:** -

    For subject tender only Class I local suppliers are eligible to bid (in line with clause no. 3 (a) of MII circular no P-45021/2/2017-PP (BE-II) Dtd-16-09-2020, as there is sufficient Local Capacity & Local Competition. In case of subsequent orders issued by nodal ministry, changing the definition of local content for the items of the NIT, the same shall be applicable even if issued after issue of this NIT, but before opening of Part-II bids against this NIT".
    The local supplier at the time of tender, bidding, solicitation, shall be required to provide self-certification that as per the offered item, they meet the requirements of Class I local supplier as per the provisions of PPP-MII Order of Govt. of India and relevant circulars issued by nodal ministry w.r.t. above mentioned orders and shall give details of location(s) at which the local value addition is made in Annexure- IV. Subject package is divisible in nature.

15. Bidder to note that this is a conditional Open Tender enquiry subject to following condition: -

    A) Meeting of Technical PQR
    B) Techno-commercial qualification/recommendation of bidder by the BHEL-PEM. This enquiry is subject to Conditions/ limits if any imposed in PMD (PEM BHEL) / Vendor registration/ In Customer Approval.
    C) Customer Approval is mandatory. Approval of vendor from end Customer(NTPC) shall be taken up by BHEL-PEM with customer. Bidders who are not approved from end customer should furnish the credentials as per (end customer) format – along with their bid.

16. Bidders 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. In case the same is found not available, BHEL has the right to reject such document from evaluation.

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17. Compliance of model clauses as provided in Annexure-III of Ministry of Finance Order (Public Procurement No. issued on 23.07.2020 (Restrictions under Rule 144 (xi) of the GFR,2017) shall be applicable for subject tender. Model Certificates provided in same Annexure-III shall also be complied. Further, relevant clause of order no. 25-11/6/2018-PG dated 02.07.20 issued by MOP shall also be complied. An undertaking regarding Model Clauses (as applicable from Annexure-III) shall be furnished by bidders along with bid documents.
Please note that following MII, MOP & MOF orders/circulars are firm part of this NIT and bidders to comply the same:
*ensure compliance to Ministry of Power (MoP) Order No. 25-11/6/2018-PG dt. 02/07/2020 & Order No. 11/05/2018-Coord. dt. 23/07/2020, if applicable.
• ensure compliance of Ministry of Finance (MoF) Order (Public Procurement No. 1 & 2) F. No. 6/18/2019/PPD dt. 23/07/2020.
• to submit "Model Certificate for Tenders" as per Annexure-III of Ministry of Finance (MoF) Order (Public Procurement No. 1 & 2) F. No. 6/18/2019/PPD dt. 23/07/2020.

Note: Subsequent orders/circulars to be checked and to be complied.

18. CIF is not available/applicable for subject package and project.

19. For bidders (who are not registered with BHEL-PEM) -Online Registration Portal is operational in BHEL. Registration in BHEL-PEM is not mandatory for this tender. However, Non-registered Vendors, who wish to apply for registration with BHEL-PEM, can apply through Online Registration Portal available at www.bhelpem.com →vendor section → Online Supplier Registration. All credentials and/or documents duly signed and stamped related to registration may be uploaded on the website and submit the application for registration.

20. All corrigenda, addenda, amendments, time extensions, clarifications etc. to the tender will be hosted on BHEL websites only (a) https://eprocurebhel.co.in/nicgep/app b) www.bhel.com c) https://pem.bhel.com/) under subject tender reference. Bidders are requested to visit our websites from time to time to keep themselves updated. Bidders may go through the Sellers' manual & Help documents provided on E-Procurement Portal website & obtain required Digital Signature Certificate for participating in the subject Tender. For Bidders' convenience, the Helpdesk Nos. of E-Procurement (NIC) Portal is available at website i.e. https://eprocurebhel.co.in/nicgep/app .

21. If any bidder uploads price bid in the unpriced section (techno-commercial attachment page) of the tender in e-Procurement (NIC portal), in that case bidder(s) shall only be responsible for such mistake and any consequences thereof. Hence all bidders are requested to be more careful at the time of uploading the Unpriced and Price Bid for Part-I and Part-II respectively to avoid mismatch.

22. Bidders to quote the freight in terms of percentage of Total Ex-works price.

23. Bidders to note that "This item /package/system falls under the list of items defined in para 3 of ministry of finance guideline date 20.09.16 (procurement of items related to public safety, health, critical security operations and Equipments etc.) & hence criteria of prior experience /turnover shall be same for all bidders including start-up /MSME".

24. Inspection shall be done by BHEL/ END CUSTOMER/Third party Agency (finalized by BHEL).Due to COVID-19 pandemic condition prevailing in the country, BHEL/PEM may go for Remote Inspection of Offered items, if required. Vendors are requested to be equipped with the facilities/gadgets as indicated in the guidelines available at https://pem.bhel.com/Documents/VendorSection/Vendor/Guidelines.pdf to take up the inspection REMOTELY.

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

26. In the course of evaluation, if more than one bidder happens to occupy L-1 status, effective L-1 will be decided by soliciting discounts from the respective L-1 bidders. In case more than one bidder happens to occupy the L-1 status even after soliciting discounts, the L-1 bidder shall be decided by a toss / draw of lots, in the presence of the

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respective L-1 bidder(s) or their representative(s). Ranking will be done accordingly. BHEL's decision in such situations shall be final and binding.

27. **Performance Bank Guarantee:** Performance Security amount shall be @5% of the value of contract value (excluding taxes duties & freight) as per GCC Rev 07.
Performance Security (Bank Guarantee) BG clause no. 11 of GCTC of GCC Rev 07 will be applicable for this tender.
Bidders to compile the following clause for timely submission of BG:
"Bidder agrees to submit performance security required for execution of the contract within the time period mentioned. In case of delay in submission of performance security, enhanced performance security which would include interest (SBI rate + 6%) for the delayed period, shall be submitted by the bidder. Further, if performance security is not submitted till such time the first bill becomes due, the amount of performance security due shall be recovered as per terms defined in NIT I contract, from the bills along with due interest "

28. **PAYMENT TERMS**: Payment terms shall be applicable as noted in GCC(Rev07) for Supply Items/respective package.

29. **DELIVERY PERIOD/SCHEDULE OF MATERIAL**: As per enclosed Annexure – B to NIT.

30. QTY.VARIATION CLAUSE: Overall (%) variation in contract values (due to changes in the scope) shall be limited to +/- 30 % , which is firm part of this NIT.

31. In case of joint bidding, bidders to furnish scope matrix which should be clearly defined between them along with the offer for the complete scope.

32. Bidders participating through open/limited tender will necessarily have to buy class III DSCs issued by the certifying authorities in India. Basic procedure/ checklist is uploaded on www.bhel.com.

33. All other terms and conditions of NIT & GCC (Rev 07) shall be applicable for the subject Package. 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).

34. Submission of complete offer as per NIT terms is the responsibility of bidder. BHEL reserves the right to reject the incomplete offer.

35. Bidders who are participating in this tender please note that GeM seller ID is mandatory before placement of order.

36. *The evaluation currency for this tender shall be INR.*

37. Detailed offers are to be uploaded including the following along with the Price schedule as per BHEL format enclosed with NIT: -

- Acceptance of BHEL-PEM GCC (Rev.-07)
- Technical & Commercial Deviations, if any along with Cost of withdrawal sheet.
- TECHNICAL Pre-Qualifying Requirement (PQR)
- Along with your offer, please submit a copy of this letter (along with acceptance of all annexures to NIT) duly signed & stamped on each page as token of acceptance of terms & instructions conveyed.
- Un-Priced price format of BOQ/BOM duly filled in 'Quoted" or 'Q' in each column/row.
- Filled Format of self-certification reg. Local content.
- Acceptance of delivery schedule.
- Land Border Certificate.
- Credentials for end customer(NTPC) approval. : i.e. Reference list indicating P.O. details, customer name, P.O. date, execution date etc., Performance certificate issued by the clients., Filled NTPC's Main & Sub-supplier questionnaire (enclosed with enquiry) and submit all the supportive documents against details furnished therein (signed & stamped on each page) .

All the above Tender Documents shall automatically become a part of the Order/Contract after its finalisation.

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Please contact to BHEL (via mail or phone) for any clarification (technical or commercial) at least one week before the due date (Techno-Commercial bid opening). Please note all correspondence from BHEL-PEM before part – I opening, shall also be part of NIT.

Yours faithfully,
For and on behalf of BHEL-PEM

HEMANT KUMAR KAUSHIK

Digitally signed by HEMANT KUMAR KAUSHIK
DN: c=IN, o=BHARAT HEAVY ELECTRICALS LIMITED, ou=BHEL PS PEM Noida, postalCode=201301, st=UTTAR PRADESH, 2.5.4.20=203696390368698 9b857141c4a3a96f3d34ee71df65ba485176ba5f765d615ce, serialNumber=b8383a9c26a60f2dba74c0aeb387434454bf7842d4041b5fa6a51f532be80a18, cn=HEMANT KUMAR KAUSHIK
Date: 2021.08.19 17:41:43 +05'30'

Hemant Kumar Kaushik
(MANAGER/PG-III/BHEL-PEM)

Enclosures:

1. Enquiry Terms and Conditions.
2. Technical Specification No. **PE-TS-480-558-E002(REV00)**
3. Technical PQR.
4. Delivery completion cum Drawings/documents submission Schedule (Annexure –B)
5. Price Schedule (BOQ/BOM- MAIN SUPPLY & MANDATORY SPARES) - Annexure-I and Annexure-IA to NIT (to be filled in e-procurement portal only)
6. Cost of withdrawal sheet -Annexure-II to NIT (to be filled in e-procurement portal only)
7. Please note that unpriced copy of Annexure-I , IA, II to NIT duly filled in word 'Quoted' should be uploaded in Part-I (techno-commercial bid also).
8. Instructions to Packing (annexure –III)
9. Format of self-Certification reg. Local content (annexure –IV)
10. Performa for End customer approval Annexure –A
11. Land Border Certificate format (Annexure-V)
12. BG Format (Annexure-6)
13. Inspection Guideline (Annexure – 7)

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ANNEXURE -B TO NIT PE/PG/RES/E-6744/2021, DTD.19-08-2021 - DELIVERY SCHEDULE
PROJECT:-3x500 MW NTPC RAMAGUNDAM ESP R&M PHASE -II
PACAKGE:-DISTRIBUTION BOARDS

Sl. No.	BHEL Drawing No	Drawing Title	Primary/Secondary	BHEL Inputs	Drg Sch for Vendors	Standard Delivery Terms for Supply Portion
1	PE-V0-480-558-E501	DATA SHEET OF LIGHTING DISTRIBUTION BOARDS	**Primary**		R-0 within 14 days from PO & subsequent revisions within 10 days of comments received from BHEL. BHEL shall furnish comments / approval on each submission within 18 days from receipt.	For Lot-1: Within Five (05) months from date of CAT-1 approval of Primary drawing/documents, subjected to drawing/document submission/re-submission schedule as stipulated, in case of any delay in submission/re-submission of Primary drawing/documents, then same shall be reduced from the given delivery period. Delay in BHEL's comments/approval beyond 18 days shall also be considered for delay analysis. For Subsequent Lots: Within 4 months from Lot clearance by BHEL.
2	PE-V0-480-558-E902	QUALITY PLAN OF LIGHTING DISTRIBUTION BOARDS	**Primary**			
3	PE-V0-480-558-E502	GA DRAWING OF LIGHTING DISTRIBUTION BOARDS	**Primary**			
4	PE-V0-480-558-E503	SCHEME DRAWING OF LIGHTING DISTRIBUTION BOARDS	**Primary**			
5	PE-V0-480-558-E504	DATA SHEET OF LIGHTING PANEL	**Primary**			
6	PE-V0-480-558-E904	QUALITY PLAN OF LIGHTING PANEL	**Primary**			
7	PE-V0-480-558-E505	GA DRAWING OF LIGHTING PANEL	**Primary**			
8	PE-V0-480-558-E506	SCHEME DRAWING OF LIGHTING PANEL	**Primary**			
9	PE-V0-480-558-E507	GA DRAWING OF LIGHTING TRANSFORMER	**Primary**			
10	PE-V0-480-558-E903	QUALITY PLAN OF LIGHTING TRANSFORMER	**Primary**			
11	PE-V0-480-558-E508	TYPE TEST REPORTS FOR LIGHTING DISTRIBUTION BOARDS	**Secondary**			
12	PE-V0-480-558-E509	TYPE TEST REPORTS FOR LIGHTING PANELS	**Secondary**			
13	PE-V0-480-558-E510	TYPE TEST REPORTS FOR LIGHTING TRANSFORMER	**Secondary**			
B	Delivery Period for Mandatory Spares: - Within four (04) months from the date of BHEL manufacturing clearance. Separate manufacturing clearance will be issued for mandatory spares .					

Notes:-

(i) The end period specified is for completion of the deliveries. Deliveries to start progressively so as to meet the completion schedule.

(ii) The delivery conditions specified are for contractual LD purposes, however BHEL may ask for early deliveries without any compensation thereof.

(iii) Non-applicable drawings shall be decided during bid evaluation of package.

(iv) Wherever schedule of drawings/documents submission / re-submission is stipulated in the Technical Specifications, same shall be superseded by delivery specified in NIT.

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DN: c=IN, o=BHARAT HEAVY ELECTRICALS LIMITED, ou=BHEL PS PEM Noida, postalCode=201301, st=UTTAR PRADESH, 2.5.4.20=2036963903686989b857141c4a3a96f3d34ee71df65ba485176ba5f765d615ce, serialNumber=b8383a9c26a60f2dba74c0aeb387434454bf7842d4041b5fa6a51f532be80a18, cn=HEMANT KUMAR KAUSHIK
Date: 2021.08.19 17:41:59 +05'30'

ANNEXURE-I TO NIT - 3 X 500MW NTPC RAMAGUNDAM ESP R&M PHASE II
BOQ CUM PRICE SCHEDULE OF DISTRIBUTION BOARDS (MAIN SUPPLY) -ANNEXURE II
ENQUIRY NO. PE/PG/RES/E-6744/2021, DTD.19-08-2021

Name of the Bidder:-													
SL NO.	SN	DESCRIPTION	UNIT	ORDERED QUANTITY	HSN Code	UNIT EX- WORKS PRICE (DULY PACKED) (Rs.)	TOTAL EX-WORKS DULY PACKED (Rs.)	FREIGHT % IN W.R.T TOTAL EX-WORKS (IN %)	FREIGHT AMOUNT (Rs.)	TOTAL PRICE (EXWORKS + FREIGHT) (Rs.)	GST @....% ON (TOTAL EXWORKS +FREIGHT) (IN %)	GST AMOUNT ON EX-WORKS + FREIGHT (Rs.)	TOTAL FOR SITE PRICE (Rs.)
1.0	1.0	**Lighting Distribution Board (LDB)**											
1.1	1.1	AC LDB Type LDB-H (12)											
1.1.1	558-13029-A	AC LDB Type LDB-H (12) without transformer (including cubicle suitable for 2 nos. 100 kVA transformer)	Nos.	6	85371000		0.00		0.00	0.00		0.00	0.00
1.1.2	558-13017-A	100kVA transformer for housing in 1.1.1 - Normal encapsulated type	Nos.	12	85371000		0.00		0.00	0.00		0.00	0.00
1.2	558-13003-A	AC WDB Type WDB-H (12)											
1.2.1	558-13003-A	AC LDB Type WDB-H (12) without transformer (including cubicle suitable for 1 no. 100 kVA transformer)	Nos.	3	85371000		0.00		0.00	0.00		0.00	0.00
1.2.2	558-13017-A	100kVA transformer for housing in AC WDB	Nos.	3	85371000		0.00		0.00	0.00		0.00	0.00
1.3	558-13005-A	DC LDB Type LDB-D (6)	Nos.	3	85371000		0.00		0.00	0.00		0.00	0.00
2.0		**Lighting Panels (LP)**											
2.1	558-13032-A	LP – A (12) [with timer] Indoor type	Nos.	12	85371000		0.00		0.00	0.00		0.00	0.00
2.2	558-13012-A	LP – A (12) [with timer] Outdoor type	Nos.	9	85371000		0.00		0.00	0.00		0.00	0.00
2.3	558-13006-A	Type LP – A (12) [with timer] (Decorative)	Nos.	3	85371000		0.00		0.00	0.00		0.00	0.00
2.4	558-13014-A	LP – A (18) [with timer] Outdoor type	Nos.	24	85371000		0.00		0.00	0.00		0.00	0.00
2.5	558-13013-A	DC outdoor Type LP – D (6)	Nos.	3	85371000		0.00		0.00	0.00		0.00	0.00
3.0	**Total of Main Supply**						**0.00**		**0.00**	**0.00**		**0.00**	**0.00**
4.0.	**Total of Mandatoy Spares (Break up as per Annexure - IA)**						**0.00**		**0.00**	**0.00**		**0.00**	**0.00**
5.0	**Grand Total (Main + Mandatory Spares)**						**0.00**		**0.00**	**0.00**		**0.00**	**0.00**
6.0	**GRAND TOTAL IN WORDS**												

Notes :

1 The LOT-1 quantities, which are indicated above, shall be released for manufacture along with LOI/PO. However, manufacturing of LOT-1 quantities shall be done after the approval of technical and quality documentation and supply of the same shall be completed as per NIT
2 Subsequent lots shall be cleared for manufacturing based on project equirements. Delivery completion of supply of each lot from the date of clearance of the quantities shall be as per NIT.
3 The total quantity variation shall be limited to (+/-) 30% of the total contract value derived on the basis of the ordered quantities.
4 The unit price quoted by bidder shall be binding for quantity variation (as per sl. No.3 above) which is at discretion of purchaser.
5 Design engineering charges are considered to be included in main equipment supply price. No separate charges shall be applicable.
6 Prices shall remain firm during contract execution.

HEMANT KUMAR KAUSHIK

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ANNEXURE - IA TO NIT - 3 X 500 MW NTPC RAMAGUNDAM ESP R&M PHASE II

BOQ CUM PRICE SCHEDULE OF DISTRIBUTION BOARDS (MANDATORY SPARES)-ANNEXURE I A

NIT NO.: PE/PG/RES/E-6744/2021, DTD.19-08-2021

Name of the Bidder:-													
SL NO.	ITEM CODE	DESCRIPTION	UNIT	QTY.	HSN Code	UNIT EX-WORKS PRICE (DULY PACKED) (Rs.)	TOTAL EX-WORKS DULY PACKED (Rs.)	FREIGHT % IN W.R.T TOTAL EXWORKS (IN %)	FREIGHT AMOUNT (Rs.)	TOTAL PRICE (EXWORKS + FREIGHT) (Rs.)	GST @....% ON (TOTAL EXWORKS +FREIGHT) (IN %)	GST AMOUNT ON EX-WORKS + FREIGHT (Rs.)	TOTAL FOR SITE PRICE (Rs.)
1.0	558-13000-B	**Mandatory Spares**											
1.1	558-13000-B	**Lighting Boards / Panels**											
1.2	558-13000-B	Each rating of MCCB	Nos.	1	9107								
1.3	558-13000-B	Each rating of HRC fuse	Nos.	4	9107								
1.4	558-13000-B	Each type of MCB's	Nos.	10	9107								
	558-13000-B	Each type of contractor	Nos.	2	9107								
	558-13000-B	Each type of push button	Nos.	2	9107								
2.0	**TOTAL OF MANDATORY SPARES**						**0.00**		**0.00**	**0.00**		**0.00**	**0.00**

Notes :

1 Manufacturing of above quantities shall be done after the approval of technical and quality documentation and supply of the same shall be completed as per NIT.

2 Subsequent lots shall be cleared for manufacturing based on project equirements. Delivery completion of supply of each lot from the date of clearance of the quantities shall be

3 The total quantity variation shall be limited to (+/-) 30% of the total contract value derived on the basis of the ordered quantities.

4 The unit price quoted by bidder shall be binding for quantity variation (as per sl. No.3 above) which is at discretion of purchaser.

5 Design engineering charges are considered to be included in main equipment supply price. No separate charges shall be applicable.

