Volume – I

Tender Notification for

SUPPLY OF CONVENTIONAL TYPE PACKAGE SUBSTATION (G+1) IN BRPL

CMC/BR/24-25/RB/PR/RJ/1221

Due Date for Submission of Bids: 04.09.2024

BSES RAJDHANI POWER LTD (BRPL)
BSES Bhawan, Nehru Place, New Delhi-110019
Corporate Identification Number: U74899DL2001PLC111527
Telephone Number: +91 11 3009 9999
Fax Number: +91 11 2641 9833
Website: www.bsesdelhi.com

BSES
RAJDHANI POWER LIMITED

Section – I

REQUEST FOR QUOTATION

Tender Notification: CMC/BR/24-25/RB/PR/RJ/1221

Supply Of Conventional Type Package Substation (G+1) In BRPL

INDEX

SECTION – I: REQUEST FOR QUOTATION

1.0 Event Information

1.01 BRPL invites sealed tenders for supply of Conventional Type Package Substation from the manufacturers. The bidder must qualify the technical requirements as specified in clause 2.0 stated below. The sealed envelopes shall be duly super scribed as — **"BID FOR SUPPLY CONVENTIONAL TYPE PACKAGE SUBSTATION (G+1) OF BRPL ,TENDER NOTICE CMC/BR/24-25/RB/PR/RJ/1221 DUE FOR SUBMISSION ON DT. 04.09.2024"**.

Sl. No.	Item Description	Specification	Requirement	Estimated Cost
			Total Qty.	
BRPL, DELHI				
1	Conventional Type Package Substation (G+1) in BRPL	SECTION V	03 Nos	2.40 Cr

Note: Quantity may vary to any extent of +/- 30% of above mentioned total quantity.

1.02 The schedule of specifications with detail terms & conditions can be obtained from address given below against demand draft/Pay Order of **Rs.1180/- with GST**-, drawn in favour of **BSES RAJDHANI POWER LTD**, payable at New Delhi. The sale of tender documents will be issued from **15.08.2024** onwards on all working days upto **04.09.2024**. The tender documents can also be downloaded from the website "**www.bsesdelhi.com**".

In case tender papers are downloaded from the above website, then the bidder has to enclose a demand draft covering the cost of bid documents as stated above in a separate envelope with suitable superscription —"Cost of Bid Documents: Tender **Notice Ref: CMC/BR/24-25/RB/PR/RJ/1221"**.This envelope should accompany the Bid Documents.

1.03 Offers will be received upto **1500 Hrs. on dt. 04.09.2024** as indicated earlier and will be opened at the address given below dt. **04.09.2024 at 1530 Hrs.** in the presence of authorized representatives of the bidders. The schedule of specifications with detail terms & conditions are enclosed. It is the sole responsibility of the bidder to ensure that the bid documents reach this office on or before the due date.

HEAD OF THE DEPARTMENT, 1st FLOOR, 'C' BLOCK,
CONTRACTS & MATERIALS DEPARTMENT, BSES RAJDHANI POWER LTD,
BSES BHAWAN,
NEHRU PLACE, NEW DELHI-110019.

1.04 BRPL reserves the right to accept/ reject any or all Tenders without assigning any reason thereof and alter the quantity of materials mentioned in the Tender documents at the time of placing purchase orders. Tender will be summarily rejected if:

i) Earnest Money Deposit (EMD) @ 2% (Two percent) of the Tender value i.e. **Rs. 4,00,000/-** is not deposited in shape of Bank Draft in favour of BSES RAJDHANI POWER LTD, payable at New Delhi or Bank Guarantee executed on favour of BSES RAJDHANI POWER LTD.

ii) The offer does not contain "FOR, NEW DELHI price indicating break-up towards all taxes & duties".

iii) Complete Technical details are not enclosed.

iv) Tender is received after due time due to any reason.

1.05 BRPL reserves the right to reject any or all bids or cancel/ withdraw the invitation for bids without assigning any reason whatsoever and in such case no bidder/ intending bidder shall have any claim arising out of such action time of placing purchase orders.

2.0 Qualification Criteria:-

The prospective bidder must qualify all of the following requirements to be eligible to participate in the bidding. Bidders who meet following requirements will be considered as successful bidder and management has a right to disqualify those bidders who do not meet these requirements.

1) The bidder should have own manufacturing facility in India for 1000 kVA Package Substation or higher since last 3 years. *Manufacturing and factory incorporation certificate/undertaking are submitted by bidder. The details of manufacturing units, locations and works from where supply against this tender shall be proposed to be furnished.*

2) The Bidder should have successfully supplied/ Executed at least 50 nos of 990/1000 KVA Package Substation or higher rating to any major Utilities/SEB's/other reputed firm in last 7 years from the date of bid opening *.i. Summary list of executed Purchase orders ii. Purchase order copies iii. Material delivery clearance certificate copy or delivery completion certificates or invoice copies.*

3) Performance certificate for minimum 2 year satisfactory performance for PSS of similar rating or higher ratings supplied in last 7 years from the date of bid opening from at least two utilities/ SEB's/ PSU's/ Govt. organization/reputed firm.
In case of bidder has a previous association with BRPL/BYPL for similar product and service, the performance feedback for that bidder by BRPL/BYPL shall only be considered irrespective of performance certificate issued by any third organization. *Performance Certificate*

4) The bidder should have servicing, repairing, testing & refurbishment facility in INDIA with necessary spares and testing equipments for providing prompt after sales service for Package Substation. *Relevant Details/certificates/Undertaking. Details of the set-up*

available shall be brought out in the offer. The bidder shall submit undertaking along with the bid confirming the infrastructure details submitted.

5) The bidder should have plant installed capacity to supply of minimum 8 nos of PSS per month. - *Installed Capacity Certificate.*

6) Supplier must be the OEM and should be manufacturer of at least one major component out of two (11KV RMU, Transformer). – *Documentary proof required*

7) The Bidder must posses valid ISO 9001:2015 certification- *Valid copy of Certification*

8) Bidder should have Average Annual Sales Turnover of Rs 500 Crores or more in last 3 financial Years (i.e 2020-21, 2021-22, 2022-23)*Balance Sheet /CA Certificate to be submit*

9) The Bidder shall submit an undertaking "No Litigation" is pending with the BRPL or its Group/Associates Companies as on date of bid opening.- *Undertaking*

10) An undertaking (self-certificate) that the bidder has not been blacklisted/debarred by any central/state government institution including electricity utilities as on date of bid opening. – *Undertaking*

11) The bidder must have valid PAN No., GST Registration Number, in addition to other statutory compliances. The bidder must submit the copy of registrations and submit an undertaking that the bidder shall comply all the statuary compliances as per the laws/rules etc. before the start of the work- *Relevant Statutory Documents Copy/Undertaking*

3.0 Bidding and Award Process

Bidders are requested to submit their questions regarding the RFQ or the bidding process after review of this RFQ. BRPL response to the questions raised by various bidders will be distributed to all participating bidders through website.

a. Time schedule of the bidding process

The bidders on this RFQ package should complete the following within the dates specified as under:

S.No.	Steps	Activity description	Due date
1	Technical Queries	All Queries related to RFQ	On or before 30.08.2024 1500 Hrs.

2	Technical Offer	Documentary evidence in support of qualifying criteria. Technical Literature/ GTP/ Drawings/ Type test report, if any, etc., Testing facilities, any other relevant document, acceptance to commercial terms & conditions viz. delivery Schedule/ Period, Payment terms, PBG etc. Quality assurance plan, Deviation from the specification, list of plant & machinery and testing equipments Un priced items.	04.09.2024, 1500 Hrs
3	Commercial Offer	Prices for Transformer and Break up regarding basic price and taxes. Delivery commitment	04.09.2024, 1500 Hrs
4	Opening of technical bid	As per RFQ	04.09.2024, 1530 Hrs

This is a two part bid process. Bidders are to submit the bids (a) Technical Bid (b) Price Bid. Both these parts should be furnished in separate sealed covers super scribing with specification no., validity etc, with particulars as **Part-I "Technical Particulars & Commercial Terms & Conditions"** and **Part-II "Financial bid"** and these sealed envelopes should again be placed in another sealed cover which shall be submitted before the due date & time specified.

Bidders are requested to submit the bid in one original plus one copy in duplicate.

- **The Part-I (Technical Bid) -** Technical Bid should not contain any cost information whatsoever. In case of Bids where the qualification requirements, technical suitability and other requirements are found to be inadequate, Part-II "Financial Bid" will be returned unopened.

- **The Part-II (Financial Bid) -** Qualified bidders will be intimated after technical evaluation of all the bids is completed. The date and time of same shall be intimated in due course to the qualified bidders. Notwithstanding anything stated above, the Purchaser reserves the right to assess bidder's capability to perform the contract, should the circumstances warrant such assessment in the overall interest of the purchaser. In this regard the decision of the purchaser is final.

4.0 Award Decision

Purchaser intends to award the business on a lowest bid basis, so suppliers are encouraged to bid competitively. The decision to place purchase order / letter of acceptance solely depends on purchaser on the cost competitiveness across multiple lots, quality, delivery and bidder's capacity, in addition to other factors that Purchaser may deem relevant.

The purchaser reserves all the rights to award the contract to one or more bidders so as to meet the delivery requirement or nullify the award decision without any reason.

BSES reserves the right to split the tender quantity amongst techno commercially qualified bidders on account of delivery requirement in tender, quantity under procurement etc.

Splitting of tender quantity amongst more than one bidder shall be governed by below mentioned guidelines:

- If the quantity is to be split among 2 bidders, it will be done in the ratio of 70:30 on L1 price.
- If the quantity is to be split among 3 bidders, it will be done in the ratio of 60:25:15 on L1 price.
- In case quantity needs to be distributed and order splitting is required, distribution of quantity shall be maximum among three (3) bidders.

In the event of your bid being selected by purchaser (and / or its affiliates) and your subsequent DEFAULT on your bid; you will be required to pay purchaser (and / or its affiliates) an amount equal to the difference in your bid and the next lowest bid on the quantity declared in RFQ.

In case any supplier is found unsatisfactory during the delivery process, the award will be cancelled and BRPL reserves the right to award other suppliers who are found fit.

Quantity Variation: The purchaser reserves the rights to vary the quantity by **+/- 30%** of the tender quantity.

Repeat Order: BRPL reserves the right to place repeat order at the same rates & terms and conditions as per this tender against additional requirement subject to mutual agreement between BRPL & supplier.

5.0 Market Integrity:

We have a fair and competitive marketplace. The rules for bidders are outlined in the Terms & Conditions. Bidders must agree to these rules prior to participating. In addition to other remedies available, we reserves the right to exclude a bidder from participating in future markets due to the bidder's violation of any of the rules or obligations contained in the Terms & Condition. Bidders who violate the marketplace rules or engage in behavior that disrupts the fair execution of the marketplace restricts a bidder to length of time, depending upon the seriousness of the violation. Examples of violations include, but are not limited to:

- Failure to honor prices submitted to the marketplace.
- Breach of the terms of the published in Request For Quotation.

6.0 Supplier Confidentiality

All information contained in this RFQ is confidential and may not be disclosed, published or advertised in any manner without written authorization from BRPL. This includes all bidding information submitted.

All RFQ documents remain the property of BRPL and all suppliers are required to return these documents to BRPL upon request.

Suppliers who do not honor these confidentiality provisions will be excluded from participating in future bidding events.

7.0 Contact Information

All communication as regards this RFQ shall be made (i) in English, (ii) in writing and (iii) sent by mail, facsimile to:

	Technical	Commercial
Contact Name	Mr. Amit Tomar Copy to Mr. Gopal Nariya	Ms Rachna Jain Copy to Mr. Pankaj Goyal
Address	BSES RAJDHANI POWER LTD, 2nd Floor, B Block, Nehru Place, New Delhi – 110019	C&M Deptt. 1st floor, D- Block, BSES Rajhdhani Power Limited, BSES Bhawan, Nehru Place, New Delhi -110019
Email-ID	amit.as.tomar@relianceada.com gopal.nariya@relianceada.com	rachna.jain@relianceada.com pankaj.goyal@relianceada.com

SECTION – II

INSTRUCTION TO BIDDERS (ITB)

PROCUREMENT OF CONVENTIONAL TYPE PACKAGE SUBSTATION(G+1) IN BRPL

CMC/BR/24-25/RB/PR/RJ/1221

A. GENERAL

1.00 BSES Rajdhani power Ltd, hereinafter referred to as the Purchaser are desirous of implementing the various Systems Improvement/Repair & Maintenance works at their respective licensed area in Delhi. The Purchaser has now floated this tender for procurement of Package Substation as notified earlier in this bid document.

2.00 SCOPE OF WORK

The scope shall include Design, Manufacture, Testing at works conforming to the Technical Specifications enclosed along with Packing, Forwarding, Freight and Unloading and proper stacking at Purchaser's stores.

3.00 DISCLAIMER

3.01 This Document includes statements, which reflect various assumptions, which may or may not be correct. Each Bidder/ Bidding Consortium should conduct its own estimation and analysis and should check the accuracy, reliability and completeness of the information in this Document and obtain independent advice from appropriate sources in their own interest.

3.02 Neither Purchaser nor its employees will have any liability whatsoever to any Bidder or any other person under the law or contract, the principles of restitution or unjust enrichment or otherwise for any loss, expense or damage whatsoever which may arise from or be incurred or suffered in connection with anything contained in this Document, any matter deemed to form part of this Document, provision of Services and any other information supplied by or on behalf of Purchaser or its employees, or otherwise a rising in any way from the selection process for the Supply.

3.03 Though adequate care has been taken while issuing the Bid document, the Bidder should satisfy itself that Documents are complete in all respects. Intimation of any discrepancy shall be given to this office immediately.

3.04 This Document and the information contained herein are Strictly Confidential and are for the use of only the person(s) to whom it is issued. It may not be copied or distributed by the recipient to third parties (other than in confidence to the recipient's professional advisors).

4.00 COST OF BIDDING

The Bidder shall bear all cost associated with the preparation and submission of its Bid and Purchaser will in no case be responsible or liable for those costs.

B BIDDING DOCUMENT

5.00 BIDDING DOCUMENTS

5.01 The Scope of Work, Bidding Procedures and Contract Terms are described in the Bidding Documents. In addition to the covering letter accompanying Bidding Documents, the Bidding Documents include:

Volume –I

a)	Request for Quotation (RFQ)	- Section – I
b)	Instructions to Bidders (ITB)	- Section – II
c)	General Conditions of Contract	- Section - III
d)	Quantity and delivery requirement	- Section –IV
e)	Technical Specifications (TS)	- Section –V

Volume – II

a)	Bid Form	- Annexure – I
b)	Bid Format	- Annexure – II
c)	Price Schedule	- Annexure – III
d)	Commercial Terms & Conditions	- Annexure - IV
e)	No Deviation Sheet	- Annexure - V
f)	Qualification Criterion	- Annexure - VI

5.02 The Bidder is expected to examine the Bidding Documents, including all Instructions, Forms, Terms and specifications. Failure to furnish all information required by the Bidding documents or submission of a Bid not substantially responsive to the Bidding Documents in every respect will may result in the rejection of the Bid.

6.00 AMENDMENT OF BIDDING DOCUMENTS

6.01 At any time prior to the deadline for submission of Bids, the Purchaser may for any reasons, whether at its own initiative or in response to a clarification requested by a prospective Bidder, modify the Bidding Documents by Amendment.

6.02 The Amendment shall be part of the Bidding Documents, pursuant to Clause 5.01, and it will be notified in writing by Fax/e-mail to all the Bidders who have received the Bidding Documents and confirmed their participation to Bid, and will be binding on them.

6.03 In order to afford prospective Bidders reasonable time in which to take the Amendment into account in preparing their Bids, the Purchaser may, at its discretion, extend the deadline for the submission of Bids.

C PREPARATION OF BIDS

7.00 LANGUAGE OF BID

The Bid prepared by the Bidder, and all correspondence and documents relating to the Bid exchanged by the Bidder and the Purchaser, shall be written in the English Language. Any printed literature furnished by the Bidder may be written in another Language, provided that this literature is accompanied by an English translation, in which case, for purposes of interpretation of the Bid, the English translation shall govern.

8.00 DOCUMENTS COMPRISING THE BID

The Bid prepared and submitted by the Bidder shall comprise the following components:

a) Bid Form ,Price & other Schedules (STRICTLY AS PER FORMAT)and Technical Data Sheets completed in accordance with Clause 9.0, 10.0, 11.0 and Technical Specification;

b) All the Bids must be accompanied with the required EMD as mentioned in the Section-I against each tender.

c) Power of Attorney or Authorization letter indicating that the person(s) signing the Bid have the authority to sign the Bid and thus that the Bid is binding upon the Bidder during the full period of its validity, in accordance with clause 12.0.

9.00 BID FORM

9.01 The Bidder shall complete an "Original" and another one "Copy" of the Bid Form and the appropriate Price & Other Schedules and Technical Data Sheets.

9.02 **EMD**

Pursuant to Clause 8.0(b) above, the bidder shall furnish, as part of its bid, a EMD amounting to 2% of the total bid value (FOR Destination) i.e. Rs. **4,00,000/-**. The EMD is required to protect the Purchaser against the risk of Bidder's conduct which would warrant the security's forfeiture.

The EMD shall be denominated in the currency of the bid, and shall be in the following form:

a) A bank guarantee issued by any scheduled bank strictly as per the form at enclosed and shall be valid for a period of thirty (30) days beyond the validity of the bid.

b) Bank Draft in favour of BSES RAJDHANI POWER LTD, payable at New Delhi.

Unsuccessful bidders' EMD will be discharged or returned as promptly as possible as but not later than thirty (30) days after the expiration of the period of bid validity.

The successful bidder's EMD will be discharged upon furnishing the performance security. The EMD may be forfeited:

a) If the Bidder:
i) Withdraws its bid during the period of bid validity specified by the Bidder in the Bid Form; or

b) in the case of a successful Bidder, if the Bidder fails:

i) to sign the Contract, or

ii) to furnish the required performance security.

10.00 **BID PRICES**

10.01 Bidders shall quote for the entire Scope of Supply with a break-up of prices for individual items. The total Bid Price shall also cover all the Supplier's obligations mentioned in or

reasonably to be inferred from the Bidding Documents in respect of Design, Supply, Transportation to site, all in accordance with the requirement of Bidding Documents The Bidder shall complete the appropriate Price Schedules included herein , stating the Unit Price for each item & total Price.

10.02 The prices offered shall be inclusive of all costs as well as Duties, Taxes and Levies paid or payable during execution of the supply work, breakup of price constituents, should be there. Prices quoted by the Bidder shall be—Firm "and not subject to any price adjustment during the performance of the Contract. A Bid submitted with an adjustable price quotation will be treated as non -responsive and rejected.

11.00 BID CURRENCIES

Prices shall be quoted in **Indian Rupees (INR) only**.

12.00 PERIOD OF VALIDITY OF BIDS

12.01 Bids shall remain valid for **120 days** post bid date.

12.02 Notwithstanding Clause12.01 above, the Purchaser may solicit the Bidder's consent to an extension of the Period of Bid Validity. The request and the responses thereto shall be made in writing by Fax/e-mail.

13.00 ALTERNATIVE BIDS

Bidders shall submit Bids, which comply with the Bidding Documents. Alternative Bids will not be considered. The attention of Bidders is drawn to the provisions of Clause 22.03 & 22.04 regarding the rejection of Bids, which are not substantially responsive to the requirements of the Bidding Documents.

14.00 FORMAT AND SIGNING OF BID

14.01 The original Bid Form and accompanying documents (as specified in Clause9.0),clearly marked "Original Bid", plus one copy must be received by the Purchaser at the date, time and place specified pursuant to Clauses15.0 and16.0. In the event of any discrepancy between the original and the copies, the original shall govern.

14.02 The original and copy of the Bid shall be typed or written in indelible ink and shall be signed by the Bidder or a person or persons duly authorized to sign on behalf of the Bidder. Such authorization shall be indicated by written Power-of-Attorney accompanying the Bid.

14.03 The Bid shall contain no interlineations, erasures or overwriting except as necessary to correct errors made by the Bidder, in which case such corrections shall be initialed by the person or persons signing the Bid.

D SUBMISSION OF BIDS

15.0 SEALING AND MARKING OF BIDS

15.01 Bid submission: One original & one Copy (hard copies) of all the Bid Documents shall be sealed and submitted to the Purchaser before the closing time for submission of the bid.

15.02 The Technical Documents and the EMD shall be enclosed in a sealed envelope and the said envelope shall be superscribed with **—Technical & EMD**. The Financial bid shall be inside another sealed envelope with superscription — **Financial Bid**. Both these envelopes shall be sealed inside another big envelope. All the envelopes should bear the Name and Address of the Bidder and marking for the Original and Copy. The envelopes should be superscribed with —**"Tender Notice No, Due date of submission, Tender opening date"**.

15.03 The Bidder has the option of sending the Bids in person. Bids submitted by Telex/ Telegram/ Fax will not be accepted. No request from any Bidder to the Purchaser to collect the proposals from Airlines/Cargo Agents etc shall be entertained by the Purchaser.

16.0 DEADLINE FOR SUBMISSION OF BIDS

16.01 The original Bid, together with the required copies, must be received by the Purchaser at the address specified not later than **1500 HRS on 04.09.2024**.

16.02 The Purchaser may, at its discretion, extend the deadline for the submission of Bids by amending the Bidding Documents in accordance with Clause9.0, in which case all rights and obligations of the Purchaser and Bidders previously subject to the deadline will thereafter be subject to the deadline as extended.

17.0 ONE BID PER BIDDER

Each Bidder shall submit only one Bid. A Bidder who submits or participates in more than one Bid will cause all those Bids to be rejected.

18.00 LATE BIDS

Any Bid received by the Purchaser after the deadline for submission of Bids prescribed by the Purchaser, pursuant to Clause 16.0, will be declared "Late" and rejected and returned unopened to the Bidder.

19.00 MODIFICATIONS AND WITHDRAWAL OF BIDS

19.01 The Bidder is not allowed to modify or withdraw its Bid after the Bid's submission.

E. EVALUATION OF BID

20.00 PROCESS TO BE CONFIDENTIAL

Information relating to the examination, clarification, evaluation and comparison of Bids and recommendations for the award of a contract shall not be disclosed to Bidders or any other

persons not officially concerned with such process. Any effort by a Bidder to influence the Purchaser's processing of Bids or award decisions may result in the rejection of the Bidder's Bid.

21.00 CLARIFICATION OF BIDS

To assist in the examination, evaluation and comparison of Bids, the Purchaser may, at its discretion, ask the bidder for a clarification of its Bid. All responses to requests for clarification shall be in writing and no change in the price or substance of the Bid shall be sought, offered or permitted.

22.00 PRELIMINARY EXAMINATION OF BIDS / RESPONSIVENESS

22.01 Purchaser will examine the Bids to determine whether they are complete, whether any computational errors have been made, whether required sureties have been furnished, whether the documents have been properly signed, and whether the Bids are generally in order.

22.02 Arithmetical errors will be rectified on the following basis. If there is a discrepancy between the unit price and the total price per item that is obtained by multiplying the unit price and quantity, the unit price shall prevail and the total price per item will be corrected. If there is a discrepancy between the Total Amount and the sum of the total price per item, the sum of the total price per item shall prevail and the Total Amount will be corrected.

22.03 Prior to the detailed evaluation, Purchaser will determine the substantial responsiveness of each Bid to the Bidding Documents including production capability and acceptable quality of the Goods offered. A substantially responsive Bid is one, which conforms to all the terms and conditions of the Bidding Documents without material deviation.

22.04 Bid determined as not substantially responsive will be rejected by the Purchaser and/or the Purchaser and may not subsequently be made responsive by the Bidder by correction of the non -conformity.

23.0 EVALUATION AND COMPARISON OF BIDS

23.01 The evaluation of Bids shall be done based on the delivered cost competitiveness basis.

23.02 The evaluation of the Bids shall be a stage-wise procedure. The following stages are identified for evaluation purposes: In the first stage, the Bids would be subjected to a responsiveness check. The Technical Proposals and the Conditional ties of the Bidders would be evaluated. Subsequently, the Financial Proposals along with supplementary Financial Proposals, if any, of Bidders with Techno-commercially Acceptable Bids shall be considered for final evaluation.

23.03 The Purchaser's evaluation of a Bid will take into account, in addition to the Bid price, the following factors, in the manner and to the extent indicated in this Clause:

(a) Supply Schedule
(b) Deviations from Bidding Documents

Bidders shall base their Bid price on the terms and conditions specified in the Bidding Documents. The cost of all quantifiable deviations and omissions from the specification, terms and conditions specified in Bidding Documents shall be evaluated. The Purchaser will make its own assessment of the cost of any deviation for the purpose of ensuring fair comparison of Bids.

23.04 Any adjustment in price, which results from the above procedure, shall be added for the purposes of comparative evaluation only to arrive at an "Evaluated Bid Price". Bid Prices quoted by Bidders shall remain unaltered.

