BSES Yamuna Power Limited

NOTICE INVITING TENDER (NIT)

SUPPLY, INSTALLATION, TESTING & COMMISSIONING

OF

11KV SMART PACKAGED SUBSTATION WITH 2000KVA OIL TYPE TRANSFORMER OF VARIOUS TYPES

NIT NO: CMC/BY/25-26/RS/SkS/SV/14
[RFx Number: 2200000140]

Due Date for Submission: 25.09.2025, 15:00 HRS

BSES YAMUNA POWER LIMITED (BYPL)
CONTRACTS & MATERIALS DEPT.,
SHAKTI KIRAN BUILDING, KARKARDOOMA,
DELHI-110032
CIN: U40109DL2001PLC111525
WEBSITE: www.bsesdelhi.com

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BSES Yamuna Power Limited

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VOLUME – I: INFORMATION TO BIDDER (ITB)

BSES

SECTION – I: REQUEST FOR QUOTATION

1.00 EVENT INFORMATION

1.01 BSES Yamuna Power Ltd (hereinafter referred to as **"BYPL"**) invites **Open Tender** in the E-Tender Bidding Process on a "Single Stage: Two Parts" from interested Bidders as detailed below:

Tender Description	Tender Fee (₹)	Estimated Cost (₹)	EMD Amount (₹)	Delivery at
Supply, Installation, Testing & Commissioning of 11kV Smart Packaged Substation with 2000kVA Oil Type Transformer of various types	1,180	3.89 Crore	7.78 Lakh	Delhi Store(s)/ Site(s)

The bidder must qualify the requirements as specified in clause 2.0 stated below.

1.02 The tender document is available for downloading from our website www.bsesdelhi.com **--> BSES YAMUNA POWER LTD --> Tender --> Open Tenders** or through our E-Tendering portal link (https://srmprdportal.bsesdelhi.com/irj/portal).

1.03 **Tender Fee**: The bidder has to compulsorily submit the non-refundable tender fee of **₹ 1,180/-** as demand draft or online transfer of the requisite amount through IMPS/NEFT/RTGS covering the cost of bid documents. Any such bid submitted without this Fee shall be rejected.

1.04 **Earnest Money Deposit (EMD)** of ₹ 7,78,000/- (Seven Lakh and Seventy Eight Thousand only) valid for 120 days from the due date of bid submission in the form of BG/FD/online transfer of the requisite amount through IMPS/NEFT/RTGS. Any such bid submitted without EMD shall be rejected.

1.05 **TIME SCHEDULE**

The bidders should complete the following events within the dates specified as under:

S. No.	Events	Due date & Time
1	Date of availability of tender documents from BYPL Website & SRM	up to 25.09.2025, 15:00 Hours
2	Date & Time of Pre-Bid Meeting Pre-Bid Meeting will be done online, Register in advance for this meeting via, the Zoom Meeting link: https://zoom.us/j/99953564558?pwd=cRAfeIqsHNHNbe8rGYM6DZrYXSGU83.1 After registering, you will receive a confirmation email containing information about joining the meeting.	12.09.2025, 14:00 Hours
3	Last Date of receipt of pre-bid queries, if any (Queries to be submitted via e-mail)	12.09.2025 up to 18:00 Hours
4	Last Date of replies to all the pre-bid queries as received	16.09.2025 up to 17:00 Hours
5	Last date and time of receipt of Complete Bids (Tender Fees, EMD, Part A & Part B)	25.09.2025, 15:00HRS
6	Date & Time of Opening of PART A – EMD and Technical Bid	25.09.2025, 16:00HRS
7	Date & Time of opening of Price/RA of qualified bids	Will be notified to the qualified bidders through our website/e-mail

Note: In the event of the last date specified for submission of bids and the date of opening of bids is declared as a closed holiday for the BSES office, the last date of submission of bids and date of opening of bids will be the following working day at the appointed times.

1.06 The Bid shall be submitted online in two (02) parts. Details of the parts are as follows:
Part A – Techno Commercial Bid
Part B – Price Bid
Bids will be submitted online and received up to **25.09.2025, 15:00 Hr.** at the address given below.
Part A of the Bid shall be opened online on **25.09.2025, 16:00 Hr.**
Part B of the Bid will be opened in case of Techno-Commercially Qualified Bidders and the date of opening of same shall be intimated in due course. It is the sole responsibility of the bidder to ensure that the bid documents are submitted online and reach this office on or before the last date.

Head of Department
Contracts & Materials Deptt.
BSES Yamuna Power Ltd
Reception, Ground Floor
Shaktikiran Building, Karkardooma
Delhi 110032

All envelopes shall be duly superscribed "**Bid for Supply, Installation, Testing & Commissioning of 11kV Smart Packaged Substation with 2000kVA Oil Type Transformer" "CMC/BY/25-26/RS/SkS/SV/14 [RFx No. 2200000140] DUE ON 25.09.2025, 15:00 Hr.**"

1.07 BSES Yamuna Power Ltd reserves the right to accept/reject any or all tenders without assigning any reason thereof in the event of the following:

a) Tender is received after the due date and time.
b) Tender fee of requisite value is not submitted.
c) Earnest Money Deposit (EMD) of requisite value & validity is not submitted in the shape of a Bank Guarantee drawn in favour of BSES Yamuna Power Ltd, payable at Delhi or Online transfer of requisite amount through IMPS/NEFT/RTGS.
d) Price Bid as per the Price Schedule is not submitted.
e) Incomplete Bids.
f) Necessary documents against compliance to Qualification Requirements mentioned in Section 1 Clause 2.0 of this Tender Document.
g) Complete documents/details are not enclosed as per the Bid Index for Part-A (Technical Bid) at APPENDIX I ANNEXURE – 1.01.
h) Filled in Schedule of Deviations as per Annexure is not submitted.

2.00 QUALIFICATION CRITERIA

The prospective bidder must qualify for all of the following requirements and shall be eligible to participate in the bidding who meets the following requirements and management has a right to disqualify those bidders who do not meet these requirements.

2.01 **Technical Criteria:**

S. No.	Criteria	Documents to be submitted by the bidder
1	The bidder must have its own established manufacturing or assembly facility in India for Package Substation with a rating of 11	i. Valid Certificate of Incorporation & Factory (Manufacturing) Licence.

	kV, 2000 kVA or higher, operational for a minimum of 3 years.	ii. The details of manufacturing units, locations and works from where supply against this tender shall be proposed to be furnished.
2	The bidder must be the original manufacturer of at least one of the two principal components of Package Substations, namely, the 11KV RMU or the Distribution Transformer, and must include that component in their offer. Or Bidder may supply major equipment's (11kV RMU / Transformer / ACB) from BYPL approved make mentioned in Technical Specification	i. Confirmation and supporting documentary proof of the equipments offered by the manufacturer. Or ii. Self Undertaking to supply major equipment's (11kV RMU / Transformer / ACB) from BYPL approved make mentioned in Technical Specification, if applicable.
3	The bidder must have successfully supplied at least Ten (10) units of Package Substations rated at 11 kV, 1,000 kVA or higher, within the last seven (7) years from the date of bid opening, to any Utility, State Electricity Board (SEB), Public Sector Undertaking (PSU), Government organization or other reputed organisation.	i. Summary list of executed Purchase orders (Details to be submitted as per the format enclosed in APPENDIX I - ANNEXURE – 1.09) ii. Copies of the relevant Purchase Orders iii. Material delivery clearance certificate copy or Invoice Copies or Delivery completion/ Performance certificate
4	The bidder must provide performance certificates substantiating the satisfactory performance of Package Substations (11/0.415 kV, 1,000 kVA or higher) supplied within the last seven (7) years from bid opening, issued by any Utility, SEB, PSU, Government organization. In case the bidder has previously supplied such products/services to BRPL/BYPL, performance feedback from BRPL/BYPL shall prevail and be considered final, irrespective of certificates from other organizations.	Performance Certificates (Details to be submitted as per the format enclosed in APPENDIX I - ANNEXURE – 1.10)
5	The bidder should have servicing, repairing, testing & refurbishment facility in Delhi-NCR with necessary spares and testing equipments for providing prompt after-sales service.	Relevant facility details/certificates/undertaking substantiating the infrastructure available, to be submitted along with a written undertaking confirming declared infrastructure
6	The bidder must have an installed plant capacity to supply a minimum of 5 units of Package Substations per month.	Installed Manufacturing Capacity Certificate (duly certified by the CE/CA/DIC/Self-Undertaking/ Government Organization/others)
7	The bidder must possess valid ISO 9001:2015 certification.	Valid copy of Certification