6 Prices shall remain firm during contract execution.

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Date: 2021.08.19 17:42:37 +05'30'

ANNEXURE-II NIT NO. PE/PG/RES/E-6744/2021, DTD.19-08-2021 : DEVIATION SHEET (COST OF WITHDRAWL)

"DISTRIBUTION BOARDS" for 3 X 500MW NTPC RAMAGUNDAM STAGE-II ESP R&M(480) PROJECT

TENDER ENQUIRY REF NO- PE/PG/RES/E-6744/2021, DTD.19-08-2021

NAME OF VENDOR:-

SL NO	VOLUME/ SECTION	PAGE NO.	CLAUSE NO.	TECHNICAL SPECIFICATION/ TENDER DOCUMENT	COMPLETE DESCRIPTION OF DEVIATION	COST OF WITHDRAWL OF DEVIATION	REFERENCE OF PRICE SCHEDULE ON WHICH COST OF WITHDRAWL OF DEVIATION IS APPLICABLE	NATURE OF COST OF WITHDRAWL OF DEVIATION (POSITIVE/ NEGATIVE)	REASONS FOR QUOTING DEVIATION	
TECHNICAL DEVIATIONS										
COMMERCIAL DEVIATIONS										

PARTICULARS OF BIDDERS/ AUTHORISED REPRESENTATIVE										
NAME				**DESIGNATIONS**			**SIGN & DATE**			

NOTES:

1. Cost of withdrawal of deviation will be applicable on the basic price (i.e. excluding taxes, duties & freight) only.
2. All the bidders have to list out all their Technical & Commercial Deviations (if any) in detail in the above format.
3. Any deviation not mentioned above and shown separately or found hidden in offer, will not be taken cognizance of.
4. Bidder shall submit duly filled unpriced copy of above format indicating "quoted" in "cost of withdrawal of deviation" column of the schedule above along with their Techno-commercial offer, wherever applicable. In the absence of same, such deviation(s) shall not be considered and offer shall be considered in total compliance to NIT.
5. Bidder shall furnish price copy of above format along with price bid.
6. The final decision of acceptance/ rejection of the deviations quoted by the bidder shall be at discretion of the Purchaser.
7. Bidders to note that any deviation (technical/commercial) not listed in above and asked after Part-I opening shall not be considered.
8. For deviations w.r.t. Credit Period, Liquidated damages, Firm prices if a bidder chooses not to give any cost of withdrawal of deviation loading as per Annexure-VII, will apply. For any other deviation mentioned in un-priced copy of this format submitted with Part-I bid but not mentioned in priced copy of this format submitted with Priced bid, the cost of withdrawal of deviation shall be taken as NIL.
9. Any deviation mentioned in priced copy of this format, but not mentioned in the un-priced copy, shall not be considered.
10. All techno-commercial terms and conditions of NIT shall be deemed to have been accepted by the bidder, other than those listed in unpriced copy of this format.
11. Cost of withdrawal is to be given separately for each deviation. In no event bidder should club cost of withdrawal of more than one deviation else cost of withdrawal of such deviations which have been clubbed together shall be considered as NIL.
12. In case nature of cost of withdrawal (positive/negative) is not specified it shall be assumed as positive.
13. In case of discrepancy in the nature of impact (positive/ negative), positive will be considered for evaluation and negative for ordering.

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Date: 2021.08.19 17:42:59 +05'30'

PROJECT: 3x500 MW NTPC RAMAGUNDAM ESP R&M PHASE II
PACAKGE: - DISTRIBUTION BOARDS
ANNEXURE -III TO NIT NO. PE/PG/RES/E-6744/2021, DTD.19-08-2021

INSTRUCTIONS TO PACKING LIST

For faster verification of bills, successful bidder to submit detailed Bill of Material (BOM) at the time of drawings/ documents submission after placement of PO. Each item of the BOM to be uniquely identified with item code no. or item Sl. No. Supplier to ensure that all items which will find separate mention in the packing list are covered in this detailed BOM.

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 items/package will be supplied free of cost in most reasonable time.

Packing List must indicate:

a) Packing size
b) Gross weight and net weight of each package
c) Contents of the package with cross reference to BOM item code no. / Sl. No.
d) Quantity of each items separately.

The packing list must cover all the BOM items.

Supplier to give following undertaking in the packing list:

The Packing list provided herewith is as per BOM approved under PO No. -----

ANNEXURE – 4
3x 500 MW NTPC RAMAGUNDAM ESP R&M PHASE II
LIGHTING DISTRIBUTION BOARDS

Letter head of Company

Ref: **PE/PG/RES/E-6744/2021, DTD.19-08-2021**

Date: …….

To,
Bharat Heavy Electricals Limited
PEM, PPEI Building, Plot No 25,
Sector -16A, Noida (U.P)-201301

Subject: - Certification regarding local content

Reference: Tender Enquiry No:- **PE/PG/RES/E-6744/2021, DTD.19-08-2021**

Name of Package: DISTRIBUTION BOARDS

Dear Sir,

We hereby certify that items offered by us of Distribution Boards for 3x 500 MW NTPC RAMAGUNDAM ESP R&M Project meets the requirement of minimum local content in line with clause no. 14 of NIT and the Public Procurement (Preference to Make in India), Order 2017 dated-15.06.2017, 28.05.2018 & 29.05.2019, 04.06.20 & 16.09.20 .

Bidder to furnish: Percentage of local content quoted/applicable for their offer is : …… .

We further confirm that details of location at which the local value addition is made will be our registered works at……
……
…… (address of the works)

Yours very truly

…….. (authorized signatory of company)

…… (firm name)

authorized signatory
of company

ANNEXURE – 5 TO NIT NO . **PE/PG/RES/E-6744/2021, DTD.19-08-2021**

An undertaking regarding Model Clauses on company letter head only

(To be provided along with bid)

Reference: **PE/PG/RES/E-6744/2021, DTD.19-08-2021**

Item: **DISTRIBUTION BOARDS**

Project: **3 X 500MW NTPC RAMAGUNDAM STAGE-II ESP R&M(480) PROJECT**

TO WHOM SO IT MAY CONCERN

This is with reference to Ministry of Finance circular dated 23.07.20 reg. restriction under rule 144 (xi) of GFR.

"I have read the clause regarding restrictions on procurement from a bidder of a country which shares a land border with India. I hereby certify that M/s ……. …… is not from such a country and is eligible to be considered/participate in tender enquiry no. :**PE/PG/RES/E-6744/2021, DTD.19-08-2021**

Sign & Signature (Not below Director/owner of the company)

Date:

Place:

ANNEXURE - 6 TO NIT NO.: **PE/PG/RES/E-6744/2021, DTD.19-08-2021**

BANK GUARANTEE FOR PERFORMANCE SECURITY

Bank Guarantee No:_____
Date:_____

To,

NAME
& ADDRESSES OF THE BENEFICIARY

Dear Sirs,
In consideration of the Bharat Heavy Electricals Limited 1 (hereinafter referred to as the 'Employer' which expression shall unless repugnant to the context or meaning thereof, include its successors and permitted assigns) incorporated under the Companies Act, 1956 and having its registered office at ……1 through its Unit at..... (name of the Unit) having awarded to (Name of the Vendor / Contractor / Supplier) having its registered office at ……2 hereinafter referred to as the 'Vendor/Contractor/Supplier', which expression shall unless repugnant to the context or meaning thereof, include its successors and permitted assigns), a contract Ref No.....dated .....3 valued at Rs ..... 4 (Rupees ……)/ FC …….. (in words .....) for..... 5 (hereinafter called the 'Contract') and the Vendor/Contractor/Seller having agreed to provide a Contract Performance 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 a maximum amount Rs …… 6 (Rupees ……..) without any demur, immediately on first demand from the Employer and without any reservation, protest, and recourse and without the Employer needing to prove or demonstrate reasons for its such demand.

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

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

The payment so made by us under this Guarantee shall be a valid discharge of our liability for payment thereunder and the Vendor/Contractors/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 up to and including..... 7 and shall be extended from time to time for such period as may be desired by Employer.

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

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

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

of the Employer in writing.

Notwithstanding anything to the contrary contained hereinabove:

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

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

Dated..... .. For and on behalf of

Place of Issue..... . (Name of the Bank)

1 NAME AND ADDRESS OF EMPLOYER i.e. Bharat Heavy Electricals Limited

2 NAME AND ADDRESS OF THE VENDOR / CONTRACTOR / SUPPLIER.

3 DETAILS ABOUT THE NOTICE OF AWARD/ CONTRACT REFERENCE

4 CONTRACT VALUE

5 PROJECT/SUPPLY DETAILS

6 BG AMOUNT IN FIGURES AND WORDS

7 VALIDITY DATE

8 DATE OF EXPIRY OF CLAIM PERIOD

Note:

1. Units are advised that expiry of claim period may be kept 3-6 months after validity date. It may be ensured that the same is in line with the agreement/ contract entered with the vendor.

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

3. In line with the GCC, SCC and contractual terms, Unit may carry out minor modifications in the Standard BG Formats. If required, such modifications may be carried out after taking up appropriately with the Unit/Region's Law Deptt.

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

a) From Nationalized Public Sector *1* Private Sector/ Foreign Banks (BG issued by Branches in India) can be accepted subject to the condition that the Bank Guarantee should be enforceable in the town/ city or at nearest branch where the Unit (New Delhi for POs issued from PEM Noida/ PO issuing agency) is located i.e. Demand can be presented at the Branch located in the town/ city or at nearest branch where the Unit is located.

b) From Foreign Banks (wherein Foreign Vendors intend to provide BG from local branch of the Vendor country's Bank)

b.1 In such cases, in the Tender Enquiry/ Contract itself, it may be clearly specified that Bank Guarantee issued by **any of the Consortium Banks** only will be accepted by BHEL. As such, Foreign Vendor needs to make necessary arrangements for issuance of Counter- Guarantee by Foreign Bank in favour of the Indian Bank's (BHEL's Consortium Bank) branch in India. It is advisable that all charges for issuance of Bank Guarantee/ Counter- Guarantee should be borne by the Foreign Vendor. The tender stipulation should clearly specify these requirements.

b 2 In case, Foreign Vendors intend to provide BG from Overseas Branch of our Consortium Bank (e.g. if a BG is to be issued by SBI Frankfurt), the same is acceptable. However, the procedure at sl.no. b.1 will required to be followed.

b 3 The BG issued may preferably be subject to Uniform Rules for Demand Guarantees (URDG) 758 (as amended from time to time). The BG Format provided to them should clearly specify the same.

or & On behalf of Guarantee issuing bank

(Office Seal)

Name:
E-mail ID:
Contact number:

Guidelines for Remote Inspection of PEM BOIs

1) OBJECTIVE:

To lay down the procedure for carrying out Remote Inspection of Bought-out Items (BOIs) for PEM suppliers wherever applicable.

2) SCOPE:

It will cover suppliers for packages of PEM BOIs for various project requirements.

Invitation is sent to the suppliers for remote inspection on applications like MS Teams, Webex, etc. by BHEL.

3) MINIMUM REQUIREMENTS AT SUPPLIER'S WORKS:

i. Uninterrupted internet services

ii. Good internet bandwidth (Min 100 Mbps)

iii. Good resolution camera (2 nos) – one preferably CCTV (static at one place) and one hand hold (moving)

iv. Smart phone with minimum 8MPi camera front and back both with optical zoom facility suitable for using web applications like Webex, MicroSoft (MS) Teams, etc.

v. Computer and Scanner with good resolution

vi. Digital signatures of supplier's Quality Engineer

vii. Availability of web applications like Webex, MicroSoft (MS) Teams, as required.

viii. All Test certificates, internal test reports, calibration reports, etc. for the items offered for inspection.

ix. Availability of the above to be submitted to BHEL two days in advance before inspection.

x. Dedicated team from supplier side for facilitating inspection requirements.

xi. For ensuring proper visibility, the suggested Portable lighting sources (torch/ electric LED bulb of minimum 15 W) with no glare is to be ensured at offered job, location for remote inspection/testing. This is to be verified before start of the inspection.

xii. The GPS location co-ordinates or any method to locate inspection location shall be captured indicating the location of the Vendor-Premises of remote inspection/testing.

4) MINIMUM REQUIREMENTS AT BHEL and CUSTOMER LOCATION :

i. Uninterrupted internet services

ii. Suitable internet bandwidth

iii. Digital signatures wherever required.

iv. Availability of web applications like Webex, MS Teams, etc. as required.

v. Clearance from customer for conducting remote inspection

5) PROCEDURE:

i. Supplier will raise the inspection call in BHEL - CQIR portal.

ii. Supplier shall ensure availability of minimum requirements at supplier's works as mentioned above at point 3.

iii. Before starting the inspection, the supplier shall submit the documents (TCs, internal test reports and calibration certificates as per approved QAP) two days before the date of inspection for review by BHEL and supplier shall coordinate with BHEL and if found satisfactory, inspection shall be considered for remote.

iv. Prior to commencement of remote inspection a pre inspection meeting shall be organised by BHEL inspector with supplier to ascertain the readiness for remote inspection.

6) During inspection, supplier shall share the location on Google maps for verifying the address of the manufacturer. Location may be captured by BHEL as screenshot.

i. Inspection shall be on the basis of approved Quality Plans and associated reference documents mentioned.

ii. For witnessing inspection, supplier shall bring the mobile video camera near to the surface of the equipment or as per requirement of the inspector for clarity in viewing the test/ equipment which shall be the responsibility of supplier. Supplier shall ensure that proper lighting in available during live video streaming.

iii. Before start of the inspection, inspector shall ensure that all instruments shall have valid calibration report. Supplier shall ensure use of digital instruments preferably for inspection to the extent possible.

iv. Details of suppliers's dedicated team handling the remote inspection shall also be incorporated in the CQIR.

v. All details of inspection/ testing referred documents shall be mentioned in the CQIR. Recording of remote inspection shall be maintained by the BHEL inspector and this recording (unedited) shall be maintained at BHEL system for a minimum period of 3 years or till the warranty period whichever is later.

vi. PEM (Engineering) shall accord final technical clearance, in case of any deviation in inspected item noticed during inspection.

vii. Inspection shall be conducted by PEM-Q&BE assigned inspector along with PEM-Engg (if required). CQIR shall be prepared and maintained by PEM-Q&BE.

viii. PG will issue MDCC on the basis of acceptance of inspected items along with accepted packing photographs as per contract provisions.

7) **UNDERTAKING BY VENDOR:** Material inspected through remote inspections is meeting all technical requirements of BHEL. In case of any discrepancy from the above procedure/ material inspected, if found later, vendor will replace the materials without any cost implication to BHEL.

8) Vendor shall provide the signed and stamped of the above guidelines to BHEL as a token of acceptance.

HEMANT KUMAR KAUSHIK

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Date: 2021.08.19 17:43:35 +05'30'

CORPORATE QUALITY ASSURANCE/ कॉरपोरेट गुणवत्ता आश्वासन

MAIN CONTRACTOR'S PROPOSAL CUM EVALUATION REPORT

मुख्य संविदाकार प्रस्ताव सह मुल्यांकन रिपोर्ट

Ref No: संदर्भ सं.:			***Date:*** तिथिः		
i.	***Main Contractor*** मुख्य संविदाकार				
ii.	***Project*** परियोजना				
iii.	***Package Name*** पैकेज का नाम		***Package No*** पैकेज सं.		
iv.	***Proposed Item/Scope of Sub-contracting*** उप-संविदा(अनुबंध) का प्रस्तावित मद/ दायरा				
v.	***Item covered under*** *निम्नलिखित के अंतर्गत शामिल मद*	***Schedule-1*** */अनुसूची-* ***1***		***As per contract clause No-*** *अनुबंध के अनुसार खंड सं.--* **-**	
		Schedule-2 *अनुसूची-* ***-2***			
vi.	***If item is Schedule-1 and proposed sub-vendor is indigenous, Main Contractor to explain how the contractual provisions will be fulfilled*** /यदि मद अनुसूची **-1** है और प्रस्तावित उप-विक्रेता स्वदेशी है, तो मुख्य संविदाकार को स्पष्ट करना होगा कि संविदा/अनुबंध के प्रावधान कैसे पूरे किए जाएंगे				
vii.	***Name and Address of the proposed Sub-vendor's works*** /प्रस्तावित सब-वेंडर का नाम तथा पता				
viii.	***PO placement date/ Start of manufacturing (if self-manufactured) as per L2 network*** **पीओ नियोजन की तिथि / एल-** 2 **नेटवर्क के अनुसार विनिर्माण (यदि स्व-निर्मित है) की शुरुआत**				

ix.	***Item Description (Type/Size/Rating/Scope of Sub-Contracting)*** मद का विवरण (प्रकार / आकार / रेटिंग / उप-अनुबंध का दायरा)	***Total quantity of proposed item envisaged in this package (Nos/ Running Meters/ Kgs/ Tons etc)*** इस पैकेज में परिकल्पित प्रस्तावित मद की कुल मात्रा (संख्या / क्रियाशील मीटर / किलोग्राम / टन आदि)	***Quantity proposed to be procured from proposed sub-vendor (Nos/ Running Meters /Kgs /Tons etc)*** प्रस्तावित उप-विक्रेता (संख्या / क्रियाशील मीटर / किलोग्राम / टन आदि) से खरीदी जाने वाली मात्रा	***Timeline for quantity requirements as per project schedule & whether the proposed Sub-vendor equipped with adequate capacity to supply proposed order quantity in time*** / परियोजना समय सूची के अनुसार मात्रा आवश्यकताओं के लिए समय-सीमा और क्या प्रस्तावित उप-विक्रेता समय पर प्रस्तावित मांग की मात्रा की आपूर्ति करने में पूरी तरह से सक्षम है

x.	***Supply experience of the proposed sub-vendor (including supplies to Main Contractor, if any) for similar item/scope of sub-contracting, for last 3 years (Note:- Only relevant experience details w.r.t. proposed item/scope of subcontracting to be brought out here)*** पिछले **3** वर्षों के लिए उप-अनुबंध के समान मद / दायरे के लिए प्रस्तावित सब-वेंडर (मुख्य संविदाकार हेतु आपूर्ति, यदि कोई हो, सहित) का आपूर्ति अनुभव (नोट: - उप-अनुबंध के प्रस्तावित मद / दायरे के संबंध में केवल प्रासंगिक अनुभव के विवरण का उल्लेख हो

CORPORATE QUALITY ASSURANCE/ कॉरपोरेट गुणवत्ता आश्वासन

MAIN CONTRACTOR'S PROPOSAL CUM EVALUATION REPORT

मुख्य संविदाकार प्रस्ताव सह मुल्यांकन रिपोर्ट

	Project/Package परियोजना/पैकेज	***Customer Name*** ग्राहक का नाम	***Supplied Item (Type/Rating/Model /Capacity/Size etc)*** आपूर्त्तित मद (प्रकार/रेटिंग /मॉडल /क्षमता/आकार आदि)	***PO ref no/date*** पीओ संदर्भ सं. /तिथि	***Supplied Quantity*** आपूर्ति की मात्रा	***Date of Supply*** आपूर्त्ति की तिथि

We confirm that as per our assessment, the proposed sub-vendor has requisite capabilities & supply experience and is suitable for supplying the proposed item/scope of sub-contracting/हम अपने आकलन के अनुसार इस बात की पुष्टि करते हैं कि, प्रस्तावित उप-विक्रेता के पास अपेक्षित क्षमता और आपूर्ति करने का अनुभव है और उप-अनुबंध के दायरे /प्रस्तावित मद की आपूर्ति के लिए उपयुक्त है।

Name: नाम:		***Desig:*** पद:		***Contact No:*** दूरभाष सं.:		***Sign:*** हस्ताक्षर:		***Date:*** तिथि:	

Company's Seal/Stamp:- कंपनी का मुहर:-

एनटीपीसी NTPC	**CORPORATE QUALITY ASSURANCE/ कॉरपोरेट गुणवत्ता आश्वासन** **SUB-VENDOR QUESTIONNAIRE/ सब-वेंडर प्रश्नावली**

i.	***Item/Scope of Sub-contracting*** **उप-संविदा(अनुबंध) का मद/ दायरा**			
ii.	***Address of the registered office*** पंजीकृत कार्यालय का पता		***Details of Contact Person*** संपर्क व्यक्ति का विवरण ***(Name, Designation, Mobile, Email)*** (नाम, पदनाम, मोबाइल, ईमेल)	
iii.	***Name and Address of the proposed Sub-vendor's works where item is being manufactured*** प्रस्तावित उप-विक्रेता के कार्यों का नाम और पता, जहां मद का निर्माण किया जा रहा है		***Details of Contact Person:*** संपर्क व्यक्ति का विवरण ***(Name, Designation, Mobile, Email)*** (नाम, पदनाम, मोबाइल, ईमेल)	
iv.	***Annual Production Capacity for proposed item/scope of sub-contracting*** **उप-संविदा(अनुबंध)** के प्रस्तावित मद / दायरे के लिए वार्षिक उत्पादन क्षमता			
v.	***Annual production for last 3 years for proposed item/scope of sub-contracting*** **उप-संविदा(अनुबंध)** के प्रस्तावित मद / दायरे के लिए पिछले 3 वर्षों का वार्षिक उत्पादन			
vi.	***Details of proposed works*** **प्रस्तावित कार्यों का विवरण**			
1.	***Year of establishment of present works*** वर्तमान फैक्टरी की स्थापना का वर्ष			
2.	***Year of commencement of manufacturing at above works*** उपरोक्त फैक्टरी में निर्माण कार्य शुरू होने का वर्ष			
3.	***Details of change in Works address in past (if any*** पूर्व में फैक्टरी स्थल में परिवर्तन का विवरण (यदि कोई हो)***)***			
4.	***Total Area*** कुल क्षेत्र			
	Covered Area शामिल क्षेत्र			
5.	***Factory Registration Certificate*** फैक्टरी पंजीकरण प्रमाण पत्र		***Details attached at Annexure – F2.1*** विवरण अनुलग्नक- एफ 2.1 पर संलग्न है	
6.	***Design/ Research & development set-up*** डिजाइन / अनुसंधान और विकास सेटअप ***(No. of manpower, their qualification, machines & tools employed etc.)*** (श्रमिकों की संख्या, उनकी योग्यता, मशीन और उपलब्ध उपकरण आदि)		***Applicable / Not applicable if manufacturing is as per Main Contractor/purchaser design)*** ***Details attached at Annexure – F2.2*** ***(if applicable)*** लागू / लागू नहीं, अगर विनिर्माण मुख्य संविदाकार / खरीददार के डिजाइन के अनुसार है) विवरण अनुलग्नक –एफ 2.2 पर संलग्न है। (यदि लागू हो)	
7.	***Overall organization Chart with Manpower Details (Design/Manufacturing/Quality etc)*** मैनपावर विवरण के साथ समग्र संगठन का चार्ट(डिजाइन / विनिर्माण / गुणवत्ता आदि)		***Details attached at Annexure – F2.3*** विवरण अनुलग्नक – F2.3 में संलग्न है।	