F. AWARD OF CONTRACT

24.0 CONTACTING THE PURCHASER

24.01 From the time of Bid submission to the time of contract award, if any Bidder wishes to contact the Purchaser on any matter related to the Bid, it should do so in writing.

24.02 Any effort by a Bidder to influence the Purchaser and/or in the Purchaser‘s decisions in respect of Bid evaluation, Bid comparison or Contract Award, will result in the rejection of the Bidder‘s Bid.

25.0 THE PURCHASER ’S RIGHT TO ACCEPT ANY BID AND TO REJECT ANY OR ALL BIDS

The Purchaser reserves the right to accept or reject any Bid and to annul the Bidding process and reject all Bids at anytime prior toward of Contract, without thereby incurring any liability to the affected Bidder or Bidders or any obligation to inform the affected Bidder or Bidders of the grounds for the Purchaser‘s action.

26.0 AWARD OF CONTRACT

The Purchaser will award the Contract to the successful Bidder whose Bid has been Determined to be the lowest-evaluated responsive Bid, provided further that the Bidder has been determined to be qualified to satisfactorily perform the Contract. Purchaser reserves the right to award order other bidders in the tender, provided it is required for progress of project & provided he agrees to come to the lowest rate.

27.0 THE PURCHASER’S RIGHT TO VARY QUANTITIES

The Purchaser reserves the right to vary the quantity i.e. increase or decrease the numbers/quantities without any change in terms and conditions during the execution of the Order.

28.0 LETTER OF INTENT/ NOTIFICATION OF AWARD

The letter of intent/ Notification of Award shall be issued to the successful Bidder whose bids have been considered responsive, techno-commercially acceptable and evaluated to be the

lowest (L1). The successful Bidder shall be required to furnish a letter of acceptance within 7 days of issue of the letter of intent /Notification of Award by Purchaser.

29.0 PERFORMANCE BANK GUARANTEE

The successful Bidder shall furnish the Performance Bank Guarantee for an amount of 10% (Ten percent) of the Contract Price in accordance with the format provided. The Performance Bond shall be valid for a period of twenty four months (24) from the date of the commissioning or thirty months (30) from the date of receipt of material (last consignment) at site/stores whichever is earlier plus 3 months towards claim period. Upon submission of the performance security, the EMD shall be released.

30.00 CORRUPT OR FRADULENT PRACTICES

30.01 The Purchaser requires that the Bidders observe the highest standard of ethics during the procurement and execution of the Project. In pursuance of this policy, the Purchaser:

(a) Defines, for the purposes of this provision, the terms set forth below as follows:

i) "Corrupt practice" means behavior on the part of officials in the public or private sectors by which they improperly and unlawfully enrich themselves and/or those close to them ,or induce others to do so, by misusing the position in which they are placed, and it includes the offering, giving, receiving, or soliciting of anything of value to influence the action of any such official in the procurement process or in contract execution; and

ii) "Fraudulent practice" means a misrepresentation of facts in order to influence a procurement process or the execution of a contract to the detriment of the Purchaser, and includes collusive practice among Bidders (prior to or after Bid submission) designed to establish Bid prices at artificial non-competitive levels and to deprive the Purchaser of the benefits of free and open competition.

(b) Will reject a proposal forward if it determines that the Bidder recommended for award has engaged in corrupt or fraudulent practices in competing for the contract in question ;

(c) Will declare a firm ineligible, either indefinitely or for a stated period of time, to be awarded a contract if it at any time determines that the firm has engaged in corrupt or fraudulent practices in competing for, or in executing, a contract.

30.02 Furthermore, Bidders shall be aware of the provision stated in the General Conditions of Contract.

SECTION – III

GENERAL CONDITIONS OF CONTRACT (GCC)

PROCUREMENT OF CONVENTIONAL TYPE PACKAGE SUBSTATION (G+1) IN BRPL

CMC/BR/24-25/RB/PR/RJ/1221

GENERAL TERMS AND CONDITIONS

1.0 General Instructions

1.01 All the Bids shall be prepared and submitted in accordance with these instructions.

1.02 Bidder shall bear all costs associated with the preparation and delivery of its Bid, and the Purchaser will in no case shall be responsible or liable for these costs.

1.03 The Bid should be submitted by the Bidder in whose name the bid document has been issued and under no circumstances it shall be transferred/ sold to the other party.

1.04 The Purchaser reserves the right to request for any additional information and also reserves the right to reject the proposal of any Bidder, if in the opinion of the Purchaser, the data in support of RFQ requirement is incomplete.

1.05 The Bidder is expected to examine all instructions, forms, terms & conditions and specifications in the Bid Documents. Failure to furnish all information required in the Bid Documents or submission of a Bid not substantially responsive to the Bid Documents in every respect may result in rejection of the Bid. However, the Purchaser's decision in regard to the responsiveness and rejection of bids shall be final and binding without any obligation, financial or otherwise, on the Purchaser.

2.0 Definition of Terms

2.01 "Purchaser" shall mean BRPL Limited, on whose behalf this bid enquiry is issued by its authorized representative / officers.

2.02 "Bidder" shall mean the firm who quotes against this bid enquiry issued by the Purchaser. "Supplier" or "Supplier" shall mean the successful Bidder and/or Bidders whose bid has been accepted by the Purchaser and on whom the "Letter of Acceptance" is placed by the Purchaser and shall include his heirs, legal representatives, successors and permitted assigns wherever the context so admits.

2.03 "Supply" shall mean the Scope of Contract as described.

2.04 "Specification" shall mean collectively all the terms and stipulations contained in those portions of this bid document known as RFQ, Commercial Terms & Condition, Instructions to Bidders, Technical Specifications and the Amendments, Revisions, Deletions or Additions, as may be made by the Purchaser from time to time.

2.05 "Letter of Acceptance" shall mean the official notice issued by the Purchaser notifying the Supplier that his proposal has been accepted and it shall include amendments thereto, if any, issued by the Purchaser. The "Letter of Acceptance" issued by the Purchaser shall be binding on the "Supplier" The date of Letter of Acceptance shall be taken as the effective date of the commencement of contract.

2.06 "Month" shall mean the calendar month and "Day" shall mean the calendar day.

2.07 "Codes and Standards" shall mean all the applicable codes and standards as indicated in the Specification.

2.08 "Offer Sheet" shall mean Bidder's firm offer submitted to BRPL in accordance with the specification.

2.09 "Contract" shall mean the "Letter of Acceptance" issued by the Purchaser.

2.10 "Contract Price" shall mean the price referred to in the "Letter of Acceptance".

2.11 "Contract Period" shall mean the period during which the "Contract" shall be executed as agreed between the Supplier and the Purchaser in the Contract inclusive of extended contract period for reason beyond the control of the Supplier and/or Purchaser due to force majeure.

2.12 "Acceptance" shall mean and deemed to include one or more of the following as will be stipulated in the specification:

a) The written acceptance of material by the inspector at suppliers works to ship the materials.

b) Acceptance of material at Purchaser site stores after its receipt and due inspection/ testing and release of material acceptance voucher.

c) Where the scope of the contract includes supply, acceptance shall mean issue of necessary equipment / material takeover receipt after installation & commissioning and final acceptance.

3.0 Contract Documents & Priority

3.01 Contract Documents: The terms and conditions of the contract shall consist solely of these RFQ conditions and the offer sheet.

3.02 Priority: Should there be any discrepancy between any term hereof and any term of the Offer Sheet, the terms of these RFQ shall prevail.

4.0 Scope of Supply - General

4.01 The "Scope of Supply" shall be on the basis of Bidder's responsibility, completely covering the obligations, responsibility and supplies provided in this Bid enquiry whether implicit or explicit.

4.02 Bidder shall have to quote for the Bill of quantities as listed in Section – IV of this RFQ.

4.03 Quantity variation and additional requirement if any shall be communicated to successful bidder during project execution.

4.04 All relevant drawings, data and instruction manuals.

5.0 Quality Assurance and Inspection

5.01 Immediately on award of contract, the bidder shall prepare detailed quality assurance plan / test procedure identifying the various stages of manufacture, quality checks performed at each stage, raw material inspection and the Customer hold points. The document shall also furnish details of method of checking, inspection and acceptance standards / values and get the approval of Purchaser before proceeding with manufacturing. However, Purchaser shall have right to review the inspection reports, quality checks and results of suppliers in house inspection department which are not Customer hold points and the supplier shall comply with the remarks made by purchaser or his representative on such reviews with regards to further testing, rectification or rejection, etc.

5.02 Witness and Hold points are critical steps in manufacturing, inspection and testing where the supplier is obliged to notify the Purchaser in advance so that it may be witnessed by the Purchaser. Final inspection is a mandatory hold point. The supplier needs to proceed with the work past a hold point only after clearance by purchaser or a witness waiver letter from BRPL.

5.03 The performance of waiver of QA activity by Purchaser at any stage of manufacturing does not relieve the supplier of any obligation to perform in accordance with and meet all the requirements of the procurement documents and also all the codes & reference documents mentioned in the procurement document nor shall it preclude subsequent rejection by the purchaser.

5.04 On completion of manufacturing the items can be dispatched only after issue of shipping release by the Purchaser.

5.05 All testing and inspection shall be done without any extra cost.

5.06 Purchaser reserve the right to send any material out of the supply to any recognized laboratory for testing and the cost of testing shall be borne by the Purchaser. In case the material is found not in order with the technical requirement / specification, the charges along with any other penalty which may be levied is to be borne by the bidder. To avoid any complaint the supplier is advised to send his representative to the stores to see that the material sent for testing is being sealed in the presence of bidders representative.

5.07 Bidder has to sign quality agreement before supply of the material.

6.0 Packing, Packing List & Marking

6.01 Packing: Supplier shall pack or shall cause to be packed all Commodities in boxes and containers and otherwise in such a manner as shall be reasonably suitable for shipment by road or rail to BRPL without undue risk of damage in transit.

6.02 Packing List: The contents of each package shall be itemized on a detailed list showing the exact weight and the extreme outside dimensions (length, width and eight) of each container or box. One copy of the packing list shall be enclosed in each package delivered. There shall

also be enclosed in one package a master packing list identifying each individual package, which is part of the shipment. On any packaging where it is not feasible to place the packing list inside the container, all pertinent information shall be stenciled on the outside and will thus constitute a packing list.

7.01 Prices basis for supply of materials

Bidders require quoting their prices on Landed Cost Basis and separate price for each item.
For Supply to BRPL Delhi the price shall be inclusive of packing, forwarding, GST and freights. The above supply prices shall also include unloading at site stores. Transit and storage insurance will be arranged by BRPL; however bidder to furnish required details in advance for arranging the same by BRPL.

8.0 Variation in taxes, duties & levies:

8.01 The total order value shall be adjusted on account of any variations in Statutory Levies imposed by Competent Authorities by way of fresh notification(s) within the stipulated delivery period only. However, in case of reduction in taxes, duties and levies, the benefits of the same shall be passed on to BUYER.

8.02 No other Taxes, Duties & Levies other than those specified above will be payable by BUYER except in case of new Levies, Taxes & Duties imposed by the Competent Authorities by way of fresh notification(s) subsequent to the issue of PURCHASE ORDER but within the stipulated delivery period.

8.03 Notwithstanding what is stated above, changes in Taxes, Duties & Levies shall apply only to that portion of PURCHASE ORDER not executed on the date of notification by Competent Authority. Further, changes in Taxes, Duties & Levies after due date of Delivery shall not affect PURCHASE ORDER Terms and Value.

8.04 PURCHASE ORDER value shall not be subject to any variation on account of variation in Exchange rate(s).

9.0 Taxes & Duties on raw materials & bought out components:

9.01 Taxes & Duties on raw materials & bought out components are included in Order Value and are not subject to any escalation or variation for any reason whatsoever.

9.02 Taxes & Duties on raw materials & bought out components procured indigenously are included in Order Value and are not subject to any escalation or variation for any reason whatsoever.

10.0 Terms of payment and billing

10.01 For Supply of Equipments:

- 100% payment shall be made within 45 days from the date of receipt of material at store/ site against submission of 10 % performance bank guarantee. (Refer 10.01)

10.02 Bidder to submit the following documents against dispatch of each consignment:

i) Consignee copy of LR

ii) Supplier detailed invoice showing commodity description, quantity, unit price, total price and basis of delivery.

iii) Original certificate issued by BRPL confirming receipt of material at site and acceptance of the same.

iv) Dispatch clearance / inspection report in original issued by the inspection authority

v) Packing List.

vi) Test Reports

vii) Guarantee Certificate.

viii) Insurance policy to be obtained by supplier

11.0 Price Validity

11.01 All bids submitted shall remain valid, firm and subject to unconditional acceptance by BRPL Delhi for 120 days post bid-date. For awarded suppliers, the prices shall remain valid and firm till contract completion.

12.0 Performance Guarantee

12.01 The successful Bidder shall furnish the Performance Bank Guarantee for an amount of 10% (Ten percent) of the Contract Price in accordance with the format provided. The Performance Bond shall be valid for a period of twenty four months (24) from the date of the commissioning or thirty months (30) from the date of receipt of material (last consignment) at site/stores whichever is earlier plus 3 months towards claim period. Upon submission of the performance security, the EMD shall be released.
Upon submission of the performance security, the EMD shall be released. It shall be in accordance with one of the following terms:

a) Depositing pay order /demand draft of the relevant amount directly with BRPL at the address listed above or as otherwise specified by BRPL, either of which shall constitute the Performance Bond hereunder; or

b) Bank guarantee from any nationalized bank in favour of BSES RAJDHANI POWER LTD (BRPL). The performance Bank guarantee shall be in the format as specified by BRPL.

13.0 Forfeiture

13.01 Each Performance Bond established under Clause 10.0 shall contain a statement that it shall be automatically and unconditionally forfeited without recourse and payable against the presentation by BRPL of this Performance Bond to the ICICI Bank at Mumbai, or to the

relevant company/ correspondent bank referred to above, as the case may be, together with a simple statement that supplier has failed to comply with any term or condition set forth in the Contract.

13.02 Each Performance Bond established under will be automatically and unconditionally forfeited without recourse if BRPL in its sole discretion determines that supplier has failed to comply with any term or condition set forth in the contract.

14.0 Release

All Performance Bonds will be released without interest within seven (7) days from the last date up to which the Performance Bond has to be kept valid (as defined in Clause 10.0) except for the case set forth in Clause 21.0.

15.0 Defects Liability Period

15.01 The bidder to Guarantee the materials / items supplied against any defect of failure, which arise due to faulty materials, workmanship or design for the entire defects liability period. The Defect liability period shall be 60 months from the date of commissioning or 66 months from the date of delivery whichever is earlier. If during the defects liability period any materials / items are found to be defective, these shall be replaced or rectified by the bidder at his own cost within 30 days from the date of receipt of intimation

16.0 Return, Replacement or Substitution.

BRPL shall give Supplier notice of any defective Commodity promptly after becoming aware thereof. BRPL may in its discretion elect to return defective Commodities to Supplier for replacement, free of charge to BRPL, or may reject such Commodities and purchase the same or similar Commodities from any third party. In the latter case BRPL shall furnish proof to Supplier of the cost of such substitute purchase. In either case, all costs of any replacement, substitution, shipping, labour and other related expenses incurred in connection with the return and replacement or for the substitute purchase of a Commodity hereunder should be for the account of Supplier. BRPL may set off such costs against any amounts payable by BRPL to Supplier. Supplier shall reimburse BRPL for the amount, if any, by which the price of a substitute Commodity exceeds the price for such Commodity as quoted in the Bid.

17.0 Effective Date of Commencement of Contract:

17.01 The date of the issue of the Letter of Acceptance shall be treated as the effective date of the commencement of Contract.

18.0 Time – The Essence of Contract

18.01 The time and the date of completion of the "Supply"" as stipulated in the Letter Of Acceptance / Purchase order issued to the Supplier shall be deemed to be the essence of the "Contract". The Supply has to be completed not later than the aforesaid Schedule and date of completion of supply.

19.0 The Laws and Jurisdiction of Contract:

19.01 The laws applicable to this Contract shall be the Laws in force in India.

19.02 All disputes arising in connection with the present Contract shall be settled amicably by mutual consultation failing which shall be finally settled as per the rules of Arbitration and Conciliation Act, 1996 at the discretion of Purchaser. The venue of arbitration shall be at Mumbai in India

20.0 Events of Default

20.01 Events of Default. Each of the following events or occurrences shall constitute an event of default ("Event of Default") under the Contract:

a) Supplier fails or refuses to pay any amounts due under the Contract;

b) Supplier fails or refuses to deliver Commodities conforming to this RFQ/ specifications, or fails to deliver Commodities within the period specified in P.O. or any extension thereof

c) Supplier becomes insolvent or unable to pay its debts when due, or commits any act of bankruptcy, such as filing any petition in any bankruptcy, winding-up or reorganization proceeding, or acknowledges in writing its insolvency or inability to pay its debts; or the Supplier's creditors file any petition relating to bankruptcy of Supplier;

d) Supplier otherwise fails or refuses to perform or observe any term or condition of the Contract and such failure is not remediable or, if remediable, continues for a period of 30 days after receipt by the Supplier of notice of such failure from BRPL.

21.0 Consequences of Default.

a) If an Event of Default shall occur and be continuing, BRPL may forthwith terminate the Contract by written notice.

b) In the event of an Event of Default, BRPL may, without prejudice to any other right granted to it by law, or the Contract, take any or all of the following actions;

i) present for payment to the relevant bank the Performance Bond;

ii) purchase the same or similar Commodities from any third party; and/or

iii) recover any losses and/or additional expenses BRPL may incur as a result of Supplier's default.

22.0 Penalty for Delay

22.01 If supply of items / equipments is delayed beyond the supply schedule as stipulated in purchase order then the Supplier shall be liable to pay to the Purchaser as penalty for delay, a sum of 1% (one percent) of the contract price for every week delay or part thereof for undelivered quantities.

22.02 The total amount of penalty for delay under the contract will be subject to a maximum of ten percent (10%) of the contract price for undelivered quantities.

22.03 The Purchaser may, without prejudice to any method of recovery, deduct the amount for such damages from any amount due or which may become due to the Supplier or from the Performance Bond or file a claim against the supplier.

23.0 Force Majeure

23.01 General

An "Event of Force Majeure" shall mean any event or circumstance not within the reasonable control directly or indirectly, of the Party affected, but only if and to the extent that:

i) Such event or circumstance materially and adversely affects the ability of the affected Party to perform its obligations under this Contract, and the affected Party has taken all reasonable precautions, due care and reasonable alternative measures in order to prevent or avoid the effect of such event on the affected party's ability to perform its obligations under this Contract and to mitigate the consequences thereof.

ii) For the avoidance of doubt, if such event or circumstance would not have materially and adversely affected the performance of the affected party had such affected party followed good industry practice, such event or circumstance shall not constitute force majeure.

iii) Such vent is not the direct or indirect result of the failure of such Party to perform any of its obligations under this Contract.

iv) Such Party has given the other Party prompt notice describing such events, the effect thereof and the actions being taken in order to comply with above clause.

23.02 Specific Events of Force Majeure subject to the provisions of above clause, Events of Force Majeure shall include only the following to the extent that they or their consequences satisfy the above requirements:

23.03 Mitigation of Events of Force Majeure Each Party shall:

i) Make all reasonable efforts to prevent and reduce to a minimum and mitigate the effect of any delay occasioned by an Event of Force Majeure including recourse to alternate methods of satisfying its obligations under the Contract;

ii) Use its best efforts to ensure resumption of normal performance after the termination of any Event of Force Majeure and shall perform its obligations to the maximum extent practicable as agreed between the Parties; and

iii) Keep the other Party informed at regular intervals of the circumstances concerning the event of Force Majeure, with best estimates as to its likely continuation and what measures or contingency planning it is taking to mitigate and or terminate the Event of Force Majeure.

23.04 Burden of Proof In the event that the Parties are unable in good faith to agree that a Force Majeure event has occurred to an affected party, the parties shall resolve their dispute in

accordance with the provisions of this Agreement. The burden of proof as to whether or not a force majeure event has occurred shall be upon the party claiming that the force majeure event has occurred and that it is the affected party.

23.05 Termination for Certain Events of Force Majeure. If any obligation of any Party under the Contract is or is reasonably expected to be delayed or prevented by a Force Majeure event for a continuous period of more than 3 months, the Parties shall promptly discuss in good faith how to proceed with a view to reaching a solution on mutually agreed basis. If a solution on mutually agreed basis cannot be arrived at within a period of 30 days after the expiry of the period of three months, the Contract shall be terminated after the said period of 30 days and neither Party shall be liable to the other for any consequences arising on account of such termination.

23.06 Limitation of Force Majeure event. The Supplier shall not be relieved of any obligation under the Contract solely because cost of performance is increased, whether as a consequence of adverse economic consequences or otherwise.

23.07 Extension of Contract Period due to Force Majeure event The Contract period may be extended by mutual agreement of Parties by way of an adjustment on account of any period during which an obligation of either Party is suspended due to a Force Majeure event.

23.08 Effect of Events of Force Majeure. Except as otherwise provided herein or may further be agreed between the Parties, either Party shall be excused from performance and neither Party shall be construed to be in default in respect of any obligations hereunder, for so long as failure to perform such obligations shall be due to and event of Force Majeure."

24.0 Transfer And Sub-Letting

24.01 The Supplier shall not sublet, transfer, assign or otherwise part with the Contract or any part thereof, either directly or indirectly, without prior written permission of the Purchaser.

25.0 Recoveries

25.01 Whenever under this contract any money is recoverable from and payable by the bidder, the purchaser shall be entitled to recover such sum by appropriating in part or in whole by detecting any sum due to which any time thereafter may become due from the supplier in this or any other contract. Should the sum be not sufficient to cover the full amount recoverable the bidder shall pay to the purchaser on demand the remaining balance.

26.0 Waiver

26.01 Failure to enforce any condition herein contained shall not operate as a waiver of the condition itself or any subsequent breach thereof.

27.0 Indemnification

27.01 Notwithstanding contrary to anything contained in this RFQ, Supplier shall at his costs and risks make good any loss or damage to the property of the Purchaser and/or the other Supplier engaged by the Purchaser and/or the employees of the Purchaser and/or employees of the

other Supplier engaged by the Purchaser whatsoever arising out of the negligence of the Supplier while performing the obligations under this contract.

SECTION – IV: QUANTITY AND DELIVERY REQUIREMENT

Sl. No.	Item Description	Specification	Requirement	Delivery Schedule	Location
BRPL,DELHI					
1	Procurement of Conventional Type Package Substation (G+1)	SECTION V	03 Nos	In lots as per PO /BRPL requirement.	Stores BRPL Delhi
TOTAL					

Annexure –I

BID FORM

Supply of Conventional Type Package Substation

To
Head of the Department Contracts & Materials BSES Rajdhani Power Ltd BSES Bhawan, Nehru Place New Delhi– 110019
Sir,

We understand that BRPL is desirous of procuring "Conventional Type Package Substation (G+1)" in its licensed distribution network area in Delhi. Having examined the Bidding Documents for the above named works, we the undersigned, offer to deliver the goods in full conformity with the Drawings, Conditions of Contract and specifications for the sum of AS PER PRICE BID ENCLOSED or such other sums as may be determined in accordance with the terms and conditions of the contract .The above amounts are in accordance with the Price Schedules attached herewith and are made part of this bid.

If our Bid is accepted, we undertake to deliver the entire goods as per delivery schedule given by you from the date of award of purchase order/letter of intent.

If our Bid is accepted, we will furnish a performance bank guarantee for an amount of 10% (Ten) percent of the total contract value for due performance of the Contract in accordance with the General Conditions of Contract.

We agree to abide by this Bid for a period of 120 days from the date fixed for bid opening under clause 9.0 of GCC, and it shall remain binding upon us and may be accepted at any time before the expiration of that period.

We declare that we have studied the provision of Indian Income Tax Law and other Indian Laws for supply of equipments/materials and the prices have been quoted accordingly.

Unless and until Letter of Intent is issued, this Bid, together with your written acceptance thereof, shall constitute a binding contract between us.

We understand that you are not bound to accept the lowest, or any bid you may receive.

There is provision for Resolution of Disputes under this Contract, in accordance with the Laws and Jurisdiction of Contract, Clause 19 of GCC .

Dated this.....day of.....20.....
Signature..... In the capacity of……
.....duly authorized to sign for and on behalf of (IN BLOCK CAPITALS)……

Annexure -II

FORMAT FOR EMD BANK GUARANTEE

(To be issued in a Non Judicial Stamp Paper of Rs.50/-purchased in the name of the bank)

Whereas [name of the Bidder] (hereinafter called the "Bidder") has submitted its bid dated [date of submission of bid] for the supply of [name and/or description of the goods] (hereafter called ''the Bid"). KNOW ALL PEOPLE by these presents that WE [name of bank]at[Branch Name and address],having our registered office at[address of the registered office of the bank](herein after called —"the Bank"),are bound unto BSES Rajdhani Power Ltd., with its Corporate Office at BSES Bhawan Nehru Place, New Delhi -110019, (herein after called —the "Purchaser") in the sum of_____ for which payment well and truly to be made to the said Purchaser, the Bank binds itself, its successors, and assigns by these presents. Sealed with the Common Seal of the said Bank this____ day of__ 20__.