2.02 **Commercial Criteria:**

S. No.	Criteria	Documents to be submitted by the bidder

8	The bidder must have an average annual sales turnover of not less than INR 10 Crore in the last three (3) financial years (i.e. FY 2022-23, 2023-24, and 2024-25).	i. Audited Balance Sheet and Profit & Loss Account Or ii. Duly certified CA certificate having UDIN to be submitted (Details to be submitted as per the format enclosed in APPENDIX I - ANNEXURE – 1.14)
9	The bidder must submit an undertaking stating that no litigation is pending with BYPL or any of its group/associate companies as of the date of bid opening.	Self-Undertaking (as per the format enclosed in APPENDIX I - ANNEXURE – 1.15) (Details to be submitted as per the format enclosed in APPENDIX I - ANNEXURE – 1.14)
10	The bidder must submit an undertaking (self-certification) that they have not been blacklisted or debarred by any Central / State Government Institution or Electricity Utility in India as of the date of bid opening.	Self-Undertaking (as per the format enclosed in APPENDIX I - ANNEXURE – 1.15) (Details to be submitted as per the format enclosed in APPENDIX I - ANNEXURE – 1.14)
11	The bidder must hold a valid PAN and GST Registration Number, and shall undertake to comply with all other applicable statutory laws and regulations prior to commencement of supply/work.	i. Copies of PAN and GST registration certificates ii. Self-undertaking confirming compliance with all statutory obligations (as per the format enclosed in APPENDIX I - ANNEXURE – 1.15) (Details to be submitted as per the format enclosed in APPENDIX I - ANNEXURE – 1.14)

Notwithstanding anything stated above, BYPL reserves the right to assess the bidder's capability to perform the contract, assess the capability and installed capacity of the Bidder for carrying out the supplies, should the circumstances warrant such assessment in the overall interest of the purchaser. In this regard the decision of the purchaser is final.

3.00 BIDDING AND AWARD PROCESS

Bidders are requested to submit their offer strictly in line with this tender document. Normally, the deviations to tender terms are not admissible and the bids with deviations are liable for rejection. Hence, the bidders are advised to refrain from taking any deviations on this Tender. Still, in case of any deviations, all such deviations shall be set out by the Bidders, clause by clause in the "Annexure - Schedule of Deviations" and the same shall be submitted as a part of the Technical Bid.

3.01 BID SUBMISSION

BIDS ARE INVITED THROUGH THE E-PROCUREMENT PORTAL:
BSES will carry out E-Procurement through its e-procurement portal (https://srmprdportal.bsesdelhi.com/irj/portal).

Interested Non-registered bidders are requested to obtain the portal user name and password (if not available) for bid submission. For participating in e-Tenders of BYPL, please write a mail to
1. Mr Rakesh Sharma, E-mail: Rakesh.Ku.Sharma@reliancegroupindia.com,

2. Mr Sumit Verma, E-mail: Sumit.Ra.Verma@@reliancegroupindia.com, with your details as per below:

a) Existing Vendor Code with BYPL or its Group/Associates Companies (if available): …….
b) Trade Name: …….
c) Address of Principal Place of Business: …….
d) Contact Person's Name: …….
e) Contact Person's Designation: …….
f) Contact Person's Mobile No.: …….
g) Contact Person's email ID: …….
h) Also, attach a valid copy of the Power of Attorney in favour of the above-mentioned Contact Person for being authorized to receive user ID and password on behalf of their organization.

The login ID details shall be sent through email to the email ID mentioned by you for the same.

Bids shall be submitted in 2 (Two) parts on the assigned folder of the e-procurement site. Please refer to the user manual available at https://srmprdportal.bsesdelhi.com/irj/portal and enclosed with the tender.

Bids have to be mandatorily submitted only through the e-procurement portal of BSES Delhi. Bids submitted through any other form/ route shall not be admissible.

However, documents that necessarily have to be submitted in originals like Tender Fee (in the form of DD) or EMD (in the form of BG/FD/DD as applicable) and any other documents mentioned in the tender documents have to be submitted at the BYPL office before the due date & time of submission.

Please mention our NIT Number: - …… on the Tender and drop the same in our Tender Box placed at **BSES Yamuna Power Ltd, Reception, Ground Floor, Shaktikiran Building, Karkardooma, Delhi 110032**

The bids and the outer envelope shall be addressed to the following:
Head of Department
Contracts & Materials Deptt.
BSES Yamuna Power Ltd, Shaktikiran Building, Karkardooma, Delhi 110032
Kindly Note:

- The bidder has to ensure that the tender is dropped in the correct box designated for tender submission only.
- BYPL shall not be responsible for any wrong placement of tender documents by the bidder.

This is a two-part bid process. Bidders are to submit the bids online in 2(Two) parts **PART-A TECHNICAL BID & COMMERCIAL TERMS & CONDITIONS** and **Part-B FINANCIAL BID** and shall be submitted before the due date & time specified.

PART A:: TECHNICAL BID comprising of the following, do not contain any cost information whatsoever and shall be submitted within the due date:

S. No.	Descriptions	Type of Documents/Format
A.1	**Bid Details**	
1	**Bid Index for Part-A (Technical Bid)**	In the prescribed format enclosed at APPENDIX I ANNEXURE – 1.01
2	**Cover Letter, if any**	Standard Format
3	**Bid Form (Unpriced) Duly Signed**	Duly Signed Bid Form as per enclosed format at APPENDIX I ANNEXURE – 1.02

4	**Tender Fee**	Non-refundable demand draft or online transfer of the requisite amount through IMPS/NEFT/RTGS for Rs 1,180/-, Duly filled and signed as per enclosed format at APPENDIX I ANNEXURE – 1.03
5	**EMD**	Online transfer of the requisite amount through IMPS/NEFT/RTGS or FD or BG in the prescribed stamp paper & format enclosed at APPENDIX I ANNEXURE – 1.05, EMD Details Duly filled and signed as per enclosed format at APPENDIX I ANNEXURE – 1.04
6	**Power-of-Attorney/ Authorization Letter**	In the standard stamp paper/letter
A.2	**Technical Bid**	
7	**Communication Details of the Bidder**	Duly filled and signed as per enclosed format at APPENDIX I ANNEXURE – 1.06
8	**Manufacturer Authorization Form (as applicable)**	Duly filled and signed as per enclosed format at APPENDIX I ANNEXURE – 1.07
9	**Technical Qualifying Criteria Compliance Index & Documents**	Documentary evidence in support of qualifying criteria mentioned in Section 1 Clause 2.00. Duly filled and signed as per enclosed format at APPENDIX I ANNEXURE – 1.08, ANNEXURE – 1.09 & ANNEXURE – 1.10
10	**Schedule of Deviations - Technical**	Duly filled and signed as per enclosed format at APPENDIX I ANNEXURE – 1.11
11	**Technical Details/ Filled in Guaranteed Technical particulars (GTP) as per specification**	Bidder shall submit duly filled GTP with all Technical documents
12	**Technical Drawings as per specification**	Bidder shall submit all Drawings as per the specification
13	**Type Test Reports**	Bidders shall submit a copy of type test reports in their technical bids in support of technical specifications. Duly filled and signed as per enclosed format at APPENDIX I ANNEXURE – 1.12
14	**Sample Submission Details (if applicable as per specification)**	Duly filled and signed as per enclosed format at APPENDIX I ANNEXURE – 1.13
15	**Product Catalogue (If applicable)**	Bidders shall submit a copy of the product catalogue in their technical bids in support of technical specifications
16	**Manufacturer's Quality Assurance Plan**	Bidders shall submit a copy of MQP in their technical bids in support of technical specifications
17	**Other drawings/ documents mentioned in technical specification**	Bidders shall submit a copy of documents in their technical bids in support of technical specifications
18	**Testing Facilities**	Bidder shall submit the details of testing facilities available at their works/factory.
A.3	**Commercial Bid**	
19	**Company Profile, Organization Chart & Manpower Details.**	Bidder shall submit the details of Organization & Manpower with qualification and experience.

20	**Commercial Qualifying Criteria Compliance Index & Documents**	Documentary evidence in support of qualifying criteria mentioned in Section 1 Clause 2.00. Duly filled and signed as per enclosed format at APPENDIX I ANNEXURE – 1.14
21	**Undertakings**	Duly signed self-undertakings as per enclosed format at APPENDIX I ANNEXURE – 1.15
22	**Schedule of Deviations - Commercial**	Duly filled and signed as per enclosed format at APPENDIX I ANNEXURE – 1.16
23	**Acceptance Form For Participation in Reverse Auction Event**	Duly signed Acceptance Form For Participation In Reverse Auction Event as per enclosed format at APPENDIX I ANNEXURE – 1.17
24	**Commercial Terms and Conditions**	Acceptance of Commercial Terms and Conditions viz. Delivery Schedule/Period, Payment terms, PBG etc. Duly filled and signed as per enclosed format at APPENDIX II ANNEXURE – 2.05
25	**Un price Bid Duly Signed**	Item wise marked as "Quoted" & Duly Signed Un price Bid as per enclosed format at VOLUME – II - PRICE BID FORMAT
26	**Signed Tender document**	Original Tender documents duly stamped & signed on each page as a token of acceptance

PART B:: FINANCIAL BID comprising of

- Price strictly in the Format enclosed at VOLUME – II - PRICE BID FORMAT indicating Break up of basic price, taxes & duties, etc.
- The Bidder has to submit the item-wise price bifurcation in the bid. An unpriced copy must be attached with the Part A (Technical Bid).