8.	***After sales service set up in India, in case of foreign sub-vendor(Location, Contact Person, Contact details etc.)*** भारत में बिक्री सेवा की स्थापना के बाद, विदेशी उप-विक्रेता के मामले में(स्थल , संपर्क व्यक्ति, संपर्क विवरण आदि)	***Applicable / Not applicable*** लागू / लागू नहीं ***Details attached at Annexure – F2.4*** विवरण अनुलग्नक -2.4 पर संलग्न है ।
9.	***Manufacturing process execution plan with flow chart indicating various stages of manufacturing from raw material to finished product including outsourced process, if any*** फ्लोचार्ट सहित विनिर्माण प्रक्रिया निष्पादन योजना , जिसमें आउटसोर्स प्रक्रिया, यदि कोई हो, सहित कच्चे माल से तैयार उत्पाद तक विनिर्माण के विभिन्न चरणों को दर्शाया गया हो,	***Details attached at Annexure – F2.5*** विवरण अनुलग्नक - F2.5में संलग्न है ।
10.	***Sources of Raw Material/Major Bought Out Item*** कच्चे माल के स्रोत / खरीदे हुए मुख्य मद	***Details attached at Annexure – F2.6*** विवरण अनुलग्नक - F2.6में संलग्न है।
11.	***Quality Control exercised during receipt of raw material/BOI, in-process , Final Testing, packing*** कच्चे माल / खरीदे हुए मद, प्रक्रियाबद्ध, अंतिम परीक्षण, पैकिंग करते समय गुणवत्ता नियंत्रण	***Details attached at Annexure – F2.7*** विवरण अनुलग्नक - F2.7 पर संलग्न है
12.	***Manufacturing facilities*** ***(List of machines, special process facilities, material handling etc.)*** विनिर्माण सुविधा(मशीनों की सूची , विशेष प्रक्रिया सुविधाएं, सामग्री रख-रखाव आदि)	***Details attached at Annexure – F2.8*** विवरण अनुलग्नक - F2.8में संलग्न है ।
13.	***Testing facilities (List of testing equipment)*** परीक्षण सुविधाएं(परीक्षण उपकरण की सूची)	***Details attached at Annexure – F2.9*** विवरण अनुलग्नक – F2. 9 में संलग्न है ।
14.	***If manufacturing process involves fabrication then-*** यदि निर्माण प्रक्रिया में फेब्रिकेशन की गई है तो- ***List of qualified Welders*** पात्र वेल्डर की सूची ***List of qualified NDT personnel with area of specialization*** विशेषज्ञता के क्षेत्र सहित पात्र एनडीटी कार्मिकों की सूची	***Applicable / Not applicable*** लागू / लागू नहीं ***Details attached at Annexure – F2.10*** विवरण अनुलग्नक - F2.10में संलग्न है। ***(if applicable)*** लागू / लागू नहीं
15.	***List of out-sourced manufacturing processes with Sub-Vendors' names & addresses*** सब-वेंडर द्वारा बाह्य स्रोतों (उनके नाम और पते सहित)से करवाएं गए निर्माण प्रक्रियाओं की सूची	***Applicable / Not applicable*** लागू / लागू नहीं ***Details attached at Annexure. –F2.11*** विवरण अनुलग्नक - F2.10में संलग्न है। ***(if applicable)*** (यदि लागू हो)
16.	***Supply reference list including recent supplies*** नवीनतम आपूर्ति सहित आपूर्ति संदर्भ सूची	***Details attached at Annexure – F2.12*** विवरण अनुलग्नक - F2.12 में संलग्न है । ***(as per format given below)*** (नीचे दिए गए प्रारूप के अनुसार)

Project/ package परियोजना /पैकेज	***Customer Name*** ग्राहक का नाम	***Supplied Item (Type/Rating/Model /Capacity/Size etc)*** आपूर्ति की गई वस्तु (प्रकार / रेटिंग / मॉडल / क्षमता / आकार आदि)	***PO ref no/date*** पीओ संदर्भ सं. / तिथि	***Supplied Quantity*** आपूर्ति की मात्रा	***Date of Supply*** आपूर्ति की तारीख

17.	***Product satisfactory performance feedback letter/certificates/End User Feedback*** उत्पाद के संतोषजनक प्रदर्शन संबंधी फीडबैक पत्र / प्रमाण पत्र / अंतिम उपयोगकर्ता फ़ीडबैक	***Attached at annexure - F2.13*** अनुलग्नक F2. 3पर संलग्न है

18.	***Summary of Type Test Report (Type Test Details, Report No, Agency, Date of testing) for the proposed product (similar or higher rating)*** प्रस्तावित उत्पाद (एक समान या उच्च रेटिंग वाले) के लिए टाइप टेस्ट रिपोर्ट (टाइप टेस्ट विवरण, रिपोर्ट संख्या, एजेंसी, जांच की तारीख) का सारांश नोट: - रिपोर्ट प्रस्तुत करने की आवश्यकता नहीं है ***Note:- Reports need not to be submitted***	***Applicable / Not applicable*** लागू / लागू नहीं ***Details attached at Annexure – F2.14*** विवरण अनुलग्नक - F2.1 4में संलग्न है ***(if applicable)*** (यदि लागू हो)
19.	***Statutory / mandatory certification for the proposed product*** प्रस्तावित उत्पाद के लिए वैधानिक / अनिवार्य प्रमाणीकरण	***Applicable / Not applicable*** लागू / लागू नहीं ***Details attached at Annexure – F2.15 (if applicable)*** (यदि लागू हो)
20.	***Copy of ISO 9001 certificate*** आईएसओ 9001 प्रमाण पत्र की प्रति ***(if available***(यदि उपलब्ध हो)	***Attached at Annexure – F2.16*** अनुलग्नक में संलग्न - F2.1 6 है
21.	***Product technical catalogues for proposed item (if available)*** प्रस्तावित मद के लिए उत्पाद तकनीकी कैटलॉग (यदि उपलब्ध हो)	***Details attached at Annexure – F2.17*** विवरण अनुलग्नक - F2.1 7 में संलग्न है

Name: ***नाम:***		***Desig:*** ***पद:***		***Sign:*** ***हस्ताक्षर:***		***Date:*** ***तिथि:***	

Company's Seal/Stamp:- कंपनी की मुहर / मोहर: -

BHEL	PRE-QUALIFICATION REQUIREMENTS FOR DISTRIBUTION BOARDS	PE-PQ-999-558-E005 REVISION NO. 01 DATE 26/08/2020 SHEET NO. 1 OF 2

ITEMS : LDBs/ WDBs/ Lighting Panels

SCOPE: Supply: YES; Erection & Commissioning: NO.

1	Availability of temperature rise and degree of protection test certificates conducted at independent lab or witnessed by third party for LDBs/ WDBs.
2	Vendor should be designer & manufacturer of LDBs/ WDBs.
3	Availability of test reports (witnessed by third party) to establish in-house capability to carry out all Functional tests, HV test, IR measurement as per relevant IS for LDBs/ WDBs.
4	Option -1: Performance certificates for min. 2 years of trouble free operation at minimum 2 different installations/sites for LDBs/ WDBs and lighting panel. Performance certificate should be from end user only. OR Option-2 : Repeat orders received from two different purchasers/end users for LDBs/WDBs and lighting panel during last 5 years provided the gap between award of two PO's is minimum 2 years. OR Option-3 : 1 no. performance certificate (as per Option-1) and 1 no. repeat order (as per Option-2)
5	Capacity of manufacturing 8 nos. LDBs/WDBs, 30 nos. Lighting Panels per month.
6	Manufactured and supplied at least 40 nos. LDB's/ WDBs, 150 nos. lighting panels in one or more orders.
7	(Minimum 2 nos. purchase orders for the LDBs/WDBs) OR (1 nos. purchase order for the LDBs/WDBs & 1 nos. purchase order for the lighting panel) shall be submitted which should not be more than five (5) years old from the date of application for registration or date of techno- commercial bid opening (as applicable) for establishing continuity in business.

Notes:-

1. The credentials for LDB/ WDB's should pertain to min. 100A rating and for LP's to min 63A incomer rating.
2. In place of LDBs/ WDBs, documents submitted for LT switchgear panels shall also be considered.

Prepared By:	Reviewed By:	Approved By:
DEVENDRA SINGH Digitally signed by DEVENDRA SINGH DN: c=IN, o=BHARAT HEAVY ELECTRICALS LIMITED, ou=BHEL PS PEM Noida, postalCode=201301, st=Uttar Pradesh, 2.5.4.20=711f5cb9be9dba4189b26994570e8fbd5e5358f4250f55631a5f658ea9f8ebb9, cn=DEVENDRA SINGH Date: 2020.08.26 13:37:46 +05'30'	PRAVEEN DUTTA Digitally signed by PRAVEEN DUTTA DN: c=IN, o=BHARAT HEAVY ELECTRICALS LIMITED, ou=PS PEM, postalCode=201301, st=UTTAR PRADESH, 2.5.4.20=da8948aa0c3e2703a98a0aacaa2aedd61dd68dbef4c976429c5c374e3b47b930, cn=PRAVEEN DUTTA Date: 2020.08.26 14:18:49 +05'30'	DEBASISA RATH Digitally signed by DEBASISA RATH DN: c=IN, o=BHARAT HEAVY ELECTRICALS LIMITED, ou=BHEL PS PEM Noida, postalCode=201301, st=UTTAR PRADESH, 2.5.4.20=6fa841891eca623b359ef779ae76b0d329ed700f76a80fccab8a422c815ea7fd, cn=DEBASISA RATH Date: 2020.08.27 16:19:32 +05'30'

	PRE-QUALIFICATION REQUIREMENTS FOR DISTRIBUTION BOARDS	PE-PQ-999-558-E005
		REVISION NO. 01 DATE 26/08/2020
		SHEET NO. 2 OF 2

3. In place of Lighting Panels, documents submitted for wall mounted electrical JB's & feeder pillars etc. (with min. rating 63A) shall also be considered.

4. Consideration of offer shall be subject to customer's approval of bidders, if applicable.

5. 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.

6. Any other project specific requirement shall be as per Annexure-I and bidder shall submit relevant supporting documents.

7. Notwithstanding anything stated above, BHEL reserves the right to assess the capabilities and capacity of the bidder/collaborators to perform the contract, should the circumstances warrant such assessment in the overall interest of BHEL.

8. 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.

9. **For FGD, Hydro and R & M projects, Clause no. 4, 5 and 6 to be read as below:-**

Clause no. 4:

1 no. performance certificates for min. 2 years of trouble free operation for LDB/ WDB and lighting panel. Performance certificate should be from end user only.

OR

1 no. repeat order received from purchaser/end user for LDB/WDB and lighting panel during last 5 years provided the gap between awards of two PO's is minimum 2 years.

Clause no. 5: Capacity of manufacturing 3 nos. LDBs/ WDBs, 10 nos. Lighting Panels per month.

Clause no. 6: Manufactured and supplied at least 10 nos. LDBs/ WDB's, 30 nos. Lighting Panels in one or more orders.

Prepared By:	Reviewed By:	Approved By:
DEVENDRA SINGH Digitally signed by DEVENDRA SINGH DN: c=IN, o=BHARAT HEAVY ELECTRICALS LIMITED, ou=BHEL PS PEM Noida, postalCode=201301, st=Uttar Pradesh, 2.5.4.20=711f5cb9be9dba4189b26994570e8fbd5e5358f4250f55631a5f658ea9f8ebb9, cn=DEVENDRA SINGH Date: 2020.08.26 13:38:08 +05'30'	PRAVEEN DUTTA Digitally signed by PRAVEEN DUTTA DN: c=IN, o=BHARAT HEAVY ELECTRICALS LIMITED, ou=PS PEM, postalCode=201301, st=UTTAR PRADESH, 2.5.4.20=da8948aa0c3e2703a98a0aacaa2aedd61dd68dbef4c976429c5c374e3b47b930, cn=PRAVEEN DUTTA Date: 2020.08.26 14:19:19 +05'30'	DEBASISA RATH Digitally signed by DEBASISA RATH Date: 2020.08.27 16:20:00 +05'30'

383241/2021/PS-PEM-EL

PRE-QUALIFICATION REQUIRMENTS FOR
DISTRIBUTION BOARDS

ANNEXURE-I

PROJECT SPECIFIC REQUIREMENT

3x500 MW RAMAGUNDAM TPS STAGE-II ESP R&M

NIL

NIDHI RAWAT

Digitally signed by NIDHI RAWAT
DN: cn=NIDHI RAWAT, o=BHEL PEM, ou=ELECTRICAL, email=nidhir@bhel.in, c=IN
Date: 2021.07.24 17:26:22 +05'30'

NIDHI RAWAT

[DY MANAGER-ELECT]

AYAN SAHA

Digitally signed by AYAN SAHA
DN: cn=AYAN SAHA, o=BHEL, ou=PEM, email=ayansaha@bhel.in, c=IN
Date: 2021.07.26 10:44:00 +05'30'

AYAN SAHA

[SR. MANAGER-ELECT]

Sandeep Lodh

Digitally signed by Sandeep Lodh
DN: cn=Sandeep Lodh, o=BHEL, ou=PEM, email=sandeeplodh@bhel.in, c=IN
Date: 2021.07.26 11:11:31 +05'30'

SANDEEP LODH

[SR DGM-ELECT]

DEBASISA RATH

Digitally signed by DEBASISA RATH
DN: c=IN, o=BHARAT HEAVY ELECTRICALS LIMITED, ou=BHEL PS PEM Noida, postalCode=201 301, st=UTTAR PRADESH, 2.5.4.20=6fa8f41891eca623b359ef779ee76bbd329ed700f76a80fcabda422c815ea7f0, cn=DEBASISA RATH
Date: 2021.07.26 17:59:08 +05'30'

DEBASISA RATH

[AGM&DH-ELECT]

3x500 MW RAMAGUNDAM TPS STAGE-II ESP R&M

VOLUME – II

TECHNICAL SPECIFICATION FOR

DISTRIBUTION BOARDS

SPECIFICATION NO: PE-TS-480-558-E002, REV-0

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

	TECHNICAL SPECIFICATION FOR DISTRIBUTION BOARDS	SPECIFICATION NO. PE-TS-480-558-E002
		VOLUME II
		CONTENTS SHEET
	3x500 MW RAMAGUNDAM TPS STAGE-II ESP R&M	REV. 0 / DATE: 23.07.2021
		SHEET 1 OF 1

CONTENTS

TOTAL NUMBER OF SHEETS (INCLUDING COVER & SEPARATOR SHEETS): 61

SECTION – I

SPECIFIC TECHNICAL REQUIREMENTS

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 other than those furnished in the 'schedule of deviations'.

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 of the specification shall not be considered (i.e. technical description & quantities as per specification shall prevail).

BIDDER'S STAMP & SIGNATURE

1.0 SCOPE OF SUPPLY

1.1 Design, manufacture, assembly, inspection & testing at vendor's/ sub-vendor's works, proper packing and delivery to site of LIGHTING DB/ WELDING DB & LIGHTING PANELS as mentioned in different sections of this specification, complete with all accessories for efficient and trouble-free operation.

1.2 Standard technical requirements of LIGHTING DBs/ WELDING DBs & LIGHTING PANELS are indicated in Section-II. Project specific requirements/changes are listed in Section-I.

1.3 The stipulations of Section-I, followed by those of Data Sheet-A shall prevail and govern in case of conflict between the corresponding requirements of Section-I and Section-II.

1.4 Review of sub-vendor's documents by the vendor shall not relieve the vendor from the responsibility of design & supply as per contract / relevant standards.

1.5 The documents shall be in English language and MKS system of units.

1.6 Make of all equipment and components shall be as per attached Sub-Vendor List enclosed as per Annexure-1 to section- I.

2.0 BILL OF QUANTITIES:

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

2.2 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."

3.0 SPECIFIC TECHNICAL REQUIREMENTS

S.no	Reference clause no of section-II (if any)	Specific requirement / change
1	Clause 3.1.1	Following clause is added: Interlock required to be provided between two incomer & bus coupler of LDB.
2	Clause 10.2	Clause 10.2 shall be read as: Erection & commissioning spares are included in the bidder's scope of supply. Bidder to furnish list of E&C spares(if applicable).
3	Clause no 3.2.1 : General requirements of	With ref. to the requirement furnished in clause 3.2.1 of Section II, Bidder to consider the following:

	lighting panel	1. All LP shall be provided with provision of manual override. 2. Bus bars of DBs shall be sized to carry continuously the total running load of the system plus a 20% margin. 3. (a) Lighting panels shall be constructed out of 2 mm thick CRCA sheet steel. The door shall be hinged and the panel shall be gasketted to achieve specified degree of protection. Lighting panels shall be powder coated with color shade RAL9002. Lighting panels shall have min. IP55 degree of protection. (b) All MCBs/isolators/Switches/Contactors etc. shall be mounted inside the panel and a fibre glass sheet shall be provided inside the main door such that the operating knobs of MCBs etc., shall project out of it for safe operation against accidental contact. (c) Terminal blocks shall be 1100 V grade, clip-on stud type, made up of polyamide 6.6 or better suitable for terminating multicore 35 or 70 Sq. mm. stranded aluminium conductor incoming cable and 10 Sq. mm. stranded aluminium conductor for each outgoing circuits voltage. All terminals shall be shrouded, numbered and provided with identification strip for the feeders. (d) MCB's shall be current limiting type with magnetic and thermal release suitable for manual closing and automatic tripping under fault condition. MCB's shall have short circuit interrupting capacity of 10 KA rms. MCB knob shall be marked with ON/OFF indication. A trip free release shall be provided to ensure tripping on fault even if the knob is held in ON position. MCB terminal shall be shrouded to avoid accidental contact. (e) DC switches shall be rotary type, 2 pole, continuous duty, load break type, quick make quick break, suitable for 220 V DC, 2 wire system. Switch knob shall be provided with ON/OFF indication. (f) Programmable Digital Timer shall be Electronic Astronomical Almanac Time switch with battery back-up of min. TEN years, 4 Digit LED display, 24 hours range, manual override facility, 10 Amp 3 relay output, with NO/NC Contacts suitable for operation on 240V single phase AC supply.
4	Clause 8.1	Clause 8.1 shall be read as :

		Standard Quality Plan is enclosed. Inspection shall be carried out as per Quality Plan (0000-999-QOE-S-034) without any implication on cost and delivery. At contract stage, the successful bidder shall submit the same QP for BHEL/ ultimate customer's approval. There shall be no commercial implication to BHEL on account of any changes in QP during contract stage.
5	Clause 8.0	In addition to Clause 8.0, bidder to consider the following: 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 ten years from date of bid opening: 04.10.2019. 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 ten 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/owners 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. Selection of samples for type test, acceptance test & routine test and acceptance criteria for all the items shall be as per relevant IS

4.0 DOCUMENTATION

4.1 Documents required along with the technical offer: -
a) Signed & Stamped copy of Compliance certificate.
b) "Deviation Schedule" with "NO Deviations" and bidder's signature and company stamp.
c) Signed & stamped copy of unpriced price schedule with "quoted" word indicated against all items.
d) List of E&C Spares (If applicable).
e) All PQR related documents.

4.2 Documents required after award of LOI/PO shall be as per NIT (to be submitted by successful bidder).

DATA SHEET –A

S. No.	Description	Unit	Value
1.0	**SYSTEM DESIGN DATA**		
1.1	Design ambient	^{0}C	50
1.2	**AC Supply**		
a)	Rated voltage	V	415
b)	Rated frequency	Hz	50
c)	Voltage variation (permissible)	%	+10% to -10%
d)	Frequency variation (permissible)	%	+3% to -5%
e)	Combined voltage & frequency variation (sum of absolutes permissible)	%	10%
f)	System fault level & duration	kA, sec.	50kA for 1 sec.
1.3	**DC Supply**		
a)	Rated voltage	V	220
b)	Voltage variation (permissible)	%	+10% to -15%
c)	System fault level and duration	kA, Sec	20kA for 1 sec.