THE CONDITIONS of this obligation are:

If the Bidder withdraws its Bid during the period of bid validity specified by the Bidder on the Bid Form; or

If the Bidder, having been notified of the acceptance of its Bid by the Purchaser during the period of bid validity:

fails or refuses to execute the Contract Form ,if required; or
fails or refuses to furnish the performance security, In accordance with the Instructions to Bidders/GENERAL CONDITIONS.;

We undertake to pay to the Purchaser up to the above amount upon receipt of its first written demand, without the Purchaser having to substantiate its demand, provided that is its demand the purchaser will note that amount claimed by it is due to it, owing to the occurrence of one or both of the two conditions, specifying the occurred condition or conditions.

This guarantee will remain in force up to and including thirty (30) days after the period of bid validity, and any demand in respect thereof should reach the Bank not later than the above date.

(Signature of the bank)

Signature of the witness

Annexure-III

PRICE FORMAT

ENQUIRY NO & DATE: NIT: CMC/BR/24-25/RB/PR/RJ/1221

PRICE SCHEDULE

ITEM DESCRIPTION	QTY AS PER RFQ	UOM	EX-WORKS RATE/ UNIT	CGST (%)	CGST AMOUNT	SGST (%)	SGST AMOUNT	IGST (%)	IGST AMOUNT	FREIGHT	LANDED RATE/ UNIT	TOTAL LANDED COST (INR)
Conventional Type Package Substation (G+1)	03	Nos										

Note: 1.Prices shall be Firm
2.The prices received without break up of ex works, Freight, GST are liable for rejection
3. Pls. Indicate the exact percentage of taxes in figures and words.
4. If there is a discrepancy between the unit price and the total price THE UNIT PRICE shall prevail.
5. Bidders are requested to attach the covering letter head alongwith the price bid indicating reference no and date.

Bidders seal & signature

Annexure – IV

Enquiry No. : CMC/BR/24-25/RB/PR/RJ/1221

COMMERCIAL TERMS AND CONDITIONS

S/NO	ITEM DESCIPTION	AS PER BRPL	CONFIRMATION OF BIDDER
1	Validity of prices	120 days from date of offer	
2	Price basis	Price Variation, FOR Delhi store basis, Prices shall be inclusive of all taxes & duties, freight upto Delhi stores. Unloading at stores be in vendor's scope Transit insurance in BRPL scope	
3	Payment Terms	100% payment within 45 days after receipt of material at stores	
4	Delivery schedule	As per our requirement	
5	Defect Liability Period	The bidder to Guarantee the materials / items supplied against any defect of failure, which arise due to faulty materials, workmanship or design for the entire defects liability period. The Defect liability period shall be 60 months from the date of commissioning or 66 months from the date of delivery whichever is earlier. If during the defects liability period any materials / items are found to be defective, these shall be replaced or rectified by the bidder at his own cost within 30 days from the date of receipt of intimation.	
6	Penalty for delay	1% per week of delay of undelivered units or part thereof subject to maximum of 10% of total PO value of undelivered units	
7	Performance Bank Guarantee	10% of total PO value for 24 months after commissioning or 30 months from date of supply, whichever is earlier plus 3 months towards claim period	

ANNEXURE - V

ENQUIRY NO: CMC/BR/24-25/RB/PR/RJ/1221

NO DEVIATION SHEET

SL NO	SL NO OF TECHNICAL SPECIFICATION	DEVIATION, IF ANY

SIGNATURE & SEAL OF BIDDER

NAME OF BIDDER

BSES
RAJDHANI POWER LIMITED

CHECK LIST

Sl No	Item Description	YES/NO
1	INDEX	YES/NO
2	COVERING LETTER	YES/NO
3	BID FORM (UNPRICED) DULY SIGNED	YES/NO
4	BILL OF MATERIAL (UNPRICED)	YES/NO
5	TECHNICAL BID	YES/NO
6	ACCEPTANCE TO COMMERCILAL TERMS & CONDITIONS	YES/NO
7	FINANCIAL BIDS (IN SEALED ENVELOPE)	YES/NO
8	EMD IN PRESCRIBED FORMAT	YES/NO
9	DEMANT DRAFT OF RS 1180/- DRAWN IN FAVOUR OF	BSES RAJDHANI POWER LTD
10	POWER OF ATTORNEY/ AUTHORISATION LETTER FOR SIGNING THE BID	YES/NO

Annexure III

FORM FOR PARTICIPATION IN REVERSE AUCTION EVENT

(To be signed & stamped by the bidder along-with bid)

BSES Rajdhani Power Ltd (BRPL) intends to use reverse auction through SAP-SRM tool as an integral part of entire tendering process. All bidders who are techno-commercially qualified on the basis of tender requirements shall participate in the reverse auction.

The following terms and conditions are deemed as accepted by the bidder on participation in the bid:-

1. In case of bidding through Internet medium, bidders are advised to ensure availability of all associated infrastructure as required to participate in the reverse auction event. Inability to bid due to telephone glitch, internet response issues, software & hardware hangs/failures, power failures or any other reason shall not be the responsibility of BRPL.

2. In case bidder fails to participate in the reverse auction event due to any reason whatsoever, it shall be presumed that the bidder has no further discounts to offer and the initial bid submitted by them as a part of tender shall be considered as bidder's Final .No Regret offer.Any off-line price bids received from a bidder in lieu of non-participation in the reverse auction event shall be rejected by BRPL.

3. The bidder is advised to understand the auto bid process t safeguard themselves against any possibility of non-participation in the reverse auction event.

4. The bidder shall be prepared with competitive price quotes during the day of reverse auction event.

5. The prices quoted by bidder in reverse auction event shall be on FOR Landed cost BRPL Store/site basis inclusive of all relevant taxes, duties, levies, transportation charges etc.

6. The prices submitted by the bidder during reverse auction event shall be binding on the bidder.

7. The bidder agrees to non-disclosure of trade information regarding bid details e.g.purchase, identity, bid process/technology, bid documentation etc.

8. BRPL will make every effort to make the bid process transparent. However award decision of BRPL will be final and binding on the bidder.

9. The prices submitted during reverse auction event shall be binding on the bidder.

10. No request for Time extension of the reverse auction event shall be considered by BRPL.

Seal & Signature of Bidder

SECTION – V

TECHNICAL SPECIFICATIONS (TS)

CONVENTIONAL TYPE PACKAGE SUBSTATION IN BRPL

CMC/BR/24-25/RB/PR/RJ/1221

The detailed technical specifications of Conventional Type Package Substation

BSES

TECHNICAL SPECIFICATION FOR

G+1 TYPE SUB-STATION

WITH

2 Nos. x 1000 KVA DRY TYPE DT, RMU & LT PANEL

Specification No.- BSES-RPL-SP-001

Prepared By		Reviewed By		Approved By		Rev	Date
Name	Sign	Name	Sign	Name	Sign		
Sunil Yadav Rohit Patil		Amit Tomar		Gopal Nariya		R1	08.08.2024

INDEX

1. SCOPE OF Work

This specification covers the Design, Engineering, Manufacture, and Assembly & testing at manufacturers, Supply and Installation of G+1(Ground & First Floor) type Packaged Substation (PSS) with all hardware and accessories at BRPL site location.

2. SERVICE CONDITION

The material to be supplied against this specification shall be suitable for satisfactory operation under following climatic condition

2.1	Location	At various location in the Delhi
2.2	HT supply System	3 phase AC, 3 wire
2.3	Voltage	11000 volt ±10%
2.4	Frequency	50 Hz ± 5%
2.5	Fault level	350MVA – 18.5kA
2.6	System neutral	Earthed at upstream 11kV source
2.7	LT supply system	3 phase AC, 4 wire
2.8	Rated voltage	415V +/-10%
2.9	Rated frequency	50 Hz ± 5%
2.10	Fault level	35MVA – 50kA
2.11	HT supply System	3 phase AC, 3 wire
2.12	Voltage	11000 volt ±10%
2.13	Frequency	50 Hz ± 5%

3. BOQ

Sr. No	Description	Qty (Nos.)
3.1	1000 kVA, 11 kV/415V , Cast resin type Dry DT , 3Phase, 50 HZ, DYN11, AN Cooled, Class F, with Temperature Rise of 90 Deg Cover Ambient. Tap Range +5% to -5% in steps 2.5 % with WTI Scanner No load loss 1780W Load loss: 7500W , Z (%) +- 5%	2
3.2	RMU 4 Way (2LBS + 2VCB) **[R1]**	1
3.3	LT Panel	2
a.	1600 Amp LT ACB Microprocessor MCCB	1
b.	630 Amp, 4P, 36 kA, MF, MCCB with MP Base release with spreder , Rotary handle **[R1]**	5

3.4	Approx. Dimension maximum (in mm)	4300(L) X 3200(W) X 5200(H)
3.5	Enclosure (to be provided for ground floor,1st floor & top) to carry all the Equipment	
a.	Material	CRCA
b.	Sheet thickness	2mm

4. TECHNICAL SPECIFCATION

Individual component specification attached in separate

Sr. No.	Component	BRPL Tech. Specification no
4.1	DT (Dry)	BSES-TS-13-CRDT-R0
4.2	RMU 3 Way (2LBS + 1VCB)	SP-ERMUX-15-R9
4.3	LT ACB	BSES-TS-19-LTACB-R0
4.4	LT MCCB	BRPL/PM CELL/PSS/MCCB/001

5. NAME PLATES & MARKINGS

5.1	Panel nameplate	Nameplate shall be made of anodized Aluminium riveted on a side of the enclosure panel. It shall have a nameplate clearly indicating the following: a) Customer Name - BSES Rajdhani Power Ltd. b) PO No. & date c) Material code d) Type of Panel e) Current rating f) Guarantee period
5.2	Danger plate	Danger plate shall be anodized Aluminium plate riveted to the enclosure or danger mar king can be screen printed on the front cover.

6. APPROVED MAKE

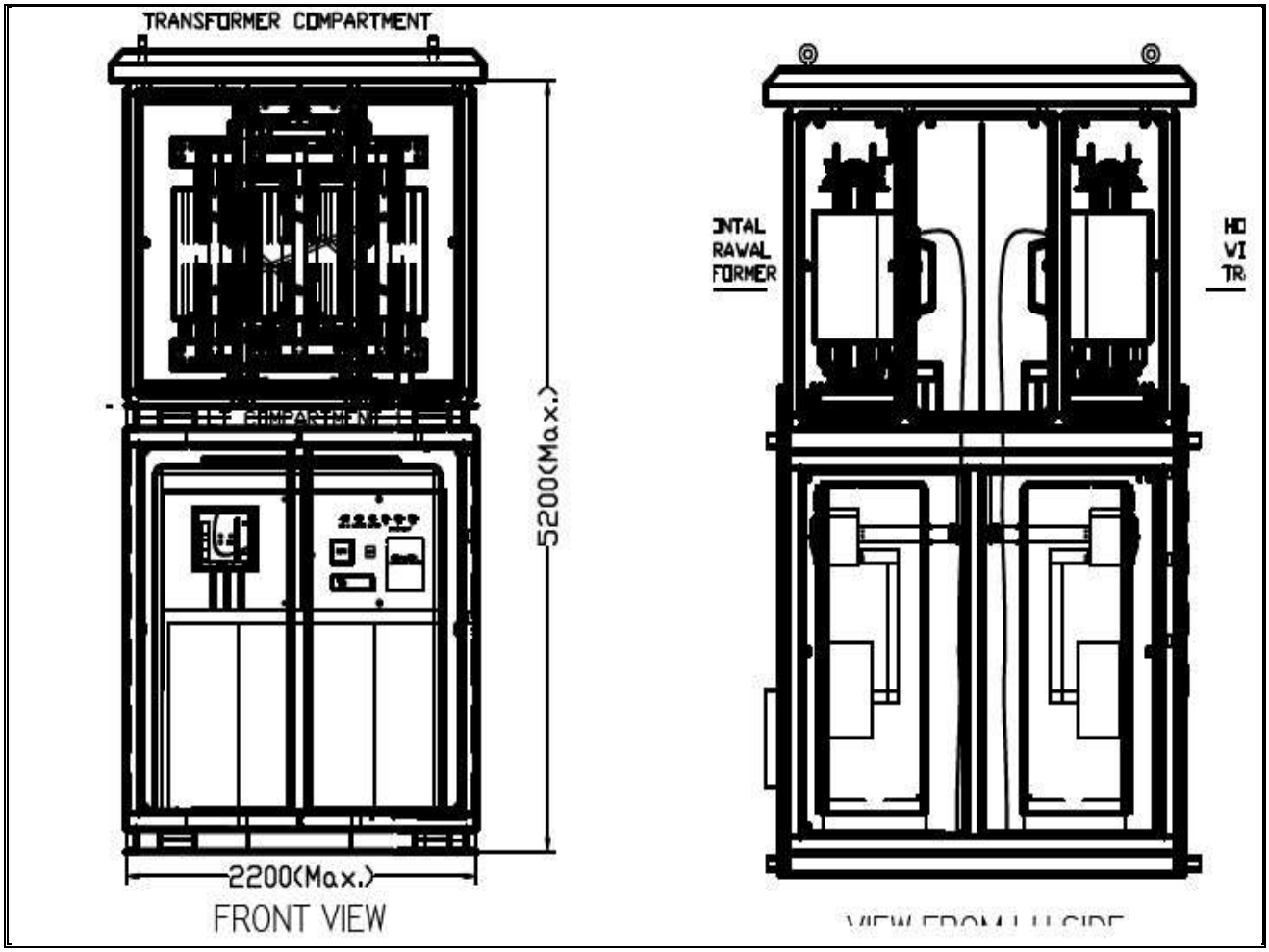
Approved make of individual major components (i.e. DT, RMU, ACB & MCCB) shall be as per BRPL technical specification

7. INSPECTION AND TESTING

- Testing of major component shall be carried out as per individual technical specification
- Submission of successful Test report of Load bearing capacity of the structure with equipments

8. Annexure A

- Reference drawing attached


TRANSFORMER COMPARTMENT
5200(Max.)
2200(Max.)
FRONT VIEW
INTAL
RAWAL
FORMER

BSES

Technical Specification of Dry Type Distribution Transformer Specification no – BSES-TS-13-CRDT-R0

Rev:		0
Date:		04 Apr 2022
Prepared by	Abhishek Harsh	
	Vani Sood	04/04/22
Reviewed by	Srinivas Gopu	
	Amit Tomar	04/04/22
Approved by	Gaurav Sharma	
	K. Sheshadri	04/04/22

Contents

Record of Revision

Sl No.	Revision No	Item/ Clause no:	Nature of Change	Approved by
1				
2				
3				
4				
5				
6				
7				
8				

1.0 Scope of supply

For scope of supply, refer annexure – A

2.0 Codes & standards

The Dry Type distribution transformers shall be designed, manufactured & tested in accordance with the following IEC & Indian standards

IS 2026- part 11/IEC 60076-11	Dry type Transformer
IS 11171	Dry Type Power Transformer
IS 2026	Power Transformers
IS 1271/IEC60085	Thermal Evaluation & Classification Of Electrical Insulation
IS/ IEC 60137	Bushing for Alternating voltage above 1000V
IS 10028	Code Of Practice For Installation And Maintenance of Transformers
IS 5	Ready Mixed Paint, Air Drying, Red-Oxide Zinc Chrome, Priming
IS 2932	Enamel, Synthetic, Exterior : A)Undercoating B) Finishing
IS 3347	Dimensions For Porcelain Transformer Bushings (For Use In Very Heavily Polluted Atmosphere)
IS 2026 part 12/IEC 60076-12	Loading Guide for dry type Power Transformers
IEC 60076	Power Transformers
IEC 60616	Terminal and Tapping Markings for Power Transformers
IEC 60726	Dry-Type Power Transformers.
IS/IECIEC 60529	Degrees of Protection Provided by Enclosures (IP Code).
Publication no. 317	CBIP Manual – Manual on transformers
	ECBC guideline-Energy conservation building guidelines

In the event of direct conflict between various order documents, the precedence of authority of documents shall be as follows:

i. Guaranteed Technical Particulars (GTP)

ii. This Specification

iii Referenced Standards

iv Approved Vendor drawings

v. Other documents

3.0 Major Design Criteria & Parameters of the Transformer

3.1	Location of equipment	Generally Outdoor but may be located indoor also with poor ventilation
3.2	Reference design ambient temperature	50 deg C
3.3	Type	Dry, core type, step down
3.4	Type of cooling	AN
3.5	Reference Standard	IS: 2026 part -11, 11171
3.6	No. of phases	3

3.7	No. of windings per phase	2
3.8	Rated frequency (Hz)	50 Hz
3.9	Highest system voltage HV side	12 KV
3.10	Highest system voltage LV side	460 V
3.11	Lightning Impulse withstand voltage	
3.11.1	For nominal system voltage of 11 kV	75 kV peak
3.12	Power Frequency Withstand Voltage	
3.12.1	For nominal system voltage of 11 kV	28 kV rms
3.12.2	For nominal system voltage of 415 V	3 kV rms
3.13	Major Design criteria	
3.13.1	Voltage variation on supply side	+ / - 10 %
3.13.2	Frequency variation on supply side	+/ - 5 %
3.13.3	Transient condition	- 20 % or + 10 % combined variation of voltage and frequency
3.13.4	Service Condition	The transformer enclosure is to be designed for outdoor location with service condition as specified, but its full rating shall be available if located indoor in poorly ventilated atmosphere
3.13.5	Insulation level	
3.13.6	Short Circuit withstand level	As per rating & impedance of transformer.
3.13.7	Overload capability	As per IS 2026-12/IEC 60076 Part 12
3.13.8	Noise level	Shall not exceed limits as per NEMA TR-1 with all accessories running measured as per IEC 551 / NEMA standard
3.13.9	Radio Influence Voltage	Maximum 250 microvolt
3.13.10	Harmonic currents	Transformer to be designed for suppression of 3^{rd}, 5^{th}, 7^{th} harmonic voltages and high frequency disturbances.
3.13.11	Partial Discharges	10 Pico C (max)
3.13.12	Parallel operation	Shall be designed to operate in parallel with existing transformer. Details of existing transformers shall be forwarded to the bidder on request.
3.14	Major Parameters	
3.14.1	Rating in KVA	250/400/630/750/1000/1600/2000/2500
3.14.2	Voltage Ratio	11000/415 Volts
3.14.3	Vector Group	Dyn11
3.14.4	Percentage Impedance at **130 deg C**	
3.14.4.1	250 KVA	5 % with IS tolerance

3.14.4.2	400 KVA	5 % with IS tolerance
3.14.4.3	630 KVA	5 % with IS tolerance
3.14.4.4	750 KVA	5 % with IS tolerance
3.14.4.5	1000 KVA	5 % with IS tolerance
3.14.4.6	1600 KVA	6 % with IS tolerance
3.14.4.7	2000 KVA	6 % with IS tolerance
3.14.4.8	2500 KVA	6 % with IS tolerance
3.14.5	No Load Losses, KW	
3.14.5.1	250 KVA	0.7 KW
3.14.5.2	400 KVA	0.9 KW
3.14.5.3	630 KVA	1.2 KW
3.14.5.4	750 KVA	1.4 KW
3.14.5.5	1000 KVA	1.78 KW
3.14.5.6	1600 KVA	3.2 KW
3.14.5.7	2000 KVA	3.56 KW
3.14.5.8	2500 KVA	4.05 KW
3.14.6	Max. full load losses at **130 deg. C**, kW	
3.14.6.1	250 KVA	2.2 KW
3.14.6.2	400 KVA	3.4 KW
3.14.6.3	630 KVA	5.4 KW
3.14.6.4	750 KVA	6.0 KW
3.14.6.5	1000 KVA	7.5 KW
3.14.6.6	1600 KVA	12 KW
3.14.6.7	2000 KVA	15.25 KW
3.14.6.8	2500 KVA	17.0 KW
3.14.7	Winding Temperature Rise above ambient deg C	**90 deg C**
3.14.8	Flux Density	1.73 T max at 110% rated voltage
3.14.9	Tapping on HV winding	Off Circuit taps on HV winding , + / - 10% in steps of 2.5% , change of taps by link
3.14.10	Design Clearance phase to phase (between bare conductor of bushings)	
3.14.10.1	For nominal system voltage of 11KV	180 mm min.
3.14.10.2	For nominal system voltage of 415 V	25 mm min.
3.14.11	Design clearance phase to earth	
3.14.11.1	For nominal system voltage of 11KV	120 mm min.
3.14.11.2	For nominal system voltage of 415 V	25 mm min.
3.14.12	System Fault Level , HV side	350 MVA
3.14.13	System Fault Level , LV side	35 MVA
3.15	System Earthing	
3.15.1	HV	Not Required

3.15.2	LV	Solidly earthed
3.16	Fire Protection Class	Class F1 shall be required
3.17	Climate Class	C2 shall be required
3.18	Environment Class	E2 shall be required
3.19	IP class requirement	IP 34
3.20	Warranty Period	66 months from date of supply & 60 months from date of commissioning whichever is earlier.

4.0 Construction & Design

4.1	Enclosure (Housing)	
4.1.1	Material	CRCA sheet steel
4.1.2	Sheet thickness	
4.1.2.1	Side, doors, covers	2 mm minimum
4.1.2.2	Top & Bottom sheet	3 mm minimum
4.1.2.3	Frames	3 mm minimum
4.1.3	Perforation on bottom sheet	As per manufacturers standard
4.1.4	Finish of perforated bottom sheet if Provided	Hot dipped Galvanized
4.1.5	Fixing of perforated bottom sheet if Provided	By nut bolt arrangement with the frame
4.1.6	Canopy at top	Required minimum 3 mm thick with slope to prevent water retention. Slope of canopy shall be kept away from cable termination side.
4.6.1	Essential provision for canopy	Canopy shall be fixed on load bearing member and shall be removable from inside of the enclosure only. Canopy shall be provided with lifting lugs.
4.1.7	Degree of protection	IP 34, Wire mesh (6 x 6 mm) shall have powder coated water blocking plates behind the wire mesh fixed on structure, plates behind wire mesh on top side of the enclosure shall have pipe routed suitably up to bottom of enclosure to drain the water accumulated in the plate, necessary slope to facilitate draining to be provided in both top and bottom water blocking plate
4.1.8	Design of door	
4.1.8.1	Minimum no of doors on HV/ LV side	Minimum 3 on each of HV / LV side
4.1.8.2	Hinges for doors of a) HV & LV side, b) for CT box c) for Winding temperature scanner box	i) Antitheft design (to make the door Non-removable type) ii) Minimum three hinges per door from top to bottom, Door suitable to be opened from outside iii) Door shall be earthed by flexible PVC insulated multi stranded copper wire of minimum 2.5 sqmm size.
4.1.8.3	Padlock Facility	Required at each HV /LV side door, CT box and WTI scanner box
4.1.8.4	Fixing of doors with the	By M6 size stainless steel Allen key screws.

	frame (applicable for CT box and Winding temperature scanner box too)	
4.1.8.5	Accessories	Welded Door handle , Danger plate on HV and LV side doors, caution plate for tap links for HT doors, Door limit switch on both HV and LV side doors to be wired up to WTI box terminal for tripping the transformer in case door is opened with the transformer energized, Phase marking plates on HV and LV doors
4.1.9	Design of covers on side other than HV /LV side	
4.1.9.1	Minimum no of covers on each side	Minimum 3 mm on each side
4.1.9.2	Hinges	None
4.1.9.3	Fixing of covers with the frame	With M6 size stainless steel Allen key screws and locking pin from inside so that the covers can be removed from inside only accessing the allen screw after opening door on HV or LV side only.
4.1.9.4	Accessories	Welded cover handle to be provided for handling while removing the cover minimum two nos per cover Covers shall be earthed by flexible PVC insulated multistranded copper wire of minimum 2.5 sqmm size.
4.2	Core	
4.2.1	Material	High grade , non ageing, low loss, high permeability, grain oriented, cold rolled silicon steel lamination. Core shall be low loss of 1Watt/kG (max)
4.2.2	Grade	Premium grade minimum M3 or better
4.2.3	Lamination Thickness with insulation	0.23 mm (max.)
4.2.4	Construction	The core shall be stack / wound-type annealed steel lamination having low loss and good grain properties, coated with high temperature insulation, bolted together and to the frames firmly to prevent vibration or noise. The core shall be properly stress relieved by annealing under inert atmosphere. The complete design of core must ensure permanency of the core losses with continuous working of the transformers. Vibration dampening pads provided to isolate the core and coil assembly from the base structure. The magnetic flux density is kept below the saturation point giving the better stability of the transformer in the long run.
4.2.5	Maximum Flux Density at 10 % over excitation / over fluxing	1.73 Tesla minimum allowed
4.2.6	Core Design Features	i) All steel sections used for supporting the core

		shall be thoroughly sand blasted after cutting , drilling, welding ii) Provision of lifting lugs for core coil assembly
4.3	Winding	
4.3.1	Material	Electrolytic Aluminium
4.3.1.1	Type	For HV shall be layer type & LV shall be with foil type.
4.3.2	Maximum current density allowed	1.5 Amp per sqmm (Max.)
4.3.3	Winding insulating material	Conductor insulation shall be class H where overall insulation class must be Class F (min), free from compounds liable to ooze out, shrink or collapse. Uniform insulation shall be applied to the windings and overall winding shall be cast resin.
4.3.4	Tappings	Off Circuit taps on HV winding , + / - 10 % in steps of 2.5 % , change of taps by link
4.3.4.1	Essential provisions for tap link	Shall be shrouded with cover made from insulating material. To prevent deposit of dust. Tap link inspection transparent window shall not be provided on the HV side door
4.3.5	Design Features	i) Stacks of winding to receive adequate shrinkage treatment ii) Connections braced to withstand shock during transport, switching, short circuit, or other transients. iii) Minimum out of balance force in the transformer winding at all voltage ratios. iv) Conductor width on edge exceeding six times its thickness v) The termination bus-bar coming out from winding shall be aluminium vi) Transposed at sufficient intervals. vii) Threaded connection with locking facility. viii) Winding leads rigidly supported , using guide tubes if practicable ix) Provision of taps as indicated in the technical particulars
4.3.6	Essential provision of HV and LV winding leads	Phase marking required near termination on both HV and LV side. Phase colour coding required on insulating sleeves on both HV and LV side. Phase sequence 1U, 1V, 1W from left to right looking inside from the HV side door. Phase sequence 2n, 2u, 2v, 2w from right to left looking inside from LV side door. Adequate HV termination clearance. Provision of check nut in all HV and LV winding lead connection.
4.4	Vibration Isolator	Vibration isolation pads shall be installed between core and coil assembly and enclosure base assembly to prevent the transmission of structure borne vibrations.
4.5	Bushing/Support Insulator/ Terminations	