This will be opened internally after techno-commercial evaluation and only of the qualified bidders.

REVERSE AUCTION CLAUSE:: Purchaser reserves the right to use the reverse auction as an optional tool through SAP-SRM as an integral part of the entire tendering process. All techno-commercially qualified bidders shall participate in the reverse auction. Reverse Auction will be carried out on individual item-wise rates or Package-wise.
Notwithstanding anything stated above, the Purchaser reserves the right to assess the 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. Bidder is to submit their acceptance as per the format APPENDIX I ANNEXURE – 1.17.

BIDS RECEIVED AFTER THE DUE DATE AND TIME MAY BE LIABLE FOR REJECTION

4.00 AWARD DECISION

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

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

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

4.04 Rate shall remain FIRM till the validity of the Contract.

4.05 Quantity Variation: The purchaser reserves the right to vary the quantity by (±) 30% of the tender quantity during the execution of the contract.

4.06 Quantity Splitting: The purchaser reserves the right to distribute the procurable quantity on one or more than one of the eligible tenders. If the quantity is to be split, quantity distribution shall be in the manner detailed below:
a) If the quantity is split among 2 bidders, it will be done at 70:30 on the L1 price.
b) If the quantity is split among 3 bidders, it will be done at 50:30:20 on the L1 price.
Note: If quantity needs to be distributed and order splitting is required, quantity distribution shall be maximum among three (3) bidders.

5.00 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 before participating. In addition to other remedies available, we reserve 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 & Conditions. Bidders who violate the marketplace rules or engage in behaviour that disrupts the fair execution of the marketplace restrict a bidder to the length of time, depending upon the seriousness of the violation. Examples of violations include, but are not limited to:

- Failure to honour prices submitted to the marketplace.
- Breach of the terms of the published in Request for Quotation/NIT.

6.00 SUPPLIER CONFIDENTIALITY

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

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

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

7.00 CONTACT INFORMATION

Technical clarification, if any, as regards this RFQ shall be sought in writing and sent by e-mail/post/courier to the following addresses. The same shall not be communicated through phone

Address	Name/ Designation	E-mail Address
Technical		
CES Dept. 3rd Floor, B-Block, BSES Yamuna Power Ltd Shaktikiran Building, Karkardooma, Delhi 110032	Ashish Joshi GM (CES)	Ashish.K.Joshi@reliancegroupindia.com
	Puneet.Duggal GM (CES)	Puneet.Duggal@reliancegroupindia.com
	Gaurav Sharma Addl. VP (HOD-CES)	Gaurav.A.Sharma@reliancegroupindia.com
Commercial		
C&M Dept. 3rd Floor, A-Block, BSES Yamuna Power Ltd Shaktikiran Building, Karkardooma, Delhi 110032	Sumit Verma GM (C&M)	Sumit.Ra.Verma@reliancegroupindia.com
	Santosh Singh Addl. VP (Head-Procurement)	Santosh.Kum.Singh@reliancegroupindia.com
	Robin Sebastian VP (HOD-C&M)	Robin.Sebastian@reliancegroupindia.com

SECTION – II: INSTRUCTION TO BIDDERS

A. GENERAL

1.00 BSES Yamuna Power Ltd, hereinafter referred to as "The Purchaser" is 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 material 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/IS along with Packing, Forwarding, Transportation and Unloading and proper stacking at Purchaser's stores/site, erection & installation, commissioning, handing over to "on turnkey basis".

3.0 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 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 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 the 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 COST OF BIDDING

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

B. BIDDING DOCUMENTS

5.01 The Scope of Work, Bidding Procedures and Contract Terms are described in the Bidding Documents.

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 may result in the rejection of the Bid.

6.0 **AMENDMENT OF BIDDING DOCUMENTS**

6.01 At any time before the deadline for submission of Bids, the Purchaser may for any reason, whether at its 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 on the website **www.bsesdelhi.com** and the same will be binding on them.

6.03 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. The same shall be published as a corrigendum on the website **www.bsesdelhi.com**

6.04 Purchaser shall reserve the rights to the following:
a) Extend the due date of submission,
b) Modify the tender document in part/whole,
c) Cancel the entire tender

6.05 **Bidders are requested to visit the website regularly for any modification/clarification/corrigendum/addendum of the bid documents.**

C. PREPARATION OF BIDS

7.0 **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.

8.0 **DOCUMENTS COMPRISING THE BID**

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

(a) All the Bids must be accompanied by the required Tender Fees and EMD as mentioned in the tender.

(b) PART A – Technical Bid and

(c) PART B - Financial Bid

9.0 **BID FORM**

9.01 The Bidder shall submit Bid Form with the Bidding Documents.

9.02 **EMD**

Pursuant to Clause 8.0(a) above, the bidder shall furnish, as part of its bid, an EMD amounting to as specified in Section I. The EMD is required to protect the Purchaser against the risk of Bidder's conduct which will warrant forfeiture.
The EMD shall be denominated in any of the following forms**:**
(a) Bank Guarantee drawn in favour of BSES Yamuna Power Ltd, payable at Delhi or
(b) Fixed Deposit (lien marked in favour of BSES Yamuna Power Limited) payable at Delhi.

(c) Online transfer of requisite amount through IMPS/NEFT/RTGS to BYPL account mentioned herein in **Appendix II - <u>BYPL BANK DETAILS WITH IFSC CODE</u>**.

EMD shall be valid for One Hundred Twenty (120) days after the due date of submission drawn in favour of BSES Yamuna Power Ltd.

The EMD may be forfeited in the case of:

(a) the Bidder withdraws its bid during the period of specified bid validity

or

(b) the case of a successful Bidder, if the Bidder does not

(i) Accept the Purchase Order, or

(ii) Furnish the required performance security BG.

10.0 **BID PRICES**

10.01 Bidders shall quote for the entire Scope of Supply/Work 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, and Transportation to the site, all in accordance with the requirement of the 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 or Levies paid or payable during the execution of the supply work, a breakup of price constituents, should be there.

10.03 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/ Price Variation Clause will be treated as non-responsive and rejected.**

11.0 **BID CURRENCIES**

11.01 Prices shall be quoted in Indian Rupees Only.

12.0 **PERIOD OF VALIDITY OF BIDS**

12.01 Bids shall remain valid for 120 days from the due date of submission of the Bid.

12.02 Notwithstanding Clause 12.01 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 and sent by post/courier.

13.0 **ALTERNATIVE BIDS**

13.01 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 regarding the rejection of Bids in the terms and conditions, which are not substantially responsive to the requirements of the Bidding Documents.

14.0 **FORMAT AND SIGNING OF BID**

14.01 The original Bid Form and accompanying documents, must be received by the Purchaser at the date, time and place specified pursuant to Clauses 15.0 and 16.0.

14.02 The original 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. The Bid submitted on behalf of companies registered with the Indian Companies Act, for the time being in force, shall be signed by persons duly authorized to submit the Bid on behalf of the Company and shall be accompanied by certified true copies of the resolutions, extracts of Articles of Association, special or general Power of Attorney etc. to show clearly the title, authority and designation of persons signing the Bid on behalf of the Company. Satisfactory evidence of the authority of the person signing on behalf of the Bidder shall be furnished with the bid. A bid by a person who affixes to his signature the words 'President', 'Managing Director', 'Secretary', 'Agent' or other designations without disclosing his principal will be rejected.

The Bidder's name stated on the Proposal shall be the exact legal name of the firm.

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 initiated by the person or persons signing the Bid.

D. SUBMISSION OF BIDS

15.0 **SEALING AND MARKING OF BIDS**

15.01 Bid submission: Bids have to be mandatorily submitted only through the e-procurement portal of BSES Delhi. Bids submitted through any other form/ route shall not be admissible.

15.02 However, documents that necessarily have to be submitted in originals like EMD or Tender Fee (in the form of BG/ DD /FD as applicable) and any other documents mentioned in the tender documents have to be submitted at the BYPL office before the due date & time of submission. The Technical Documents and the EMD shall be enclosed in a sealed envelope and the said envelope shall be superscribed with - "Technical Bid & EMD". All the envelopes should bear the Name and Address of the Bidder and mark for the Original. The envelopes should be superscribed with - "Tender No. & Due date of opening".

15.03 The Bidder has the option of sending the Bids in person. Bids submitted by Email/Telex/Telegram /Fax will be rejected. No request from any Bidder to the Purchaser to collect the proposals from Courier/Airlines/Cargo Agents etc. shall be entertained by the Purchaser.