2.0 APPLICABLE STANDARDS

IS 60947	Low voltage switchgear and controlgear
IS 11171	Dry type transformers
IS 13703	Low voltage fuses for voltages not exceeding 1000V AC or 1500 V
IS 10118	Code of practice for selection, installation and maintenance of switchgear and controlgear
IS 60898	Electrical Accessories - circuit breakers for over protection for household and similar installations
IS 1901	Visual indicator lamps
IS 60079	Explosive atmospheres
IS 5572	Classification of hazardous areas (other than mines) having flammable gases and vapours for electrical installation
IS:2551	Danger notice plates

3.0	**LIGHTING/ WELDING DISTRIBUTION BOARDS**		
3.1	Operational Front		Single Front
3.2	Type of execution of modules (functional unit)		[√] Fixed [ ] Draw out
3.3	Type of sheet steel		CRCA
3.4	Sheet metal thickness (minimum)		
a)	Non-load bearing covers	mm	2.0 mm
b)	Non-load bearing partitions	mm	2.0 mm
c)	Load bearing members	mm	2.0 mm
d)	Frames	mm	2.0 mm
e)	Door	mm	2.0 mm
f)	Withdrawable unit (if applicable)	mm	2.0 mm
3.5	Cable alley width (minimum)	mm	250mm (Cable terminations located in cable alley shall be designed to meet the Form IVb Type 7 (as per IEC 61439) for safety purpose.)
3.6	Bus bar material		[√] Aluminium grade E 91E
3.7	Earth bus bar material		[√] GI Strip [ ] Aluminium [ ] Copper
3.8	Degree of Protection		
a)	Main Panel		IP-54
b)	Transformer cubicle		IP-42 , IP-52 for transformer terminal box.
3.9	Gland plate thickness	mm	3.0
3.10	**AC LDB/ WDB**		
a)	No. of Incomers		[ ] One [√] Two *(One incomer for WDB)
b)	Bus coupler required		[√] Yes [ ] No
c)	Incomer and Bus coupler rating	A	As per transformer rating
d)	Type of Incomer and Bus coupler		[ ] TPN SFU [√] TPN MCCB
e)	Type of Outgoing Feeders		[ ] TPN SFU [√] TPN MCCB
f)	Outgoing feeders rating	A	63

g)	Cable entry		[√] Bottom [ ] Top
3.11	**Lighting Transformer**		
a)	Rating	kVA	100
b)	Type of cooling		Air natural
c)	Voltage ratio	V	415/415
d)	Rated frequency	Hz	50
e)	No. of phases		3
f)	Vector group		Dyn1
g)	Off circuit taps		
	Tap range, steps	%	+5% to -5% in steps of 2.5%
	Voltage of each tap	V	As per manufacturer's data
h)	Impedance at rated current, frequency at 75 ^{o}C	%	As per IS
i)	Rated current		
	Primary	A	As per manufacturer's data
	Secondary	A	As per manufacturer's data
j)	Transformer type		[√] Cast resin [√] Encapsulated [ ] Non-Encapsulated
k)	Transformer winding insulation		Class-B or better
l)	Transformer winding insulation temperature rise limit		As per applicable standard
n)	Type of ventilation arrangement provided for transformer enclosure		As per manufacturer's data
o)	Winding conductor material		Copper
p)	Iron loss at 50 Hz and 100% rated voltage	kW	As per manufacturer's data
q)	Copper loss at rated load at 75 ^{o}C	kW	As per manufacturer's data
r)	Regulation at full load at 75 ^{o}C and 0.8 p.f. lagging		As per manufacturer's data
s)	Weight	kg	As per manufacturer's data

3.12	**DC LDB**		
a)	No of incomers		[√] One [ ] Two
b)	DC incomer type		DP Switch fuse unit with contactor
c)	DC incomer rating	A	63
d)	AC incomer type		NA
e)	AC incomer rating		NA
f)	Buscoupler required		[ ] Yes [√] No
g)	Incomer and bus coupler rating	A	63
h)	Type of bus coupler		[ ] SFU [ ] DP MCCB
i)	Type of outgoing feeders		[√] DP SFU [ ] MCCB [ ] DP MCB
j)	Outgoing feeders rating	A	32
k)	Changeover required in DC LDB		[ ] Yes (Converter for Conversion of AC to DC) [√] No
l)	Cable entry		[√] Bottom [ ] Top
4.0	**LIGHTING PANELS**		
4.1	Application		[ ] Indoor [ ] Outdoor [√] Both
4.2	Type of sheet steel		CRCA
4.3	Sheet metal thickness (minimum)		2.0
3.4	Degree of Protection		
a)	Indoor panel		IP-55
b)	Outdoor panel		IP-55, Weatherproof
c)	Canopy in outdoor panel		[√] Yes [ ] No
4.5	Bus bar material		[√] Aluminium [ ] Copper
4.6	Earth bus bar required		[√] Yes [ ] No
4.7	Earth bus bar material (if applicable)		[√] GI Strip [ ] Aluminium [ ] Copper
4.8	Gland Plate	mm	3.0

4.9	Earthing studs required		[√] Yes [ ] No
4.10	Hinged door with locking facility		[√] Yes [ ] No
4.11	**AC Lighting Panel**		
a)	Incomer rating	A	63A
b)	Type of Incomer		[ ] TPN SFU [√] TPN MCCB
c)	Earth Leakage Circuit Breaker (ELCB) in incomer required		[√] Yes [ ] No
d)	Type of Outgoing Feeders (non-flameproof panel)		[√] SPN MCB [ ] TPN MCB
e)	Timer required for indoor panel		[√] Yes [ ] No
f)	Timer required for outdoor panel		[√] Yes [ ] No
g)	Outgoing feeders rating	A	20
4.12	**DC Lighting panel**		
a)	Incomer rating	A	32
b)	Type of incomer		[√] DP SFU [ ] DP MCCB
c)	Type of outgoing feeders (non- flameproof panel)		[√] DP MCB
d)	Type of outgoing feeders (flameproof panel)		NOT APPLICABLE
e)	Outgoing feeders rating	A	20
5.0	**COMPONENTS OF LIGHTING SYSTEM EQUIPMENT**		
5.1	**Moulded Case Circuit Breaker (MCCB)**		
a)	Rated voltage	V	415
b)	Number of poles		Refer Sr. No. 3 & 4
c)	Rated short circuit duty	kA	50
d)	Rated breaking capacity (rms)	kA	50
e)	Rated making current (peak)	kA	105
f)	Release with short circuit		[√] Yes [ ] No
g)	Release with overload		[√] Yes [ ] No
h)	Release with under voltage		[√] Yes [ ] No

i)	Auxiliary contacts		
	Numbers	NO+NC	2NO + 2NC
	Rating	A	As per manufacturer data
5.2	**Switch-Fuse Unit**		
a)	Utilisation category for main contacts		DC23
b)	Number of poles		Double Pole
5.3	**Miniature Circuit Breaker**		
a)	SPN MCB rating (min)	A	Refer Sl. No. 3 & 4
b)	DP MCB rating (min)	A	Refer Sl. No. 3 & 4
c)	TPN MCB rating (min)	A	Refer Sl. No. 3 & 4
d)	Short time rating	kA	10
e)	Magnetic short circuit protection required		[√] Yes [ ] No
f)	Thermal overload protection required		[√] Yes [ ] No
5.4	**Current Transformer**		
a)	Type		Cast resin
b)	Secondary current rating	A	[√] 1 [ ] 5
c)	Burden	VA	10
d)	Accuracy class		1.0
e)	Instrument Safety Factor		<5
5.5	**Voltage Transformer**		
a)	Type		Cast resin
b)	Secondary terminal voltage (phase-phase)	V	110 V
c)	Burden	VA	10
d)	Accuracy class		1.0
e)	Winding configuration		Star/ Star
f)	System grounding		[√] Effective [ ] Non-effective
5.6	**Indicating Meters**		

5.6.1	**Ammeter**		
a)	Type		Analog
b)	Shape		Square
c)	Size		96mm x 96mm
d)	Accuracy		1.0
e)	Current coil rating	A	1
f)	Angle of deflection	deg	90
5.6.2	**Voltmeter**		
a)	Type		Analog
b)	Shape		Square
c)	Size		96mm x 96mm
d)	Accuracy		1.0
e)	AC voltage coil rating	V	0-500
f)	DC voltage coil rating	V	0-250
g)	Angle of deflection	deg	90
5.7	**Power Contactors**		
a)	Coil voltage (nominal)		
	AC contactors	V	240
	DC contactors	V	220
b)	Current rating of contacts		
	Power	A	As per manufacturer data
	Control	A	As per manufacturer data
5.8	**Under voltage relay**		
a)	Type		[√] Electromagnetic [ ] Static
b)	Coil voltage rating	V	110
c)	Means for in-built testing provided		As per manufacturer data
5.9	**Timer**		

5.9.1	**Time switch**		
a)	Type		Digital synchronous
b)	Range	hr	0-24
c)	Coil voltage rating	V	240
5.10	**Selector switch**		
a)	Type of selector switch		[√] Stay put [ ] Wing knob
b)	Lockable		[ ] Yes [√] No
5.11	**Push Button**		
a)	Voltage grade	V	500
b)	Potential free contacts		2NO+2NC
5.12	**Indicating Lamps**		
a)	Lens Colour		
	ON condition		Red
	OFF condition		Green
b)	Circuit voltage	V	240V
5.13	**Cable Glands**		**By vendor for all incoming and outgoing cables [Cable sizes shall be informed during detail engineering]**
a)	Type		[√] Double compression [ ] Single compression
b)	Material		Heavy duty brass machine finished
c)	Nickel Plating provided		[√] Yes [ ] No
d)	Flameproof glands with flameproof equipment		[√] Yes [ ] No
5.14	**Cable Lugs**		**By vendor for all incoming and outgoing cables [Cable sizes shall be informed during detail engineering]**
a)	Type		Crimping type/ ring type
b)	Material		Tinned copper
6.0	**PAINTING**		

6.1	**Paint shade**		
a)	LDBs		Two coats of Red oxide primer followed by two coats of Powder coated, colour shade 9002
b)	LPs		Two coats of Red oxide primer followed by two coats of Powder coated, colour shade 9002
6.2	**Paint Finish**		
a)	Interior		[ ] Matt [√] Semi-glossy
b)	Exterior		[√] Semi-glossy [ ] Full-glossy
6.3	**Paint Thickness**	Microns	50 (minimum)

ANNEXURE-1

SUB-VENDOR LIST

S.No.	ITEM CODE	ITEM/SERVICE DESCRIPTION	SL NO.	VENDOR CODE	VENDOR NAME	ADDRESS
1	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
		AC CONTACTORS	2	A35	GE-POWER	KAMAK TOWER, 3RD FLOOR, PLOT NO. 12-A, TVK INDUSTRIAL ESTATE, EKKADUTHANGAL, GUINDY, CHENNAI-600032
		AC CONTACTORS	3	E1144	TELEMECHANIQUE/ SCHNEIDER ELECTRIC INDIA	9TH FLOOR, BLDG. NO. 10, TOWER-C, DLF CYBER CITY, PH-II, GURGAON-122002
		AC CONTACTORS	4	L01	L&T	32, SHIVAJI MARG, P.O. BOX- 6223, NEW DELHI-110015
		AC CONTACTORS	5	B04	BCH	20/4, MATHURA ROAD, FARIDABAD, HARYANA-121006
2	ES2	AC LOAD BREAK SWITCH	1	A35	GE-POWER	KAMAK TOWER, 3RD FLOOR, PLOT NO. 12-A, TVK INDUSTRIAL ESTATE, EKKADUTHANGAL, GUINDY, CHENNAI-600032
		AC LOAD BREAK SWITCH	2	L01	L&T	32, SHIVAJI MARG, P.O. BOX- 6223, NEW DELHI-110015
		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
		AC LOAD BREAK SWITCH	4	E1076	KAYCEE	KAYCEE INDUSTRIES LTD., C/O-CMS COMPUTERS LTD., 35A, REAR BLDG., KILOKARI, NEW DELH1-110014
		AC LOAD BREAK SWITCH	5	C01	C&S ELECTRIC LTD.	222, OKHLA IND. ESTATE, PH-III, NEW DELHI-110020
3	ES3	AC MCCB	1	C01	C&S ELECTRIC LTD.	222, OKHLA IND. ESTATE, PH-III, NEW DELHI-110020
		AC MCCB	2	S03	SCHNEIDER ELECTRIC INDIA PVT. LTD.	9TH FLOOR, BLDG. NO. 10, TOWER-C, DLF CYBER CITY, PH-II, GURGAON-122002
		AC MCCB	3	S01	SIEMENS	RC-IN I S NR DEL AREA, JIL BUILDING, TOWER-B, PLOT NO. 78, SECTOR 18, GURGAON-122015, INDIA
		AC MCCB	4	A35	GE-POWER	KAMAK TOWER, 3RD FLOOR, PLOT NO. 12-A, TVK INDUSTRIAL ESTATE, EKKADUTHANGAL, GUINDY, CHENNAI-600032
		AC MCCB	5	L01	L&T	32, SHIVAJI MARG, P.O. BOX- 6223, NEW DELHI-110015
		AC MCCB	6	C02	CROMPTON GREAVES	RAIL TRANSPORTATION SYSTEMS,VANDANA BUILDING, 11, TOLSTOY MARG, TOLSTOY MARG, NEW DELHI, DL 110001
7	ES7	AUXILIARY RELAYS	1	A24	ABB	14, MATHURA ROAD, FARIDABAD, HARYANA-121003
		AUXILIARY RELAYS	2	G01	ALSTOM LTD	A-7, SEC-65, NOIDA
		AUXILIARY RELAYS	3	E1075	JYOTI LTD.	JYOTI LIMITED, E&CS DIVISION,3/15, BIDC, GORWA,VADODARA - 390 016, E-MAIL ID: ECS@JYOTI.COM
		AUXILIARY RELAYS	4	E1099	OEN INDIA LTD	29/1479, VYTILLA, COCHIN - 682 019 KERALA, INDIA
		AUXILIARY RELAYS	5	S01	SIEMENS	RC-IN I S NR DEL AREA, JIL BUILDING, TOWER-B, PLOT NO. 78, SECTOR 18, GURGAON-122015, INDIA
8	ES8	BIMETAL RELAYS	1	L01	L&T	32, SHIVAJI MARG, P.O. BOX- 6223, NEW DELHI-110015
		BIMETAL RELAYS	2	A35	GE-POWER	KAMAK TOWER, 3RD FLOOR, PLOT NO. 12-A, TVK INDUSTRIAL ESTATE, EKKADUTHANGAL, GUINDY, CHENNAI-600032
		BIMETAL RELAYS	3	S01	SIEMENS	RC-IN I S NR DEL AREA, JIL BUILDING, TOWER-B, PLOT NO. 78, SECTOR 18, GURGAON-122015, INDIA
		BIMETAL RELAYS	4	E1144	TELEMECHANIQUE/ SCHNEIDER ELECTRIC INDIA	9TH FLOOR, BLDG. NO. 10, TOWER-C, DLF CYBER CITY, PH-II, GURGAON-122002
		CABLE GLANDS	1	E1201	ALLIED TRADERS & EXPORTERS	C-124 A, SECTOR-2, NOIDA -201 301, UTTAR PRADESH, INDIA
		CABLE GLANDS	2	E1017	ARUP ENGG & FOUNDARY WORKS	391/119,PRINCE ANWAR SHAH ROAD, CALCUTTA-700068
		CABLE GLANDS	3	E1206	BALIGA LIGHTING EQPT.PVT.LTD.	63A,CP RAMASWAMY ROAD, ALWARPET,P.B.No 6910, CHENNAI-600018
		CABLE GLANDS	4	E1036	COMMET BRASS PRODUCTS	NUTAN CHEMICAL COMPOUND, WALBHAT ROAD, GOREGAON, MUMBAI-400063

S.No.	ITEM CODE	ITEM/SERVICE DESCRIPTION	SL NO.	VENDOR CODE	VENDOR NAME	ADDRESS
11	ES11	CABLE GLANDS	5	DW08	DOWELLS	M/S. DOWELLS ELECTRICALS 47/47A, SATGURU INDUSTRIAL ESTATE. OFF AAREY ROAD, GOREGOAN (EAST). MUMBAI 400 063.
		CABLE GLANDS	6	E1044	ELECTROMAC INDUSTRIES	27/28AF NEW EMPIRE IND.ESTT., R.KRISHNA MANDIR RD.JB NGR ,ANDHERI(E),MUMBAI-400059
		CABLE GLANDS	7	I01	INCAB	HARE STREET,KOLKATA,WEST BENGAL-700001
12	ES12	CABLE LUGS	1	E1040	DOWELLS	M/S. DOWELLS ELECTRICALS 47/47A, SATGURU INDUSTRIAL ESTATE. OFF AAREY ROAD, GOREGOAN (EAST). MUMBAI 400 063.
		CABLE LUGS	2	E1149	UNIVERSAL MACHINES LTD.	4,B.B.D.BAG (EAST) 90,STEPHEN HOUSE,5TH FLR CALCUTTA-700001
13	ES13	D.C. MCCB	1	C02	CROMPTON GREAVES	RAIL TRANSPORTATION SYSTEMS,VANDANA BUILDING, 11, TOLSTOY MARG, TOLSTOY MARG, NEW DELHI, DL 110001
		D.C. MCCB	2	L01	L&T	32, SHIVAJI MARG, P.O. BOX- 6223, NEW DELHI-110015
		D.C. MCCB	3	A35	GE-POWER	KAMAK TOWER, 3RD FLOOR, PLOT NO. 12-A, TVK INDUSTRIAL ESTATE, EKKADUTHANGAL, GUINDY, CHENNAI-600032
		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
14	ES14	EARTH LEAKAGE CB	1	L01	L&T	32, SHIVAJI MARG, P.O. BOX- 6223, NEW DELHI-110015
		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
		EARTH LEAKAGE CB	3	A35	GE-POWER	KAMAK TOWER, 3RD FLOOR, PLOT NO. 12-A, TVK INDUSTRIAL ESTATE, EKKADUTHANGAL, GUINDY, CHENNAI-600032
		EARTH LEAKAGE CB	4	S03	SCHNEIDER ELECTRIC INDIA PVT. LTD.	9TH FLOOR, BLDG. NO. 10, TOWER-C, DLF CYBER CITY, PH-II, GURGAON-122002
		EARTH LEAKAGE CB	5	C01	C&S ELECTRIC LTD.	222, OKHLA IND. ESTATE, PH-III, NEW DELHI-110020
		EARTH LEAKAGE CB	6	A24	ABB	14, MATHURA ROAD, FARIDABAD, HARYANA-121003
		EARTH LEAKAGE CB	7	E1068	INDO ASIAN	B-24, PHASE - II , NOIDA - 201305, U.P.
		EARTH LEAKAGE CB	8	E1088	MDS SWITCHGEAR LTD	314-317SHAH NAHAR ESTATE
		EARTH LEAKAGE CB	9	E1120	S&S POWER SWITCHGEAR LTD,	NEW NO. 67, OLD NO. 19, DR. RANGA ROAD, MYLAPORE, CHENNAI - 600004
15	ES20	DC CONTACTORS	1	S03	SCHNEIDER ELECTRIC INDIA PVT. LTD.	9TH FLOOR, BLDG. NO. 10, TOWER-C, DLF CYBER CITY, PH-II, GURGAON-122002
		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
		DC CONTACTORS	4	L01	L&T	32, SHIVAJI MARG, P.O. BOX- 6223, NEW DELHI-110015
		DC CONTACTORS	5	S01	SIEMENS	RC-IN I S NR DEL AREA, JIL BUILDING, TOWER-B, PLOT NO. 78, SECTOR 18, GURGAON-122015, INDIA
		DC CONTACTORS	6	E1144	TELEMECHANIQUE/ SCHNEIDER ELECTRIC INDIA	9TH FLOOR, BLDG. NO. 10, TOWER-C, DLF CYBER CITY, PH-II, GURGAON-122002
		DC CONTACTORS	7	A35	GE-POWER	KAMAK TOWER, 3RD FLOOR, PLOT NO. 12-A, TVK INDUSTRIAL ESTATE, EKKADUTHANGAL, GUINDY, CHENNAI-600032
16	ES21	CONTROL SWITCHES/ SELECTOR SWITCH	1	E1076	KAYCEE	KAYCEE INDUSTRIES LTD., C/O-CMS COMPUTERS LTD., 35A, REAR BLDG., KILOKARI, NEW DELH1-110014
		CONTROL SWITCHES/ SELECTOR SWITCH	2	A35	GE-POWER	KAMAK TOWER, 3RD FLOOR, PLOT NO. 12-A, TVK INDUSTRIAL ESTATE, EKKADUTHANGAL, GUINDY, CHENNAI-600032
		CONTROL SWITCHES/ SELECTOR SWITCH	3	G01	ALSTOM LTD	A-7, SEC-65, NOIDA
		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