4.5.1	Type of HV and LV Bushings, support insulators	Epoxy Resin Cast
4.5.2	Minimum creepage of bushing & support insulators	31mm/KV
4.5.3	Arcing Horns	Not Required
4.5.4	Termination on HV side	By cable within main enclosure
4.5.4.1	HV side cable size	11KV(E) grade, A2XCEWY 3CX150 sqmm
4.5.4.2	HV side cable entry	At bottom of enclosure through detachable gland plate
4.5.4.3	Gland plate material	Hot dipped Galvanized Steel 3 mm thick
4.5.4.4	Gland	Nickel plated brass double compression weatherproof cable gland
4.5.4.5	Cable Lugs	
4.5.4.6	HV side cable terminating busbar	Aluminium with size of 50X10 mm
4.5.4.7	Support of HT cable with enclosure	By MS flat of minimum size 50X10 mm
4.5.5	Termination on LV side	By cable with main enclosure/ By Bus Duct as per enquiry. In case of bus duct termination, there shall be separate box on LV side. The same box shall be suitable for cable termination & for bus duct arrangement also i.e. bus duct flange on the top & gland plate at the bottom/ as per enquiry.
4.5.5.1	LV side cable size	LV cable size, 650/1100 V grade, A2XY cable single core 630 sqmm unarmoured (appx. cable dia. is 40 mm)
4.5.5.2	LV side cable entry	At bottom of enclosure through detachable gland plate.
4.5.5.3	No. of cables on LV side	
4.5.5.3.1	250 KVA	2 runs per phase + 1 run in Neutral
4.5.5.3.2	400 KVA	2 runs per phase + 2 runs in Neutral
4.5.5.3.3	630 KVA	3 runs per phase + 2 runs in Neutral
4.5.5.3.4	750 KVA	3 runs per phase + 2 runs in Neutral
4.5.5.3.5	1000 KVA	4 runs per phase + 2 runs in Neutral
4.5.5.3.6	1600 KVA	6 runs per phase + 3 runs in Neutral
4.5.5.3.7	2000 KVA	7 runs per phase + 4 runs in Neutral
4.5.5.3.8	2500 KVA	9 runs per phase + 5 runs in Neutral
4.5.5.3	Gland plate material & type	Aluminium of 5 mm thick and gland plate should be single piece with “Knock Out” holes of dia. 45 mm.
4.5.5.4	Gland	Nickel plated brass double compression weatherproof cable gland
4.5.5.5	Cable Lugs	Shall be double hole lug with lug dia. Of 31 mm
4.5.5.6	LV side cable terminating busbar	Aluminium of size as follows
4.5.5.6.1	250 KVA	
	Phase	2 nos 100 x 10 mm
	Neutral	2 nos 100 x 10 mm
4.5.5.6.2	400 KVA	
	Phase	2 nos 100 x 10 mm

	Neutral	2 nos 100 x 10 mm
4.5.5.6.3	630 KVA	
	Phase	2 nos 100 x 10 mm
	Neutral	2 nos 100 x 10 mm
4.5.5.6.4	750 KVA	
	Phase	2 nos 100 x 10 mm
	Neutral	2 nos 100 x 10 mm
4.5.5.6.5	1000 KVA	
	Phase	2 nos 100 x 10 mm
	Neutral	2 nos 100 x 10 mm
4.5.5.6.6	1600 KVA	
	Phase	2 nos 120 x 12 mm
	Neutral	2 nos 120 x 12 mm
4.5.5.6.7	2000 KVA	
	Phase	2 nos 130 x 12 mm
	Neutral	2 nos 130 x 12 mm
4.5.5.6.8	2500 KVA	
	Phase	2 nos 160 x 12 mm
	Neutral	2 nos 160 x 12 mm
4.5.5.7	Support of LV cable with enclosure	By Aluminium (non magnetic) clamp size 50 x 3 mm fixed on MS bracket of size 50 x 10 mm supported from enclosure wall inside
4.5.5.8	Maximum Overall Dimension Acceptable (length x width x height),mm x mm x mm	
	250 KVA	1600 x 1650 x 1850
	400 kVA	1700 x 1750 x 1850
	630 kVA	1900 x 1750 x 1850
	1000 kVA	2200 x 2100 x 2400
	1600 kVA	2460 x 2200 x 2600
	2000 KVA	2750 x 2250 x 2600
	2500 KVA	3000 x 2300 x 2650
4.5.5.9	Short Circuit withstand Capacity of the transformer	
4.5.5.9.1	Three phase dead short circuit at secondary terminal with rated voltage maintained on the other side	As per IEC 60076-5
4.5.6	Partial Discharge	Transformer to be free from partial discharge
4.5.7	Tappings	Off Circuit taps on HV winding , + / - 10 % in steps of 2.5 % , change of taps by link
4.5.8	Tap link current rating, Amp	
	250/400 kVA	60 A
	630/ 750 kVA	100 A
	1000/1500/2000 kVA	125 A
	2500 kVA	150 A
4.6	Current Transformer	

4.6.1	Mounting	On LV side terminal busbars on all three phases with the help of fibre glass mounting plate
4.6.2	Maintenance requirements	Replacement should be possible without dismantling LV side support insulators
4.6.3	Accuracy Class	0.5
4.6.4	Burden	15 VA
4.6.5	Type	Resin Cast Ring type suitable for outdoor use
4.6.6	CT Ratio	
4.6.6.1	250 KVA	
4.6.6.2	400 KVA	600/5
4.6.6.3	630 KVA	1000/5
4.6.6.4	750 KVA	1200/5
4.6.6.5	1000 KVA	1500/5
4.6.6.6	1600 KVA	2500/5
4.6.6.7	2000 KVA	3000/5
4.6.6.8	2500 KVA	3500/5
4.6.7	CT Terminal Box	
4.6.7.1	Size	650 mm height x 450 mm width x 275 mm depth.
4.6.7.2	Fixing of instruments/meters within box	On slotted channel 40 x 12 mm size, channel fixed on vertical slotted angle 40 x 40 mm size at two ends
4.6.7.3	No of horizontal channels to be provided	Four
4.6.7.4	Fixing of terminals within box	On horizontal slotted channel with the help of C channel available with the terminals
4.6.7.5	Location	Within enclosure frame such that box door comes in line with enclosure surface
4.6.7.6	Box Door design	
4.6.7.7	Terminal strip	Nylon 66 material, minimum 4 sq mm, screw type for control wiring and potential circuit.
4.6.7.8	Cables & Wires	PVC insulated, extruded PVC inner sheathed, armoured, extruded PVC outer sheathed 1100 V grade control cable as per latest edition of IS 1554 part 1 minimum 2.5 sqmm for signals and 4 sqmm for CT with multistrand copper conductor & PVC insulated multistrand flexible copper wires of minimum 2.5 sqmm size, 1100 V grade as per latest edition of relevant IS
4.6.7.9	Cable Glands	Nickel plated brass double compression weatherproof cable gland
4.6.7.10	Lugs on wires	Tinned copper preinsulated Pin, Ring, Fork type as applicable
4.6.7.11	Potential signal in CT box	Tapped from main LV busbars
4.6.7.12	Hinges of CT terminal Box & WTI scanner box	Shall be of Anti theft type & shall not be visible from outside.
4.6.7.13	Essential provision	i) Wiring diagram to be fixed on the back of door along with CT spec. ii) Wiring diagram, name plate / danger plate etc shall be made from Aluminium with black engraving & shall be fitted by riveting at

		appropriate place
4.7	Hardware	
4.7.1	External	Stainless Steel only
4.7.2	Internal	Cadmium plated except special hardware for frame parts and core assembly as per manufacturer's design
4.8	Gasket	Nitrile Cork based gasket across all doors & covers
4.9	Control cable specification (to be used by the vendor)	PVC insulated, extruded PVC inner sheathed, armoured, extruded PVC outer sheathed 1100 V grade control cable as per latest edition of IS 1554 part 1 minimum 2.5 sqmm for signals and 4 sqmm for CT with multistrand copper conductor. Control cables shall be of FRLS only.
4.10	Specification of wires to be used inside CT box , WTI box etc.	PVC insulated multistrand flexible copper wires of minimum 2.5 sqmm size, 1100 V grade as per latest edition of relevant IS
4.11	Terminal Blocks to be used by the vendor	Nylon 66 material, minimum 4 sq mm,screw type for control wiring and potential circuit.
4.11.1	Essential provision for CT terminals	Sliding link type disconnecting terminal block screwdriver operated stud type with facility for CT terminal shorting material of housing melamine/ Nylon66
4.12	Cable glands to be used by the vendor	Nickel plated brass double compression weatherproof cable gland
4.13	Cable lugs to be used by the vendor	
4.13.1	For power cables	Long barrel medium duty Aluminium lug with knurling on inside surface
4.13.2	For control cables	Tinned copper pre insulated Pin, Ring, Fork type as applicable
4.14	Painting of transformer, CT box, WTI box	
4.14.1	Surface preparation	By 7 tank pretreatment process or shot blasting method
4.14.2	Finish on internal surfaces	Powder coated, Epoxy polyester base, grade A, shade – White, Uniform thickness of 80 microns minimum.
4.14.3	Finish on external surface	Powder coated, Epoxy polyester base, grade A, shade – 7032, Uniform thickness of 120 microns minimum with 01 coat of primer & 02 coats of paint.
4.14.4	Finish shade on external surfaces	RAL 7032 Siemens Grey
4.14.5	Painting on welding	All welding to be applied zinc rich paint before final painting
4.15	Labels & Name Plate	All name plate, wiring scheme plate, R&D plate, caution plate, danger plate, phase identification plate, identification plate shall be aluminium with black engraving Sticker of any form is not acceptable.
4.15.1	Fixing of name plate	By riveting only at appropriate location
4.16	Insulating support material	Backelite shall not be used as a base plate for

	for base plate for mounting components	mounting any components, insulating material non hygroscopic insulating material like FRP shall be used
4.17	Hazard sticker/plate	As per IS standard
4.18.0	Surge Arrester	Required, Connected on Transformer Primary side on all three phases
4.18.1	Type	Gapless Metal Oxide
4.18.2	Housing	Polymeric preferable, at bottom of HV winding
4.18.3	Surge Arrestor requirement for solidly grounded system	
4.18.4	System Voltage , kV rms	11
4.18.5	Rated Voltage of Arrestor, kV rms	9
4.18.6	Continuous operating voltage, kV rms	6.35
4.18.7	Maximum Continuous operating voltage, kV rms	7.65
4.18.8	Nominal Discharge Current, kA peak	10
4.18.9	Energy Absorption Capability, kJ/kV	Greater than 2.5
4.18.10	Creepage distance	31 mm /kV
4.18.11	Reference std	IS 3070 part 3 and IEC 99-4
4.19.0	Winding Temperature scanner	Required
4.19.1	No. of RTD inputs	Five (Three for windings, one for enclosure & one shall be spare) RTD for enclosure temperature monitoring shall be fixed at enclosure Top from inside to give max. Enclosure temp reading & shall be wired up to temp. Scanner to indicate the reading.
4.19.1.1	Location of winding RTD	At location of winding where maximum temperature is expected.
4.19.2	No of potential free trip contacts	Two
4.19.3	No of potential free Alarm contacts	Two
4.19.4	Auxiliary Supply	240 V AC, 1 phase, 50 Hz. Tapped from LV side busbar through a MCB located inside box.
4.19.5	Communication port	RS 485 port for interfacing with FRTU on Modbus protocol. Battery/Super capacitor for data transmission to SCADA in the event of Auxiliary supply fail
4.19.6	Winding Temperature Scanner terminal Box	Required
4.19.6.1	Size	As per manufacturers standard
4.19.6.2	Fixing of instrument within box	On side wall of enclosure
4.19.6.3	Fixing of terminals within the box	On C channel available with the terminals
4.19.6.4	Location	Within enclosure frame such that Marshalling Box &

		WTI on same side & free access to all LV side doors.
4.19.6.5	Terminal Strip	Nylon 66 material, minimum 4 sq mm, screw type for control wiring and potential circuit.
4.19.6.6	Cables & Wires	PVC insulated, extruded PVC inner sheathed, armoured, extruded PVC outer sheathed 1100 V grade control cable as per latest edition of IS 1554 part 1 minimum 2.5 sq mm for signals and 4 sq mm for CT with multi strand copper conductor & PVC insulated multi strand flexible copper wires of minimum 2.5 sq mm size, 1100 V grade as per latest edition of relevant IS
4.19.6.7	Cable Glands	Nickel plated brass double compression weatherproof cable gland
4.19.6.8	Lugs on wires	Tinned copper pre insulated Pin, Ring, Fork type as applicable
4.19.6.9	Auxiliary supply in box	Tapped from main LV busbars, taken via MCB for isolation and protection of scanner, MCB to be fixed on DIN rail with clamps on two sides.
4.19.6.10	Essential provision	Wiring diagram to be fixed on the back of door along with brief details of scanner, HV side , LV side door limit switches to be wired up-to Terminal Block, Service socket to be provided with switch, fuse and link.

5.0 Fittings and Accessories on Transformer

5.1	Rating & Diagram Plate	Required
5.1.1	Material	Anodized Aluminium 16 SWG
5.1.2	Background	Satin silver
5.1.3	Letters, diagram & border	Black
5.1.4	Process	Etching
5.1.5	Name Plate details	Following details shall be provided on rating and diagram plate as a minimum i) Type of transformer i.e cast resin with winding material ii) Standard to which it is manufactured iii) Manufacturer's name; iv) Transformer serial number; v) Month and year of manufacture. vi) Rated frequency in Hz. vii) Rated voltages in kV. viii) Number of phases. ix) Rated power in kVA. x) Type of cooling. xi) Rated currents in A. xii) Vector group symbol. xiii) 1.2/50ıs wave impulse voltage withstand level in kV. xiv) Power frequency withstand voltage in kV.

		xv) impedance voltage at rated current and frequency in percentage at principal, minimum and maximum tap at highest temperature. xvi) load loss at rated current at highest temperature. xvii) No-load loss at rated voltage and frequency. xviii) auxiliary loss xix) Continuous ambient temperature at which ratings apply in C. xx) winding connection diagram with taps and table of tapping voltage, current and power xxi) Transport weight of transformer xxii) Weight of Core xxiii) Weight of Winding xxiv) Weight of core coil assembly xxv) Weight of enclosure and fittings xxvi) Total weight xxvii) tapping details xxviii) Phase CT details xxix) Class of insulation xxx) IP protection rating of the enclosure xxxi) Name of the purchaser xxxii) PO no. & date xxxiii) Guarantee period xxxiv) Fire, Environment & Climate Class
5.2	Detachable Bi-directional flat Roller Assembly	Required
5.2.1	Roller center to center distance	Minimum 900 mm on the side of HV and LV termination Maximum 800 mm on the other side (perpendicular to HV, LV termination).
5.2.2	Essential provision	Roller dia. 150 mm min, roller to be fixed in such a way so that the lowermost part of the skid is above ground by at least 100 mm when the transformer is installed on roller.
5.3	Earthing pad on enclosure for transformer earthing complete with Stainless Steel nut, bolt, washers, spring washers etc.	Required with identification plate on outside of enclosure.
5.4	Core, frame to tank earthing	Required
5.5	Off circuit tapping links	Required. Shrouds to be provided on tap link
5.6	Tap link position plate	Required inside HV side door
5.7	Danger plate made of Anodized aluminum with white letters on red background on HV and LV side	Required
5.8	Skid with Haulage lugs	Required
5.9	Lifting lugs for complete	Required

	transformer as well as enclosure	
5.9.1	Essential provision for lifting lugs	Lifting lugs for core coil assembly shall be provided in such a way that the weight shall not come on canopy while lifting. Lifting lugs for canopy/ enclosure shall be provided in such a way that the weight shall not come on canopy while lifting , it shall be born by supporting members.
5.10	Caution plate for tap links	Required
5.11	Ventilation louvers with stainless steel wire mesh and rain water guard	Required as per Manufacturer's design, but it is to be provided minimum required to prevent ingress of excessive dust.
5.12	Surge arrester & its grounding bushings	Required. Shrouds to be provided on surge arrester terminations
5.12.1	Essential provision	Surge arrestor shall be erected vertically in such a way that the surge arrestor can be removed at site without removing HV cable lug. Surge arrestor shall not be used for any kind of support. Surge arrestor grounding strip to be routed to the surge arrester grounding bushing near bottom of enclosure with proper support. Surge arrestor grounding bushing shall be identified by identification plate on outside of enclosure. Surge arrestor grounding bushing shall be supplied with all hardware to readily connect purchaser's ground lead.
5.13	LV additional neutral earthing bushing	Required, separate & outside the enclosure.
5.13.1	Essential provision	Busbar connecting the neutral to additional neutral bushing shall be properly supported and additional neutral bushing shall be identified by identification plate on outside of enclosure. Additional neutral bushing shall be supplied with all hardware to readily connect purchaser's ground lead.
5.14	Extra earthing stud for cable armour earthing	Required
5.15	Winding temperature scanner	Required
5.16	RTD in Winding and near top of enclosure.	Required
5.17	Space heater inside enclosure	Required
5.17.1	Mounting of space heater	By suitable spacers so that heater does not come in contact with panel wall directly.
5.18	Copper earthing link	Across all gasketted joints in the enclosure body.

6.0 Approved make of components

6.1	Core	Nippon/JFE/Posco/Thyssen Krupp
6.2	Aluminium	Hindalco, Nalco, Sterlite, Birla
6.3	Steel	Essar/SAIL/Tata
6.4	Winding Temperature	Precimeasure / Pecon

	Indicator	
6.5	CT	Pragati/ECS/Kappa
6.6	Terminals	Elmex/Connectwell
6.7	Resin	Huntsmen
6.8	Lugs/Glands	Jainson/Dowells/Comet
6.9	Bushing/Support Insulator	Baroda Bushing/CJI/Jaipur Glass

*Vendor shall take prior approval of BSES before using any other make than approved make.

7.0 Quality Assurance

7.1	Quality Assurance program	To be submitted before contract award. Program shall contain following i) The structure of the organization ii) The duties and responsibilities assigned to staff ensuring quality of work. iii) The bidder should have qualified technical & dedicated QA personnel at various stages of manufacture & testing. iv) Factory inspection of bidder may be carried out to ascertain the quality system and process in place at manufacturing facility. The same is applicable to bidders not approved with BSES. v) The system for purchasing, taking delivery and verification of materials vi) The system for ensuring quality of workmanship vii) The system for control of documentation viii) The system for the retention of records ix) The arrangements for the Supplier's internal auditing x) A list of the administration and work procedures required to achieve and verify Contract's quality requirements. These procedures shall be made readily available to the Purchaser for inspection on request
7.2	Quality Plan	To be submitted by the successful bidder for approval. Plan shall contain following as a minimum i) An outline of the proposed work and programm sequence ii) The structure of the Supplier's organisation for the contract iii) The duties and responsibilities assigned to staff ensuring quality of work for the contract iv) Inspection Hold and notification points mutually agreed. v) Submission of engineering documents required

		by the specification vi) The inspection of materials and components on receipt vii) Reference to the Supplier's work procedures appropriate to each activity viii) Inspection during fabrication/ construction ix) Final inspection and test x) Successful bidder shall include submittal of Mills invoice, Bill of lading, Mill's test certificate for grade, physical tests, dimension, specific watt loss per kG for the core material to the purchaser for verification in the quality plan suitably

8.0 Progress Reporting

8.1	Outline document	To be submitted for purchaser approval for outline of production, inspection, testing, inspection , packing, dispatch, documentation programme
8.2	Detailed Progress report	To be submitted to Purchaser once a month containing i) Progress on material procurement ii) Progress on fabrication iii) Progress on assembly iv) Progress on internal stage inspection v) Reason for any delay in total programme vi) Details of test failures if any in manufacturing stages vii) Progress on final box up viii) Constraints/Forward path

9.0 Inspection an Testing

9.1	Inspection and Testing during manufacture	Only type tested equipment shall be acceptable
9.1.1	Enclosure	i) Check correct dimensions between wheels demonstrate turning of wheels through 90 deg and further dimensional check ii) Check for physical properties of materials for lifting lugs etc. All load bearing welds, including lifting lug welds shall be subjected to required load tests.
9.1.2	Core	
9.1.2.1	Mother Core coil	Verification & inspection of the mother coil at port & putting stamp & seal may be inspected by BSES.
9.1.2.2	Core sample type testing	Reconciliation of mother coil by checking stamp & seal at factory before slitting. One sample of CRGO to be sealed for testing at ERDA/CPRI. Following Tests shall be conducted on the sample per P.O.

		i) Specific core loss measurement ii) Magnetic polarization iii) Magnetic permeability iv) Specific core loss measurement after accelerated ageing test v) Surface insulation resistivity vi) Electrical resistivity measurement vii) Stacking factor viii) Ductility(Bend test) ix) Lamination thickness x) Magnetization characteristics (B-H curve)
9.1.2.3	Core cutting	Bidder should have in house core cutting facility for proper monitoring & control on quality. In case it is done outside cutting shall be done in presence of BSES.
9.1.2.4	Core physical verification	i) Check on the quality of varnish if used on the stampings. a) Measurement of thickness and hardness of varnish on stampings. b) Solvent resistance test to check that varnish does not react in hot oil. c) Check over all quality of varnish by sampling to ensure uniform hipping colour, no bare spots. No ever burnt varnish layer and no bubbles on varnished surface. ii) Check on the amount of burns. iii) Bow check on stampings. iv) Check for the overlapping of stampings. Corners of the sheet are to be apart. v) Visual and dimensional check during assembly stage. vi) Check on complete core for measurements of iron-loss and check for any hot spot by exciting the core so as to induce the designed value of flux density in the core. vii) Check for inter laminar insulation between core sectors before and after pressing. viii) Visual and dimensional checks for straightness and roundness of core, thickness of limbs and suitability of clamps. ix) High voltage test (2 KV for one minute) between core and clamps. Certification of all test results.
9.1.2.5	Documents verification	Following documents to be submitted during the stage inspection i) Invoice of supplier ii) Mills test certificates iii) Packing list iv) Bill of lading

		v) Bill of entry certificates by customs
9.1.3	Insulating Materials	i) Sample check for physical properties of materials. ii) Check for dielectric strength. iii) Visual and dimensional checks. iv) Check for the reaction of hot oil on insulating materials. v) Certification of all test results.
9.1.4	Windings	i) Sample check on winding conductor for mechanical properties and electrical conductivity. ii) Visual and dimensional check on conductor for scratches, dept. mark etc. iii) Sample check on insulating paper for PE value, Bursting strength, Electric strength. iv) Check for the bending of the insulating paper on conductor. v) Check and ensure that physical condition of all materials taken for winding is satisfactory and free of dust. vi) Check for absence of short circuit between parallel strands. vii) Check for Brazed joints wherever applicable. viii) Measurement of voltage ratio to be carried out when core/ yoke is completely restocked and all connections are ready. ix) Weight of winding x) Certification of all test results.
9.1.4	Tests on fitting and Accessories	As per Manufacturer's Standards
9.2	Routine Tests	The sequence of routine testing shall be as follows i) Visual and dimension check for completely assembled transformer ii) Measurements of voltage ratio iii) Measurements of winding resistance at principal tap and two extreme taps. iv) Vector Group and polarity test v) Measurements of insulation resistance. vi) Separate sources voltage withstand test. vii) Measurement of iron losses and exciting current at rated frequency and 90%, 100% and 110% rated voltage. viii) Induced voltage withstand test. ix) Load losses measurement. x) Impedance measurement of principal tap (HV and LV) of the transformer. xi) Induced voltage withstand test (to be repeated if type tests are conducted). xii) Measurement of Iron loss (to be repeated if

		type test are conducted). xiii) Measurement of capacitance and Tan Delta for HV and LV bushings xiv) Partial discharge test xv) Ratio of LV CT xvi) Magnetic balance test xvii) Power frequency voltage withstand test on all auxiliary circuits xviii) Temperature rise test # xix) Certification of all test results. Note: a) #Temperature rise test may be necessary to be carried out on one unit/lot. Purchaser's engineer, will at its discretion, select transformer for temp.rise test from any lot offered for inspection at manufacturer's works and witness the same for comparison with CPRI/ERDA lab type test results b) BSES may appoint recognized testing authority like CPRI /ERDA lab with their instruments & engineer's team and measure no load loss, load loss and percentage impedance of the transformer at supplier's works at our own cost. Bidder shall agree and give them full co-operation during their stay & testing at shop floor. The losses & impedance values so obtained will be considered as final.
9.3	Acceptance test at NABL lab	Bidder should have in-house NABL accredited testing facility. In case of unavailability of same, one Transformer of each rating shall be randomly selected and sealed by BSES representative for complete acceptance test as per IS 2026-Part 11 (including temperature test) at third party NABL Lab. Tests shall be conducted once per Rate contract.
9.4	Type Tests	On one transformer of each rating and type at CPRI/ERDA. i) Impulse withstand test on all three HV limbs of the transformers for chopped wave as per standard ii) Temperature rise test as per IS Note – Purchaser may choose to carry out short circuit, impulse & temperature rise test on one unit from a lot offered for inspection at CPRI/ERDA lab **.** Cost of such tests shall be borne by the bidder**.**
9.5	Special Tests	On one transformer of each rating and type i) Dynamic & Thermal (3 sec) Short Circuit Test as per IS 2026 at CPRI/ERDA

		ii) Measure of zero seq. impedance (Cl. 16.10 IS 2026 Part I). iii) Measurement of acoustic noise level (Cl. 16.12 of IS 2026 Part I). iv) Measurement of harmonic level on no load current. v) Partial discharge test. vi) Enclosure Ingress protection at CPRI/ERDA vii) High voltage withstand test shall be performed on the auxiliary equipment and wiring after complete assembly. Cost of such tests, if extra, shall be quoted separately by the Bidder.
9.6	Notification to bidders	In case bidder had conducted type & special tests from CPRI/ERDA on BSES design and there is no design change in the transformer less than 10 years from the date of the bid opening, then bidder need not to conduct the type test from CPRI/ERDA lab. The bidder shall submit the under taking that there is no change in design with respect to type tested design.
		The product offered must be of type tested quality. In case the product offered is never type & special tested the same (as per above clause 9.4.& 9.5), is to be conducted by bidder at his own cost at CPRI/ERDA
9.7	Customer Hold Point	i) GTP & Drawings approval ii) Core Inspection(See Cl No 9.1.2) Sample to be tested at CPRI/ERDA for each lot. iii) Core & Coil Stage inspection of each lot to be offered for final testing.