16.0 **DEADLINE FOR SUBMISSION OF BIDS**

16.01 The Bid must be received by the Purchaser on or before the due date & time of submission.

16.02 The Purchaser may, at its discretion, extend the deadline for the submission of Bids by amending the Bidding Documents in accordance with Clause 6.0, 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**

17.01 Each Bidder shall submit only one Bid by itself. No Joint venture is acceptable. A Bidder who submits

or participates in more than one Bid will cause all those Bids to be rejected.

18.0 **LATE BIDS**

18.01 No Bid will be received by the Purchaser after the deadline for submission of Bids prescribed by the Purchaser, pursuant to Clause 16.0.

19.0 **MODIFICATIONS AND WITHDRAWAL OF BIDS**

19.01 The Bidder is not allowed to modify or withdraw its Bid after the Bid's due date & time of submission subject to any corrigendum/addendum/modifications in the tender documents uploaded to the website.

E. EVALUATION OF BID

20.0 **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.

21.0 **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.

22.0 **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. Purchaser may ask for submission of original documents to verify the documents submitted in support of qualification criteria.

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 will be subjected to a responsiveness check. The Technical & qualifying Proposals and the Conditional ties of the Bidders will 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) Delivery Schedule

(b) Conformance to Qualifying Criteria

(c) 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 the Bidding Documents shall be evaluated. **The Purchaser will make its own assessment of the cost of any deviation to ensure a fair comparison of Bids.**

23.04 Any price adjustments that result from the above procedures shall be added for 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 If any Bidder wishes to contact the Purchaser on any matter related to the Bid, from the time of Bid opening to the time of contract award, the same shall be done in writing only.

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

Submission of bids shall not automatically construe qualification for evaluation. The Purchaser reserves the right to accept or reject any Bid and to annul the Bidding process and reject all Bids at any time prior to the award of the 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 the order to other bidders in the tender, provided it is required for the timely execution of the project & provided he agrees to come to the lowest rate. Purchaser reserves the right to distribute the entire tender quantity at its own discretion without citing any reasons thereof.

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 the issue of the letter of intent /Notification of Award by Purchaser.

29.0 **PERFORMANCE BANK GUARANTEE (PBG)**

To be submitted within twenty-eight (28) days from the date of issuance of the Letter of Intent/Award/PO. Bidder shall submit PBG equivalent to 10% of the PO value (including GST) valid for a period of 30 months from the date of last receipts at site/stores plus 3 months claim period.

30.0 **CORRUPT OR FRAUDULENT 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 this provision, the terms set forth below as follows:

(i) "Corrupt practice" means behaviour 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 contract execution; and

(ii) "Fraudulent practice" means a misrepresentation of facts to influence a procurement process or the execution of a contract to the detriment of the Purchaser, and includes collusive practice among Bidders (before 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 for award 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, 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 Terms and Conditions of the Contract.

31.0 **STATUTORY GUIDELINES & REGULATIONS**

The bidder shall make himself fully aware & familiarize himself with all applicable laws/guidelines/regulations.

32.0 **SAFETY**

Safety related requirements as mentioned in our safety Manual put on the Company's website which can be accessed at http://www.bsesdelhi.com. All bidders shall strictly abide by the guidelines provided in the safety manual at all relevant stages during the contract period.

33.0 **PRIORITY OF CONTRACT DOCUMENTS**

The several documents forming the Agreement are to be taken as mutually explanatory of one another, but in case of ambiguities or discrepancies, the same shall be explained and adjusted by the company, who shall, accordingly, issue suitable instructions thereon to the Contractor. In such event, unless otherwise provided in the agreement or explained by way of instructions by the company, as mentioned above, the priority of the documents forming the Agreement shall be as follows:

i) Contract Agreement/Purchase Order.
(a)Special Conditions of Contract
(b)General Conditions of Contract
(ii)The Letter of Acceptance/ Intent
(iii)Agreed Minutes of the Tender Negotiation Meetings
(iv) Agreed Minutes of the Tender Technical Meetings
(v) The Priced Bill of Quantities
(vi)The Technical Specifications / Scope of work
(vii)The Tender document, including all Appendices and/or Addenda, Corrigendum the latest taking precedence.

In the event of any conflict between the above-mentioned documents, the more stringent requirement or conditions which shall be favourable to the company shall govern and the decision of the company/BYPL shall be final and binding upon the parties.

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APPENDIX I ANNEXURE – 1.01

BID INDEX FOR PART-A (TECHNICAL BID)

(To be filled & submitted on Bidder Letter Head, Bidders document submission should have following main categories as outlined below and should have page numbers printed at the bottom of each page with this page as page number 1. The page number should be in "Page X of Y" format. Separator with document description shall be provided before each document)

NIT & RFX No.:
Bidder's Name:
Bidder's Bid Reference No. & Date:

S. No.	Particulars	Bid Pdf Page No.	
		From	To
A.1	**Bid Details**		
1.	Bid Index for Part-A (Technical Bid) as per APPENDIX I ANNEXURE - 1.01	1	
2.	Cover Letter, If any		
3.	Bid Form (Unpriced) Duly Signed as per APPENDIX I ANNEXURE - 1.02		
4.	Tender Fee Details as per APPENDIX I ANNEXURE - 1.03		
5.	EMD Details as per APPENDIX I ANNEXURE - 1.04 & 1.05		
6.	Power-of-Attorney / Authorization Letter		
A.2	**Technical Bid**		
7.	Communication Details of the Bidder as per APPENDIX I ANNEXURE - 1.06		
8.	Manufacturer Authorization Form (as applicable) as per APPENDIX I ANNEXURE - 1.07		
9.	Technical Qualifying Criteria Compliance Index & Documents as per APPENDIX I ANNEXURE - 1.08, 1.09, 1.10		
10.	Schedule of Technical Deviations (along with soft editable Excel copy) as per APPENDIX I ANNEXURE - 1.11		
11.	Guaranteed Technical particulars (GTP) as per specification		
12.	All Drawings as per specification		
13.	Type Test Reports (Sequence of Tests shall be strictly in accordance with relevant IS/IEC) as per APPENDIX I ANNEXURE - 1.12		
14.	Sample Submission Details (If applicable as per Specification) as per APPENDIX I ANNEXURE - 1.13		
15.	Product Catalogue (If applicable)		
16.	Manufacturer's quality assurance plan (as applicable)		
17.	Other drawings/ documents mentioned in technical specification		
18.	Testing Facilities		
A.3	**Commercial Bid**		
19.	Company Profile/Organogram/Organization Chart & Manpower Details		
20.	Commercial Qualifying Criteria Compliance Index & Documents as per APPENDIX I ANNEXURE - 1.14		
21.	Undertakings as per APPENDIX I ANNEXURE - 1.15		
22.	Schedule of Commercial Deviations (along with soft editable Excel copy) as per APPENDIX I ANNEXURE - 1.16		
21.	Acceptance form for participation in reverse auction event as per APPENDIX I ANNEXURE - 1.17		
24.	Acceptance of Commercial Terms and Conditions as per APPENDIX II ANNEXURE - 2.05		
25.	Un Price Bid Duly Signed (Volume - II Price Bid Format)		
26.	NIT Document complete Signed & Stamped		

ANNEXURE – 1.02

BID FORM

To

Head of Department
Contracts & Material Deptt.
BSES Yamuna Power Ltd
Shaktikiran Building, Karkardooma,
Delhi 110032

Sir,

1. We understand that BYPL is desirous of procuring…….
   for it's licensed distribution network area in Delhi.
2. Having examined the Bidding Documents for the above-named works, we the undersigned, offer to deliver the goods in full conformity with the Terms and Conditions and technical specifications for the sum indicated in the Price Bid or such other sums as may be determined in accordance with the terms and conditions of the contract. The amounts are in accordance with the Price Schedules attached herewith and are made part of this bid.
3. If our Bid is accepted, we undertake to deliver the entire goods as per the delivery schedule mentioned in Section IV from the date of award of the purchase order/letter of intent.
4. If our Bid is accepted, we will furnish a performance bank guarantee for due performance of the Contract in accordance with the Terms and Conditions.
5. We agree to abide by this Bid for 120 days from the due date of bid submission and it shall remain binding upon us and may be accepted at any time before the expiration of that period.
6. We declare that we have studied the provision of Indian Laws for the supply/services of equipments/materials and the prices have been quoted accordingly.
7. Unless and until Letter of Intent is issued, this Bid, together with your written acceptance thereof, shall constitute a binding contract between us.
8. We understand that you are not bound to accept the lowest or any bid you may receive.
9. There is provision for Resolution of Disputes under this Contract, by the Laws and Jurisdiction of Contract.

Dated this..... day of..... 20XX

Signature..... In the capacity of ……

.....duly authorized to sign for and on behalf of

(IN BLOCK CAPITALS) .....

ANNEXURE – 1.03

TENDER FEE DETAILS

a. Amount (Rs.) : **1,180/- (One Thousand One Hundred Eighty Only)**

b. Mode of Payment : DD or online transfer through IMPS/NEFT/RTGS (select any one)

c. DD /UTR No. (As applicable) : .....

d. Dated : .....

e. Bidders Bank Account No. : .....

f. Name of the Bank : .....

g. Address of the Bank : .....

h. IFSC Code of the Bank : .....