S.No.	ITEM CODE	ITEM/SERVICE DESCRIPTION	SL NO.	VENDOR CODE	VENDOR NAME	ADDRESS
		CONTROL SWITCHES/ SELECTOR SWITCH	5	SRC01	M/s Shrenik & Co.	39A/3, PANCHRATNA INDUSTRIAL ESTATE, SARKHEJ-BAVLA ROAD, CHANGODAR, AHMEDABAD – 382 213
		CONTROL SWITCHES/ SELECTOR SWITCH	6	RE05	RECOM PVT. LTD.	M/S RECOM PVT. LTD.,16A , 2ND FLOOR A, WING RAJ INDUSTRIAL COMPLEX, MILITARY ROAD , MAROL ANDHERI (EAST),MUMBAI ,MAHARASHTRA STATE : 400059
18	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
		LT- CURRENT TRANSFORMER	2	E1009	AUTOMATIC ELECTRIC LTD.	96 AB LONAVLA INDUSTRIAL ESTATE NANGARGAON, LONAVLA-410401
		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
		LT- CURRENT TRANSFORMER	4	K18	KAPPA ELECTRICALS	KAPPA ELECTRICALS, KAPPA CONSOLIDATED PVT. LTD., SOUTHERN ELECTRIKS 14, CART TRACK ROAD, MADUVANKARAI, CHENNAI - 600 042, INDIA.
		LT- CURRENT TRANSFORMER	5	E1104	PRAGATI ELECTRICALS	280/3,II POKHRAN RD
		LT- CURRENT TRANSFORMER	6	E1106	PRECISE ELECTRICALS	47A-49A,CHAKALA ROAD ANDHERI(E),MUMBAI-99 MUMBAI, MAHARASHTRA, INDIA PIN-400 099
		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
		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
		LT- CURRENT TRANSFORMER	9	C01	C&S ELECTRIC LTD.	222, OKHLA IND. ESTATE, PH-III, NEW DELHI-110020
		LT- CURRENT TRANSFORMER	10	NK09	M/s Newtek Electricals	M-90, M.I.D.C, Waluj, Aurangabad 431136, Maharashtra, India
19	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
		LT- POTENTIAL TRANSFORMER	2	E1009	AUTOMATIC ELECTRIC LTD.	96 AB LONAVLA INDUSTRIAL ESTATE NANGARGAON, LONAVLA-410401
		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
		LT- POTENTIAL TRANSFORMER	4	K18	KAPPA ELECTRICALS	KAPPA ELECTRICALS, KAPPA CONSOLIDATED PVT. LTD., SOUTHERN ELECTRIKS 14, CART TRACK ROAD, MADUVANKARAI, CHENNAI - 600 042, INDIA.
		LT- POTENTIAL TRANSFORMER	5	E1104	PRAGATI ELECTRICALS	280/3,II POKHRAN RD
		LT- POTENTIAL TRANSFORMER	6	E1106	PRECISE ELECTRICALS	47A-49A,CHAKALA ROAD ANDHERI(E),MUMBAI-99 MUMBAI, MAHARASHTRA, INDIA PIN-400 099
		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
		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
		LT- POTENTIAL TRANSFORMER	9	NK09	M/s Newtek Electricals	M-90, M.I.D.C, Waluj, Aurangabad 431136, Maharashtra, India
20	ES25	DC SWITCH	1	A35	GE-POWER	KAMAK TOWER, 3RD FLOOR, PLOT NO. 12-A, TVK INDUSTRIAL ESTATE, EKKADUTHANGAL, GUINDY, CHENNAI-600032
		DC SWITCH	2	E1076	KAYCEE	KAYCEE INDUSTRIES LTD., C/O-CMS COMPUTERS LTD., 35A, REAR BLDG., KILOKARI, NEW DELH1-110014
		DC SWITCH	3	S01	SIEMENS	RC-IN I S NR DEL AREA, JIL BUILDING, TOWER-B, PLOT NO. 78, SECTOR 18, GURGAON-122015, INDIA

S.No.	ITEM CODE	ITEM/SERVICE DESCRIPTION	SL NO.	VENDOR CODE	VENDOR NAME	ADDRESS
21	ES26	DISTRIBUTION BOX	1	SRC01	M/S SHRENIK & CO.	39A/3, PANCHRATNA INDUSTRIAL ESTATE, SARKHEJ-BAVLA ROAD, CHANGODAR, AHMEDABAD – 382 213
22	ES28	FUSE BASE	1	E1068	INDO ASIAN	B-24, PHASE - II , NOIDA - 201305, U.P.
		FUSE BASE	2	G01	GE-POWER	KAMAK TOWER, 3RD FLOOR, PLOT NO. 12-A, TVK INDUSTRIAL ESTATE, EKKADUTHANGAL, GUINDY, CHENNAI-600032
		FUSE BASE	3	L01	L&T	32, SHIVAJI MARG, P.O. BOX- 6223, NEW DELHI-110015
		FUSE BASE	4	C01	C&S ELECTRIC LTD.	222, OKHLA IND. ESTATE, PH-III, NEW DELHI-110020
		FUSE BASE	5	S01	SIEMENS	RC-IN I S NR DEL AREA, JIL BUILDING, TOWER-B, PLOT NO. 78, SECTOR 18, GURGAON-122015, INDIA
		FUSE BASE	6	A24	ABB	14, MATHURA ROAD, FARIDABAD, HARYANA-121003
		FUSE BASE	7	S02	SPACEAGE SWITCHGEARS LTD.	68 & 13-A INDUSTRIAL DEVELOPMENT COLONY, MEHRAULI ROAD GURGAON, HARYANA-122001
		FUSE BASE	8	S03	SCHNEIDER ELECTRIC INDIA PVT. LTD.	9TH FLOOR, BLDG. NO. 10, TOWER-C, DLF CYBER CITY, PH-II, GURGAON-122002
		FUSE BASE	9	G01	ALSTOM LTD	A-7, SEC-65, NOIDA
		FUSE BASE	10	E1050	ESSEN DEINKI	FLAT NO. 502, SKYLINE HOUSE 85, NEHRU PLACE NEW DELHI
23	ES29	HRC FUSES	1	E1068	INDO ASIAN	B-24, PHASE - II , NOIDA - 201305, U.P.
		HRC FUSES	2	G01	GE-POWER	KAMAK TOWER, 3RD FLOOR, PLOT NO. 12-A, TVK INDUSTRIAL ESTATE, EKKADUTHANGAL, GUINDY, CHENNAI-600032
		HRC FUSES	3	L01	L&T	32, SHIVAJI MARG, P.O. BOX- 6223, NEW DELHI-110015
		HRC FUSES	4	C01	C&S ELECTRIC LTD.	222, OKHLA IND. ESTATE, PH-III, NEW DELHI-110020
		HRC FUSES	5	S01	SIEMENS	RC-IN I S NR DEL AREA, JIL BUILDING, TOWER-B, PLOT NO. 78, SECTOR 18, GURGAON-122015, INDIA
		HRC FUSES	6	A24	ABB	14, MATHURA ROAD, FARIDABAD, HARYANA-121003
		HRC FUSES	7	S02	SPACEAGE SWITCHGEARS LTD.	68 & 13-A INDUSTRIAL DEVELOPMENT COLONY, MEHRAULI ROAD GURGAON, HARYANA-122001
		HRC FUSES	8	S03	SCHNEIDER ELECTRIC INDIA PVT. LTD.	9TH FLOOR, BLDG. NO. 10, TOWER-C, DLF CYBER CITY, PH-II, GURGAON-122002
		HRC FUSES	9	G01	ALSTOM LTD	A-7, SEC-65, NOIDA
		HRC FUSES	10	E1050	ESSEN DEINKI	FLAT NO. 502, SKYLINE HOUSE 85, NEHRU PLACE NEW DELHI
24	ES31	GI WIRE & FLAT	1	I039	INDUSTRIAL PERFORATION (I) PVT.LTD.	MR. A. K. SAHA 327, R.N.GUHA ROAD, DUM DUM KOLKATA-West Bengal-India Phone- 9830241788 Pincode : 700028 Email : ipipl@cal2.vsnl.net.in
		GI WIRE & FLAT	2	I070	INDIA ELECTRICALS SYNDICATE	Mr. Suresh Kumar Agarwal 55, Ezra Street, Kolkata-West Bengal-India Phone- 033-22354047 Pincode : 700001 Email : cabletray@vsnl.com
		GI WIRE & FLAT	3	I072	INDMARK FORMTECH PVT. LTD.	Mr. Narendra R. Meher J Block, Plot No.-375, MIDC BHOSARI PUNE-MAHARASHTRA-INDIA Phone- 020-27130546 Pincode : 411026 Email : indmarkformtech@vsnl.net
		GI WIRE & FLAT	4	P039	PREMIER POWER PRODUCTS (CAL) PVT. LTD.	Chatterjee International Centre, 33A, Jawaharlal Nehru Road, 6th Floor, Suit No. - 11A, Kolkata,-West Bengal-India Phone- 9331008739 Pincode : 700071 Email : hemantdaga@dagaventures.com
		GI WIRE & FLAT	5	P050	PATNY SYSTEMS (P) LTD	PATNY PLAZA 160 , SARDAR PATEL ROAD SEUNDRABAD SECUNDRABAD-TELANGANA-INDIA Phone- 040-27902451 Pincode : 500003 Email : mr.mkt@patnysystems.com
		GI WIRE & FLAT	6	P079	PASSIVE INFRA PROJECTS PVT. LTD.	MR. VARUN AGRAWAL 182, VAISHALI, PITAMPURA Delhi-DELHI-INDIA Phone- 9871183059 Pincode : 110088 Email : ATANU.SAHA@PASSIVEINFRA.COM
		GI WIRE & FLAT	7	R036	RUKMANI ELECTRICAL & COMPONENTS PVT LTD	11A , MAHARISHI DEBENDRA ROAD 1ST FL , ROOM NO.4 KOLKATA-WEST BENGAL-INDIA Phone- Pincode : 700007 Email : maruthikabra@gmail.com

S.No.	ITEM CODE	ITEM/SERVICE DESCRIPTION	SL NO.	VENDOR CODE	VENDOR NAME	ADDRESS
		GI WIRE & FLAT	8	R037	RATAN PROJECTS & ENGINEERING CO. PVT.LTD.	MR. G.D. SINGHEE/MR. MAHESH SINGHEE 26, P.K. TAGORE STREET, MAIN BUILDING KOLKATA-WEST BENGAL-INDIA Phone- 9830177331 Pincode : 700006 Email : mahesh@ratans.com
		GI WIRE & FLAT	9	R041	RABI ENGINEERING WORKS PVT. LTD.	MR. TAPAN KUMAR SEN/MR. SIDDHARTHA 327, R.N. GUHA ROAD, DUM DUM, KOLKATA-WEST BENGAL-INDIA Phone- 9748753002 Pincode : 700028 Email : rabiengineering@gmail.com
		GI WIRE & FLAT	10	R200	RAJASTHAN METAL SMELTING CO.	Mr. R. K. Tibrewala D-80, Road No. 7, V.K.I.A., Jaipur-Rajasthan-India Phone- 0141-2332269 Pincode : 302013 Email : info@rmscoindia.com
		GI WIRE & FLAT	11	S210	SARAL INDUSTRIES	Mr. Y.K. Gupta L-1, L-2, Industrial Area-1 Sultanpur Road Rae Bareli-Uttar Pradesh-India Phone- 0535-2702474 Pincode : 229010 Email : saralindustries@gmail.com
		GI WIRE & FLAT	12		PARCO Engineers Pvt. Ltd.	401, skyline Epitom Building ,Near to Jolly Gym Khana, Kirol Road , Vidhyavihar, MH 400086 India
		GI WIRE & FLAT	13	U019	UNITECH FABRICATORS and ENGINEERS PVT LTD	INDRAPRASHTHA APARTMENT 24 , M.B.RAOD , BIRATI KALABAGAN KOLKATA KOLKATA-WEST BENGAL-INDIA Phone- Pincode : 700051 Email : ufepl@vsnl.net; ufepl@rediffmail.com
25	**ES33**	IND.POWER & WLDG SOCKETS	1	C02	CROMPTON GREAVES	3RD FLOOR, EXPRESS BUILDING,9-10, BAHADUR SHAH ZAFAR MARG, NEAR ITO CROSSING,NEW DELHI-110002, INDIA
		IND.POWER & WLDG SOCKETS	2	E1207	CYCLO ELECTRIC DEVICE & SERV.CO.	: A-3, NEAR ANTHEM BIOSCIENCE, KSSIDC INDUSTRIAL AREA, BOMMASANDRA, BOMMASANDRA INDUSTRIAL AREA, BANGALORE, KARNATAKA 560099
		IND.POWER & WLDG SOCKETS	3	B04	BCH	20/4, MATHURA ROAD, FARIDABAD - 121006, HARYANA, INDIA
		IND.POWER & WLDG SOCKETS	4	B02	BEST & CROMPTON	Best & Crompton Engineering Ltd 28C, Ambattur Industrial Estate (North) Ambattur, Chennai - 600 098
		IND.POWER & WLDG SOCKETS	5	A03	AJMERA INDUSTRIES & ENGG. WORKS	AJMERA INDL. AND ENGG. WORKS. AJMERA HOUSE, A-61 / KHAIRANE MIDC. , TTC INDL. AREA, NAVI MUMBAI – 400705.
26	**ES34**	INTERPOSING RELAY	1	A24	ABB	14, MATHURA ROAD, FARIDABAD, HARYANA-121003
		INTERPOSING RELAY	2	G01	ALSTOM LTD	A-7, SEC-65, NOIDA
		INTERPOSING RELAY	3	E1075	JYOTI LTD.	JYOTI LIMITED, E&CS DIVISION,3/15, BIDC, GORWA,VADODARA - 390 016, E-MAIL ID: ECS@JYOTI.COM
		INTERPOSING RELAY	4	E1099	OEN INDIA LTD	29/1479, VYTILLA, COCHIN - 682 019 KERALA, INDIA
		INTERPOSING RELAY	5	S01	SIEMENS	RC-IN I S NR DEL AREA, JIL BUILDING, TOWER-B, PLOT NO. 78, SECTOR 18, GURGAON-122015, INDIA
27	**ES35**	INDICATING LAMPS	1	B04	BCH	20/4, MATHURA ROAD, FARIDABAD, HARYANA-121006
		INDICATING LAMPS	2	C01	C&S ELECTRIC LTD.	222, OKHLA IND. ESTATE, PH-III, NEW DELHI-110020
		INDICATING LAMPS	3	E1050	ESSEN DEINKI	FLAT NO. 502, SKYLINE HOUSE 85, NEHRU PLACE NEW DELHI
		INDICATING LAMPS	4	E1153	VAISHNO(HOTLINE SWGR.& CONTROL)	G-19, SECTOR - 11, NOIDA - 201301, UTTAR PRADESH, INDIA
		INDICATING LAMPS	5	A35	GE-POWER	KAMAK TOWER, 3RD FLOOR, PLOT NO. 12-A, TVK INDUSTRIAL ESTATE, EKKADUTHANGAL, GUINDY, CHENNAI-600032
		INDICATING LAMPS	6	S01	SIEMENS	RC-IN I S NR DEL AREA, JIL BUILDING, TOWER-B, PLOT NO. 78, SECTOR 18, GURGAON-122015, INDIA
		INDICATING LAMPS	7	S03	SCHNEIDER ELECTRIC INDIA PVT. LTD.	9TH FLOOR, BLDG. NO. 10, TOWER-C, DLF CYBER CITY, PH-II, GURGAON-122002

S.No.	ITEM CODE	ITEM/SERVICE DESCRIPTION	SL NO.	VENDOR CODE	VENDOR NAME	ADDRESS
28	ES45	LIGHTING SWITCH , SOCKET & S/F UNIT	1	F04	ELEXPRO ELECTRICALS PVT/ LTD.	C 1/27 & 37 GIDC KABILPORE NAVSARI-396424
		LIGHTING SWITCH , SOCKET & S/F UNIT	2	E1012	ANCHOR	STEEL HOUSE, B WING, PLOT NO. 24, MAHAL INDUSTRIAL ESTATE, MAHAKALI CAVES ROAD, NEAR PAPER BOX, ANDHERI (E), MUMBAI, MAHARASHTRA.- 400093
		LIGHTING SWITCH , SOCKET & S/F UNIT	3	E1076	KAYCEE	KAYCEE INDUSTRIES LTD., C/O-CMS COMPUTERS LTD., 35A, REAR BLDG., KILOKARI, NEW DELH1-110014
		LIGHTING SWITCH , SOCKET & S/F UNIT	4	L01	L&T	32, SHIVAJI MARG, P.O. BOX- 6223, NEW DELHI-110015
		LIGHTING SWITCH , SOCKET & S/F UNIT	5	S01	SIEMENS	RC-IN I S NR DEL AREA, JIL BUILDING, TOWER-B, PLOT NO. 78, SECTOR 18, GURGAON-122015, INDIA
		LIGHTING SWITCH , SOCKET & S/F UNIT	6	E1068	INDO ASIAN	B-24, PHASE - II , NOIDA - 201305, U.P.
29	ES46	LIGHTING TRANSFORMER	1	E1021	AUTOMATIC ELECTRIC LTD.	ADDRESS : 96 AB LONAVLA INDUSTRIAL ESTATE NANGARGAON, LONAVLA-410401
		LIGHTING 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
		LIGHTING TRANSFORMER	3	E1103	POWER PACK ENTERPRISES	POWER PACK ENTERPRISES MR. NEHAL SHAH / MR. SHARAD SHAH (PARTNER) NO. 3, JAYSHREE SADAN, 1ST FLOOR, OLD NAGARDAS ROAD, ANDHERI EAST MUMBAI - 400069, MAHARASHTRA, INDIA
		LIGHTING TRANSFORMER	4	E1155	VIJAY ELECTRICALS LTD.	6-3-648/1&2, OFF RAJ BHAVAN ROAD, SOMAJIGUDA, HYDERABAD - 500 082. ANDHRA PRADESH, INDIA.
		LIGHTING TRANSFORMER	5	E1057	GILBERT & MAXWELL	WORKS PLOT G-28 , M.I.D.C., AMBAD NASHIK - 422010, MAHARASHTRA, INDIA
		LIGHTING TRANSFORMER	6	K18	KAPPA ELECTRICALS	KAPPA ELECTRICALS, KAPPA CONSOLIDATED PVT. LTD., SOUTHERN ELECTRIKS 14, CART TRACK ROAD, MADUVANKARAI, CHENNAI - 600 042, INDIA.
		LIGHTING TRANSFORMER	7	AIE01	Ames Impex Electricals Pvt. Ltd	C-1B/1207, PHASE IV, GIDC NARODA, AHMEDABAD, GUJARAT 382330
		LOCAL PUSH BUTTON STATION (NON FLAME PROOF)	8	A35	GE-POWER	KAMAK TOWER, 3RD FLOOR, PLOT NO. 12-A, TVK INDUSTRIAL ESTATE, EKKADUTHANGAL, GUINDY, CHENNAI-600032
		LOCAL PUSH BUTTON STATION (NON FLAME PROOF)	9	E1019	ASIATIC	A-58 NARAINA IND. AREA, PHASE-I , NEW DELHI 110028
		LOCAL PUSH BUTTON STATION (NON FLAME PROOF)	10	C01	C&S ELECTRIC LTD.	222, OKHLA IND. ESTATE, PH-III, NEW DELHI-110020
		LOCAL PUSH BUTTON STATION (NON FLAME PROOF)	11	E1051	EVERGREEN ENGG. CO.	EVERGREEN ENGG COMPANY WORKS-5, PLOT NO. 9,10,11,12, SURVEY NO. 242, CHINCH PADA, VASAI EAST-401208
		LOCAL PUSH BUTTON STATION (NON FLAME PROOF)	12	E1143	TECKNIC CONTROLS	703, MADHAVA, BANDRA, KURLA COMPLEX, BANDRA EAST, MUMBAI, MAHARASHTRA 400051
		LOCAL PUSH BUTTON STATION (NON FLAME PROOF)	13	E1053	EX-PROTECTA LIGHTING EQUIPMENT	305-306, GIDC ESTATE, VITHAL UDYOGNAGAR - 388121 DIST. ANAND, GUJARAT 388121 INDIA
		LOCAL PUSH BUTTON STATION (NON FLAME PROOF)	14	E1206	BALIGA ELECTRICALS	63A,CP RAMASWAMY ROAD, PB NO 6910, CHENNAI-600018
		LOCAL PUSH BUTTON STATION (NON FLAME PROOF)	15	E1210	ENPRO ENGG.	NO.995P, DIAMOND PLAZA, 2ND FLOOR, 12TH MAIN ROAD, ANNA NAGAR, CHENNAI-40
		LOCAL PUSH BUTTON STATION (NON FLAME PROOF)	16	E1132	STERLING SWGR CONTROL PVT.LTD.	P.O. BOX NO. 17023, SORAB HOUSE, 2ND FLOOR, 555, S.B. MARG, DADAR, MUMBAI - 400028, MAHARASHTRA, INDIA