10.0 Packing, Shipping, Handling and Storage

10.1	Packing	
10.1.1	Packing protection	Against corrosion, dampness, heavy rains, breakage and vibration
10.1.2	Packing for accessories and spares	Robust wooden non returnable packing case with all the above protection
10.1.3	Packing details	On each packing case details required as follows i) Individual serial number; ii) Purchaser's name; iii) PO number (along with SAP item code, if any) & PO date iv) Equipment tag no. (if any) v) Destination vi) Manufacturer/Supplier's name; vii) Address of Manufacturer/supplier/it's agent viii) Description and quantity ix) Month & Year of Manufacturing

		x) Country of origin xi) Case measurements xii) Gross and net weights in kilograms xiii) All necessary slinging and stacking instructions. xiv) As built drawings & O&M manual. One copy with each transformer
10.2	Shipping	i) The bidder shall ascertain at an early date and definitely before the commencement of manufacture, any transport limitations such as weights, dimensions, road culverts, overhead lines, free access etc. from the manufacturing plant to the project site; and furnish to the Purchaser confirmation that the proposed packages can be safely transported, as normal or oversize packages, upto the plant site. ii) Any modifications required in the infrastructure and cost thereof in this connection shall be brought to the notice of the Purchaser
10.3	Handling and Storage	Manufacturer instruction shall be followed. Detail handling & storage instruction sheet / manual needs to be furnished before commencement of supply.

11.0 Deviations

Deviations from this Specification shall be stated in writing with the tender by reference to the Specification clause/GTP/Drawing and a description of the alternative offer. In absence of such a statement, requirements of the Specification shall be met without exception.

12.0 Drawings & Data Submission Matrix

Drawing submission shall be as per the matrix given below. All documents/ drawing shall be provided on A3/A4 sheet in box file with separators for each section. PDF shall also be provided of all documents via USB. Deviation sheet and GTP shall be provided in excel sheet. Language of the documents shall be English only. Deficient/ improper document/ drawing submission may liable for rejection.

S.no	Documents to be submitted	With the bid	After Award	
			For Approval	Prior to dispatch
1	Copy of specification along with company seal & signature on each page.	✓	✓	
2	Guaranteed technical particulars	✓	✓	
3	Outline dimension drawing for each major component, general arrangement drawing showing component layout an general schematic diagrams.	✓	✓	

S.no	Documents to be submitted	With the bid	After Award	
			For Approval	Prior to dispatch
4	Type test certificates, where available, and sample routine test reports	✓	✓	
5	Detailed reference list of customers already using equipment offered during the last 5 years with particular emphasis on units of similar design and rating	✓		
6	Details of manufacturers quality assurance standard and programme and ISO 9000 series or equivalent national certification.	✓		
7	Deviations from this specification. Only deviations approved in writing before award of contract shall be accepted.	✓		
8	Recommended spare parts and consumable items for the five years of operation with prices and spare parts catalogue with price list for future requirements.	✓		
9	Transport / shipping dimension and weights, space required for handling parts for maintenance	✓		
10	Quality assurance program.	✓	✓	
11	Programme for production and testing		✓	
12	General description of the equipment and all components, including brochures		✓	
13	Detailed dimension drawing for all components, general arrangement drawing showing detailed component layout		✓	
14	Rating and Diagram Plate		✓	
15	Wiring Diagram of Marshaling box		✓	
16	CT/VT termination box		✓	
17	Foundation details		✓	
18	Core coil Assembly		✓	
19	Wiring diagram Plate for CT Box		✓	
20	Tap Link position plate		✓	
21	Label plate for phase, Neutral, surge arrester & other essential parts		✓	

S.no	Documents to be submitted	With the bid	After Award	
			For Approval	Prior to dispatch
22	Surge Arrester Arrangement		✓	
23	HV &LV Cable support		✓	
24	22kV Support insulator		✓	
25	3.3kV support insulator		✓	
26	CT mounting details		✓	
27	Scanner box mounting details		✓	
28	HT termination detail		✓	
29	LT termination details		✓	
30	Enclosure assembly & door arrangement		✓	
31	Louver back plate arrangement		✓	
32	Calculations to substantiate choice of electrical, structural, mechanical component size, ratings		✓	
33	Detailed loading drawing to enable the purchaser to design and construct foundations for the transformer.		✓	
34	Transport /shipping dimension with weights ,wheel base details, untanking height etc.		✓	
35	Terminal arrangements and cable box details		✓	
36	Lists of makes of all fittings and accessories		✓	
37	Statement drawing attention to all exposed points in the equipment at which contact with or in close proximity to other metals and stating clearly what protection is employed to prevent corrosion at each point		✓	
38	Complete casting process		✓	
39	Resin Data sheet		✓	
40	Detailed installation and commissioning instructions			✓
41	Inspection and test reports carried out in manufacturers works			✓
42	Test certificates of all bought out items. and catalogues			✓
43	Operation and maintenance instructions as well as trouble shooting charts.			✓

Annexure A Scope of supply

Sr. No	Description	Scope of Supply
1.0	Scope	Design, manufacture, assembly, testing at stages of manufacture as per this specification, final testing at manufacturer works on completely assembled transformer before dispatch, packing, transportation, delivery and submission of all documentation for the Distribution transformer with all accessories as below and Cl. 4 & 5 of this specification (Above is typical, It has to be validated on a case to case basis
1.1	Nickel Plated brass double compression glands for HV and LV, LVN cables (in case of termination by cable)	YES
1.2	Long barrel medium duty Aluminium lugs for power cables (in case of termination by cable)	YES
1.3	Nickel Plated brass double compression glands and tinned copper lugs for control cable termination in Marshalling box and CT/VT box for vendor's	YES
1.4	Cables and wires for transformer accessories, CTs etc. and internal wiring of CT	YES
1.5	Touch up paint	YES
1.6	Routine testing as per Cl. Of this specification	YES
1.7	Type testing as per Cl. of this specification	YES
1.8	Special testing as per Cl. of this specification	YES
1.9	Supervision of testing & commissioning of transformer	YES

Annexure B Service Condition

1.0	Delhi Atmospheric conditions	
1.2	Average grade atmosphere	Heavily polluted , dry
1.3	Maximum altitude above sea level	1000 M
1.4	Ambient Air temperature	Highest 50 deg C, Average 40 deg C
1.5	Design ambient air temperature	50 deg C
1.6	Relative Humidity	90 % Max
1.7	Seismic Zone	4
1.8	Rainfall	750 mm concentrated in four months

Annexure C Guaranteed Technical Particulars (Data by Seller)

Sr. No.	Particulars	Specified / Required	Offered
1.0	General		
1.2	Make		
1.2	Type	core type , outdoor, step down	
1.3	Full rating available for installation of the same transformer in indoor poorly ventilated condition (YES/ NO)		
1.4	IP Class		
1.5	Fire Protection Class		
1.6	Environment Class		
2.0	Nominal Continuous Rating, KVA		
2.1	HV Winding	250/400/630/750/1000/1600/2000/2500	
2.2	LV Winding	250/400/630/750/1000/1600/2000/2500	
3.0	Rated Voltage (kV)		
3.1	HV winding	11 KV	
3.2	LV winding	415 Volts	
4.0	Rated current (Amps)		
4.1	HV winding		
4.2	LV winding		
5.0	Connections		
5.1	HV winding	Delta	
5.2	LV winding	Star with additional neutral	
5.3	Vector Group Reference	Dyn11	
6.0	Impedance at principal tap rated current and frequency at 130 deg C		
6.1	Impedance	5/5/5/5/5/6/6/6 %	
6.2	Reactance		
6.3	Resistance		
6.4	Impedance at lowest tap rated current and frequency		
6.5	Impedance at highest tap rated current and frequency, %		
7.0	Resistance of the winding at 130 deg C ,at principal tap, ohm		

7.1	a) HV		
7.2	b) LV		
8.0	Zero sequence impedance, ohm		
8.1	a) HV		
8.2	b) LV		
9.0	Guaranteed maximum losses principal tap full load and 130°C without any positive tolerance kW		
9.1	No load losses (max)	As per Spec Cl.	
9.2	Load Losses (max)	As per Spec Cl.	
9.3	Total stray loses @ 130 deg C		
10.0	Temperature rise over reference design ambient		
10.1	Winding by resistance 0 C		
10.2	Maximum hot spot temperature, deg. C		
11.0	Efficiency		
11.1	Efficiency at 130 degC and unity power factor %		
11.1.1	At 110% Load		
11.1.2	At 100% Load		
11.1.3	At 80% Load	Not less than 99.5 %	
11.1.4	At 60% Load		
11.1.5	At 40% Load		
11.1.6	At 20% Load		
11.2	Efficiency at 130 degC and 0.8 power factor lag %		
11.2.1	At 110% Load		
11.2.2	At 100% Load		
11.2.3	At 80% Load	Not Less than 99.5 %	
11.2.4	At 60% Load		
11.2.5	At 40% Load		
11.2.6	At 20% Load		
11.3	Maximum efficiency at 130 deg C, %		
11.4	Load and power factor at which it occurs		
12.0	Regulation , (%)		
12.1	Regulation at full load at		

	130 deg C		
12.1.1	at unity power factor		
12.1.2	at 0.8 power factor lagging		
12.2	Regulation at 110% load at 130 deg C		
12.2.1	at unity power factor		
12.2.2	at 0.8 power factor lagging		
13.0	Details of enclosure		
13.1	Material		
13.2	Thickness of sides mm		
13.3	Thickness of bottom mm		
13.4	Thickness of cover mm		
14	Core		
14.1	Type:	Core	
14.2	Core material grade	Premium grade minimum M3 or better	
14.3	Thickness of lamination		
14.4	Insulation of lamination	With insulation coating on both sides	
14.5	Design Flux Density at rated condition at principal tap, Tesla	1.6 T	
14.5.1	Maximum flux density at 10 % over excitation /over fluxing, Tesla	1.73 Tesla maximum allowed	
14.6	Equivalent cross section area mm^2		
14.7	Guaranteed No Load current At 100% rated voltage , Amps		
14.7.1	HV		
14.7.2	LV		
14.8	Guaranteed No Load current At		
14.8.1	HV		
14.8.2	LV		
15	Type of Winding		
15.1	HV		
15.2	LV		
15.3	Conductor material	Electrolytic Aluminium	

15.4	Current density Amps/sqmm	Maximum allowed 1.5 A per sqmm.(max.)	
15.4.1	HV Winding		
15.4.2	LV Winding		
15.5	Gauge/area of cross section of conductor, sqmm		
15.5.1	HV		
15.5.2	LV		
15.6	Tappings provided as per Cl. 3.14.9 (YES / NO)		
15.7	Tap link Current rating , A		
16	Insulating Material		
16.1	HV Turn		
16.2	LV Turn		
16.3	LV Core		
16.4	HV - LV		
17	Insulating material thickness, mm		
17.1	HV Turn		
17.2	LV Turn		
17.3	LV to Core		
17.4	HV to LV		
18	Minimum design clearance, mm		
18.1	HV to earth in Air		
18.2	LV to earth in Air		
18.3	Between HV & LV in Air		
18.4	Top winding and yoke		
18.5	Bottom winding and yoke		
19	Bushing / Support Insulator		
19.1	Make		
19.2	Type		
19.3	Reference Standard		
19.4	Voltage class, kV		
19.4.1	HV side Bushing / Support insulator		
19.4.2	LV side line and neutral bushing / Support insulator		
19.5	Creepage factor for all bushing mm/KV		
19.6	Weight, Kg		
9.6.1	HV bushing / Support		

	insulator		
19.6.2	LV line and neutral bushing		
19.7	Free space required for bushing / Support insulator removal, mm		
19.7.1	HV bushing / Support		
19.7.2	LV line and neutral bushing / Support insulator		
20	Terminal connections		
20.1	HV		
20.2	LV		
20.3	Terminal Details		
20.3.1	HV side busbar size		
203.2	HV Termination suitable for cable size		
20.3.3	HV Termination height, mm		
20.3.4	HV side gland Plate dimension, mm x mm		
20.3.5	HV side gland Plate		
20.3.6	HV side Gland Plate Thickness, mm		
20.3.7	HV side Phase to clearance inside enclosure , mm		
20.3.8	HV side Phase to earth inside box, mm		
20.3.9	LV side busbar size		
20.3.10	LV Termination suitable for cable size		
20.3.11	LV Termination height, mm		
20.3.12	LV side gland Plate dimension, mm x mm		
20.3.13	LV side gland Plate material		
20.3.14	LV side Gland Plate Thickness, mm		
20.3.15	LV side Phase to phase clearance inside enclosure , mm		
20.3.16	LV side Phase to earth inside box, mm		

21	Current Transformer on LV phases		
21.1	Type		
21.2	Make		
21.3	Reference Standard		
21.4	CT Ratio		
21.5	Burden, VA		
21.6	Class of Accuracy		
22	CT terminal box size		
23	WT scanner terminal box size		
24	Alarm and Trip contact ratings of protective devices		
24.1	Rated / making/ breaking currents , Amp @ Voltage for		
24.1.1	Winding temperature		
25	Fittings and Accessories as per Cl. 5.0 provided (YES / NO)		
26	Painting as per clause 4.14 provided (Yes/No)		
27	Over all transformer dimensions		
27.1	Length, mm		
27.2	Width, mm		
27.3	Height, mm		
28	Weight data		
28.1	Core, kG		
28.2	Frame parts, kG		
28.3	Core and frame, kG		
28.4	Total Winding, kG		
28.5	Core , Frame, Winding, kG		
28.6	Enclosure, kG		
28.7	Total Transport weight of the transformer, kG		
28.8	Total weight of the transformer with all accessories		
29	Shipping Data		
29.1	Weight of heaviest package, kG		

29.2	Dimensions of the largest package (L x B x H) mm		
30	Surge Arrestor requirement		
30.1	Type		
30.2	System Voltage , kV rms		
30.3	Rated Voltage of Arrestor, kV rms		
30.4	Continuous operating voltage , kV rms		
30.5	Maximum Continuous operating voltage, kV rms		
30.6	Nominal Discharge Current, kA peak		
30.7	Energy Absorption Capability, kJ/kV		
30.8	Creepage factor		
30.9	Reference std		
31	WTI Scanner Details		
31.1	Make		
31.2	Model no.		
31.3	Manual submitted		
31.4	Modbus communication (Yes/No) port available		
32	Tests (As per Cl 9.0 of the spec)		
32.1	All in process tests confirmed (Yes/ No)		
32.2	All Type Tests confirmed (Yes / No)		
32.3	All Routine Tests confirmed (Yes/ No)		
32.4	All Special Tests confirmed (Yes/ No)		
33	Guarantee Period		

Technical Specification

for

11 kV Ring Main Unit

Specification no – SP-ERMUX-15-R9

Prepared by		Reviewed by		Approved by		Rev	Date
Name	Sign	Name	Sign	Name	Sign		
Gautam Deka/Pronab Bairagi	27/02/20 27/02/2020	Amit Tomar	27.02.2020	K. Sheshadri	27/02/2020	R9	27/02/2020

Index

Record of Revision

Revision No	Item / clause no.	Nature of Change	Approved By
R5	1, Annex. 1.9	Service performance requirements during guarantee period specified.	DS
R5	1, Annex. 1.11	Training requirements for RMU & Self powered relay specified.	DS
R5	2	IEC 62271 specified	DS
R5	4.4.1	Solid Shielded Insulation Added	DS
R5	5.6	Added – Operating Handle support	DS
R5	5.13.3	Cable termination height is increased to 900 mm.	DS
R5	5.14.2	Bus bar short time withstand capacity changed to 20kA for 3 sec	DS
R5	5.24	Added – Avoid any type of Gaps or holes on the cable termination chamber wall.	DS
R5	6.5.4	Included provision of 2nos AC incoming supply MCB	DS
R5	6.6.2	LBS short time withstand capacity revised to 20kA for 3 sec	DS
R5	6.7	LBS fault making capacity revised to 50kA peak	DS
R5	6.8	Mechanism endurance class M1 and Electrical Endurance class E3 specified	DS
R5	6.9	Minimum no. of operations at rated fault current specified – Electrical endurance class E3	DS
R5	6.10	Fault Passage Indicator specifications included	DS
R5	7.2	CB arc interruption medium only in Vacuum bottle	DS
R5	7.4	Added – Protective flap on Emergency PB	DS
R5	7.5.2	20kA short time withstand capacity specified	DS
R5	7.6	Mechanical – M1 & Electrical-E2 endurance class specified for circuit breaker module	DS
R5	7.7	CB fault making capacity revised to 50kAspecified	DS
R5	7.8	CB fault breaking capacity revised to 20kA	DS
R5	8.7	No load mechanical endurance class M0 specified for earth switch	DS

R6	8.8	Making capacity endurance class E2 specified	DS
R5	10.6	Added – Prevent electrical operation if handle is inserted for manual operation	DS
R5	12.1	Sticker type mimic diagram non acceptance specified	DS
R5	13.3	Process audit included in the Quality systems for RMU, self powered relay	DS
R5	13.4	Approved sub vendor list specified for FPI self powered relay	DS
R5	Annexure A – 1.5	2 nos. is changed to 2 sets of Operating handle	DS
R5	Annexure C – 21 to 26	Earth Switch , Self powered relay, FPI, CT, VPI details included in GTP particulars, to be provided by supplier	DS
R5	Annexure F	BSES 11kV terminal connection lug dwg. – Bimetallic Ring type, provided for supplier to provide suitable terminal fixing arrangement at 11Kv bushing.	DS
R6	Annexure I	Requirement of 11 kV "Metering Cubicle" requirement added	DS/GS
R7	4.2	Added Both side extensible (L.H.S. and R.H.S.) requirement	VP
R7	18.0	Added Equipment ID requirement	VP
R7	1.10	Added Equipment ID requirement	VP
R7	7.11	Circuit breaker (TCB / FCB): Added all the CTS shall be bushing mounted requirement	VP
R7	Annexure G(1)	Added Servicing and Warranty requirement-Equipment supply (11kV Ring Main Unit) requirement	VP
R8	6.10	FPI (for both Earth Fault and Over Current Protection)	VP
R8	Annexure-I	Make List	VP
R8	16	Deviation Clause	VP
R8	1.0A	Motorized Compatibility	VP
R8	7.13	Self Powered –shall be communicable	VP
R8	9.4	Digital Manometer for SF6 gas pressure measurement	VP
R8	Annexure-E (f)	4 Way Outdoor RMU (2VCB+2LBS)	VP
R9	5.1, 5.7	Panel Construction –CRCA/GI with 2 to 2.5 mm thick sheet	KS
R9	5.8	Base frame shall be constructed with 75mm ISMC/ISA channel and HDPE cleat shall be adjustable to hold the cable	KS
R9	5.12	11kV, 3CX400 sqmm cable added provision of termination facility.	KS

R9	5.15	Earth Bus bar-Tinned Copper flat sized for rated fault duty for 3 sec	KS
R9	5.20	TBs shall be push on type in the place of screw type.	KS
R9	6.10.2	Connection of CBCT with FPI shall be with only PVC wire	KS
R9	7.11	Position of CTs inside compartment shall be adjustable in vertical and horizontal direction	KS
R9	7.12	CT accuracy class shall be 5P10	KS
R9	7.16	VCB breaking timing shall be 40 to 60ms	KS
R9	8.8	Making capacity endurance of earth switch- E2 Class with 5 operation as per IEC 62271-102	KS
R9	9.1	Stainless steel Tank enclosure suitable for IP67. Metal thickness shall be 3mm	KS
R9	Annexure-H-8.14 and 9.10	Make and grade of Epoxy Resin shall be Cycloaliphatic	KS
R9	12.8	Printed copy of termination and wiring diagram shall be fixed/mounted inside each and every compartment	KS
R9	Annexure-I	Make list	KS
R9	Annexure-K	Special Technical Requirement	KS

Proposed by	Reviewed By	Approved by
27/02/20 27/02/2020	27/02/2020	
Gautam deka/ Pronab Bairagi	Amit Tomar	K. Sheshadri

1.0 Scope of work

A. 11kV Manual RMU shall be supplied as per the specification. All the manual RMU shall be compatible for retrofit solution of motorized RMU in future

B. Metering Cubicle (Only with Outdoor RMU, if specified with purchase requisite) **[R6]**

C. For scope of supply, refer annexure – A

2.0 Codes & standards

Materials, equipment and methods used in the manufacture of switchboards shall conform to the latest edition of following –

S No.	Title
Indian Electricity Rules	With latest amendments
Indian electricity act	IE act 2003
IS 3427	A.C. Metal Enclosed Switchgear and Control gear for Rated Voltages Above 1 Kv
IS 9920 part 1,3 & 4	High voltage switches above rated voltage 1kv
IS 13118	General requirements of circuit breakers above rated voltage 1kv
IS 3231	Electric Relays for Power System Protection
IEC 60265 part 1	High voltage switches
IEC 60056	High voltage alternating current circuit breakers
IEC 60059	Preferred current ratings of high voltage switchgear
IEC 60185	Current transformers
IEC 60694	Specification for high voltage switchgear
IEC 60298	AC metal enclosed switchgear
IEC 60129	Ac disconnector and earth switches
IEC 60529	Classification of degrees of protection provided by enclosures
IEC 60255	Electrical relays