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ANNEXURE – 1.04

EMD DETAILS

a. EMD Amount (Rs.) : ……

b. Mode of Payment : BG/FD/online transfer through IMPS/NEFT/RTGS (select any one)

c. BG/FD/UTR No. (As applicable): ……

d. Dated : ……

e. BG valid up to : ……

f. BG Claim period up to : ……

g. Bidders Bank Account No. : ……

h. Name of the Bank : ……

i. Address of the Bank : ……

j. IFSC Code of the Bank : ……

BSES

ANNEXURE – 1.05

(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*] (hereinafter called the "Bank"), are bound unto BSES Yamuna Power Ltd., with its Corporate Office at Shaktikiran Building, Karkardooma, Delhi - 110032, (hereinafter called - the "Purchaser") in the sum of Rs…… (Rupees…….. only) 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:

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

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

(a) fails or refuses to execute the Contract Form, if required; or

(b) fails or refuses to furnish performance security, In accordance with the Instructions to Bidders/Terms and 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 condition(s), specifying the occurred condition or condition(s).

This guarantee will remain in force up to and including One Hundred Twenty (120) days after the due date of submission bid, and any demand in respect thereof should reach the Bank not later than the above date.

(Stamp & signature of the bank)

Signature of the witness

ANNEXURE – 1.06

COMMUNICATION DETAILS OF THE BIDDER

S. No.	Designation	Name	Mobile No.	E-mail id
1	CEO / MD			
2	Sales / Marketing Head			
3	Sales Representative / Key Account Manager (KAM)			
4	Technical Head			
5	Manufacturer Plant / Operations Head			
6	Post Order Execution In Charge			
7	Authorized contact person (Primary responsibility for the Bid)			
8	Authorized contact person (Secondary responsibility for the Bid)			

BSES

ANNEXURE – 1.07

MANUFACTURER AUTHORIZATION FORM
(To be submitted on OEM's Letter Head)

Date: …….
Tender No.: ……..

To

Head of Department
Contracts & Material Deptt.
BSES Yamuna Power Ltd
Shaktikiran Building, Karkardooma,
Delhi 110032

Sir,

WHEREAS M/s. *[name of OEM]*, who are official manufacturers of …… having factories at *[address of OEM]* do hereby authorize M/s *[name of bidder]* to submit a Bid in relation to the Invitation for Bids indicated above, the purpose of which is to provide the following Goods, manufactured by us ……and to subsequently negotiate and sign the Contract.

We hereby extend our full guarantee and warranty by the Conditions of the Contract or as mentioned elsewhere in the Tender Document, concerning the Goods offered by the above firm in reply to this Invitation for Bids.

We hereby confirm that in case, the channel partner fails to provide the necessary services as per the Tender Document referred above, M/s *[name of OEM]* shall provide standard warranty on the materials supplied against the contract. The warranty period and inclusion/exclusion of parts in the warranty shall remain the same as defined in the contract issued to our channel partner against this tender.

Yours Sincerely,
For ……..

Authorized Signatory

ANNEXURE – 1.08

QUALIFYING CRITERIA COMPLIANCE INDEX - TECHNICAL CRITERIA				
S No	**Qualifying Criteria Description as per section 1 clause 2.00**	**Documentary Proof Description**	**Documentary Proof Enclosed on Bid Page No.**	
			From	**To**
1				
2				
3				
4				
5				

BSES

ANNEXURE – 1.09

LIST OF PURCHASE ORDERS EXECUTED & DELIVERY DETAILS IN SUPPORT OF QUALIFYING REQUIREMENTS													
S No	Item Details				PO & Execution Details					Customer Name	End User (shall be Utility/ SEB's/ PSU's) name and details	PO copy, MDCC /Delivery completion certificates/ Invoice Copies enclosed on Bid Page no.	
	Item	Model	Voltage Rating (kV)	Current Rating (A)	PO No	PO Date	PO Qty	Executed Qty	Execution Year			From	To
Total							∑	∑					

Note – Only items relevant as per qualifying requirements should be included in the list.

BSES

ANNEXURE – 1.10

LIST OF PERFORMANCE CERTIFICATES IN SUPPORT OF QUALIFYING REQUIREMENT														
S No	Item Details				PO No	Supplied/ Commissioning		Performance Certificate Issue Date	Performance Certificate Issued By End User (Utility/SEB/Govt Org.)	Contact Details of Issuing Person			Enclosed on Bid Page No.	
	Item	Model	Voltage Rating (kV)	Current Rating (A)		Qty.	Date			Name	Email	Mobile	From	To
Total						∑								

Note –

1. **Only items relevant as per qualifying requirement should be included in the list.**
2. **Only Performance certificates issued by End User (utilities/ SEB's/PSU's only) will be accepted as per qualifying requirement.**

BSES

ANNEXURE – 1.11

SCHEDULE OF DEVIATIONS - TECHNICAL

Vendor shall refrain from taking any deviations on this TENDER. Still, in case of any deviations, all such deviations from this tender shall be set out by the Bidder, Clause by Clause in this schedule and submit the same as a part of the Technical Bid.

Unless **specifically** mentioned in this schedule, the tender shall be deemed to confirm the BYPL's specifications:

Technical Deviations:-

S. No.	NIT Pdf Page No.	NIT Clause No.	NIT Clause Descriptions	Details of Clarification/deviation with justifications

Note – Please enclose detailed GTP and drawings as per specification after the technical deviation sheet

Seal of the Bidder:

Signature:

Name:

BSES

ANNEXURE – 1.12

TYPE TEST REPORTS (SEQUENCE OF TESTS SHALL BE STRICTLY IN ACCORDANCE WITH RELEVANT IS/IEC)								
S No	Test Description	Reference Standard	Reference Standard Clause No.	Name of Testing Lab	Test Report Reference Number	Date of Issue of Report	Report Enclosed on Bid Page No	
							From	To
1								
2								
3								
4								
5								
6								
7								

BSES

ANNEXURE – 1.13

SAMPLE SUBMISSION DETAILS (IF APPLICABLE AS PER SPECIFICATION)		
S No	**Description**	**Bidder's Response**
1	Samples submitted with the bid	Yes/No
1	Sample Type -1	
1.1	Model Number	
1.2	Number of samples	
2	Sample Type -2	
2.1	Model Number	
2.2	Number of samples	

BSES

ANNEXURE – 1.14

QUALIFYING CRITERIA COMPLIANCE INDEX - COMMERCIAL CRITERIA				
S No	**Qualifying Criteria Description as per section 1 clause 2.00**	**Documentary Proof Description**	**Documentary Proof Enclosed on Bid Page No.**	
			From	**To**
1				
2				
3				
4				
5				

BSES

ANNEXURE – 1.15

UNDERTAKINGS
(To be submitted on Bidders Letter Head)

Date: …….

Tender No.: ……..

To

Head of Department
Contracts & Material Deptt.
BSES Yamuna Power Ltd
Shaktikiran Building, Karkardooma,
Delhi 110032

Sir,

We M/s *[name of bidder]*, …… do hereby undertake that

- *[name of bidder]* has "No Litigation" pending with the BYPL or its Group/Associates Companies as on the date of bid opening.
- *[name of bidder] has* not been blacklisted/debarred by any central/state government institution/Electricity utilities as on the date of bid opening.
- *[name of bidder]* shall comply with all the statuary compliances as per the laws/rules etc. before the start of the supply/work.

Yours Sincerely,
For ……..

Authorized Signatory

BSES

ANNEXURE – 1.16

SCHEDULE OF DEVIATIONS - COMMERCIAL

Vendor shall refrain from taking any deviations on this TENDER. Still, in case of any deviations, all such deviations from this tender shall be set out by the Bidder, Clause by Clause in this schedule and submit the same as a part of the Technical Bid.

Unless **specifically** mentioned in this schedule, the tender shall be deemed to confirm the BYPL's specifications:

Commercial Deviations:-

S. No.	NIT Pdf Page No.	NIT Clause No.	NIT Clause Descriptions	Details of Clarification/deviation with justifications

By signing this document we hereby withdraw all the deviations whatsoever taken anywhere in this bid document and comply with all the terms and conditions, technical specifications, scope of work etc. as mentioned in the standard document except those mentioned above.

Seal of the Bidder:

Signature:

Name:

BSES

ANNEXURE – 1.17

ACCEPTANCE FORM FOR PARTICIPATION IN REVERSE AUCTION EVENT

(To be signed and stamped by the bidder)

BSES Yamuna Power Ltd (hereinafter referred to as **"BYPL"**) intends to use the reverse auction through the SAP-SRM tool as an integral part of the entire tendering process. All the bidders who are found as techno commercial qualified based on the tender requirements shall be eligible to participate in the reverse auction event.