S.No.	ITEM CODE	ITEM/SERVICE DESCRIPTION	SL NO.	VENDOR CODE	VENDOR NAME	ADDRESS
30	ES47	LOCAL PUSH BUTTON STATION (NON FLAME PROOF)	17	F04	ELEXPRO ELECTRICALS PVT/ LTD.	C 1/27 & 37 GIDC KABILPORE NAVSARI-396424
		LOCAL PUSH BUTTON STATION (NON FLAME PROOF)	18	E1153	VAISHNO(HOTLINE SWGR & CONTROL)	G-19, SECTOR - 11, NOIDA - 201301, UTTAR PRADESH, INDIA
		LOCAL PUSH BUTTON STATION (NON FLAME PROOF)	19	J01	JASPER ENGNIREES PVT. LTD.	A-23, SECTOR - 8, NOIDA-201301
		LOCAL PUSH BUTTON STATION (NON FLAME PROOF)	20	KM1	KMG ATOZ SYSTEMS	C-49, SECTOR-81-NOIDA-201305
		LOCAL PUSH BUTTON STATION (NON FLAME PROOF)	21	E05	UNILEC ENGINEERS PVT. LTD.	BEHRAMPUR INDUSTRIAL AREA, BEGAMPUR KHATOLA ROAD, GURGAON-122001
		LOCAL PUSH BUTTON STATION (NON FLAME PROOF)	22	B04	BCH	20/4, MATHURA ROAD, FARIDABAD, HARYANA-121006
		LOCAL PUSH BUTTON STATION (NON FLAME PROOF)	23	E1035	CANDS	J/202, ANSA INDUSTRIAL ESTATE, SAKI VIHAR ROAD, SAKINAKA, ANDHERI (EAST), MUMBAI-72
		LOCAL PUSH BUTTON STATION (NON FLAME PROOF)	24	S01	SIEMENS	RC-IN I S NR DEL AREA, JIL BUILDING, TOWER-B, PLOT NO. 78, SECTOR 18, GURGAON-122015, INDIA
		LOCAL PUSH BUTTON STATION (NON FLAME PROOF)	25	S03	SCHNEIDER ELECTRIC INDIA PVT. LTD.	9TH FLOOR, BLDG. NO. 10, TOWER-C, DLF CYBER CITY, PH-II, GURGAON-122002
		LOCAL PUSH BUTTON STATION (NON FLAME PROOF)	26	E1143	TECKNIC CONTROLS	703, MADHAVA, BANDRA, KURLA COMPLEX, BANDRA EAST, MUMBAI, MAHARASHTRA 400051
		LOCAL PUSH BUTTON STATION (NON FLAME PROOF)	27	E1148	UNITED ELECTRIC	97 UDYOG VIHAR PHASE-I, GURGAON 122015, HARYANA
		LOCAL PUSH BUTTON STATION (NON FLAME PROOF)	28	SRC01	M/s Shrenik & Co.	39A/3, PANCHRATNA INDUSTRIAL ESTATE, SARKHEJ-BAVLA ROAD, CHANGODAR, AHMEDABAD – 382 213
31	ES51	MCB	1	E1088	MDS SWITCHGEAR LTD	314-317SHAH NAHAR ESTATE
		MCB	2	E1068	INDO ASIAN	B-24, PHASE - II , NOIDA - 201305, U.P.
		MCB	3	S03	SCHNEIDER ELECTRIC INDIA PVT. LTD.	9TH FLOOR, BLDG. NO. 10, TOWER-C, DLF CYBER CITY, PH-II, GURGAON-122002
		MCB	4	E1120	S&S POWER SWITCHGEAR LTD,	NEW NO. 67, OLD NO. 19, DR. RANGA ROAD, MYLAPORE, CHENNAI - 600004
32	ES52	MCC (FIXED TYPE)	1	S02	SPACEAGE SWITCHGEARS LTD.	68 & 13-A INDUSTRIAL DEVELOPMENT COLONY, MEHRAULI ROAD GURGAON, HARYANA-122001
		MCC (FIXED TYPE)	2	A01	ASSOCIATED SWGR & PROJ.LTD.	C-10, UPSIDC, INDUSTRIAL AREA, SITE-IV, KASNA ROAD, GREATER NOIDA-201306
		MCC (FIXED TYPE)	3	B04	BCH	20/4, MATHURA ROAD, FARIDABAD, HARYANA-121006
33	ES61	SWITCH BOX	1	E1012	ANCHOR	STEEL HOUSE, B WING, PLOT NO. 24, MAHAL INDUSTRIAL ESTATE, MAHAKALI CAVES ROAD, NEAR PAPER BOX, ANDHERI (E), MUMBAI, MAHARASHTRA.- 400093
		SWITCH BOX	2	F04	ELEXPRO ELECTRICALS PVT/ LTD.	C 1/27 & 37 GIDC KABILPORE NAVSARI-396424
		SWITCH BOX	3	B05	BAJAJ ELECTRICALS	BAJAJ ELECTRICALS LTD. ENGINEERING & PROJECTS BU (NORTH) 3rd FLOOR, GULMOHARHOUSE, COMMUNITY CENTRE 161/B-4, GAUTAM NAGAR, YUSUF SARAI NEW DELHI – 110049

S.No.	ITEM CODE	ITEM/SERVICE DESCRIPTION	SL NO.	VENDOR CODE	VENDOR NAME	ADDRESS
		SWITCH BOX	4	A03	AJMERA INDUSTRIES & ENGG. WORKS	AJMERA INDL. AND ENGG. WORKS. AJMERA HOUSE, A-61 / KHAIRANE MIDC. , TTC INDL. AREA, NAVI MUMBAI – 400705.
		SWITCH BOX	5	SB02	S.B. ELECTRICAL ENGINEERING CORPORATION	03, SARDAR GRIHA BUILDING, LOHAR CHAWAL, MUMBAI-400002
34	ES62	TERMINAL BLOCKS	1	C01	WAGO-CONTROLS	C 27, GREATER NOIDA, SECTOR 58, C BLOCK, SECTOR 58, NOIDA, UTTAR PRADESH 201307
		TERMINAL BLOCKS	2	E1038	CONNECT WELL	309A/4, 3RD FLOOR, KALKAJI, OKHLA IND AREA PH-2, GOVINDPURI, NEW DELHI, DL 110019
		TERMINAL BLOCKS	3	E1047	ELMEX CONTROLS PVT. LTD.	12,G.I.D.C.ESTATE,MUKARPURA ROAD,VADODARA-390010
		TERMINAL BLOCKS	4	E1050	ESSEN DEINKI	FLAT NO. 502, SKYLINE HOUSE 85, NEHRU PLACE NEW DELHI
		TERMINAL BLOCKS	5	E1142	TECHNOPLAST	OPP.I.M.INTER COLLEGE, BEGUM SARAI KHURD ROAD, AMROHA - 244221, U.P.
		TERMINAL BLOCKS	6	PME-01	M/s PHOENIX MECANO LTD.,	388 BHARE, TALUKA MULSHI, POST GHOTAWADE, PIRANGOOT, INDUSTRIAL AREA, PUNE-412115
		TERMINAL BLOCKS	7	E1050	ESSEN DEINKI	FLAT NO. 502, SKYLINE HOUSE 85, NEHRU PLACE NEW DELHI
35	ES63	TIMERS - PNEUMATIC	1	B04	BCH	20/4, MATHURA ROAD, FARIDABAD, HARYANA-121006
		TIMERS - PNEUMATIC	2	G01	ALSTOM LTD	A-7, SEC-65, NOIDA
		TIMERS - PNEUMATIC	3	L01	L&T	32, SHIVAJI MARG, P.O. BOX- 6223, NEW DELHI-110015
		TIMERS - PNEUMATIC	4	E1144	TELEMECHANIQUE/ SCHNEIDER ELECTRIC INDIA PVT. LTD.	9TH FLOOR, BLDG. NO. 10, TOWER-C, DLF CYBER CITY, PH-II, GURGAON-122002
		TIMERS - PNEUMATIC	5	S03	SCHNEIDER ELECTRIC INDIA PVT. LTD.	9TH FLOOR, BLDG. NO. 10, TOWER-C, DLF CYBER CITY, PH-II, GURGAON-122002
		TIMERS - PNEUMATIC	6	E01	ELECTRONIC AUTOMATION PVT. LTD.	20, KHB INDUSTRIAL AREA YELAHANKA BANGLORE-560064
36	ES64	TIMERS - ELECTRONIC	1	E1050	ESSEN DEINKI	FLAT NO. 502, SKYLINE HOUSE 85, NEHRU PLACE NEW DELHI
37	ES65	TRANSDUCERS	1	E1021	AUTOMATIC ELECTRIC LTD.	ADDRESS : 96 AB LONAVLA INDUSTRIAL ESTATE NANGARGAON, LONAVLA-410401
		TRANSDUCERS	2	E1202	SOUTHERN TRANSDUCERS	INTERTECH B-83, FLATTED FACTORY COMPLEX, NEAR MODI MILLS, OKHLA, NEW DELHI-110020
38	ES66	WINDING TEMP INDICATOR	1	E1101	PERFECT CONTROLS	OFFICE ADDRESS: 7, NORTH ROAD,WEST C.I.T. NAGAR,CHENNAI - 600035, INDIA.
		WINDING TEMP INDICATOR	2	E1105	PRECIMEASURE	M/S. PRECIMEASURE CONTROLS PVT. LTD. 168/C, INDUSTRIAL SUBURB, PEENYA 3RD PHASE, BANGALORE - 560058. KARNATAKA, INDIA
39	ES72	ENERGY METER (ANALOG)	1	B07	BHEL (EDN)	MYSORE ROAD,BANGALORE-560026
		ENERGY METER (ANALOG)	2	E1129	SIMCO ENGG. LTD	NO. 126, K ROAD, TIRUCHIRAPPALLI -620001, TAMIL NADU
		ENERGY METER (ANALOG)	3	R01	RISHABH INST.PVT LTD	RISHABH INSTRUMENTS PVT. LTD. F-31, MIDC, SATPUR NASHIK - 422007 MAHARASHTRA INDIA
		ENERGY METER (ANALOG)	4	E1009	AUTOMATIC ELECTRIC LTD.	96 AB LONAVLA INDUSTRIAL ESTATE NANGARGAON, LONAVLA-410401
		ENERGY METER (ANALOG)	5	CON1	CONZERVE SYSTEMS PVT. LTD.(SCHNEIDER)	87, 1ST FLOOR INDUSTRIAL DEVELOPMENT COLONY (IDC) MEHRAULI ROAD, UGURGAON 122001 HARYANA, INDIA.
40	ES73	ENERGY METER (DIGITAL)	1	CON1	CONZERVE SYSTEMS PVT. LTD.(SCHNEIDER)	87, 1ST FLOOR INDUSTRIAL DEVELOPMENT COLONY (IDC) MEHRAULI ROAD, UGURGAON 122001 HARYANA, INDIA.
		ENERGY METER (DIGITAL)	2	NK09	M/s Newtek Electricals	M-90, M.I.D.C, Waluj, Aurangabad 431136, Maharashtra, India

S.No.	ITEM CODE	ITEM/SERVICE DESCRIPTION	SL NO.	VENDOR CODE	VENDOR NAME	ADDRESS
41	ES74	AMMETER	1	E1009	AUTOMATIC ELECTRIC LTD.	96 AB LONAVLA INDUSTRIAL ESTATE NANGARGAON, LONAVLA-410401
		AMMETER	2	R01	RISHABH INST.PVT LTD	RISHABH INSTRUMENTS PVT. LTD. F-31, MIDC, SATPUR NASHIK - 422007 MAHARASHTRA INDIA
		AMMETER	3	NK09	M/s Newtek Electricals	M-90, M.I.D.C, Waluj, Aurangabad 431136, Maharashtra, India
42	ES75	VOLTMETER	1	E1009	AUTOMATIC ELECTRIC LTD.	96 AB LONAVLA INDUSTRIAL ESTATE NANGARGAON, LONAVLA-410401
		VOLTMETER	2	R01	RISHABH INST.PVT LTD	RISHABH INSTRUMENTS PVT. LTD. F-31, MIDC, SATPUR NASHIK - 422007 MAHARASHTRA INDIA
		VOLTMETER	3	NK09	M/s Newtek Electricals	M-90, M.I.D.C, Waluj, Aurangabad 431136, Maharashtra, India
43	ES76	MPCB	1	S03	SCHNEIDER ELECTRIC INDIA PVT. LTD.	9TH FLOOR, BLDG. NO. 10, TOWER-C, DLF CYBER CITY, PH-II, GURGAON-122002
		MPCB	2	L01	L&T	32, SHIVAJI MARG, P.O. BOX- 6223, NEW DELHI-110015
		MPCB	3	S01	SIEMENS	RC-IN I S NR DEL AREA, JIL BUILDING, TOWER-B, PLOT NO. 78, SECTOR 18, GURGAON-122015, INDIA
		MPCB	4	A35	GE-POWER	KAMAK TOWER, 3RD FLOOR, PLOT NO. 12-A, TVK INDUSTRIAL ESTATE, EKKADUTHANGAL, GUINDY, CHENNAI-600032
		MPCB	5	S03	SCHNEIDER ELECTRIC INDIA PVT. LTD.	9TH FLOOR, BLDG. NO. 10, TOWER-C, DLF CYBER CITY, PH-II, GURGAON-122002
		MPCB	6	C01	C&S ELECTRIC LTD.	222, OKHLA IND. ESTATE, PH-III, NEW DELHI-110020
44	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.
		MULTIFUNCTION METER	2	NK09	M/s Newtek Electricals	M-90, M.I.D.C, Waluj, Aurangabad 431136, Maharashtra, India
45	ES79	RCCB	1	C01	C&S ELECTRIC LTD.	222, OKHLA IND. ESTATE, PH-III, NEW DELHI-110020
		RCCB	2	S03	SCHNEIDER ELECTRIC INDIA PVT. LTD.	9TH FLOOR, BLDG. NO. 10, TOWER-C, DLF CYBER CITY, PH-II, GURGAON-122002
		RCCB	3	S01	SIEMENS	RC-IN I S NR DEL AREA, JIL BUILDING, TOWER-B, PLOT NO. 78, SECTOR 18, GURGAON-122015, INDIA
		RCCB	4	A35	GE-POWER	KAMAK TOWER, 3RD FLOOR, PLOT NO. 12-A, TVK INDUSTRIAL ESTATE, EKKADUTHANGAL, GUINDY, CHENNAI-600032
		RCCB	5	L01	L&T	32, SHIVAJI MARG, P.O. BOX- 6223, NEW DELHI-110015
		RCCB	6	C02	CROMPTON GREAVES	RAIL TRANSPORTATION SYSTEMS,VANDANA BUILDING, 11, TOLSTOY MARG, TOLSTOY MARG, NEW DELHI, DL 110001
46	ES80	PVC WIRES	BIS APPROVED MAKE			
47	ES85	HUME PIPE	REPUTED MAKE			
48	ES86	PHOTOELECTRIC SWITCH	REPUTED MAKE			

NOTE: Make of all the equipment / instrument under this specification shall be subjected to owner's approval in the event of order. Owner reserves the right to accept/ reject any make or sub-vendor and to add new sub-vendors for the project after award of contract. Approval, rejection or addition of makes shall not have any price implication to the owner after award of contract.

DATA SHEET –C

S. No.	Description	Unit	Value
1.0	**SYSTEM DESIGN DATA**		
1.1	Design ambient	^{0}C	
1.2	**AC Supply**		
a)	Rated voltage	V	
b)	Rated frequency	Hz	
c)	Voltage variation (permissible)	%	
d)	Frequency variation (permissible)	%	
e)	Combined voltage & frequency variation (sum of absolutes permissible)	%	
f)	System fault level & duration	kA, sec.	
2.0	APPLICABLE STANDARDS IS 60947 Low voltage switchgear and controlgear IS 11171 Dry type transformers IS 13703 Low voltage fuses for voltages not exceeding 1000V AC or 1500 V IS 10118 Code of practice for selection, installation and maintenance of switchgear and controlgear IS 60898 Electrical Accessories - circuit breakers for over protection for household and similar installations IS 1901 Visual indicator lamps IS 60079 Explosive atmospheres IS 5572 Classification of hazardous areas (other than mines) having flammable gases and vapours for electrical installation IS:2551 Danger notice plates		
3.0	**LIGHTING/ WELDING DISTRIBUTION BOARDS**		
3.1	Operational Front		
3.2	Type of execution of modules (functional unit)		
3.3	Type of sheet steel		
3.4	Sheet metal thickness (minimum)		
a)	Non-load bearing covers	mm	

b)	Non-load bearing partitions	mm	
c)	Load bearing members	mm	
d)	Frames	mm	
e)	Door	mm	
f)	Withdrawable unit (if applicable)	mm	
3.5	Cable alley width (minimum)	mm	
3.6	Bus bar material		
3.7	Earth bus bar material		
3.8	Degree of Protection		
a)	Main Panel		
b)	Transformer cubicle		
3.9	Gland plate thickness	mm	
3.10	**AC LDB/ WDB**		
a)	No. of Incomers		
b)	Bus coupler required		
c)	Incomer and Bus coupler rating	A	
d)	Type of Incomer and Bus coupler		
e)	Type of Outgoing Feeders		
f)	Outgoing feeders rating	A	
g)	Cable entry		
3.11	**Lighting Transformer**		
a)	Rating	kVA	
b)	Type of cooling		
c)	Voltage ratio	V	
d)	Rated frequency	Hz	
e)	No. of phases		
f)	Vector group		

g)	Off circuit taps		
	Tap range, steps	%	
	Voltage of each tap	V	
h)	Impedance at rated current, frequency at 75 ^{o}C	%	
i)	Rated current		
	Primary	A	
	Secondary	A	
j)	Transformer type		
k)	Transformer winding insulation		
l)	Transformer winding insulation temperature rise limit		
n)	Type of ventilation arrangement provided for transformer enclosure		
o)	Winding conductor material		
p)	Iron loss at 50 Hz and 100% rated voltage	kW	
q)	Copper loss at rated load at 75 ^{o}C	kW	
r)	Regulation at full load at 75 ^{o}C and 0.8 p.f. lagging		
s)	Weight	kg	
4.0	**LIGHTING PANELS**		
4.1	Application		
4.2	Type of sheet steel		
4.3	Sheet metal thickness (minimum)		
3.4	Degree of Protection		
a)	Indoor panel		
b)	Outdoor panel		

c)	Canopy in outdoor panel		
4.5	Bus bar material		
4.6	Earth bus bar required		
4.7	Earth bus bar material (if applicable)		
4.8	Gland Plate	mm	
4.9	Earthing studs required		
4.10	Hinged door with locking facility		
4.11	**AC Lighting Panel**		
a)	Incomer rating	A	
b)	Type of Incomer		
c)	Earth Leakage Circuit Breaker (ELCB) in incomer required		
d)	Type of Outgoing Feeders (non-flameproof panel)		
e)	Timer required for indoor panel		
f)	Timer required for outdoor panel		
g)	Timer required Street Light panel/ High mast feeder pillar		
h)	Photocell required for Street Light panel/ High mast feeder pillar		
i)	Outgoing feeders rating	A	
5.0	**COMPONENTS OF LIGHTING SYSTEM EQUIPMENT**		
5.1	**Moulded Case Circuit Breaker (MCCB)**		
a)	Rated voltage	V	
b)	Number of poles		
c)	Rated short circuit duty	kA	
d)	Rated breaking capacity (rms)	kA	
e)	Rated making current (peak)	kA	
f)	Release with short circuit		

g)	Release with overload		
h)	Release with under voltage		
i)	Auxiliary contacts		
	Numbers	NO+NC	
	Rating	A	
5.2	**Switch-Fuse Unit**		
a)	Utilisation category for main contacts		
b)	Number of poles		
5.3	**Miniature Circuit Breaker**		
a)	SPN MCB rating (min)	A	
b)	DP MCB rating (min)	A	
c)	TPN MCB rating (min)	A	
d)	Short time rating	kA	
e)	Magnetic short circuit protection required		
f)	Thermal overload protection required		
5.4	**Current Transformer**		
a)	Type		
b)	Secondary current rating	A	
c)	Burden	VA	
d)	Accuracy class		
e)	Instrument Safety Factor		
5.5	**Voltage Transformer**		
a)	Type		
b)	Secondary terminal voltage (phase-phase)	V	
c)	Burden	VA	
d)	Accuracy class		
e)	Winding configuration		

f)	System grounding		
5.6	**Indicating Meters**		
5.6.1	**Ammeter**		
a)	Type		
b)	Shape		
c)	Size		
d)	Accuracy		
e)	Current coil rating	A	
f)	Angle of deflection	deg	
5.6.2	**Voltmeter**		
a)	Type		
b)	Shape		
c)	Size		
d)	Accuracy		
e)	AC voltage coil rating	V	
f)	DC voltage coil rating	V	
g)	Angle of deflection	deg	
5.6.3	**Energy meter (if applicable)**		
a)	Type		
b)	Accuracy		
c)	Current coil rating	A	
d)	Voltage coil rating	V	
5.7	**Power Contactors**		
a)	Coil voltage (nominal)		
	AC contactors	V	
	DC contactors	V	
b)	Current rating of contacts		
	Power	A	

	Control	A	
5.8	**Under voltage relay**		
a)	Type		
b)	Coil voltage rating	V	
c)	Means for in-built testing provided		
5.9	**Timer**		
5.9.1	**Time switch**		
a)	Type		
b)	Range	hr	
c)	Coil voltage rating	V	
5.10	**Selector switch**		
a)	Type of selector switch		
b)	Lockable		
5.11	**Push Button**		
a)	Voltage grade	V	
b)	Potential free contacts		
5.12	**Indicating Lamps**		
a)	Lens Colour		
	ON condition		
	OFF condition		
b)	Circuit voltage	V	
5.13	**Cable Glands**		
a)	Type		
b)	Material		
c)	Nickel Plating provided		
d)	Flameproof glands with flameproof equipment		

5.14	**Cable Lugs**		
a)	Type		
b)	Material		
6.0	**PAINTING**		
6.1	**Paint shade**		
a)	LDBs		
b)	LPs		
6.2	**Paint Finish**		
a)	Interior		
b)	Exterior		
6.3	**Paint Thickness**	Microns	

SECTION – II

STANDARD TECHNICAL REQUIREMENTS

1.0 INTENT OF SPECIFICATION

1.1 The requirements given in specification shall be fully complied with.

1.2 The “design” shall broadly cover the selection of components, materials, sizes etc. for the equipment of supply in vendor’s scope. Complete responsibility of establishing the correctness of equipment design rests with the vendor.

1.3 It is not the intent to specify herein all the details of design and manufacture. However, the equipment shall conform in all respects to high standards of design, engineering and workmanship, and shall be capable of performing required function in a manner acceptable to Purchaser, who will interpret the meaning of drawings and specifications and shall be entitled to reject any work or material, which in his judgement is not in full accordance herewith.

1.4 Make of all equipment and components shall be to the approval of Purchaser.

2.0 CODES & STANDARDS

2.1 The material shall comply with all currently applicable safety codes and statutory regulations of India as well as of the locality where the material is to be installed.