In the event of direct conflict between various order documents, the precedence of authority of documents shall be as follows -

i. Guaranteed Technical Particulars (GTP)

ii. Specification including applicable codes & standards

iii. Approved Vendor Drawings

iv. Other documents

3.0 Electrical Distribution System Data

3.1	Supply	3 phase AC, 3 wire
3.2	Voltage	11000 volt ±10%

3.3	Frequency	50 Hz ± 5%
3.4	System neutral	Earthed at upstream 11kv source

4.0 11kv RMU System layout

4.1	RMU Configuration	As per scheme given in Annexure E & type as per Purchase requisition
4.2	Extensibility	Both side extensible (L.H.S. and R.H.S.) **[R7]**
4.3	Load break switch, Circuit breaker & earth switch in RMU panel	All shall be non draw out type, fixed position
4.4.1	Insulation medium for panel	SF6 gas or Dry air in sealed metallic tank
4.4.2	Breakers	SF6 gas or Vacuum type (with disconnector & earth switch)
4.4.3	Load break switches	SF6 gas or Vacuum type (With Earth Switch)
4.5	Arc interruption chamber for breaker	i) Separate for each breaker ii) Arc interruption chamber of breakers shall be separate from the main insulated tank. (Desirable feature)
4.6	Maximum dimensions for a 3 way panel (1 CB + 2 LBS)	
4.6.1	Width (measured from front)	1250 mm
4.6.2	Depth	800 mm
4.6.3	height	2000 mm

5.0 RMU panel construction

5.1	Panel type	CRCA/GI Metal enclosed, framed, Compartmentalized panel construction {R9}
5.2	Service Location	Indoor, non air conditioned environment / Outdoor with continuous ambient temperature of 50 deg C and shall be suitable for external climatic condition Resistant to water ultraviolet radiation (Canopy for outdoor application)
5.3	Mounting	Free Standing
5.4	Overall Enclosure Protection	IP4X minimum, vermin proof IP 54 (For outdoor duty)

5.5	Doors	Front access with anti theft hinge arrangement, Minimum three hinges. Hinges arrangement shall ensure that door cannot be removed.
5.6	Covers	Bolted for rear access, with handles. Support for handle shall be provided at suitable place on RMU body. **[R5]** All the accessible bolts / screws shall be vandal proof. One set of required Special tools per RMU (if any) shall be in the scope of supply.
5.7	Construction	CRCA/GI Metal enclosed, framed, Compartmentalized panel construction. CRCA thickness shall be 2 to 2.5 mm subject to type test report from CPRI/ERDA**. Sheet thickness below 2 mm in any part of RMU shall not be accepted {R9}**
5.8	Base frame	Base frame shall be made with 75mm ISMC/ISA channel for both Indoor and Outdoor type RMU. Proper Bolted fixing arrangement shall be provided for erection on RCC foundation. Also, base frame shall be painted with 2 coats of anti rust red oxide and 2 coats of bitumen paint shall be provided. {R9}Adjustable HDPE clits as cable supporting clamps for each power cable (to suit the cable size from 150 to 400 sq mm PILC / XLPE cable. Exact size shall be provided during drawing approval stage.), also cleat shall be adjustable vertically. {R9}
5.9	Lifting lugs	Four numbers
5.10	Cable Entry	Bottom 3mm metallic, removable type & split type in two parts, with 1no. 90 mm diameter knocks out punch/hole in the centre (For double cable boxes, Un-drilled gland plate to be supplied. Approval should be taken for the same during drawing submission)
5.12	Cable type & size	3c x 150 / 240 / 300/400 sq mm Aluminum conductor XLPE/ PILC with armor & PVC outer sheath {R9}
5.13	Terminals for 11kv cable termination	Suitable for Ring Type Bimetallic lug as per annexure F **[R5]**
5.13.1	Right angled boots	Single piece cold shrink type per bushing
5.13.2	Brass Nut bolt	M16 size
5.13.3	Bimetallic washers	Required
5.13.4	Termination type	suitable for heat shrinkable type
5.13.5	Termination height	For Indoor / Outdoor : Min. height from gland plate shall be 900mm **[R5]**

5.14	Bus bar	Copper with sleeve (Sizing Calculation to be submitted in support of its Guaranteed S.C. rating / Capability) {R9}
5.14.1	Bus bar continuous rated current	630amp (at designed 40 deg.C ambient) {R9}
5.14.2	Bus bar short time withstand capacity	20 KA for 3 sec **(R5)**
5.14.3	Bus bar support insulator material	SMC / DMC resin
5.14.4	Maximum temperature rise above reference ambient 40 deg C	In line with Table 3 of IEC60694
5.15	Earth bus bar	Tinned Copper flat sized for rated fault duty for 3 sec {R9}
5.16	Earth bus internal connection to all non current carrying metal parts	By 2.5 sq mm copper flexible wire, Earth connection point maximum 1 meter away from cable test facility
5.17	Earth bus external connection to owners earth	Studs on both sides with holes for M10 bolt + hardware to readily receive purchaser earth connection
5.18	Cooling arrangement	By natural air without fan
5.19	Panel internal wiring	Multi strand flexible color coded PVC insulated Cu wire 1 sq mm (SCADA) / 2.5 sq mm (for CT's) 1100 volt grade (AC-black, DC – grey, Earth – green) with ferrules at both ends.
5.20	Hardware (Nut, bolts & handle)	Stainless steel (Except termination nut-bolts which are Brass / Tinned Copper)
5.21	Gasket	Neoprene rubber
5.22	Marshalling terminal blocks	1 Sq mm, Nylon 66 material, push on type + 20% spare in each row of TB. {R9}
5.23	Panel cover fixing bolts	Allen head 6mm with hexagonal slot
5.24	Padlock facility	Required for all earth switches & all handles
5.25	Bushings for future extensions of RMU	Should be duly insulated & covered with metallic covers in unused condition
5.26	Explosion vents	To ensure operator's safety, design should ensure that gases / flames generated during flash over / blast in any of the compartment, must not come out from the front of RMU as well shall not go to adjacent cable compartment. Internal

		arc test report (for Cable compartment & other compartments) must be submitted to support above, along with RMU GA drawing indicating these vents. There shall not be any type of holes, gaps etc on the walls of cable termination compartment. **[R5]**
5.27	SF6 gas annual Loss	< 0.1% of total mass. Pressure of SF6 gas shall be above the operating limit throughout the life of the equipment.

6.0 Load break switch (LBS) / Isolator

6.1	Type	Three poles operated simultaneously by a common shaft
6.2	Arc interruption in dielectric medium	SF6 or Vacuum
6.4.2		Clause deleted. **[R5]**
6.6.1	Continuous rating of LBS	630 Amp at design 40 deg C ambient
6.6.2	Short time withstand capacity	20 KA for 3 sec **[R5]**
6.7	Fault making capacity	50 kA peak **[R5]**
6.8	Minimum number of operations at rated current (as per IEC 62271-102)	Mechanical Endurance – Class M1(1000 operations) Electrical Endurance – Class E3 (100 operations) **[R5]**
6.9	Minimum number of operations at rated fault current (as per IEC IEC 62271-102)	Class E3 (Min 10 operations) **[R5]**
6.10	Fault passage indicator (FPI) (For both Earth fault and Over Current Protection) **[R8]**	To be provided on right hand side of one LBS for panel type 1CB + 2 LBS. For all other configuration of RMU, FPI to be provided on all LBS. Wherever, there are two cables per LBS, two FPI needs to be considered for that particular LBS
6.10. 1	Earth Fault Indicator	CBCT – Split open type suitable for mounting without disconnection of cable.
6.10.2	Connection of CBCT with FPI	Cable connection of FPI with CBCT shall be of pre moulded type on the CBCT side. Cable shall be 2.5 sq.mm cu cable or {R9}

6.10.3	Fault Passage Indicator (For both Earth Fault and Over Current Protection) **[R8]**	Digital type and shall operate as the current exceeds the set value. Flash indication for identifying faults with red LED with one flash for every one sec. Test & rest button 1 NO + 1 NC potential free contact for remote indication FPI power supply unit shall use lithium battery with minimum life of 1000 blinking hours , so that FPI shall continue to function even after main feeder has tripped.
6.10.4	Data by Purchaser	
6.10.4.1	System Fault Level	2kA – 8.75kA
6.10.4.2	Type of Grounding	Solidly Grounded
6.10.4.3	Fault clearing time	100ms
6.10.4.4	Cable Type	PILC / XLPE , 70 sq.mm to 400 sq.mm {R9}
6.10.4.5	Earth Fault Indicator	
6.10.4.5.1	Sensing Current	100 to 400A {R9}
6.10.4.5.2	Sensing Time	30 to 100 ms in steps of 10ms.
6.10.4.5.3	Reset Time	0.5 -1-2-3-4 hr
6.10.4.5.4	Resetting Facility	a) Self rest after reset time b) Self rest after restoration of voltage c) Manual d) Remote resetting
6.10.4.5.5	Contact Rating	1A at 230 V
6.10.4.5.6	Degree of Protection	IP 54
6.10.4.5.7	Mounting Arrangement	Surface or Flush Mounting
6.10.4.5.8	Ambient Temperature	-20 to 50 Deg C {R9}

7.0 Circuit breaker (TCB / FCB)

7.1.1	Type	Three pole, operated simultaneously by a common shaft
7.1.2	Transformer circuit breaker -TCB	For controlling transformer, manual operation only
7.1.3	Feeder circuit breaker - FCB	For controlling cable feeder, manual operation. Remote trip operation by SCADA
7.2	Arc interruption in dielectric medium	Vacuum Bottle **(R5)**
7.3.1	Operating mechanism - TCB	Manual spring charged stored energy type
7.3.2	Operating mechanism - FCB	Manual spring charged stored energy type, remote electrical close / open operation possible.
7.4	Emergency trip / open push button	On panel front with Protective flap to prevent any accidental tripping of breaker. **[R5]**
7.5.1	Continuous rating at design 40 deg C	630amp

	ambient {R9}	
7.5.2	Short time withstand capacity	20 KA for 3 sec **(R5)**
7.6	Minimum number of operations at rated current (as per IEC 62271-100)	Mechanical Endurance – Class M1(2000 operations) Electrical Endurance – Class E2 **(R5)**
7.7	Fault making capacity	50 KA peak **(R5)**
7.8	Fault breaking capacity	20 KA Minimum **(R5)**
7.9	Maximum number of operations at rated Fault current *(as per IEC 62271-100*)	Electrical Endurance – Class E2 . To be guaranteed by manufacturer with authorized lab test reports **(R5)**
7.10	Breaker status auxiliary contact	2NO + 2NC wired to terminal block
7.11	Current transformer	1. 75-400 / 1 amp for TCB/ FCB. {R9} 2. Considering three core cable terminations, mounting flexibility shall be provided for CT's (in horizontal & vertical direction both). Additionally, CAUTION marking (by sticker/ paint) shall be provided to avoid CT's installation above the screen of cable. (I.e. earth potential point.) 3. Position of CTs inside compartment shall be adjustable in vertical and horizontal direction {R9}
7.12	CT accuracy class	5P10 minimum {R9}
7.13	Protection relay	Self powered, Microprocessor based Numerical relay (with LCD display), IDMT over current / earth fault protection with high set element, manual reset type Relay mounting flush to panel front. Relay shall be communicable for automation purposes
7.14	Relay auxiliary contacts for remote indication	Potential free contact 1NO + 1NC wired to terminal block
7.15	Shunt trip 230v AC (for WTI trip & door limit switch of Dry type transformer) & for remote trip from SCADA.	To be wired to terminal blocks (If the functional requirement is achieved by the Protection relay, then shunt trip is not required.
7.16	Breaking Timing	40 to 60 ms {R9}

8.0 Earth switch (ES)

8.1	Type	Three Pole (ON, OFF and Earth), operated simultaneously by a common shaft, for each Circuit breaker & Load break switch.
8.2	Switching in dielectric medium	Dry Air in sealed medium or SF6 gas
8.3	Operating mechanism for close & open	Manual
8.4	Fault making capacity	50 kA (Desirable)
8.5	Auxiliary contacts	1NO+1NC wired to terminal block
8.6	Disconnect switch (if provided in series with vacuum bottle)	Desirable to be located on purchaser cable connection side of vacuum bottle
8.7	Minimum number of operations at no load (as per IEC 62271-102)	Mechanical Endurance – Class M0(1000 operations) **[R5]**
8.8	Making capacity endurance of earth switch (as per IEC 62271-102)	Class E2 (Min 5 operations) **[R5]** {R9}

9.0 Requirements of sealed housing live parts

9.1	Enclosure	Stainless steel enclosure suitable for IP67. Metal thickness shall be 3mm. {R9}
9.2	SF6 gas pressure low alarm	To be given
9.3	Provision for SF6 gas filling	To be given (For 'sealed for life' design of RMU, this is not applicable)
9.4	Provision for SF6 gas pressure indication	Digital Manometer with non return valve
9.5	Arc interruption method for SF6 breaker / Load break switch	Puffer type / rotating arc type
9.6	Potential free contacts for SF6 gas pressure low	1NO +1NC (Desirable)

10.0 Operational interlocks

10.1.1	Interlock type	Mechanical
10.1.2	Load break switch & respective earth switch	Only one in 'close' condition at a time
10.1.3	Circuit breaker & respective earth switch	Only one in 'close' condition at a time

10.2	Prevent the removal of respective cable covers if load break switch or circuit breaker is 'ON'	Electrical / Mechanical
10.3	Prevent the closure of load break switch or circuit breaker if respective cable cover is open	Electrical / Mechanical
10.4		® clause deleted
10.5	Cable test plug for LBS/CB accessible only if Earth switch connected to earth	Mechanical

11.0 Indication & signals (for Local)

11.1	Operation counter on front / Inside the RMU LT chamber	To be provided for each LBS & Circuit breaker, with minimum four digits & non resettable type
11.2	Cable charge status indication for all LBS & CB	Capacitor type voltage indicators with LED on all the phases (Shall be clearly visible in day light)
11.3	Spring charge status indication	On front for breaker
11.4	Earth switch closed indication (For Each LBS)	On front
11.5	Load break switch ON/OFF indication	Green for OFF / Red for ON
11.6	Circuit breaker On/OFF indication	Green for OFF / Red for ON
11.7	Circuit breaker protection relay operated on fault	Flag
11.8	Fault passage indication on LBS	Flag
11.9	Status signals to SCADA-to be wired to marshalling terminal block	2NO + 2NC
11.9.1	LBS close / open	potential free contacts
11.9.2	LBS & CB Earth Switch close /open	potential free contacts
11.9.4	CB close / open	potential free contacts
11.9.5	Protection relay operated	potential free contacts

11.9.6	FPI operated	potential free contacts
11.9.7	SF6 gas pressure low	potential free contacts (Desirable)
11.10.1	Commands from SCADA- to be wired to marshalling terminal block	LBS close / open
11.10.2		FCB close / open
11.10.3		FPI Reset

12.0 Mimic diagram, labels & finish

12.1	Mimic	1. Mimic diagram (Shall not be accepted with Stickers) **[R5]** 2. On panel front with description of function & direction of operation of handles/buttons
	Operating Instructions	Operating instruction chart and Do's & Don'ts in Hindi / local language to be displayed on left / front side of panel enclosure on anodized Al Sheet 16SWG, duly affixed on panel.
12.2	Name plate on panel front	Fixing by rivet only
12.2..1	Material	Anodized aluminum 16SWG / SS
12.2.2	Background	SATIN SILVER
12.2.3	Letters, diagram & border	Black
12.2.4	Process	Etching
12.2.5	Name plate details	Month & year of manufacture, equipment type, input & output rating, purchaser name & order number, guarantee period
12.3	Labels for meters & indications	The label shall be riveted and not pasted on the panel compartment door. Preferable the labels shall be engraved on the plate.
12.4	Danger plate on front & rear side	Anodized aluminum 16 SWG with white letters on red background
12.5	Painting surface preparation	Shot blasting or chemical 7 tank process
12.6	Painting external finish	Powder coated epoxy polyester base grade A, shade -RAL 7032, uniform thickness 60 micron minimum
12.7	Painting internal finish	Powder coated epoxy polyester base grade A, shade -white, uniform thickness 60 micron minimum
12.8	Termination Drawing and Wiring Drawing	Printed copy shall be fixed/mounted inside each and every compartment. {R9}

13.0 Quality assurance

13.1	Vendor quality plan	To be submitted for purchaser approval
13.2	Inspection points in quality plan	To be mutually identified & agreed
13.3	Quality – Process Audits	BSES shall carryout vendor process audits.
13.4	Field quality plan	Bidder to submit field quality plan along with the bid
13.5	Spare part list	Bidder to submit detailed spare part list along with the bid
13.6	Maintenance manual	Bidder to submit maintenance manual along with the bid
13.7	Approved sub vendor List	**[R5]**
13.7.2	Fault Passage Indicator	pls refer make list
13.7.4	Self Powered O/C & E/F Relay	Ashida ADR241S-761 {R9}
13.7.5	Boots	3M / Raychem/K.D.Joshi

14.0 Inspection & testing

14.1	Type test	1. Equipment of type tested quality only, including internal arc test on various compartments like cable chamber, SF6 gas tank etc. 2. Type test certificate to be submitted along with offer for scrutiny. Type test more than 5 years old will not be acceptable. 3. a) temperature rise test b) voltage regulation test
14.2	Routine test	As per relevant Indian standard
14.3	Acceptance test	To be performed in presence of purchaser at manufacturer works
		1. Physical inspection & BOM, wiring check
		2. Insulation resistance test (Before & after HV test)
		3. HV test for one minute,
		4. Operation & interlock check
		5. Measurement of resistance of main circuit
		6. Voltage Indication check
		7. Functional testing of Fault passage Indicator for Alarm
		8. Primary current injection test for each circuit breaker feeder with relay
		9. Breaker closing & opening time measurement

15.0 Shipping, Handling and Site support

15.1	Packing Protection	Against corrosion, dampness, heavy rains, breakage and vibration
15.2	Packing for accessories and spares	Robust wooden non returnable packing case with all the above protection & identification Label
15.3	Packing Identification Label (Anodized Aluminum Plate)	On each packing case, following details are required:
		i. Individual serial number
		ii. Purchaser's name
		iii. PO number (along with SAP item code, if any) & date
		iv. Equipment Tag no. (if any)
		v. Destination
		vi. Manufacturer / Supplier's name
		vii. Address of Manufacturer / Supplier / it's agent
		viii. Description (Configuration of RMU; e.g. 1CB + 2 ISO, Manual, Extensible and Quantity must be prominently displayed at least 3 sides of packing box & on top.
		ix. Country of origin
		x. Month & year of Manufacturing
		xi. Case measurements
		xii. Gross and net weights in kilograms
		xiii. All necessary slinging and stacking instructions
15.4	Shipping	The seller shall be responsible for all transit damage due to improper packing.
15.5	Handling and Storage	1. Manufacturer instruction shall be followed. 2. Detail handling & storage instruction sheet / manual to be furnished before commencement of supply.

16.0 Deviations

16.1	a) Deviations from this specification shall be listed separately by bidder clause wise (format given below) along with optional offer and has to submit the list along with bid/quotation. BRPL will review the deviations and if BRPL is agreed with the deviation, seller has to take written confirmation from BRPL on deviation during tender evaluation. b) In the absence of any separate list of deviations from the bidders with bid as well as written confirmation from BRPL on deviations, it will be assumed by the Buyer that the Seller complies with the Specification fully. c) Any deviations mentioned in any other submitted bid documents (i.e.in filled GTP, Catalog, BRPL old approval, buyer's/seller's standards etc) by seller without separate deviation sheets will not consider as a deviation from this tech spec at any stage of contract.

Deviation sheet format.

Sl. No.	Document Name	Clause No.	Deviation	Reason	Merit to BRPL

17.0 Drawings Submission

17.1	To be submitted along with bid	The seller has to submit following:
17.1.1	GA / cross sectional drawing of product showing all the views / sections	
17.1.2	Detailed reference list of customers using the offered product during the last 5 years with similar design and rating	
17.1.3	Completely filled GTP	
17.1.4	Manufacturer's quality assurance plan and certification for quality standards	
17.1.5	Type test reports for the type, size & rating of product / equipment offered	
17.1.6	Complete product catalogue and Manual.	
17.1	Recommended spare parts and consumable items for five years of operation and spare parts catalogue with price list	
17.2	All documents as per clause 13 of this specification	
17.3	After award of contract, Seller has to submit following drawings for buyer’s Approval (A) / Reference (R)	
17.3.1	Program for production and testing (A)	
17.3.2	Guaranteed Technical Particulars (A)	
17.3.3	GA drawing	
17.3.4	Schematic and wiring drawings for all components	
17.3.5	Terminal arrangement & cable box details including gland plate arrangement etc	
17.3.6	Bill of material	
17.3.7	Detailed loading drawing to enable the buyer to design and construct foundations	
17.3.8	Transport / Shipping dimensions with weights, wheel base details, un tanking height	
17.3.9	detailed installation and commissioning instructions	
17.3.10	quality plan	
17.4	Submittals required prior to dispatch	
	-Inspection and test reports, carried out in manufacturer’s works	
	-Test certificates of all bought out items	
	-Operation and maintenance Instruction as well as trouble shooting charts/ manuals	

17.5	Drawing and document sizes	Standard size paper A3, A4
17.6	Number of Documents required at different stages shall be per Annexure-A	
Note :	Duly signed & stamped copies of the drawings / documentation are required to be submitted to BRPL for approval.	

18.0 Equipment ID [R7]

I. Equipment ID shall be painted on any appropriate face of the equipment at a clearly readable height from the base level of the equipment.

II. Font: Recommended type face for the signage is True type or Post script

III. Font Size: All painting should be in UPPERCASE. Recommended height of 50 mm with spacing between alphabets of 3 mm.

IV. Total No's of Character: 18

V. Height of Font: 50 mm

VI. Height of Base: 100 mm

VII. Spacing between alphabets: : 3 mm

VIII. Paint: Base coat – Dense Yellow. Letters – Black Quick Drying paint 2 coats.

IX. Equipment ID shall be separately provided by BRPL

Annexure A Scope of supply

1.0 The scope of supply shall include following

1.1 Design, manufacture, testing at manufacturer works before dispatch, packing, delivery and submission of all documentation the 11kv Ring Main Unit (RMU). All the manual RMU shall be compatible for retrofit solution of motorized RMU in future 11kV RMU shall be as per scheme enclosed as Annexure E.

1.2 Configuration of 11kV RMU shall be as per Purchase Requisition.

1.3 Control Center has to be carried out at all sites by vendor engineer. [R5]

1.4 Guarantee Period for RMU shall be 66 months from the date of supply or 60months from date of commissioning, whichever is earlier. [R5]

1.5 Service Performance Requirements During Guarantee Period: [R5].

1.6 Each RMU shall be supplied with 2 sets of Operating Handle. [R5]

1.7 Supplier scope includes training of BRPL team – Minimum 4 batches (each batch with 4-5 engineers) for minimum 3 days at factory for erection, commissioning,

maintenance trouble shooting of mechanism, FPI and all other components. This shall be carried out within 1 week from date of 1st shipment/ dispatch. Supplier shall also provide training for Self Powered relay at respective manufacturer' factory for 12 engineers/ technicians in 2 batches. [R5].All the trainings shall be applicable for each P.O.

1.8 Unit price for Conversion kit should be offered separately for converting the RMU from single cable termination design to double cable termination design, at site.

1.9 BOQ as following –

Sr No	Purchaser Equipment Tag No / SAP code	RMU standard configuration Type	Unit	Quantity
1		*Example – Type A2*	No	*e.g. 1*
2		*Example – Type R5*		
3				
4				

2.0 Submission of documents

	Along with offer	For Approval after award of contract	Final after approval
Documents as given in clause no 17 of specification	3 copies + 1 soft copy on CD	4 copies + 1soft copy on CD	6 copies + 1 soft copy on CD for all type of documents

3.0 Delivery schedule

3.1	Delivery period start date	-	from date of purchase order
3.2	Delivery period end date	-	as agreed with supplier
3.3	Material dispatch clearance	-	after inspection by purchaser

Annexure B Technical particulars (Data by purchaser)

Sr No	Description	Data by purchaser
1.	Reference design ambient temperature	*40 deg C*
2.	Maximum ambient temperature	50 deg c for Delhi
3.	Relative humidity	e.g. 85% for Delhi
4.	Seismic zone	e.g. 4 for Delhi
5.	Extensibility of RMU on one side is required -	Yes / No

Annexure C Guaranteed Technical Particulars (Data by Supplier)

Bidder shall furnish the GTP format with all details against each clause.
Bidder shall not change the format of GTP or clause description.
Bidder to submit duly filled GTP in hard copy format with company seal.