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

1. BYPL shall provide the user ID and password to the authorized representative of the bidder. (Authorization letter in lieu of the same be submitted along with the signed and stamped acceptance form)
2. BYPL will make every effort to make the bid process transparent. However, the award decision by BYPL would be final and binding on the bidder.
3. The bidder agrees to non-disclosure of trade information regarding the purchase, identity of BYPL, bid process, bid technology, bid documentation, bid details, etc.
4. The bidder is advised to understand the auto bid process to safeguard themselves against any possibility of non-participation in the auction event.
5. In case of bidding through internet medium, bidders are further advised to ensure availability of the entire infrastructure as required at their end to participate in the auction event. Inability to bid due to telephone line glitches, internet response issues, software or hardware hangs; power failure or any other reason shall not be the responsibility of BYPL.
6. In case of intranet medium, BYPL shall provide the infrastructure to bidders, further, BYPL has sole discretion to extend or restart the auction event in case of any glitches in infrastructure observed which has restricted the bidders from submitting the bids to ensure fair & transparent competitive bidding. In case an auction event is restarted, the best bid already available in the system shall become the start price for the new auction.
7. In case the bidder fails to participate in the auction event due to any reason whatsoever, it shall be presumed that the bidder has no further discounts to offer and the initial bid as submitted by the bidder as a part of the tender shall be considered as the bidder's final no regret offer. Any offline price bids received from a bidder in lieu of non-participation in the auction event shall be outright rejected by BYPL.
8. The bidder shall be prepared with competitive price quotes on the day of the reverse auction event.
9. The prices as quoted by the bidder during the auction event shall be inclusive of all the applicable taxes, duties and levies and shall be FOR Landed Cost basis at the BYPL site.
10. The prices submitted by a bidder during the auction event shall be binding on the bidder.
11. No requests for time extension of the auction event shall be considered by BYPL.
12. The original price bids of the bidders shall be reduced on pro-rata basis against each line item based on the final all-inclusive prices offered during the conclusion of the auction event to arrive at the contract amount.

Signature & seal of the Bidder

ANNEXURE – 1.18

CODE OF CONDUCT FOR SUPPLIERS

BSES expects suppliers including their personnel (employees or sub-contractors) to support, embrace and enact the following Code of Conduct (CoC), apart from complying with all national and international regulations and laws that are applicable at any given time. BSES encourages its suppliers to go beyond compliance and embrace the principles of sustainability. BSES will support training and capacity-building programmes undertaken by suppliers, which promote awareness on sustainability and responsible business practices. BSES shall incorporate regulatory compliance and ESG performance as key criteria based on requirements as stated in the Code during evaluation of the suppliers.

A. Promote Environmental Sustainability

All suppliers support a precautionary approach to environmental issues and undertake initiatives to promote better environmental responsibility. To this end, suppliers will

1. Reduce resource consumption and conserve natural resources:
   1.1. Conduct all operations, sourcing, manufacture, distribution of products and the supply of services with the aim of protecting and preserving the environment.
   1.2. Use natural resources rationally and work towards reducing resource consumption (water, energy, fuel, electricity, other materials etc.) and GHG emissions.
   1.3. Identify environmental risks and set up appropriate prevention measures.

2. Prevent pollution and reduce waste generation
   2.1. Maintain all required official permits, licenses and registrations.
   2.2. Prevent contamination, limit waste generation, and avoid or minimise adverse impact on the environment and biodiversity by facilitating reusing and recycling material.
   2.3. Clearly monitor the precautions to be taken during operations & maintenance in case of emission of heat, vibrations, radioactive rays, noise or similar.
   2.4. Use only those chemicals and aerosols with very low or zero ODP (Ozone Depletion Potential), which are allowed as per the regulatory provisions.
   2.5. Ensure that all the chemical and hazardous substances are accompanied by the manufacturer MSDS (Material Safety Data Sheet) during transport, storage, use and disposal, and that instructions mandated be strictly followed. No chemical and hazardous substance shall be received without a MSDS document. All the applicable regulatory guidelines shall be adhered strictly for the procurement, transport, storage, use and disposal of such harmful and hazardous chemicals.
   2.6. Provide written instructions about handling and/or disposal of equipment and product during the life cycle if special handling is required.

B. Commitment to Human Rights, Labour and the Society

Suppliers shall support, respect and protect human and labour rights and make sure their organisation/entity is not complicit in any kind of abuses and/or violations. In this regard, the suppliers must:

1. Fair working conditions
   1.1. Provide and maintain healthy and safe working conditions and welfare facilities for the employees in its establishment.
   1.2. Ensure that that wages and benefits of their employees and subcontractors are fair and comply with applicable national and local laws as well as with contractual agreements.

1.3. Provide all workers, both permanent and non-permanent, with employment documents that are freely agreed to and which respect their legal and contractual rights.

2. Health & Safety

Ensure that the activities of suppliers do not harm the health and safety of their own employees, suppliers and subcontractors, local communities/population, and finally the users of its products and services, which is in accordance with the BSES's Mission Zero Harm in Health and Safety.

3. Child Labour

3.1. No person below 18 years shall be employed or permitted to work in any occupation or process.

3.2. Zero tolerance for any kind of child labour in their establishments and supply chain.

4. Forced Labour

4.1. Under no circumstance shall suppliers use forced labour[1], whether in form of compulsory or trafficked labour, indentured labour, bonded labour or other forms, through direct or indirect use of force and/or intimidation.

4.2. Any kind of slavery, mental and physical coercion, human trafficking and debt bondage in the supply chain shall not be tolerated.

5. Wages and Working hours

5.1. Ensure that all applicable regulations related to wages, overtime compensation and other legally mandated benefits of their employees and subcontractors are fair and comply with applicable national and local laws as well as with contractual agreements. Minimum wages are applicable as per applicable in central Act and State rules.

5.2. Ensure that maximum working hours laid down and are adhered to.

6. Freedom of Association and Collective Bargaining

6.1. Recognise and respect the rights of workers to freedom of association and collective bargaining. Workers are not intimidated or harassed in the exercise of their right to join or refrain from joining any organisation.

6.2. Ensure that all employees can communicate with the management regarding working conditions.

7. Non-Discrimination and Equal opportunity

7.1. Commit, within the scope of prevailing laws and statutes, to oppose all forms of discrimination[2].

7.2. Maintain a work environment free from any form of discrimination and harassment.

7.3. Refrain from discrimination in hiring and employment practices on grounds of skin colour, age, caste, gender, race, ethnicity, nationality, socio-economic background, physical or mental disability, religion, sexual orientation, marital status, pregnancy, dependants, political or religious opinion, ideology, union membership and personal or social circumstances. Special attention must be paid to the rights of workers most vulnerable to discrimination.

8. Zero Tolerance towards Harassment

8.1. Treat all employees with respect and dignity and furthermore ensure that their own suppliers treat their employees in the same manner.

8.2. No tolerance towards unacceptable treatment of employees, such as physical punishment or torture, sexual harassment[3], or abuse, mental or physical coercion or verbal abuse, or the threat of any such treatment.

8.3. No worker should be subjected to any physical, sexual, psychological, or verbal harassment, abuse or other form of intimidation.

C. Ethical Integrity and Legality

Suppliers shall demonstrate the highest standard of integrity, ethics, and business conduct.

1. Compliance with Applicable laws and regulations:

1.1. All activities must be carried out in compliance with the legislation that is applicable in the countries in which the suppliers operate.

1.2. All other applicable international laws and regulations must be complied with, including those relating to international trade (such as those relating to sanctions, export controls and reporting obligations), data protection and antitrust/ competition laws.

1.3. Avoid any conduct that could tarnish or damage the reputation of BSES.

2. Anti-Corruption & Anti Bribery

2.1. All forms of bribery and corruption are prohibited

2.2. Adequate measures and procedures should be in place to prevent bribery in all commercial dealings.

2.3. Maintain a policy of 'Zero Tolerance' of any practice that may be deemed to be corruption, either active or passive.

2.4. No tolerance for unacceptable conduct, which includes, but not limited to, non-compliance with anti- corruption laws and, directly or indirectly offering, promising, hiring or authorising payments in cash or in kind to any BSES employee, public official or any other person or entity, with intention of a) obtaining or retaining business b) Influencing business decisions; and/or c) securing an unfair advantage.

3. Conflict of Interest

3.1. All and any conflict of interest in any business dealings with BSES, of which the suppliers are aware, should be declared to BSES so that appropriate action can be taken.

3.2. Avoid a situation where there is a real or potential conflict of interest with BSES employees, or with their family or closely associated persons, that could affect the independence or objectivity of their professional actions or decisions. If avoidance is not possible, the suppliers should inform BSES of the situation so that appropriate action can be taken.

4. Insider Trading and Other Economic Crimes

4.1. Ensure that all business and commercial dealings are transparently performed and accurately recorded in the books and records.