2.2 The material, construction, manufacture, inspection and testing shall conform to the latest revisions of standards as specified in Data Sheet A.

2.3 In case of conflict between the applicable reference standard and this specification, stringent requirement shall govern.

3.0 DESIGN REQUIREMENTS

3.1 LIGHTING DISTRIBUTION BOARD (LDB) / WELDING DISTRIBUTION BOARD (WDB)

3.1.1 General Requirements of LDBs/ WDBs

a) LDB/WDB shall be totally enclosed, modular in construction, indoor type and suitable for electrical system data as specified in Data Sheet-A. The LDB/ WDB shall be free standing type suitable for installation on cable trenches / floor.

b) LDB/ WDB shall consist of dust and vermin proof cubicles without the use of louvers (except the transformer compartment, where applicable).

c) Good quality synthetic rubber / neoprene gaskets shall be put around the door, cover edges and cut-out edges for push button, lamps etc. for protection against dust. The door when closed, shall compress the gasket uniformly.

d) Cut-out edges for instruments, relays etc. shall have sufficient overlap surface to minimize the dust entry. The arrangement for the front mounting of switch

handles shall render the LDB/ WDB reasonably dust free such that the normal operations are not affected.

e) The LDB/ WDB shall be designed to prevent contact with live parts both within the modules and in the cable alley.

f) The bidder shall be responsible to check and coordinate the MCB characteristic with back up fuses etc. provided.

g) All equipment shall be constructed of non-hygroscopic and non-inflammable materials.

h) All components mounted in the LDB/ WDB shall be accessible and shall not impede access to wiring or terminals. All faults except busbar fault which may occur within any individual unit shall be confined within that unit only and shall not cause shutdown of any section of the board other than the affected unit itself. Maintenance and inspection shall be possible in any individual unit without affecting other units.

i) Incoming unit shall comprise of either switch-fuse/ composite switch-fuse unit or MCCB as per Data Sheet A. Outgoing units shall be either switch-fuse/ composite switch-fuse unit or MCCB as per data Sheet A.

j) Interlock between compartment door and modules shall be provided such that the door cannot be opened without switching off the power supply to the module.

k) Defeat interlock shall be provided for the units comprising of switch or moulded case circuit breaker as a means of isolation device, such that it is possible to open the door with device ON. It shall not be possible to close the door till the interlock has been reinstated.

l) Each LDB/ WDB shall be fitted with base frame made of angle or channel.

m) All fixing nuts and bolts together with grounding bolts shall be provided.

n) Lifting lugs shall be provided for each shipping section of LDB/ WDB. Removal of such lugs or hooks shall leave no opening in the LDB/ WDB.

3.1.2 LDB/ WDB with transformers (Additional Features)

a) The LDB/ WDB shall be arranged in two adjacent but separate compartments, one compartment for the lighting transformer and the other for the incoming & outgoing feeders etc.

b) The transformer shall be mounted on the base channel and it shall be possible to easily remove the transformer from the cubicle after opening the door. Necessary portable ramp made of mild steel shall be supplied along with each LDB/ WDB.

c) Independent gasket hinged door with operating handle shall be provided for access to transformer & its taps. Operating handle shall have built-in key locking arrangement.

d) Suitable ventilation arrangement for the transformer compartment to dissipate the heat of the transformer shall be provided. The arrangement shall be in the form of louvers and the same shall be provided with galvanised wire mesh with dust catchers on the inside.

e) Connections between transformer secondary terminals and the busbars shall be made by using PVC insulated flexible copper cables or busbars.

f) Warning plate shall be provided on transformer enclosure. The inscription of warning plate shall be as given below:

- DO NOT OPEN DOORS WHEN ENERGISED
- KEEP TAPS AT SAME POSITION FOR ALL PHASES

g) Transformer enclosure shall be provided with a danger plate.

3.1.3 Lighting Transformer/ Welding Transformer

a) Transformer, where specified, shall form an integral part of LDB/ WDB.

b) Lighting transformer shall be dry type, natural air cooled and suitable for mounting inside the lighting distribution board. Transformer particulars shall be as specified in Data Sheet A.

c) Rating of transformer shall be as per BOQ.

d) Winding shall be of copper material and maximum winding temperature at full load and under site conditions shall not exceed 120 ^{o}C.

e) Transformer shall be suitable for cable connections on the primary side and flexible cable or busbar connection on the secondary side.

f) The secondary neutral of the transformer shall be brought out for getting a grounded 4 wire supply system.

g) The transformer neutral shall be brought outside the LDB/ WDB for earthing. The neutral bus bar shall be insulated from the LDB/ WDB enclosure.

h) Transformers shall be provided with the rollers, pulling holes, lifting lugs, jacking positions etc.

3.1.4 Busbars, Connections and Joints

a) Busbars shall be supported on non-hygroscopic and non-inflammable insulators of material such as glass reinforced moulded plastic material, epoxy cast resin

etc. Separate supports shall be provided for each phase of the busbars. Insulation level of neutral busbar shall be same as that of phase busbars.

b) Busbars shall be contained in a separate vermin-proof compartment within the LDB/ WDB and shall have bolted sheet steel covers for providing suitable access.

c) Busbar clearances in the air shall be as per applicable standard for 415V, 3 phase system.

d) Temperature for busbars, droppers and connections shall not exceed 90 deg.C for an ambient of 50 deg.C while carrying maximum continuous current.

e) The busbar, busbar connections and supports shall have sufficient strength to withstand thermal and electromechanical stresses produced by the specified short circuit level of the system.

f) Busbars (including neutral busbar) shall be capable of carrying the short-time current specified in Data Sheet A. The duration of short-time current shall be 1 sec unless mentioned otherwise in Data Sheet A. For the specified current and duration, there shall be no damage to the equipment.

g) The neutral bus shall be rated same as phase bus.

h) Main busbars and connections shall be prominently marked and displaced for standard sequence counting from rear to front, top to bottom, or left to right as viewed from the switching device operating mechanism side.

i) Busbars and connections shall be provided with colour coded PVC sleeves. All live parts shall be properly shrouded with insulating material.

j) Earth busbar shall be provided separately.

k) Busbar Joints

- Busbar and tap off joints shall be bolted type.
- Busbars shall be thoroughly cleaned before jointing. Suitable contact grease shall be applied to remove oxide film just before jointing.
- For copper busbars, the connecting portion shall be tinned or silver plated.

3.1.5 Wiring and Terminals

a) All internal wiring for connections to remote equipment shall be brought to terminal boards. Spare contacts of devices shall also be wired upto terminal board as per schemes. Wires shall not be jointed or teed-off except at terminal points.

b) Wiring shall be made by 1100 volt grade three / seven strand PVC insulated copper wire having a cross-sectional area of not less that 1.5 sq.mm. All

connections from CT leads upto instruments, terminals shall be made by copper wires of minimum 2.5 sq.mm size.

c) All wiring shall be made with the Colour Codes specified below :

i) 3 phase AC Connections

Phase 1 (R)	Red
Phase 2 (Y)	Yellow
Phase 3 (B)	Blue
Neutral	Black

ii) 1 phase AC Connections

Phase	Red / Yellow / Blue (as per associated circuit)
Neutral	Black

iii) DC Connections

Positive	White
Negative	Grey

iv) Earth Connection Green

d) Where wiring passes from one compartment to another, the aperture shall be 'Bushed' to prevent damage to wires against sheet metal edges. Bushes may comprise of good quality rubber / PVC grommets.

e) Every wire end shall be fitted with numbered ferrules of white or yellow colour having glossy finish with identification number engraved in black. Ferrules shall be made of moisture and oil resisting insulating material. Ferrules shall be of interlocked type or tight fitting type. Ferrules shall be so fitted that they will not get detached, when the wire is removed from the terminal.

f) System of marking of wiring shall be as per applicable standard.

g) All wires used internally shall have crimped on tinned copper lugs for terminations.

h) Terminal boards shall be stud type with insulating barriers of adequate height.

i) Terminal boards shall have separate terminals for incoming and outgoing wires with not more than two wires connected to any one terminal.

j) Terminal boards shall be mounted vertically or in the horizontal rows and properly spaced to have clean wiring arrangement, adequate access for putting ferrules, making terminations etc. It shall be possible to read the ferrule numbers when the wiring is complete. Where terminals may be live when the equipment is isolated from the main supply, these shall be clearly marked near the terminal boards.

3.1.6 Cable Terminations

a) All cables, either incoming or outgoing to the LDB/ WDB, shall be terminated in a cable chamber. For each panel, there shall be a cable chamber on the side. The door of cable chamber should open or be locked with the help of a tool. Unless stated otherwise in Data Sheet A, all cables shall enter from the bottom.

b) Removable undrilled gland plates of sheet steel shall be provided in the cable chamber for entry of cables. Minimum thickness of gland plate shall be as per Data Sheet-A. The gland plate shall be of adequate size for connecting requisite number of cable glands for power and control cables.

c) Heavy duty bolt-on termination tinned copper lugs of compression type shall be used for power cable termination. The tinned copper cable lugs for all incoming and outgoing power cables shall be supplied by the vendor.

d) For supporting and clamping of cable cores at regular interval in cable alleys, suitable slotted angle upto the respective terminal blocks shall be provided.

3.1.7 Earthing

a) An earth busbar of adequate size of shall be provided at the bottom for the entire length of the LDB/ WDB. Material of earth busbar shall be GI unless mentioned otherwise in Data Sheet A.

b) Every metal part other than those forming parts of an electrical circuit shall be connected to the earth bus by means of high conductivity copper wire of size not less than 2.5 sq. mm. cross-sectional area.

c) Doors shall have a flexible copper wire for earth connection to fixed unit.

d) Each LDB/ WDB shall be fitted with two earthing studs located in accessible position on sides for connection of internal earth busbar to the external earthing connection.

e) Earth busbar shall be brought outside LDB/ WDB for making external connections.

3.1.8 Types of LDB/ WDB

a) The LDB/ WDB shall be of following type:

- LDB/ WDB-H (n) - AC LDB/ WDB with 100 kVA transformer
- LDB/ WDB-F (n) - AC LDB/ WDB with 50 kVA transformer
- LDB/ WDB-N (n) - AC LDB/ WDB with no transformer
- LDB-D (n) - DC LDB

NOTE: (n) indicates number of outgoing feeders.

b) AC LDB/ WDB (LDB/ WDB-H, LDB/ WDB-F, LDB/ WDB-N)

Each LDB/ WDB shall comprise of the following and comply with Data Sheet A:

i. One lighting/welding transformer (LDB/WDB-H & LDB/WDB-F).

ii. Incomer(s) of TP / TPN switch-fuse unit or MCCB / MCCB with neutral link as per Data Sheet A. It shall be provided on the primary side of transformer for LDB/WDB type LDB/WDB-H & LDB/WDB-F.

iii. Set of busbars with 3 phase and neutral.

iv. TPN switchfuse units or MCBs for each outgoing circuit.

v. Three indicating lamps with fuses for indicating bus supply ON.

vi. CT operated ammeter with selector switch.

vii. VT operated voltmeter with selector switch.

viii. Power & control terminals, earth-stud, earth busbar, designation labels, internal wiring, power cable lugs, glands etc. shall be provided to complete the LDB/ WDB in all respects.

c) DC LDB (LDB-D)

Each LDB shall comprise of following and comply with enclosed Data Sheet A:

i. Incomer & Outgoing feeders shall be as per Datasheet-A.

ii. Two pole DC contactor on the incoming circuit for changeover to DC in case of AC normal supply failure.

iii. One under voltage relay of suitable range, if required.

iv. One ON delay timer.

v. One test push button.

vi. Set of bus bars for positive and negative.

vii. Two indicating lamps with fuses for indicating bus supply ON.

viii. Power & control terminals, earth-stud, earth busbar, designation labels, internal wiring, power cable lugs, glands etc. shall be provided to complete the LDB in all respects.

3.2 LIGHTING PANELS (LPs)

3.2.1 General Requirements of Lighting Panels

a) LPs shall be totally enclosed, suitable for electrical system data as specified in Data Sheet A. The LP shall be suitable for mounting on wall / column / structure.

b) Panels shall be suitable for indoor / outdoor application as per Data Sheet A.

c) All components of the LP shall be fully mounted inside the panel. LPs shall have only one operational front. Door shall be provided to give full access to all the components. Door shall have padlocking arrangement.

d) LPs shall consist of dust and vermin proof cubicles without the use of louvers.

e) Good quality synthetic rubber / neoprene gaskets shall be put around the door. The door when closed, shall compress the gasket uniformly.

f) The LPs shall be designed to prevent contact with live parts when the front door is open.

g) All busbars (phase, neutral, positive, negative as applicable) within a panel shall be of the same size.

h) All control wiring inside the panels shall be carried out with 1100 V grade, PVC insulated flexible copper wire of 2.5 sq. mm size.

i) The rated continuous current of the equipment and components shall be as given in Datasheet-A. These ratings shall be obtained with the components mounted in their housing as in service without exceeding the permissible temperature rise.

j) Each LP shall be fitted with M.S. mounting brackets.

k) Panel shall be suitable for top / bottom cable / conduit entries. However, outdoor LPs shall have bottom cable / conduit entry. Removable undrilled gland plate of sheet steel shall be provided for entry of cables. Minimum thickness of gland plate shall be as per Data Sheet-A. The gland plate shall be of adequate size having knock-outs for requisite number cable connections. Gland plate shall be provided with gasket.

l) The lighting panel shall be complete with copper busbars, and shall incorporate incomer and outgoing circuits as per Data Sheet-A. Number of outgoing circuits shall be as per BOQ.

m) Each lighting panel shall be fitted with two GI earth studs located in accessible position on the outside of the panel on opposite sides.

n) All metal parts of the panel except current carrying parts shall be bonded together electrically to the earthing stud.

o) Each panel shall be fitted with phase barriers of fireproof insulating material in such a manner that it is not readily possible for personnel to touch the phase busbars. Insulating sheet shall be fitted around the MCBs such that only the surface and toggle of the MCBs are available on the front.

p) The supply of cable lugs for power and control cable connections forms part of the supply of equipment.

q) Each panel shall be provided with a circuit directory plate with inscriptions neatly typed and laminated, fitted on the inside of door.

3.2.2 Type of Lighting Panels

a) LP-A (n) - AC Lighting Panel

b) LP-D (n) - DC Lighting Panel

c) LP-F (n) - Fancy Lighting Panel (Decorative)

d) LP-S (n) - Street Lighting Panel

NOTE: (n) indicates number of outgoing circuits.

3.2.3 AC Lighting Panel (LP-A)

a) LPs shall be provided with incomer and requisite number of outgoing circuits as per Data Sheet-A. Number of outgoing circuits shall be as per BOQ.

b) Separate neutral shall be available at terminal block for each outgoing circuit.

c) Construction of AC Normal and AC Emergency panels shall be same.

3.2.4 DC Lighting Panels (LP-D)

~~a)~~ LPs shall be provided with incomer and requisite number of outgoing circuits as per Data Sheet-A. Number of outgoing circuits shall be as per BOQ.

3.2.5 Decorative Type Lighting Panels (LP-A)

a) Decorative lighting panels shall be designed for use in areas like administrative building, service building, canteen, residential premises etc.

b) Thickness of sheet steel shall be as per manufacturer's practice.

c) LPs shall be of tone colour with elegant finish.

d) LPs shall be provided with incomer and requisite number of outgoing circuits as per Data Sheet-A. Number of outgoing circuits shall be as per BOQ.

e) LPs shall be suitable for either surface or flush mounting. Flush mounted panels shall have the collared door suitable for matching with the wall.

f) Lighting Panels may be provided with transparent acrylic cover for operation of MCBs.

g) LPs shall be provided with knockouts on the top, bottom and sides.

3.2.6 Street Lighting Panel (LP-S)

a) Street Lighting Panels shall be provided for feeding power supply to luminaires of street light poles, flood lighting poles, lighting masts, watch towers etc.

b) Each Street Lighting Panel shall comprise of the following :

i. One TPN door interlocked switch-fuse unit incomer. Interlock defeat feature shall also be provided.

ii. Three pole AC Contactor

iii. 0 - 24 hrs timer and/or photo-electric switch for automatic switching of contactor

iv. Three phase & neutral busbars

v. Single pole or three pole MCBs for each outgoing circuit as per Data Sheet A

vi. Two lamps for bus supply ON & OFF indications

vii. Complete wiring arrangement as per control scheme.

viii. Auto-Manual selector switch

ix. ON push button

x. OFF push button

c) Switching ON and switching OFF shall be through both 0 - 24 hrs timer and light sensor in automatic mode.

d) One number light sensor in weather proof enclosure having IP:55 degree of protection shall be supplied loose along with each SLP.

e) Internal power wiring shall be done with PVC insulated Cu wire of suitable size. All control wiring inside the panel shall be carried out with 1100 V grade, PVC insulated flexible copper wires.

f) Two nos. outgoing circuit in each panel shall be tapped before contactor for watch tower supply.

4.0 COMPONENTS OF LDB/WDB AND LIGHTING PANEL

4.1 MOULDED CASE CIRCUIT BREAKERS

a) Moulded case circuit breakers (MCCBs) shall be provided when called for in Data Sheet A for use in lieu of switch fuse. MCCB shall meet the requirements stipulated in Data Sheet A.

b) MCCBs in AC circuits shall be of single throw, air break, heavy duty type triple pole construction arranged for simultaneous three pole manual closing and opening and for automatic tripping at short circuit and overload. Neutral link shall be provided for LDB/ WDB without transformers.

c) Operating mechanism shall be quick make, quick break and trip free type.

d) The ON, OFF & TRIP positions of the MCCB shall be clearly indicated so as to be visible to the operator when mounted as in service. Operating handle shall be provided on front of the LDB/ WDB.

e) MCCBs shall be capable of withstanding the thermal stresses caused by overloads and short circuits. The maximum tripping time under short circuit shall not exceed 20 milli-seconds.

f) MCCB terminals shall be shrouded and designed to receive cable lugs for cable sizes relevant to circuit ratings.

g) Under voltage releases and other releases shall be provided as specified in data Sheet-A.

4.2 SWITCH-FUSE UNITS

a) These units shall preferably comprise of switches having integral fuses, called composite units. Alternatively, combination units of separate switch and fuse may also be acceptable.

b) These units shall be provided for general purpose i.e. incoming or outgoing units.

c) The units shall be of the air break air insulated type and designed to ensure safety to operating personnel.

d) Composite units shall have integral fuses i.e. fuse carrier with fuse link (fuse link forming the moving contact). The design shall ensure that the moving contact is not live when switch is open i.e. in OFF position, so as to facilitate removal of fuse.

e) The switch shall be capable making and carrying the system prospective fault current, but limited in magnitude and duration by the cut off characteristics of the largest HRC fuse link that may be fitted to that unit.

f) The fixed contact shall be so shrouded that maintenance of the unit can be carried out in safety with the busbars live.

g) Where one isolating switch is used as the incoming device, the incoming side fixed contacts shall be shrouded to ensure that maintenance can be carried out with the remote fuse and switch closed.

h) Composite switch-fuse or the combination of switch and fuse shall meet the requirements of its components as follows:

Isolating Switch

i. Switches shall be air-break, quick make, and quick break heavy duty type conforming to applicable standard.

ii. All switches shall have visible ON / OFF position indication and shall be padlockable in any (ON / OFF) position.

iii. Switches shall be door interlocked such that it shall not be possible to gain access to inside the unit unless the isolating switch is in OFF position.

iv. The switches shall be suitable for independent manual operation.

v. The switch contacts shall be of silver alloy or silver plated copper and springs of non-corrosive material.

vi. Inter-phase barriers shall be provided to prevent possibilities of phase to phase fault in the switch. The switch shall also be shrouded from all sides to prevent access to live parts on the switch after opening the unit door. The barriers and shrouding shall extend upto the height of switch to fully enclose both side terminals of the device. The arrangement shall permit easy maintenance.

High Rupturing Capacity (HRC) Fuses

i. The fuse serving as the short-circuit protective device in isolating fuse-switch units shall be of HRC cartridge, current limiting and plug-in non-deteriorating type.

ii. The fuse carriers shall be easily withdrawable for replacement of fuse. Insulated fuse pullers shall be provided where fuses are not mounted in insulating carriers to remove and replace fuses in live conditions.

iii. Fuses shall preferably be fitted with a device to indicate operation (i.e. when the fuse has blown).

iv. Live terminals of fuse bases shall be shrouded to prevent contact with personnel where fuse links are not mounted in carriers and are directly plugged into the fuse base. Inter-phase barriers extending throughout the length of the fuse base shall be provided to prevent inter-phase short circuit. They shall be shrouded from all sides to prevent accidental contact.

v. Fuse carriers and bases shall be of good quality moulded insulating material. Porcelain fuse bases and carriers will not be accepted.

vi. The rating and characteristics of fuse links shall be chosen appropriately for short circuit protection of circuits downstream.

4.3 MINIATURE CIRCUIT BREAKERS

a) The use of miniature circuit breakers (MCBs) combining thermal overload and magnetic short circuit protection shall be application for the outgoing circuits of Lighting Panels.

b) MCBs shall have suitable rating as specified in Data Sheet A.

c) MCBs shall be suitable for housing in the lighting panel and for connection of copper link bus bar at the incoming and copper lugs at the outgoing ends.

d) The terminals of MCB and ON/OFF positions shall be clearly and indelibly marked.