Sr. No.	Description	Data to be filled by Manufacturer
1	11kv RMU (as per scope of supply annexure A)	Separate GTP to be filled for each type of RMU
2	Equipment make	
	Equipment type / brand name	
3	Conformance to design standards as per specification clause no 2.0 –	Yes/No
4	Conformance to specification clause no 3.0 to 17.0 –	Yes/No
5	If NO for pt 3 or pt 4 above, Submission of deviation sheet for each specification clause no –	Yes/No
6	Panel overall dimensions in mm	
	Width (measured from front)	
	Depth	
	height	
7	Panel weight in kg	
8	Panel extensible on both sides – Yes / No	
9	Panel enclosure protection offered	
10	Panel tested for internal arc (Cable & other compartments) –Yes / No	
11	Heat generated by the panel in Kw	
12	Insulation level for complete panel	
12.1	Impulse withstand (Kv peak) -70kvp min	
12.2	Power frequency withstand (Kv rms) –	

	28kv min	
13	Bus bar	
13.1	Material & grade	
13.2	Bus bar cross section area in sq mm	
13.3	Bus bar rated current in amp i) at designed 50 deg.C ambient {R9} ii) at 50 deg.C ambient	
13.4	Max temperature rise above reference ambient of 40 deg C	
13.5	Short time current withstand capacity for 3 seconds (in KA)	
13.6	Bus bar clearances in mm P-P / P-E	
13.7	Bus bar with insulation sleeve / barriers	
13.8	Bus bar support insulator type	
13.9	Bus bar support insulator voltage class	
13.10	Bus bar support insulator minimum creepage distance / mm	
13.11	Earth bus bar material	
13.12	Earth bus bar size	
14	**Circuit breaker type – SF6 or VCB**	
14.1	Rated voltage & frequency	
14.2	Rated current in amp	
14.3	Rated breaking current – KA rms symmetrical	
14.4	Short time withstand capacity in KA for 3 sec	
14.5	Rated making current - KA peak	
14.6	Breaker total opening time at rated breaking capacity (in milliseconds)	
14.7	Number of breaks per pole	

14.8	Total length of contact travel in mm	
14.9	No of circuit breaker operation cycles (close & open) guaranteed at rated current, Electrical endurance class	25% rated current -
		50% rated current -
		75% rated current -
		100% rated current -
14.10	No of breaker opening operations guaranteed at rated fault current, Electrical Endurance Class	
14.11	No of breaker mechanical operation cycles (close & open) guaranteed at zero current , Mechanical endurance class	
14.12	Contact material	
14.13	Operating mechanism – trip free	
	Manual Spring charge type	
14.14	Feeder circuit breaker (FCB) –VCB	
14.14.3	Closing coil wattage & rated DC voltage	
14.14.4	Trip coil wattage & rated DC voltage	
14.15	Transformer CT class, ratio & Vk	
15	**Load break switch type – SF6 or VCB**	
15.1	Rated voltage & frequency	
15.2	Rated current in amp	
15.3	Load break switch total opening time at rated current (in milliseconds)	
15.4	Number of breaks per pole	
15.5	Total length of contact travel in mm	
15.7	No of LBS close & open operation cycles guaranteed at	25% rated current -
		50% rated current -
		75% rated current -
		100% rated current -
15.8	No of LBS making operations guaranteed	

	at rated fault current, Electrical endurance class	
15.9	No of LBS close & open operations guaranteed at zero current, Mechanical endurance class	
15.10	Contact material	
15.11	Operating mechanism type	
15.13	Minimum permissible SF6 gas pressure (For SF6 type RMU only)	
15.14	Capacitor type cable voltage indication provided?	Yes / No
15.15	Operation counter provided	Yes/ No
16.1	Disconnect switch continuous rating (Amp)	
16.2	Disconnect switch Short time withstand rating -20kA for 3 sec minimum	Yes / No
16.3	One LBS open operation possible in the event of loss of SF6 gas	Yes/No
17.1	Cable termination – Height of power terminal from gland plate	mm
17.2	Torque required for tightening terminal lug	
18	Mimic diagram, labels & finish as per cl no 12	Yes / No
19	Submission of RMU / component catalogue	Yes/No
20	Unit price for Conversion kit offered separately for converting the RMU from single cable termination design to double cable termination design	Yes / No
21	Earth Switch	
21.1	Minimum number of operations at no load- Mechanical Endurance class	

21.2	Making capacity endurance of earth switch – Electrical endurance class	
22	Self Powered Relay – Make / Model	As per make list (refer annexure I (Relay shall be communicable with SCADA)
22.1	CT Input	
22.2	IDMT Setting Range 4 element – Over Current & Earth fault & steps	Overcurrent- Earth Fault- Instantaneous O/C- Instantaneous E/F-
22.3	Operating Time	Over Current – Curves Instantaneous
22.4	Pick up Current	
22.5	Resetting Current	
22.6	Relay Burden	
22.7	Time Accuracy	
22.8	Tripping Coil O/P – type & duration	
22.9	Fault Current Display	
22.10	No of Fault Current Latching with time stamping	
22.11	Display Facility / Type	
22.12	Operational Indicators	
22.13	Potential Free Output Contacts	
22.14	Thermal Withstand Capacity of Relay	
23	Fault Passage Indicator	Over Current and Earth Fault
23.1	CBCT	
a	Type	
b	Mounting Arrangement	
c	CT to indicator connection	

d	ID of sensor	
23.2	Earth Fault Indicator	Make / Model as per Annexure-I
a	Sensing Current	
b	Sensing Time	
c	Indication	
d	Reset Time	
e	Resetting Facility	
f	Output Contact	
g	Contact Rating	
h	Aux Power Supply	
i	Degree of Protection	
j	Mounting Arrangement	
k	Ambient Temperature	
24	Current Transformer- Make	As per Annexure-I
24.1	Ratio	
24.2	Burden	
24.3	Accuracy Class	
25	Voltage Presence Indicator	
	Make	As per Annexure-I
	Rating	
	Model No	
26.8	Terminal Blocks, Disconnecting type fuses make	

Bidder / Vendor seal / signature ----------

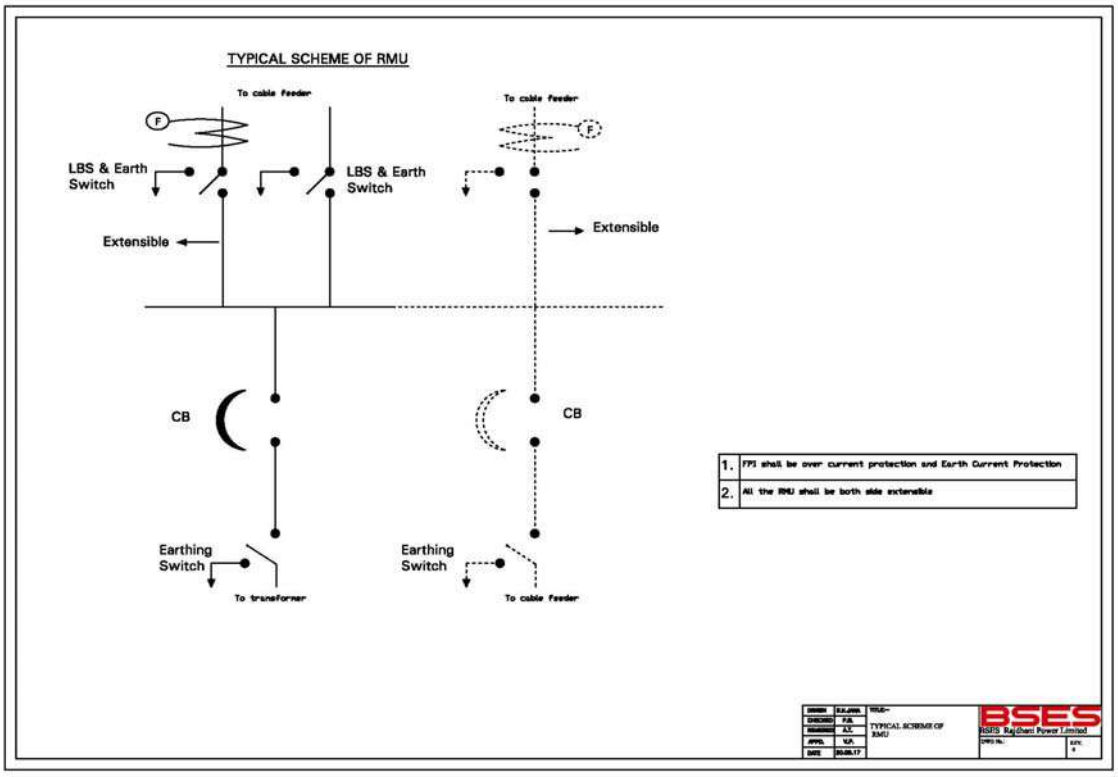
Name of the bidder	
Address of bidder	
Name of contact person	
Telephone no & email id	

Annexure D Recommended spares (Data by supplier)

List of recommended spares as following

Sr No	Description of spare part	Unit	Quantity
1		No	
2		No	
3			
4			
5			
6			

Annexure E Typical scheme of RMU



a) 11kv RMU shall have Transformer circuit breakers (TCB) with Load break switches (LBS) or Feeder circuit breakers (FCB) as per configuration defined in Purchase Requisition.c) TCB shall be operated manually only with facility for remote shunt trip.

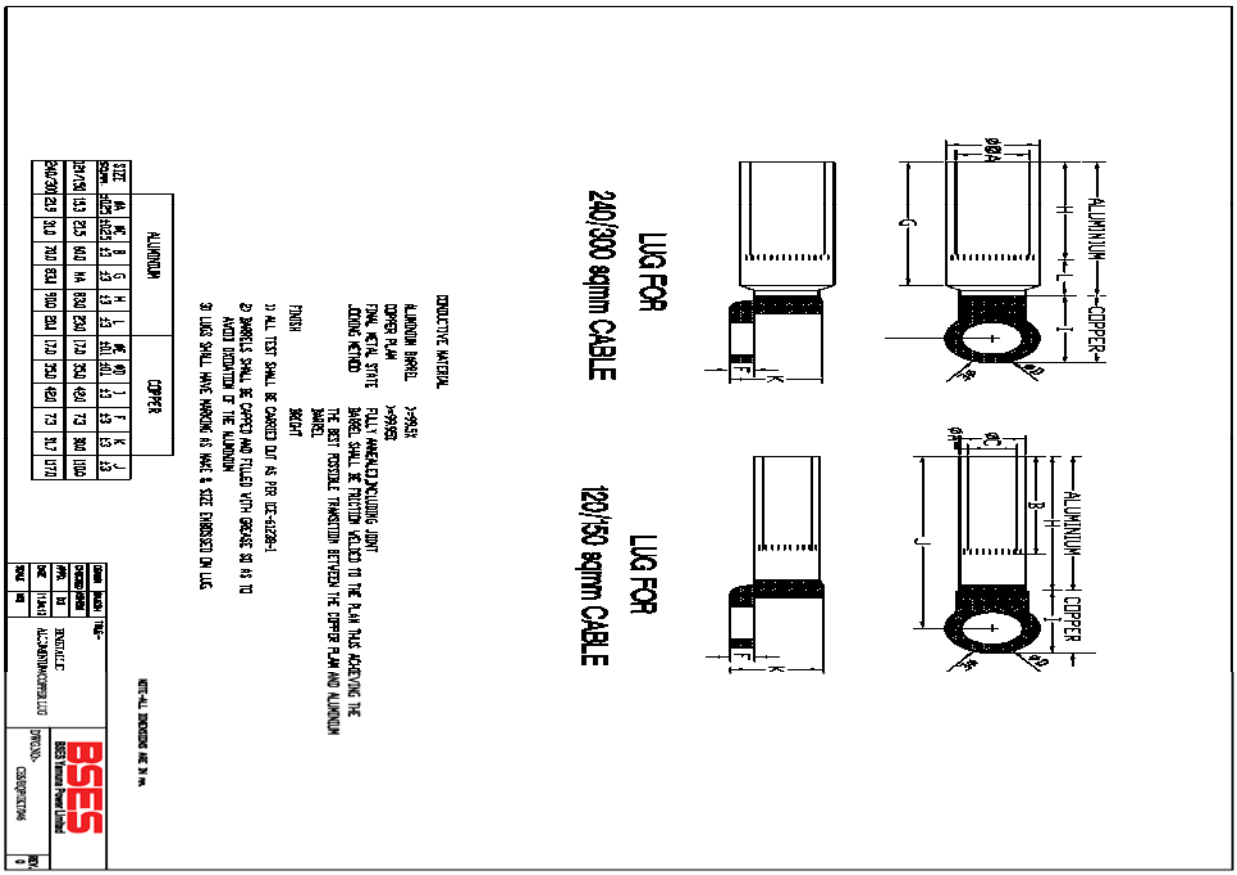
d) 11kv RMU shall be suitable for extension on sides for addition of LBS, TCB or FCB.

e) Fault passage indicator (For Both Earth Fault and Over Current Protection) including associated CT & connecting cable is shown by letter 'F'.

f) RMU Configuration-

S.no.	Item description	Type	Combination
1	3 Way	Indoor	2LBS+1VCB
2	4 Way	Indoor	2LBS+2VCB
3	3 Way	Outdoor	2LBS+1VCB
4	4 Way	Outdoor	2LBS+2VCB
5.	1 way	Outdoor	1VCB

Annexure F Drawing of Bimetallic Ring Type Lug



Annexure G(1) [R7] SERVICING AND WARRANTY REQUIREMENT-EQUIPMENT SUPPLY (11KV RING MAIN UNIT)

INDEX

1. Purpose

This document is prepared to specify the servicing requirement and Warranty / Guarantee handling procedure in case of difficulty that arises in the supplied equipment within the useful service life of the equipment being procured by BSES Rajdhani Power Limited.

2. Applicability

It is applicable to any equipment supplied directly or indirectly for installation / use in BSES Rajdhani Power Limited.

3. Priority

This document which include service, warranty / guarantees management / handling procedures shall be considered a final in case of any contradiction with other contractual document.

4. Liability

i) Supplier shall be liable to arrange OEM qualified service engineers as and when required by BSES Rajdhani Power Limited to attend defects, trouble shooting to restore equipment health to ensure 100 % capacity availability.

ii) OEM shall be liable to provide essential spares at reasonable price for entire lifespan of the equipment.

iii) Service call shall be attended within reasonable time frame as mentioned in this document.

iv) Service cannot be denied by supplier/OEM till completion of useful life of the equipment.

v) The commercial liability shall be restricted to supply/service contract provision.

It will be liability of manufacturer /vendor tie up with accessories / component manufacturer to full fill requirement stipulated this document.

5. Warranty Requirements

i) The equipment failed / malfunctioned within stipulated warranty period shall be attended free of cost for the reasons not attributed to BSES Rajdhani Power Limited.

ii) The cost incurred for service, spares, transportation, consumable and manpower / labour shall be borne by supplier.

iii) OEM is bound to send service engineer to site on request for troubleshooting promptly.

iv) There is no cap on number of visit or spare replacement required to repair / trouble soot the problem in the equipment during warranty period.

v) Each break down / problem reported shall be analysed scientifically to establish the root cause of breakdown.

vi) In case it is established that any component or accessories is not performing satisfactorily or causing repeated failure due to poor performance, manufacturing mistakes, design mistakes or not suitable to our environment condition applicable to NCR region, the OEM shall be liable to rectify or replace the same in all equipment supplied to BRPL irrespective of warranty period.

vii) In case if RMU supplier is not OEM of the equipment / accessories, the supplier will be liable to tie up with OEM to provide service / spares to meet warranty / servicing requirement stipulated in this documents.

viii) Irrespective of onsite or workshop repairing, it will be responsibility of OEM to maintain work quality to ensure no compromise on performance and useful life of the equipment.

6. Process requirements

6.1 Complain Registration.

i) Supplier to provide communication details for complaint registration in O&M Manual, on website as well as shall be printed on the equipment. In case of changes, same shall be communicated to BRPL.

ii) BRPL will register complain through a e-mail / telephonic call to the call centre / service centre

6.2 Confirmation and Service time Schedule.

i) All timing will be counted from date of call registration by BRPL till restoration of equipment health at respective site in operation condition satisfactory of BRPL engineer.

ii) Service call confirmation & service engineer visit schedule shall be provided within two hour for working hour call (09:00AM to 06:00PM, Monday to Saturday) and before 10 AM next working day for off working hour calls.

iii) Emergency trouble shooting calls - within 12 Hrs including spare arrangements.

iv) Normal trouble shooting call - within 48 Hrs.

v) On site repairing / component replacement - within 7 days.

vi) OEM workshop repairing - within 30 days including returning to BRPL stores.

vii) Replacement of complete RMU - within 45 days.

viii) The service engineer shall intimate necessary requirement to attend call along with confirmations

6.3 Site visit & Investigation.

i) The OEM shall depute qualified and experienced engineer to carryout trouble shoot as well as testing and collecting necessary data / details essential for root cause analysis.

ii) The service engineer shall collect preliminary details to understand and estimate the spare requirement, shutdown time requirement from our respective area engineer whose details will be provided along with service call.

iii) The necessary tools shall be carried by service engineer attending calls.

iv) Service engineer to get call attendance certificate from respective area BRPL engineers.

v) Service engineer to intimate necessary precaution required to prevent repetition of problem to respective area BRPL engineer as well as CES Team.

vi) Detailed technical report (root cause analysis) to be submitted to CES Team for records and analysis against each call.

6.4 Recommendation.

i) Shall be based on scientific study / test results only.

ii) Shall cover root cause analysis for failure.

iii) Shall cover spares / component list for repairing.

iv) Shall cover time requirement.

v) Shall cover site preparation / condition requirement.

vi) Other critical measures essential for quality work.

6.5 On Site Repairing.

i) All site repairing shall be under supervision of OEM engineer and shall meet all OEM recommendation to ensure quality of work.

ii) All spares arrangement shall be carried out well in advance to minimize outage time. The list must be shared with CES team

iii) Necessary repairing process to be intimated to CES team in advance. It shall include in process & final quality and performance checks / test.

iv) The repairing process shall be certified by OEM design / quality expert.

v) Detailed time schedule and spares arrangement details shall be submitted to CES team for necessary planning.

vi) The repairing work shall be witness by BRPL CES engineer, who may insist in process / performance checks / test in addition to above if felt essential.

vii) If BRPL engineer observed any quality problem / skill problem, may insist for repairing at OEM facility.

6.6 Repairing at OEM facility.

Following requirement shall be fulfilled during OEM workshop repairing work: -

i) During site inspection, if service engineer felt necessary to send equipment to OEM facility, the same shall be organized by OEM.

ii) In case if BRPL felt that site repairing is not up to the required quality or felt necessary to analyze cause of failure, the same shall be organized by OEM.

iii) Equipment unpacking, testing and opening for analysis inspection shall be carried out in presence of BRPL engineer. It shall be intimated to BRPL at least 3 days in advance for necessary travel arrangement.

iv) If cause of failure observed due to design mistake / manufacturing mistakes, the same shall be rectified in all other similar design equipments without any cost to BRPL.

v) OEM to intimate the final testing for inspection. BRPL may depute engineer or third party representative to carryout inspection / testing before dispatch.

vi) Dispatch shall be carried out only after BRPL clearance.

vii) Necessary lifting, shifting, loading / unloading & transportation arrangement shall be in the scope of OEM / supplier.

viii) A document required essential for lifting and shifting of equipment will be intimated at least two days in advance.

6.6 Witness / Inspection stages.

Even though OEM is liable for overall quality of work, BRPL may witness / Inspection following activity:-

i) On site inspection, repairing/replacement work.

ii) Testing / inspection equipments / any accessories / component to establish the cause of failure.

iii) Opening of equipment for internal part inspection.

iv) Final testing/inspection before despatch.

v) Testing / checking of the evidence causing failure / problem.

Note: It will be responsibility of OEM / Supplier to establish with facts, figure, photographs, and evidence to prove that cause of failure not attributed to design.

7 .0 Documents / records / report submission

The following be recorded and provided to BRPL by OEM against each call / repairing / rectification works for BRPL clearance and future reference:-

i) Root cause analysis report.

ii) All test report.

iii) Minutes of meeting.

iv) Spares / accessories test report / calibration certificates.

v) Proof of expenditure for cost incurred to BRPL.

vi) Copy of transportation documents.

vii) All technical details of parts / accessories being replaced.

8.0 Qualification requirements for service engineers

i) All work must be carried out by only qualified, experience engineer certified by OEM. BRPL may request qualification and experience details if felt necessary.

9.0 Safety.

i) All necessary personal protective equipments requirement for the personal and labour will be in the scope of OEM / supplier.

ii) It will be liability of OEM / Supplier to meet the necessary safety norms , standards, rules & regulation .

iii) BRPL may audit the same during on site work.

10.0 Communications.

For better coordination, single channel communication must be followed. BRPL and OEM / Supplied to communicate to each other their team for communication time to time in case of any changes.

At present, all warranty related communication is to be done with CES team.

11.0 Changes / revision management.

Necessary approval of O&M analytic cell is essential for changes in this document.
In case if any stack holders do not agree or wish to amend its content may send request to BRPL O&M analytic cell for approval.
The request will be in effect only on consideration and authorized release of revision in document by O&M analytic cell.

Annexure 'H' 11 Kv Metering Cubicle

1.0 General Requirement

1	Panel Type	Outdoor, Metal enclosed, framed, Compartmentalized panel construction
2	Service Location	Outdoor
3	Mounting	Free Standing
4	Overall Enclosure Protection	IP 54 Minimum (Complete unit i.e. RMU coupled to Metering unit shall be IP54)
5	Panel Fabrication	The metering cubicle shall be fabricated with 2.0mm CRC sheet. Load bearing members and high voltage compartments shall be 3.0 mm. The panel shall be vermin proof and totally enclosed. CT/PT compartment shall be fabricated after bending the M.S. Sheets on three sides and fourth side shall be welded to make the complete assembly tamper proof. Pressure release device/ explosion vent should be provided on the CT PT compartment at the rear side.
6	Compartmentalized panel construction	The panel shall have four separate compartments. All the compartments shall be completely segregated from each other. 1. Meter Compartment 2. CT- PT compartment 3. Incoming 4. Outgoing

7	Meter Compartment	The Upper compartment i.e. the “meter compartment” shall be suitable for housing 3 phase 4 wire Energy Meter (energy meter not in bidder’s scope of supply) and associated wiring.
7.1	Double door	1. Double door arrangement as front and back door to meet IP54 requirement. Both the doors should have 02 no’s concealed type (Anti Theft) hinges. 2. Front door should have at least 01 no's padlocking and 02 no's sealing arrangements.
7.2	Meter reading Window	Provided on front and back door to enable the meter reader to perform inspection of meter compartment and note down the reading of meter. 1. Front Door: window of size 350 (W) X 300 (H) mm approximately with colour-less transparent acrylic sheet and wire mesh welded from inside. 2. Back door: window of size 350 (W) X 300 (H) mm approximately with colour-less transparent acrylic sheet.
7.3	Data Downloading slot	Slot to facilitate installation of data downloading cable with DB9 serial connector. 1. Front door: Slot of size 25mm X10 mm (+/- 2 mm) should be provided on front door with sealable cover. 2. Back door: Slot of size 30 mm X 50 mm shall be provided to facilitate installation of data downloading cable.
7.4	Meter hanging arrangement	The meter compartment shall contain hanger arrangement of slotted angle for mounting meter so that meter can be adjusted vertically and horizontally. Two horizontal and two vertical slotted channels should be provided for the same.
8	CT PT Compartment	The CT/PT compartment shall be completed welded type and house the 11 KV dry type current transformers (3 no’s) and 3 phase dry type potential transformer.
8.1	Current Transformers	The metering current transformers shall be suitable for 11 KV; 50Hz effectively earthed neutral system. The CT shall be single core, epoxy resin cast, copper wound primary type with rated burden 5VA and accuracy class 0.5s or better conforming to IS:2705 (Part-I&II). Instrument security factor shall be less than or equal to 10. CTs should have solid copper bus bar type primary terminals for connection with main busbar/bushing terminal. Secondary terminals of CTs should be made of copper or brass.