4.2. Comply with applicable anti-money laundering laws, conduct business only with ethically responsible partners and receive funds only from legitimate sources.

4.3. Avoid actual or attempted participation in economic offences, such as (but not limited to) money laundering, criminal breach of trust, counterfeiting, criminal misappropriation of properties, forgery, cheating, extortion, embezzlement and fraud.

4.4. Refrain from insider trading. No confidential information regarding BSES is used to either engage, facilitate or support insider trading in BSES's shares.

4.5. Take necessary measures to detect and prevent any illicit or suspicious forms of payment and inform and/or report through established channels if it has any suspicion or concern in this regard.

5. Gifts & Hospitality

5.1. Any business entertaining/hospitality with BSES should be modest in value, appropriate, and

compliant with the law and company policies, entirely for the purpose of maintaining good business relations and not intended to influence in any way BSES's decisions on future business relationship.

5.2. Only gifts/honorarium of nominal value accepted or offered on festivals, at conferences, etc. will be permitted. Such gifts should comply with local laws and customs (including cultural and religious festivals) and should not be prohibited under applicable law and should not include cash or cash equivalents, gold or other precious metals, gems or stones.

5.3. Neither receive nor offer or make, directly or indirectly, any illegal payments, remunerations, gifts, donations or comparable benefits that are intended, or perceived, to obtain uncompetitive favours for the conduct of its business with BSES.

5.4. Neither directly or indirectly offer any gift, entertainment, trip, discount, service, or other benefit to any official of BSES or his/her close relations which would or be capable of compromising, influencing, liable to corrupt the integrity and objectivity of that person.

6. Competition, Confidentiality and Data Privacy

6.1. All market survey/other entities information must be obtained and used legitimately and in compliance with all applicable laws and regulations.

6.2. No attempt should be made to divulge to BSES any information about any other entity in violation of any law or agreement.

6.3. Likewise, BSES's confidential information must not be shared with any Supplier unless expressly permitted by BSES in writing by authorised signatory under the respective purchase order or agreement, as the case may be.

7. Transparency and Ethics

7.1 Fair competition

Avoid any action that may constitute an illegal practice of unfair competition and ensure compliance with applicable competition laws.

7.2 Corporate image and reputation

Suppliers must NOT:

- Make false statements or provide any misleading information regarding its products/services.
- Give the impression of representing or being the spokesperson of BSES while getting associated with any religious/political party or for activities in their personal capacity.

8. Protection of Intellectual Property and No Misuse or Improper use of BSES's assets/ property

8.1. Respect and protect all confidential information and intellectual property of BSES.

8.2. Do not misuse and share assets of BSES and employ them only for the purpose of conducting the business for which they are duly authorised by BSES. These include tangible assets such as equipment and machinery, systems, facilities, materials, and resources and intangible assets such as intellectual property rights, processes, know how & technology, proprietary information, etc.

8.3. Safeguard, secure, and protect BSES's assets and information technology from theft, destruction, misappropriation, wastage, and abuse.

8.4. Promptly report loss, theft or destruction of any intellectual property and data of the Company or that of any Supplier.

9. Financial Records and Accuracy in Books

9.1. Have accounting practices in place to ensure accuracy of its financial books and records.

9.2. Ensure accurate accounting and proper reporting of information pertaining to the business and

financial results in accordance with applicable Accounting Standards [Generally Accepted Accounting Principles (GAAP)].

9.3. Ensure compliance to applicable laws and regulations with respect to accounting and taxation and timely discharge of tax liability.

10. Sanction Laws

10.1 Do not engage in any dealings or transactions with any person, or in any country or territory that are subject to global / regional sanctions as mentioned herein below in clause 10.2. BSES is vigilant of its suppliers who may be on a sanctions list or have a related company in a country subject to global/regional sanctions. In case of any concerns, the supplier should immediately report to BSES.

10.2 Do not be subject to or the target of any economic or financial sanctions or trade embargoes imposed, administered or enforced by the U.S. Government including without limitation by the World Bank or by the United Nations Security Council, the European Union, the United Kingdom including by Her Majesty's Treasury or the Department of Business, Innovation and Skills, a relevant regulatory authority or the Minister of Foreign Affairs of Canada under the Special Economic Measures Act or the United Nations Act or legislation or regulations with similar purpose or effect or any other relevant sanctions authority of any other country (collectively, 'Sanctions Laws') nor is the Company or any of its subsidiaries / affiliates located, organised or resident in a country or territory that is the subject of the target of Sanctions Laws

10.3 Do not take any action which places or is likely to place BSES in violation of Sanctions Laws and/ or breaches affecting the reputation and/ or business interests of BSES

11. Responsible Sourcing

Ensure that goods and materials are not sourced in a suspicious or illegal way and implement measures for sustainable procurement practices[3] to ensure compliance with laws and regulations.

12. Quality of Product and Services

Products and services should meet the specifications, quality, safety and environmental criteria specified in the relevant contract documents and required by applicable laws

13. Corporate Citizenship

Suppliers shall be committed to be good corporate citizens, not only in compliance with all relevant laws and regulations, but also by assisting and supporting initiatives to improve the quality of life of local communities/regions in which it operates. The activities may be, but not limited to, community health and family welfare, vocational training, education and literacy and employment.

[1] 'Forced Labour' or 'Involuntary Labour' refers to all work or service that is extracted under the menace of penalty. It also includes terms such as, bonded labour and modern slavery. It also includes any labour for which the worker receives less than the government stipulated minimum wage.

[2] 'Discrimination' refers to unjust or prejudicial treatment of people, especially on the grounds of, but not limited to, caste, creed, gender, race, ethnicity, age, colour, religion, disability, socio-economic status or sexual orientation.

[3] Sustainability shall mean to device a practice & procedure proactively to sustain resources of organisation and society at present levels with reasonable degradation. Sustainable procurement or sourcing is the process of making purchasing decisions that meet an organisation's needs for goods and services in a way that benefits not only the organisation but society, while minimising its impact on the environment. Organisation integrates the sustainability into business model as a resultant of ESG principles. This is achieved by ensuring that the working conditions of its suppliers' employees are decent, the products or services purchased are sustainable, where possible, and that socio- economic issues, such as inequality and poverty, are addressed.

GENERAL CONDITIONS OF CONTRACT (GCC)

BSES

GENERAL CONDITIONS OF CONTRACT (GCC)

The General Condition of Contract shall form a part of specifications, contract document.

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 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 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 COMPANY/OWNER/PURCHASER/BUYER/CUSTOMER means BSES Yamuna Power Ltd (BYPL), a company incorporated under the Companies Act 1956 and having its registered office at BSES Yamuna Power Limited, Shakti Kiran Building, Karkardooma, Delhi - 110032, which expression shall include its authorized representatives, agents, successors and assigns.

2.02 BIDDER / SELLER / CONTRACTOR / AGENCY / MANUFACTURER 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 OFFER SHEET shall mean Bidder's firm offer submitted to BYPL in accordance with the specification.

2.04 CONTRACT PRICE/RATE means the price specified in the Letter of Intent, Letter of Award, Rate Contract, or Purchase Order, as applicable.

2.05 SITE means the working location in the BYPL area. Under this tender, working location shall be as mentioned elsewhere.

2.06 STORE means the location/ area where goods or products are kept or as defined elsewhere in this Contract.

2.07 ENGINEER IN CHARGE means the Company's authorized/nominated representative for the purpose of carrying out the work.

2.08 APPLICABLE LAW means the constitution of India and any act, rule, regulation, directive, notification, code, order or instruction having its force of law enacted or issued by any competent legislature or Governmental Agency (including those related to taxes, duties, assessments, expropriation and compulsory acquisition) as may be in effect from time to time the implications thereof shall be deemed a Change in Law or Change in Permits.

2.09 OTHER CLEARANCES means any consent, approval, permit or other authorization that is required to be granted by authorities (local, government or any other) essential to start/complete the work.

2.10 DEFECT LIABILITY PERIOD means the period during which the contractor shall remain liable for repair or replacement of any defective part of the work performed under the contract, free of cost.

2.11 TENDER SPECIFICATION means the Indian Standard specification of the work and description of work as detailed in Tender document/Tender enclosed and all such particulars mentioned directly/referred to or implied as such in the Tender.

2.12 SPECIFICATIONS means collectively all the terms and stipulations contained in those portions of this bid document known as RFQ, Commercial Terms & Conditions, Instructions to Bidders, Technical Specifications and the Amendments, Revisions, Deletions or Additions, as may be made by the Purchaser from time to time.

2.13 CODES AND STANDARDS means all the applicable codes and standards as indicated in the Specification.

2.14 CHANGE OF WORK means any addition to, deletion from, suspension of or other modification, to the Work, or to the quality, function or as delineated in this Contract, including any such addition, deletion, suspension or other modification, which requires a change in one or more of the Technical Specifications and the completion schedule

2.15 GOOD INDUSTRY PRACTICE means the exercise of that degree of skill, diligence and prudence which would reasonably and ordinarily be expected from a skilled, experienced and recognised Service Provider engaged in the provision of services similar to the one undertaken by the Service Provider and acting generally in accordance with the prevailing laws, rules, regulations, codes and industry standards.