4.4 CURRENT TRANSFORMERS

a) CTs shall be air insulated having insulation class E or better, cast resin type and shall be capable to withstand the thermal and mechanical stresses resulting from maximum short circuit.

b) The short time current duration for CTs shall be one second.

c) CT primary current shall not be less than the full load thermal rating of the associated circuit. CT secondary current shall be as specified in Data Sheet A. Polarity shall be marked in a suitable manner. The ratings shall be adequate to cater for the burden of connected instruments.

d) CTs shall be of bar primary / wound primary / ring type capable of carrying the rated primary current.

4.5 VOLTAGE TRANSFORMER

a) Voltage transformers (VT) shall be dry, cast resin type comprising of single phase or three phase units. They shall have their primary windings protected by current limiting fuses with interrupting capacity corresponding to that of the lighting board / panel.

b) VT secondary windings shall be earthed in LDB/ WDB / LP through link, which can be removed for insulation testing.

c) Three phase voltage transformers shall be as per Data Sheet A.

Single phase VTs shall have voltage rating of (Nominal System Voltage / $\sqrt{3}$) V / (110 / $\sqrt{3}$) V so that secondary voltage shall be 110 volts phase to phase when the secondary winding is star connected.

d) VTs shall have an output rating adequate to cater to the burden connected to them.

4.6 INDICATING METERS

a) Meters shall be panel mounted, flush type and suitable for rear terminal connection.

b) Meters and instruments shall be enclosed in dust proof, moisture resistant black finished cases and shall be suitable for tropical use. Instruments shall be suitable for operation from the secondary windings of CTs and VTs.

c) All instruments shall be calibrated to enable direct reading of primary quantities. Instruments shall be adjusted and calibrated at manufacturer's works and shall have means of calibration, checking and zero adjustment at site.

d) All the divisions and the quantity to be measured shall be clearly marked. Instruments shall conform to applicable standard having black numerals and lettering on white anti-parallax dial with knife edge pointer. Indicating instruments shall be of moving iron type for AC and moving coil type for DC circuits.

e) Instruments having metallic cases shall be fitted with earthing terminals.

4.7 CONTACTORS

a) Contactors shall be of the air break type, electromagnetic type fitted with arc shields.

b) The operating coil shall be suitable for satisfactory operation in the range of 85% - 110% of nominal voltage specified under the Data Sheet A. The coil shall be tropicalized having insulation not less than class 'E'.

c) Electrically independent auxiliary contacts not less than 2NO + 2NC for interlocking and indication shall be fitted to individual power contactor.

d) All springs shall be made out of a corrosion proof material.

4.8 RELAYS

a) Relays shall be provided on the various circuits as per schemes. Relays shall be flush mounted on front of the board. Relay case shall be painted with dull black or egg shell black enamel and with back connected terminals. Metal cases and frames of relay shall be earthed.

b) All relays shall be of withdrawable type with built-in testing facilities, with provision for inspection, maintenance and replacement. Where built-in test facility is not provided for a particular relay, separate suitable test block shall be provided on the board for this purpose.

c) Relay performance shall not alter due to mechanical shock or vibration or external magnetic field which may be present at the place of mounting.

d) Each relay shall not have less than two independent pairs of contacts.

4.9 TIMERS

4.9.1 Time Switch

a) Time switch shall be suitable for automatic switching ON and OFF of street lighting / flood lighting circuits.

b) Time switch have 00 - 24 hrs clock base.

c) Time switch shall indicate actual time and shall permit accurate time setting.

d) Time switch shall be rugged, independent of normal fluctuations of voltage / frequency and free from maintenance.

e) Contact rating, clock accuracy, rated voltage rating and frequency rating of timer shall be suitable to its application.

f) Time switch shall be provided with Ni-Cd battery.

g) Time switch shall be suitable for mounting inside the panel.

4.9.2 On/Off Delay Timer

a) On delay timer shall be required for continuation of DC supply for a limited duration when the AC Emergency supply has been restored and DG set is under stabilisation.

b) Timer shall be fully static and suitable for operation on normal frequency and system voltage.

c) Timer shall have high setting accuracy, high repeat accuracy, low reset time and low power consumption.

d) Timer shall have the time setting range as mentioned in Data Sheet A.

e) Timer shall be suitable for mounting inside the panel.

4.10 SELECTOR SWITCHES

a) The rating and other features of the switches shall be suitable for the application. The number of positions and the number of contacts required for each switch shall be as indicated in the schemes

b) Selector switches shall be stay put type, provided with properly designated escutcheon plates clearly marked to show operating position.

c) Terminals carrying potential above 120 Volts shall be shrouded to prevent accidental contact with personnel.

d) Ammeter selector switches shall have make before break contacts.

e) The switches shall be suitable for semi-flush mounting with the front plate and operating handle projecting out. All connection to the switches shall be from the back.

f) The arrangement for front mounting of these devices shall be such as to make them reasonably dust free so as not to interfere with normal operation.

4.11 PUSH BUTTONS

a) Push button shall be heavy duty, flush mounted suitable for the application.

b) Push button shall be provided with integral escutcheon plates marked with its function identified as per schemes.

c) Colour shall be appropriate to the function.

d) Minimum number of contacts shall be 2 NO + 2 NC or as per the requirements of control scheme.

4.12 INDICATION LAMPS

a) Indication lamps shall be complete with lens covers and holders.

b) Each lamp shall be fitted with a durable resistance integrally wired in series with the lamp. Alternatively, lamps with built in transformers are acceptable.

c) The lamp cover (lens) shall be translucent of appropriate colour.

d) Bulbs and covers shall be interchangeable, easily replaceable from the front without the need for any special means.

e) Terminals having potential above 120V shall be shrouded to prevent contact with personnel.

f) Terminals shall be suitable for ring type copper cable lugs of size depending upon the circuit rating.

4.13 CABLE GLANDS

a) Whether specifically mentioned or not, cable glands of suitable sizes shall be supplied along with each equipment for power and control cables.

b) Rubber components used in the gland shall be of neoprene.

c) Name / trade name of manufacturer, type no. and applicable range of outer diameter of cable shall be engraved / indelibly printed on the cable gland.

4.14 CABLE LUGS

a) All equipment shall be supplied with the power and control cable lugs of suitable size, whether specifically mentioned or not.

b) Name / trade name and size of lug shall be engraved/ indelibly printed on each cable lug.

4.15 TERMINALS

a) Terminals shall be stud type of copper material.

b) Terminals shall be provided with transparent cover(s).

c) Separate terminals shall be available for each termination of loop-in and loop-out power connections.

5.0 LABELING

5.1 Labels to identify all the Main assemblies, Sub-assemblies and components of the LDB/ WDB and LPs shall be provided.

5.2 Name and rating plate / marking shall be provided as required by relevant standard applicable to each component / assembly to be identified.

5.3 Labels shall be of two colour, three layer plastic material with matt or semi matt finish or of the anodised aluminium sheet.

5.4 All labels other than “Danger” or “Warning” labels shall have black lettering on a white background. Danger labels shall be as per applicable standard and shall not be affixed on to removable parts.

5.5 All labels shall be securely fixed on to the equipment by means of self tapping screws or other approved means.

5.6 Stick-on type labels of good quality and permanent mounting shall be acceptable for internally mounted components only.

5.7 A list of all such items to be labeled and text and type of labels to be provided is given below:

a) BOARD DESIGNATION (MAIN EQUIPMENT LABEL)

i. **Inscription** :
Designation & LDB/ WDB number for LDB/ WDB.
Designation and LP number for LPs.

ii. **Location** :
Top centre in the front of the LDB/ WDB.
Top centre in the front of the LP.

iii. **Material** :
3 Layer plastic material, fixation by self tapping, non-rusting screws, black inscription on white back ground.

b) OUTGOING - FEEDER DESIGNATION

i. **Inscription** : Module number, LP number / purpose.

ii. **Material** :
Black engraving on white anodised aluminium plate of thickness 1.6 mm or more. Plate to be secured with screws.

c) COMPONENT DESIGNATION

i. **Inscription** : Letter symbol / Legend as assigned in schemes.

ii. **Location** : Near or on the component

iii. **Material** : Stick-on type

5.8 CIRCUIT DIAGRAM / DIRECTORY PLATE

a) A diagram is to be prepared for fixing to the inside cover of every lighting panel giving details of the points controlled by each circuit.

b) The circuit list shall be typed or printed stating the location of the equipment served, rating of the protective unit and the circuit loadings.

c) The list shall be mounted on the inside of the cover door and shall be protected by an acrylic sheet cover to be easily removable to permit circuit modifications.

6.0 SURFACE TREATMENT

6.1 All metal parts and the surfaces (exterior & interior) of equipment, unless stated otherwise in case of reflectors, shall be degreased by dipping in hot alkaline solution and rubbed with wire brush to remove oil & scale from them & then rinsed in water. Alternatively, they may be shot / sand blasted.

6.2 Parts shall be pickled by dipping in hydrochloric acid tank to remove the rust from the surfaces formed during storage of sheets & then rinsed to remove traces of the acid. The cleaning and pretreatment of all metal parts shall be as per applicable standard.

6.3 The surfaces to be painted shall then be prepared by phosphatizing to protect them from further rusting & to create a good bond with the paint. The pretreatment shall conform to the applicable standard.

6.4 All parts shall then be subjected to a coat of red oxide primer paint.

6.5 All inside and outside surfaces of panel shall be spray painted with synthetic enamel of the shade and minimum thickness as per Data Sheet A.

6.6 Electrostatic or powder painting shall be acceptable subject to purchaser’s approval.

6.7 Wherever possible, finished parts shall be coated with peelable compound by spraying method to protect the finished product from scratches, grease, dirty and oily spots during handling and transportation.

7.0 PACKING

7.1 Packing procedure shall conform to the following :

a) The equipment shall be properly packed before dispatch. The packing shall prevent damage to the contents while handling and lengthy period of outdoor storage.

b) The equipment shall be wrapped in weather proof packing using polythene sheets/ air bubble sheets/ thermocol sheets and then secured in wooden packing cases. Wood for wooden packing cases/ crates shall be chemically treated to prevent deterioration due to fungi and attack by termites, borers, and any other kind of infection.

c) The equipment shall be secured by fixing base plate/ frame with the help of bolt and nuts etc. to bottom frame of the wooden packing cases/ crates. Suitable cushioning material like rubberised coir (min. 50 mm thick & 100 mm wide) shall be provided on the bottom support. Gap between the panel and casing shall be filled with rubberised coir with distance between consecutive supports less than 500mm.

7.2 Specification for the sea worthy packing, if enclosed, for the export jobs shall form part of the specification.

8.0 INSPECTION & TESTING

8.1 Bidder shall confirm compliance with the BHEL Standard Quality Plan (PE-QP-999-558-E005) without any deviations. At contract stage, the successful bidder shall submit the same QP for BHEL/ ultimate customer's approval. In case bidder has reference QP agreed with ultimate customer, same can be submitted for specific project after award of contract for BHEL/ ultimate customer's approval. There shall be no commercial implication to BHEL on account of any changes in QP during contract stage.

8.2 All the components and completely assembled equipment shall be tested as per the latest edition of standards. Charges for these tests shall be deemed to be included in equipment price.

8.3 All the specified type and routine tests shall be carried out to verify the rating and performance of the equipment. Where valid type test certificates in evidence of equipment performance claimed are available & approved by purchaser, the requirements for conducting type tests may be waived. The general arrangement of object under test shall be to purchaser's approval.

8.4 Functional testing shall be carried out for Lighting/Welding Distribution Boards/ Lighting Panels.

8.5 All manufacturing processes viz. machining, sheet forming, electroplating, wire routing, cleating & crimping, assembly, surface preparation shall conform to good manufacturing practices.

8.6 Inspection for dimensional & visual checks especially of the following, with respect to contract drawings, documents & standards shall be conducted:

a) General sturdiness & rigidity of equipment.
b) Surface finishing.
c) Gasketting.
d) Inter-changeability.
e) Constructional features viz. location, accessibility & marking of components, segregation, accessibility to live parts (shrouding) etc.
f) Completeness of scope.

8.7 Safety interlocking verification shall be done.

8.8 Each lighting transformer shall be routine tested and one transformer of each rating shall be type tested in accordance with relevant standard in case type test certificates of similar transformers are not available / not acceptable to the purchaser.

8.9 Equipment shall be liable for rejection if tolerances on the values of dimensions, power consumption, impedances, temperature rise etc. exceed the specified values by purchaser and / or standards.

9.0 TOOLS AND TACKLE

9.1 Tools & tackle which are essential to facilitate assembly, adjustments, erection, maintenance & dismantling of equipment shall be provided as part of equipment supplied.

9.2 The above tools shall be supplied along with the initial consignment of equipment so as to be available prior to erection but may not be used for erection purposes.

9.3 Vendor shall also submit a list of recommended tools and tackle. Acceptance of these tools and tackle shall not be a binding on the purchaser.

9.4 Schedule of tools & tackle shall be filled up by bidder.

10.0 SPARES

10.1 Mandatory spares (if applicable) are indicated in BOQ-cum-price schedule.

10.2 Erection & commissioning spares are included in the bidder's scope of supply. Bidder to furnish list of E&C spares in the relevant schedules of the Bid Form and Price Schedules.

	ITEM : (MATERIAL, CLASS, GRADE, RATING, SIZE ETC.): LIGHTING PANEL & LIGHTING DISTRIBUTION BOARDS	STANDARD QUALITY PLAN	Q.P. No. : 0000-999-QOE-S-034 REV. : 0 1 DTD: 15/03/04 PAGE 1 OF 3 VALID UPTO :14.03.07	REVIEWED BY S.D .SINGH O.P.NIRANJAN I. J. SINGH	APPROVED BY ANIL GUPTA

SL. NO.	COMPONENT & OPERATIONS	CHARACTERSTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK M	QUANTUM OF CHECK C / N	REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORD	D*	AGENCY M	AGENCY C	AGENCY N	REMARKS
1	2	3	4	5	6		7	8	9	D*	**	10		11
1	Lighting Panels & Lighting Distribution Boards **Final Inspection and Testing**	a) Overal Dimensions	MA	Meas.	100%	One Panel/ Type/lot	NTPC/Main supplier Appd. Drg / data sheet	NTPC/Main supplier Appd. Drg / data sheet	Inspt. Report		P	W	W	
		b) Thickness of sheet	MA	Meas.	100%	--DO--	--DO--	--DO--	--DO--		P	W	W	
		c) Paint shade	MA	Visual	100%	--DO--	--DO--	--DO--	--DO--		P	W	W	
		d)Thickness of paint	MA	Meas	100% of items	Min. 5 points/ Panel	--DO--	--DO--	--DO--		P	W	W	
		e) Surface finish	MA	Visual	100%	--D0--	Smooth, without lump	Smooth, without lump	--DO--		P	W	W	
		f) Adhesion Test	MA	Mech.	One sample/ lot/size	One sample lot	Should not peel off	Should not peel off	--DO--		P	W	W	
		g) Name Plate	MA	Visual	100%	10% of each type	NTPC/Main supllier Appd drg/ data sheet	NTPC/Main supplier Appd drg/ data sheet	--DO--		P	W	W	
		h) Tightness of bus bar bolts	MA	Mech	100%	One Panel/ Type/lot	Manufacturer Std.	Manufacturer Std.	--DO-		P	W	W	
		i) Bus Bar Clearance	MA	Meas.	100%	--DO--	NTPC/Main supplier Appd drg /data sheet	NTPC/Main supplier Appd drg /data sheet	--DO--		P	W	W	

LEGEND: RECORDS IDENTIFIED IDENTIFIED WITH **"TICK"** SHALL BE ESSENTIALLY INCLUDED BY THE CONTRACTOR IN QA DOCUMENTATION

** M: MANUFACTURER/SUB-SUPPLIER, C:CONTRACTOR/NOMINATED INSPECTION AGENCY(SUBJECT TO PRIOR APPROVAL OF NTPC). N: NTPC. INDICATE **"P"** PERFORM **"W"** WITNESS AND **"V"** VERIFICATION AS APPROPRIATE

"CHP" BY NTPC SHALL BE IDENTIFIED IN COLUMN **"N"** AS **"W"**.

	ITEM : (MATERIAL, CLASS, GRADE, RATING, SIZE ETC.): LIGHTING PANEL & LIGHTING DISTRIBUTION BOARDS	STANDARD QUALITY PLAN	Q.P. No. : 0000-999-QOE-S-034 REV. : 0 1 DTD: 15/03/04 PAGE 2 OF 3 VALID UPTO :14.03.07	REVIEWED BY S.D .SINGH O.P.NIRANJAN I. J. SINGH	APPROVED BY QUALITY ASSURANCE APPROVED N.T.P.C. NOIDA

SL. NO.	COMPONENT & OPERATIONS	CHARACTERSTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK M	QUANTUM OF CHECK C / N	REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORD	D*	AGENCY M	AGENCY C	AGENCY N	REMARKS
1	2	3	4	5	6		7	8	9	**	10			11
		j) GA& Bill of material	CR	Phy.	100%	10% of each type	--DO--	--DO--	--D0--		P	W	W	
		k) Identification of Component lay out	MA	Visual	100%	One Panel/ type/lot	--DO--	--DO--	--DO--		P	W	W	
		l) Completeness of												
		i) Wiring	MA	Elect.	100%	--DO--	--DO--	--DO--	--DO--		P	W	W	
		ii) Ferruling	MA	Visual	100%	--DO--	--DO--	--D0--	--DO--		P	W	W	
		m) Size of wires	MA	Meas.	100%	--DO--	--DO--	--DO--	--DO--		P	W	W	
		n) Colour coding of bus bar	MA	Visual	100%	--DO--	--DO--	--DO--	--DO--		P	W	W	
		o) Spare terminals	MA	Meas.	100%	--DO--	--DO--	--DO--	--DO--		P	W	W	
		p) Shrouding of live parts	MA	Visual	100%	--DO--	--DO--	--DO--	--DO--		P	W	W	
		q) Door earthing	MA	Megger	100%	--DO--	--DO--	--DO--	--DO--		P	W	W	
		r) Functional Tests including HV, IR & continuity	CR	Elec.	100%	10%	--DO--	--DO--	--DO--		P	W	W	
		s) Degree of protection (Paper insertion method)	CR	Phy.	100%	One Panel/ type/lot	NTPC/Main supplier Appd drg./data sheet	NTPC/Main supplier Appd drg./data sheet	--DO--		P	W	W	

LEGEND: RECORDS IDENTIFIED IDENTIFIED WITH **"TICK"** SHALL BE ESSENTIALLY INCLUDED BY THE CONTRACTOR IN QA DOCUMENTATION

** M: MANUFACTURER/SUB-SUPPLIER, C:CONTRACTOR/NOMINATED INSPECTION AGENCY(SUBJECT TO PRIOR APPROVAL OF NTPC). N: NTPC. INDICATE **"P"** PERFORM **"W"** WITNESS AND **"V"** VERIFICATION AS APPROPRIATE

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	ITEM : (MATERIAL, CLASS, GRADE, RATING, SIZE ETC.): LIGHTING PANEL & LIGHTING DISTRIBUTION BOARDS	STANDARD QUALITY PLAN	Q.P. No. : 0000-999-QOE-S-034 REV. : 0 1 DTD: 15/03/04 PAGE 3 OF 3 VALID UPTO :14.03.07	REVIEWED BY S.D .SINGH O.P.NIRANJAN I . J. SINGH	APPROVED BY ANIL GUPTA

ANNEXURE 1 TO SQP NO. 0000 - 999 - QOE - S - 034 REV 01

Sl. No	Item	Make	NOTE : Makes of major BOIs will be subject to NTPC approval / acceptance
1	Indicating Meters		
2	Indicating lamp		
3	Current Transformer		
4	Potential Transformer		
5	Dry Type Transformer		
6	Timer		
7	MCB		
8	On-Off Switch		
9	Fuse		
10	Push Button		
11	Contactor		
12	Terminal Block		
13	Wires		

LEGEND: RECORDS IDENTIFIED IDENTIFIED WITH **"TICK"** SHALL BE ESSENTIALLY *INCLUDED BY THE* CONTRACTOR IN QA DOCUMENTATION

** M: MANUFACTURER/SUB-SUPPLIER, C:CONTRACTOR/NOMINATED INSPECTION AGENCY.(SUBJECT TO PRIOR APPROVAL OF NTPC) N: NTPC. INDICATE *"P" PERFORM* **"W"** WITNESS AND **"V"**

"CHP" BY NTPC SHALL BE IDENTIFIED IN COLUMN **"N"** AS **"W"**.

Note: Packing shall be witnessed as per Annexure - I to Quality Plan.

PACKING SPECIFICATION FOR DISTRIBUTION BOARDS PACKAGE (LIGHTING DISTRIBUTION BOARDS AND LIGHTING PANELS)

ANNEXURE - I

DISTRIBUTION BOARDS (LDB & LP) 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

1.5.1 NAILS

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

1.5.2 BLUE NAILS

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

1.5.3 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.

1.5.4 CLIPS

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

1.5.5 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.

1.5.6 MULTI LAYERED CROSS LAMINATED POLYTHELENE FILM

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.

1.5.6 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.

1.5.7 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 DISTRIBUTION BOARDS (LDB & LP) during transit.

1.5.8 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.

1.5.9 MARKING PLATE:

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

HEMANT KUMAR KAUSHIK

Digitally signed by HEMANT KUMAR KAUSHIK
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