<table>
<tr><td rowspan="7">8.2</td><td rowspan="7">STC of CT</td><td>SL</td><td>CT ratio</td><td>Short time rating</td><td>Size of main Bus bar</td></tr>
<tr><td>1</td><td>15 / 5 A</td><td>6 KA for 1 sec.</td><td>30 x 4 sqmm</td></tr>
<tr><td>2</td><td>30 / 5 A</td><td>6 KA for 1 sec.</td><td>30 x 4 sqmm</td></tr>
<tr><td>3</td><td>60 / 5 A</td><td>18KA for 1 seconds</td><td>30 x 4 sqmm</td></tr>
<tr><td>4</td><td>100 / 5A</td><td>18KA for 1 seconds</td><td>30 x 4 sqmm</td></tr>
<tr><td>5</td><td>150 / 5 A</td><td>18KA for 1 seconds</td><td>30 x 4 sqmm</td></tr>
<tr><td>6</td><td>300 / 5 A</td><td>18KA for 1 seconds</td><td>40 x 6 sqmm</td></tr>
<tr><td>8.3</td><td>Potential Transformer</td><td colspan="4">The Potential Transformer shall be dry type Epoxy resin cast, Copper wound suitable for 3 phase 11KV, 50Hz effectively earthed neutral system. The PT shall be connected in star to have ratio 11KV/√3 / 110/√3 V with rated burden of 10VA per phase and accuracy class 0.5 or better conforming to IS:3156 (Part I & II). Primary terminal of PT should be of copper. Secondary terminals of PT should be made of copper or brass.</td></tr>
<tr><td>8.4</td><td>Pressure release device</td><td colspan="4">Pressure release device/ explosion vent should be provided on the CT PT compartment at the rear side.</td></tr>
<tr><td>9</td><td>Incoming</td><td colspan="4">1. Coupled to the breaker module of RMU.
2. Coupling arrangement should meet the IP54 requirement.</td></tr>
<tr><td>10</td><td>Outgoing</td><td colspan="4">Cable compartment with cover/ door.</td></tr>
<tr><td>10.1</td><td>Cable type & size</td><td colspan="4">3C x 300 to 400 sq mm Aluminum conductor XLPE with armor & PVC outer sheath {R9}</td></tr>
<tr><td>10.1</td><td>Cable Entry</td><td colspan="4">1. Bottom
2. Gland plate - 3mm metallic, removable & split type in two parts, with 1no. 90 mm diameter knocks out punch/hole in the centre. Approval should be taken for the same during drawing submission</td></tr>
<tr><td>10.2</td><td>Cable support</td><td colspan="4">‘HDPE’ cleat(s) shall be provided.</td></tr>
<tr><td>10.3</td><td>Termination Type</td><td colspan="4">Suitable for heat shrinkable type</td></tr>
<tr><td>10.4</td><td>Terminals for 11kV cable termination</td><td colspan="4">1. Suitable for Ring Type Bimetallic lug.
2. Material of Nut, bolts and spring washer- Brass
3. Size of Nut bolt- M16</td></tr>
</table>

10.5	Termination height	From gland plate 900 mm minimum
10.6	Right angled boots	Single piece cold shrink type (make – 3M/K.D.Joshi Raychem) {R9}
11	Panel Wiring	1. Secondary wiring of CTs and PTs shall be done with 2.5 sq. mm PVC insulated cables with stranded copper conductor. 2. CT and PT wiring should run in independent rigid steel conduit pipes of appropriate size from CT/PT compartment to meter compartment. 3. Conduit pipes shall be clamped with the inner wall of the panel and shall be so laid that none of the wires can be tampered from outside. 4. Current transformer and Potential transformer secondary wiring shall be colour coded as per IS and shall be suitably ferruled for identification. 5. No link or test terminals shall be provided in wire from CT/PT to meter terminals.
12	Earthing	1. The assembly comprising of the chassis, framework and the fixed parts of the metal casing shall be provided with two separate earthing terminals of M10 or above. 2. These terminals shall be provided over and above all other means provided for securing and earthing metallic enclosures (armour or other metallic coverage) or current-carrying cables. 3. The earthing terminals shall be readily accessible and so placed that the earth connection of the CT/ PT chamber is maintained when the cover or any other movable part is removed. 4. The earthing terminals shall be protected against corrosion and shall be metallically clean. 5. Earth continuitity shall be provided to all Gesketted joints by copper braid suitable for rated fault current. 6. Under no circumstances shall a movable metal part of the enclosure be insulated from the part carrying the earthing terminals when the movable part is in place. 7. The earthing terminals shall be identified by means of the symbol marked in a legible and indelible manner on or adjacent to the terminals.

13	Bushing	Bushing should be made of homogeneous epoxy / polymeric material free from laminations, cavities and other flaws or imperfections that might affect the mechanical or dielectric quality. Bushings shall be designed to have ample insulation level, mechanical strength and rigidity for the conditions under which they will be used. The hollow porcelain bushings shall conform to IS-5621. Bushing clamping accessories, bolts, studs etc shall be hot dip galvanized. All the nuts and washer shall be SS-304. All iron parts shall be hot tin galvanized and all points shall be airtight. All current carrying contact surfaces shall be silver plated. The creepage distance of the bushing shall not be less than 31 mm/KV. Bushing shall be tested in accordance with IS-2099. Routine as well as type tests reports in conformity with IS-2099 shall be furnished to the purchaser.
14	Connections	1. No joint in the primary winding of CT shall be acceptable. 2. Connection between CT terminal and bushing terminals shall be done with solid copper busbar of adequate size. 3. Flexible copper strip / rope are not acceptable for primary connection. 4. PT should be connected to primary busbar through bus bar of appropriate size (connections using flexible conductor are not acceptable). 5. All bus bars/ connections in the CT/PT compartment shall be encapsulated in epoxy.
15	Lifting Lug	1. 04 No's lifting lugs shall be provided at the top of the metering cubicle for transportation. 2. All nuts, bolts, flat and spring washers shall be SS only.
16	Height of the Base frame	The total height including base channel shall not be more than 2000 mm. Width and depth should be minimum possible and may be increased suitably to accommodate CT's/PT's.
17	Provision for Sealing	Welded Stud with nut must be provided for the purpose of sealing on the following compartments/ locations. 1. Meter compartment 2. Coupling arrangement of RMU and metering cubicle. 3. Outgoing cable compartment

2.0 Labels & painting

1	Name plate	The metering cubicles shall be provided with a non detachable type nameplate with legible and indelible marking fixed on the enclosure sheet with welded arrangement so that in case name plate is removed no passage holes are left. (separate name plate should be provided for RMU & metering cubicle)
2.1	Location	Name plate having complete data shall be provided outside as well as inside the metering cubicle at a suitable place where it can be easily read.
2.2	Material	Anodized aluminum 16SWG / SS
2.3	Background	SATIN SILVER
2.4	Letters, diagram & border	Black
2.5	Process	Etching
2.6	Name plate details	1. BRPL Property 2. Supplier's name 3. P.O. No. & Year of manufacturing 4. Sr. No. of metering cubicle 5. Particulars of CT's such as ratio, VA burden, accuracy class, SC rating, BIL. 6. Particulars of PT's such as ratio, accuracy class, VA burden, BIL. 7. Standard connection diagram 8. Consumer account no 9. Sanctioned load. 10. Date of release of connection.
2.7	Labels for CT Ratio	On CT PT compartment by anodized aluminum with white character on black background OR 3 ply lamicoid
2.8	Danger plates	1. On CT PT compartment and each cable compartment 2. Anodized aluminum 16 SWG with white letters on red background
2.9	BSES Insignia	a) 01 no's b) Shall be etched on anodized aluminium 16SWG / SS

		plate. c) Details shall be finalized during drawing approval.
2.10	Enclosure painting surface preparation	7 tank chemical process
2.11	Enclosure painting internal/ external finish Powder coated epoxy polyester base	Hot dip galvanizing – 80 micron thick grade A, shade - RAL 7032, uniform thickness 60 micron minimum.

3.0 Technical requirement of CT and PT

SL	Description	Requirement for CT	Requirement for PT
1	Nominal System Voltage (KV rms)	11KV	11KV
2	Highest System Voltage (KV rms)	12KV	12KV
3	Type	Single phase Indoor CT's	Three phase Star/Star PT.
4	Accuracy Class	0.5s	0.5
5	Rated frequency	50Hz	50Hz
6	Rated Secondary Current Amp.	5 Amp	N / A
7	Rated continuous thermal current	1.2 times of rated primary current,	NA
8	Max Ratio error	As per IS 2705	As per IS 3156
9	Max Phase angle error	As per IS 2705	As per IS 3156
10	Rated burden	5VA at 0.8 pf (Lag)	10VA/ phase at 0.8 pf (Lag)
11	Rated voltage factor	N / A	1.2 times continuous and 1.5 times for 30 seconds
12	Short time current rating		
12.1	Thermal rating	As provided in section 3.2	N / A
12.2	Dynamic rating	2.55 times of short time thermal current rating	N / A

13	One minute high voltage power frequency withstand voltage		
13.1	On primary winding KV rms On secondary winding KV rms	28KV (rms) for 1 minute for 11 KV class 3KV (rms) for 1 minute	28KV (rms) for 1 minute for 11 KV class 3KV (rms) for 1 minute
13.2	1.2 / 50 impulse withstand voltage	75 KV (peak) for 11 KV class	75 KV (peak) for 11 KV class
14	Winding materials	Copper	Copper
15	Insulation security factor	< 10	N / A

4.0 Inspection & testing

1	Type test	1. Metering cubicle shall be type tested as per IS 3427 2. CT and PTs shall be type tested as per IS2705 and IS3156 respectively. 3. Bushings shall be type tested in accordance with IS2099. 4. Type tests should not pertain to period earlier than five Years.
2	Routine test	1. Metering cubicle shall be tested as per IS 3427 2. CT and PTs will be tested in accordance with IS2705 and IS3156 respectively. 3. Temperature rise test will have to be carried out during Inspection. 4. During inspection, all routine and acceptance tests shall be carried out in presence of purchaser's representative.
3	Physical Inspection	1. Checks of all mounting plates / fasteners. 2. Checking of components as per drawing. 3. Electrical circuit's fasteners tightness / surface area contacts. 4. Labels / identification / nameplates. 5. All doors checks – safety and accessibility. 6. Panel surface finish / smoothness.

4	Right to waive off tests	Reserved by Purchaser

5.0 Guaranteed Technical Particulars (Data by Supplier)

SL	Description	Requirement	Data By Supplier
1	Name of Manufacturer		
2	Type and Designation	Outdoor type with resin cast CT and PT	
3	Normal system voltage	11KV	
4	Highest system voltage	12KV	
5	Frequency	50Hz	
6	Insulation Class		
7	Impulse Withstand Voltage (On assembled CT-PT set)	75 KV peak	
7.1	One minute power frequency dry withstand voltage (On assembled CT-PT set Primary)	28KV rms	
7.2	Secondary	3KV rms	
8	Current Transformers:	(3 nos. total, 01 no. per phase)	
8.1	Type	Resin cast wound type	
8.2	Transformation ratio (CT Ratio)	As per requirement	
8.3	Rated Output (VA Burden)	5VA	
8.4	Class of accuracy	0.5s	
8.5	Rated continuous thermal current	1.2 times of rated primary current	
8.6	Short time thermal current rating for one second	As per CT ratio and specification	
8.7	Rated Dynamic current	2.55 times of short time thermal current rating	
8.8	Security factor	Less than 10	

SL	Description	Requirement	Data By Supplier
8.9	Insulation level	28KV for 1 min	
8.10	No. of cores	One	
8.11	Max Ratio error	As per IS:2705/1992	
8.12	Max phase angle error	As per IS:2705/1992	
8.13	Max. temp rise over max ambient temp of 50 deg C at rated continuous thermal current at rated frequency & withstand burden	As per IS:2705/1992	
8.14	Make and Grade of epoxy resin	Cycloaliphatic {R9}	
9	Potential Transformers	(3 Phase 4 wire unit)	
9.1	Burden in VA/Phase	10 VA/phase	
9.2	Transformation ratio	11KV/110V (L-L)	
9.3	Class of accuracy	0.5	
9.4	Winding connection	Star/Star	
9.5	Insulation level	28KV for 1 min	
9.6	Rated voltage factor and time	1.2 continuous and 1.5 for 30 seconds	
9.7	Temp rise over max ambient temp	Within limits of IS-3156/1992	
9.8	Max phase angle error	Within limits of IS-3156/1992	
9.9	Max Ratio error	Within limits of IS-3156/1992	
9.10	Make and Grade of epoxy resin	Cycloaliphatic {R9}	
10	Size of main bus bar		
10.1	For CT ratio less than and equal to 150/5	30 x 4mm (minimum)	
10.2	For CT ratio of 400/5 {R9}	40 x 6mm (minimum)	

SL	Description	Requirement	Data By Supplier
11	Core material	CRGO (Virgin grade)	
12	Minimum creepage for HT Bushing	341mm	
13	Clearances a. Phase to phase clearance b. Phase to earth clearance		
14	No. of Paint coats a. Primer b. Enameled RAL 7032	2 coats 2 coats	
15	Weight of complete unit		
16	Gauge of a. Meter box b. HT compartments	2mm (min) 3 mm (min)	
17	Dimensions of complete Metering cubicle a. Height (mm) b. Breadth (mm) c. Length (mm)		
18	Meter compartment		
18.1	Dimensions of meter compartment with double door (minimum sheet thickness 2mm) a. Height (mm) b. Breadth (mm) c. Length (mm)		
18.2	Protection class	IP 5X	
18.3	Provision of Acrylic window		
18.4	Provision of slotted channel (40*12mm) suitable for 6mm bolts (4 Nos)	Required	
18.5	Provision of Pad locking & sealing arrangement of door		
18.6	Provision of mounting metering reading port on door.		
19	Metering cubicle mounting	Floor mounting	

Annexure 'I' Make list

Make List of RMU's Accessories {R9}		
Sl. No.	Descriptions	Make
1	Relay (Self Power+ AUX DC/ACSupply+ Communicable)	Ashida 241S-761
2	CT	Narayan Power Tech (NPT)/Gilbert Maxwell, 400/75-1/1, 5P10, 2.5 VA, Pragati, Nortex
3	FPI (Both for Earth Fault and Over Current Protection)	EMG/C&S/Schneider/SIEMENS
4	CBCT (Both for Earth fault and Over current protection)	EMG/C&S/Schneider/SIEMENS
5	Boot	3M/Raychem/K.D.Joshi
6	Wire	Polycab/Havells/Finolex/KEI
7	AC & DC MCB	SIEMENS/Havells/C&S/ Schneider
8	Disconnecting type fuses	Connectwell/Wago/Phoenix/Elmex
9	TB (disconnecting type)	Connectwell/Wago/Phoenix/Elmex
10	Vacuum Interrupter	CG/ ABB/Schneider/SIEMENS/other type tested

Annexure 'J' Type test

The entire product shall be type tested from CPRI / ERDA. In case of new offer or type test report is older than 5 years, bidders shall carry out type tests from CPRI / ERDA without any cost implication to BRPL

Annexure-K -Special Technical Requirement: {R9}

Sl. No	Descriptions
1	Animated video for ETC guide of RMU shall be submitted to BRPL before delivery of first lot
2	Relay Protection setting (min 10%)
3	All the communicable accessories shall have Latch contact
4	NO/NC contact for manometer shall be provided

Sl. No	Descriptions
5	--Bidders shall have additional RMU readily available of each type to replace under warranty faulty RMU in case it is repairable at OEM factory --In case of under warranty failure and if the faulty RMU is repairable only at OEM factory, bidder has to replace the faulty RMU during lifting with new/ operatable same type of RMU within the time period mentioned in the tech spec warranty clauses. --BRPL shall not issue any RMU from their assets for replacement activity. In case of delay, penalty shall be imposed as per this corrigendum sl no 9 --After Warranty period completion (5 years), these clause shall not be applicable to OEM
6	Sample RMU
6.1	1 sample RMU of each type shall be manufactured as per BRPL specification after award of PO. BRPL will do the routine testing and inspection of the sample RMU and if found satisfactory as per BRPL specification, BRPL will give clearance/ approval for bulk manufacturing
6.2	During inspection of the sample RMU, BRPL may ask the vendor to modify/ change the design as per BRPL requirement including the make of accessories mentioned in the specification. OEM is liable to modify the design irrespective of the offer submitted during tender stage. However, BRPL will not ask for the requirement beyond the technical specification.
6.3	The lead time required to arrange the accessories/ to modify the design required as per BRPL requirement shall be in the account of bidder.
6.4	BRPL is not liable to bear any extra cost, out of the PO for the approval of sample RMU and the bulk quantity afterwards.
6.5	The sample may be used in BRPL network based on fulfilment of technical requirement and BRPL approval. Else fesh RMUs as per the approved sample shall be supplied in line with PO quantity.
6.6	During bulk manufacturing and PO execution, BRPL may ask necessary changes to be done (if required). Bidder is liable to provide the required changes as per the BRPL requirement irrespective of the offer / design given during tendering stage without any cost implication to BRPL. However, BRPL will not ask any changes out of BRPL Technical specification
7	Warranty clause's terms & conditions mentioned in the technical specification Annexure- G(1), Clause no-6.2 shall be strictly followed by the OEM, in the event of violation of warranty clauses, BRPL is liable to impose penalty with1% of RMU unit rate per day basis (Unit rate shall be considered as per the PO)
8	Submission of Type test report (not more than 5 years from the date of tender opening) of internal arc for 1 sec (AFLR 20kA for 1 sec) from CPRI/ERDA is mandatory with minimum 3 way RMU configurations.
9	Complete Civil foundation Drawing along with sectional view (RCC casting shall be followed) and Bar Bending Scheduled (BBS) shall be submitted by bidders

Sl. No	Descriptions
	along with drawing
10	Submission of 3nos as built drawing to BRPL before dispatch of first lot of material is mandatory. Also one set of as built drawing shall send with each unit of supplied RMU. Proper holding arrangement to be provided to place as built drawing inside the RMU.
11	Test bushing feature-The bushing of RMU must have the feature of “Test Bushing”.
12	Broken conductor feature in relay-The relay must have the feature of detecting change in impedance (negative phase sequence over current)
13	BRPL may conduct stage wise inspection of RMU manufacturing at vendor works. OEM is liable to intimate the manufacturing scheduled along with related dates before commencement of manufacturing.

BSES

Technical Specification

Specification for MCCB for Package Substation

DOCUMENT NO. -BRPL/PM CELL/PSS/ MCCB/001

Prepared by:		Approved by:		Rev	Date
Name	Sign	Name	Sign		
Supriya Raina		Gopal Nariya		R0	18.07.2016

INDEX

1.0 SCOPE OF SUPPLY

Design, Manufacture, Testing at manufacturers works before dispatch, Packing, Delivery of material and submission of documents to purchaser

2.0 CODES & STANDARDS

MCCB shall conform to specification & latest revision of codes with all amendments –

	Standard no	Title
2.1	IEC 60947	Low voltage switch gear & control gear – part 2, 3 & 4
2.2	IS 13947	Low voltage switch gear & control gear
2.3		Indian electricity rules 1956

3.0 SERVICE CONDITION

MCCB shall be designed to work for following conditions –

3.1	Supply voltage	3 phase – neutral, AC 415 volt
3.2	Supply frequency	50 Hz
3.3	Location	Indoor
3.4	Pollution	High corrosive dust
3.5	Humidity	90% maximum
3.6	Ambient temperature	Average 35^{0} C, Maximum 50^{0} C

4.0 MCCB (MOLDED CASE CIRCUIT BREAKER)

	MCCB shall have following features -	
4.1	Standard Current Rating in Amp at 50 Deg C, (IN)	400/630 A as per purchase enquiry / order
4.2	MCCB Installation	Horizontal or Vertical Mounting
4.3	Housing	Thermoplastic Material resistant to fire & abnormal heat, non-hygroscopic
4.4	Choice of use or Bus Bar and / or cable at terminal	Required. Terminal shall be suitable for termination of 300sqmm Aluminum cable lugs
4.5	Terminal	Silver Coated copper with phase barriers, spreader terminals & shrouds.
4.5.1	Spreader Size & Material	Minimum - 50 (W) x 50 (L)x10 (D) mm-Cu suitable for bimetallic joint i.e. for aluminum bus / cable lugs
4.6	Terminal suitable for	Al / Copper Cable or Bus Bar
4.6.1	Rating 400A	Suitable for one Al lugs of 300 sq mm (As per Table – 2 of IS:8309)
4.6.2	Ratings 630A	Suitable for two Al lugs of 300 sq. mm (as per Table 2 of IS:8309), which may be connected back to back
4.7	Operating Handle	Required

4.8	MCCB position indication	ON, OFF & Trip
4.9	MCCB Ingress Protection	IP2X Minimum
4.10	Pollution Degree as per IS	Minimum 2
4.11	MCCB Protection	Thermal magnetic +earth fault
4.12	Product Information	As per clause 5 of IS: 13947 Part-I, Purchased Name shall be marked on front of device.
4.13	Additional Features	Sealing/padlocking of operating knob in OFF position Isolation suitable with positive contact Indication

5. 0 OPERATIONAL FEATURES

MCCB shall have following features :-

5.1	Number of Poles	Three pole, one break per pole
5.2	Rated Operational Voltage (V)	415
5.3	Rated Insulation Voltage (V)	800
5.4	Rated Impulse Voltage (KV)	8 KV
5.5	Category of Utilization (Rating up to 400A, 630A)	A
5.6	Rated Ultimate breaking capacity at rated Voltage (Rating up to 630A) I cu .	36KA
5.7	Rated Service breaking capacity at rated Voltage Ics	100 % I cu
5.8	MCCB Mechanical & Electrical endurance	As per IS 13947/IEC
5.9	De-rating at 50 Degree Celsius atmospheric temperature	No De-rating (0 %)
5.10	Tripping characteristic required	
5.10.1	Overload Setting	Range 60 – 100 % In (Set on 95%)
5.10.2	Short Circuit Setting	Range 200-1200% In (Set on 300%)
5.10.3	Earth Fault Setting	To be provided
5.11	MCCB Clearances in Air	As per table XIII of IS 13947-1
5.12	MCCB temperature rise limits	As per table 2 & 3 of IS 13947-1

6.0 TESTING & INSPECTION

MCCB shall have following features –

6.1	Type test as per clause 8.3.1 of IS13947	Only type tested MCCB shall be Accepted
6.2	Type Tests reports as per IS-13947-2 / IEC-60947	To be submitted by vendor
	Test reports from CPRI/ ERDA or NABL accredited laboratory only acceptable	
6.3	Type test report validity	valid for last 5 years
6.4	Inspection test witness by Purchaser	On samples selected from lot
6.5	Acceptance & routine test	As per relevant IS /IEC on each lot
6.6	Inspection by Purchaser	On 15 days advance notice

7.0 PACKING & DELIVERY

MCCB packing & delivery shall have following features –

7.1	Packing protection	Against shocks, vibration & corrosion
7.2	Packing identification labels as per IS / IEC	To show purchaser name, PO number, quantity of MCCB, MCCB type, Manufacturer serial number.
7.3	Handling instruction	To be marked on packing boxes

8.0 DOCUMENTATION & DEVIATION

8.1	Deviations to specification to be submitted in writing by Vendor. Bidder to submit copy of specification & GTP with seal & signature on each page.	
8.2.1	Technical bid submission to include	Duly filled GTP,
8.2.2		Valid type test report
8.2.3		Sample of fixture offered
8.2.4		MCCB catalogue, GA drawing, curves

ANNEXURE A - GUARANTEED TECHNICAL PARTICULARS

Bidder to submit hard copy duly filled & signed along with techno commercial offer.

Bidder to submit separate GTP for each type of MCCB –

Sr. No.	Item Description	Requirement	Data by Vendor
1	Manufacturer Details		
1.1	Company Name		
1.2	Address		
1.3	Contact Person		
1.4	Telephone No/ Email ID		
2	MCCB Rated Current at 50 deg C atmospheric temperature (After De-rating)	400A/630A as per enquiry	
3	No of Poles	Three	
4	Rated Voltage	415V	
5	Rated Insulation Voltage	800V at 50Hz	
6	Rated Impulse withstand Voltage	8KV Minimum	
7	Category of Utilization (Rating 400A & 630A)	A	
8	Rated Ultimate Breaking Capacity at Rated Voltage (Rating 400A & 630A) –I cu	Icu - 36KA Minimum	
9	Rated Service Breaking Capacity at rated Voltage - Ics	Ics =100% Icu	
10	MCCB Mechanical & Electrical Endurance	As per IS 13947 / IEC	
11			
12	De-rating of MCCB	0 % at 50 degree C Atmospheric temperature	
13	MCCB clearances in air	As per table XII of IS 13947-1	
14	MCCB temperature rise limits	As per table XIII of IS-13947-1	
15	MCCB Installation	horizontal or vertical mounting	
16	Housing	Thermoplastic material resistant to fire & abnormal heat, non-hygroscopic	
17	Choice of use of bus bar or cable at terminal	Provided	
18	Terminal	Silver coated copper with phase barriers, spreader terminals & shrouds	
	Spreader Size & Material	Minimum - 50 (W) x 50 (L) x 10 (D) mm - Cu suitable for bimetallic joint i.e. for	

		aluminum bus / cable lugs.	
19	Termination suitable for	Al cable / Cu bus bar	
19.1	Rating 400A	Suitable for one Al lugs of 300 mm^2 (as per Table-2 of IS:8309)	
19.2	Rating 630A	Suitable for two Al lugs of 300 mm^2 (as per Table-2 of IS:8309), which may be connected back to back	
20	Operating Handle	Required	Yes / No
21	MCCB position indication	ON , OFF & trip	Yes / No
22	MCCB Ingress Protection	IP2X Minimum	Yes / No
23	Pollution Degree as per IS	Minimum 2	Yes / No
24	Product Information as per Clause 5 of IS:13947/ Part - I	In addition, Name of purchaser shall be marked on front on devices as BSES	Yes / No
25	Tripping Mechanism / Releases		
25.1	Rating up to 400A & 630A	Thermal Magnetic	
26	Tripping characteristic requirement		
26.1	Overload Setting	Range 60 – 100 % In (Set on 95%)	
26.2	Short Circuit Setting	Range 200-1200 % In (Set on 300%)	
26.3	Earth Fault Setting	To be provided	
27	MCCB Dimensions	L X B X H in mm	
28	MCCB Features	Sealing / Padlocking of operating knob in OFF position	
		Isolation Suitability with positive Contact Indication	
29	Copy of Type Test Report	Submitted along with GTP?	Yes / No
30	Copy of MCCB Catalogue	Submitted along with GTP?	Yes / No
31	Spreader drawing	Submitted along with GTP?	Yes / No
32	Deviation Sheet	Submitted along with GTP?	Yes / No

Name, Address & Contact Details of Vendor - _____

Vendor Contact Person Name & Signature - _____