2.16 CONTRACT shall mean the Letter of Intent / Letter of Acceptance/ Agreement / Contract / Purchase Order issued by the Purchaser.

2.17 EFFECTIVE DATE OF CONTRACT means the date of issue/award of contract shall be the Effective Date of Contract or Contract Commencement date.

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

2.19 CONTRACT COMMENCEMENT DATE means the date of issue/award of contract shall be the Effective Date of Contract or Contract Commencement date.

2.20 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 the extended contract period for reason beyond the control of the Supplier and/or Purchaser due to force majeure.

2.21 CONTRACT COMPLETION DATE means the date of expiry of Guarantee/defect liability Period shall be deemed as the Contract Completion Date.

2.22 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.

2.23 **Contract Documents & Priority**

2.23.1 The several documents forming the Contract are to be taken as mutually explanatory of one another, but in case of ambiguities or discrepancies, the same shall be explained and adjusted by the Employer, who shall thereupon issue to the Vendor, instructions thereon. In such event, unless otherwise provided in the Contract, the priority of the documents forming the Contract shall be as follows:

a. Contract Agreement/Work Order
   I. Special Conditions of Contract
   II. General Conditions of Contract
b. The Letter of Acceptance/ Intent
c. Agreed Minutes of the Tender Negotiation Meetings
d. Agreed Minutes of the Tender Technical Meetings
e. The Priced Bill of Quantities
f. The Technical Specifications / Scope of work
g. The Tender document, including all Appendices and/or Addenda, Corrigendum the latest taking precedence.

3.0 Governing Laws & Jurisdiction

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

3.02 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 Delhi, India

4.0 Scope of Supply & Services - 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 - II of this RFQ.

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

4.04 All relevant drawings, data and instruction manuals.

4.05 **Scope Of Services**

The scope of work shall be "Installation Testing and commissioning of PSS at site(s), Delhi, includes:

1) Construction of RCC foundation/plinth. The foundation height should be 600 mm (minimum) from the Finished Ground Level (FGL).

2) Installation, Testing & Commissioning of PSS at site along with interconnection of all components DI/DO/AI signals, status monitoring signals and wireless sensors signals to FRTU. Integration of FRTU with SCADA.
3) Connection of PSS body with substation earth mesh at two independent points using 50 x 10 mm GI Strip.
4) Transformer neutral connection with substation earth mesh at two independent points using 50 x 10 mm GI strip.
5) The vendor's scope of work includes all labor, cranes, tools, tackles, testing instruments/kit, and technical supervision.
6) Submission of necessary testing reports.
7) Obtaining approval from the Electrical Inspector (BSES) is the bidder's responsibility. The supplier must provide all relevant documents, including drawings, test reports, and any other required documentation.
8) The cost of transit insurance, freight, loading/unloading of materials/equipments during its handling/erection at site is included in the vendor scope of work.
9) The involvement of cranes, hydras, tractors, and trailers for this work is part of the vendor's scope.
10) For this contract, individual framework orders or site intimations will be issued, and work must be completed within 30 days from the date of the order or site intimation.
11) Transportation of PSS from the store to the site, including loading, transportation, and unloading, is required if needed.

A Single order may be placed for supply & ETC which inter-alia includes the Scope of Work as mentioned/required for satisfactory operation of the Scheme shall be in Bidder's scope. Bidder(s) must provide goods and services that conform to these specifications for the entire term of the agreement.

5.0 Transmittal Approval/Clearance For Manufacturing

5.01 Transmittal Approval Documents (GTP/Drawings/QAP/etc.) are to be submitted within 15 days to the concerned official in BYPL for approval. BYPL shall approve/provide comments on the submitted drawings within 7 days of first submission. In case resubmission is required, it shall be completed by the supplier within next 5 days. The timelines for approval by BYPL shall be 5 days in case of every resubmission. However, repetitive submissions are not desirable.

5.02 Manufacturing shall be started only after Transmittal approval by BYPL & giving manufacturing clearance.

5.03 Relevant documents submitted for Transmittal approval should be made considering all the pre-award discussion/confirmation between BYPL & Vendor.

5.04 Post Order Transmittal Approval shall be completed within 04 weeks from the date of Rate Contract/Purchase Order. Delay in getting Transmittal Approval should not be an excuse for late deliveries and waiver of LD Charges.

6.0 Quality Assurance and Inspection

6.01 Immediately on award of contract, the Vendor 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.

6.02 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 is to proceed with the work past a hold point only after clearance by purchaser or a witness waiver letter from BYPL.

6.03 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.

6.04 On completion of manufacturing, the items can only be dispatched after receipt of Material Dispatch Clearance Certificate (MDCC)/Instructions issued by the Purchaser.

6.05 All in-house testing and inspection shall be done without any extra cost. The in-house inspection shall be carried out in presence of BSES/BSES authorized third party inspection agency. Cost of Futile/abortive visit(s) shall be debited from the invoices.

6.06 Purchaser reserves the right to send any material being supplied to any recognized laboratory for testing, wherever necessary and the cost of testing shall be borne by the Vendor. In case the material is found not in order with the technical requirement/specification, the charges along with any other penalty that may be levied are to be borne by the Vendor. 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 Vendor's representative.

7.0 Inspection & Test Charges

7.01 GOODS shall be inspected by BUYER and/or third party inspection agency nominated by BUYER. Inspection shall carry out stage-wise/final inspection as per agreed QA/QC procedure. In addition, inspection of GOODS shall be carried out at our Site/stores. VENDOR shall, however, repair/replace the damaged/rejected GOODS to the satisfaction of BUYER at no extra cost.

7.02 Inspection charges are included in the total order value, however, BUYER will bear third-party inspection charges. In case of a futile/abortive visit of BUYER's inspector at VENDOR'S works, the cost towards the same shall be debited from the VENDOR's invoices.

7.03 GOODS covered by this PURCHASE ORDER shall not be dispatched in whole or in part until VENDOR has received a written Release for Shipment Notice from BUYER or their designated representative.

7.04 Stage/Pre-Dispatch Inspection request must be submitted at least seven (7) days in advance using the official format provided by BYPL.

8.0 Handling and Storage

8.01 Material Safety Data Sheet (MSDS), detail handling & storage instruction sheet/manual, wherever applicable, to be furnished before the commencement of supply and one copy is to be submitted in-store/site with First Lot.

9.0 Packing, Packing List & Marking

9.01 **Packing:** Supplier shall pack or shall cause to be packed all Commodities in crates/boxes/drums/containers/cartons and otherwise in such a manner as shall be reasonably suitable for shipment by road or rail to BYPL, Delhi/New Delhi stores/site without undue risk of damage in transit. All the packaging materials as prescribed shall be supplied preferably with bio-degradable packing- materials.

9.02 **Packing List:** The contents of each package shall be itemized on a detailed list showing the exact weight, and extreme outside dimensions (length, width & weight) of each container/box/drum/carton, Item SAP Code, PO No & date. One copy of the packing list shall be enclosed in each package delivered.

10.0 Documentation

10.01 The vendor must procure all items from BYPL-approved sources in accordance with BYPL specifications/Transmittal Approval. The Vendors shall submit copies of Material/Type Test Certificates, O&M Manuals, and Approved & As-built drawings, related to various equipment. The vendor shall ensure strict compliance with the specifications and Field Quality Procedures issued by BYPL.

11.0 Price Validity

11.01 All bids submitted shall remain valid, firm and subject to unconditional acceptance by BYPL Delhi for 120 days from the due date of submission. For awarded suppliers, the prices shall remain valid till contract completion.

12.0 Effective Date of Commencement of Contract

12.01 The date of the issuance of the Letter of Intent/Letter of Acceptance/Purchase Order shall be treated as the effective date of the commencement of Contract.

13.0 Delivery Period For PO

13.01 The contractual delivery for the Goods covered under this Contract shall be completed as per the schedule.

13.02 Delivery shall mean delivery at F.O.R BYPL - DELHI STORES/SITES.

13.03 Request for delivery date extension, if any, shall be submitted to BYPL 7(seven) days prior to the contractual delivery date/ schedule mentioning proper justifications/ reasoning for the delay. Any reason which is not attributable to BYPL may not be entertained.

14.0 Delivery Terms & Address

14.01 The GOODS shall be delivered at BYPL Store(s)/Site(s). The goods shall be dispatched on FOR destination basis including payment of local taxes and duties, if any.

14.02 Unloading at BYPL Store(s)/Site(s) shall be done by Vendor.

14.03 Wherever applicable, the Vendor shall be responsible for issuing required transit documents/E Way Bills for the movement of Goods and the logistic partner/transporter shall not be liable for any loss

arising due to confiscation of goods by government agencies on account of lack of proper documents or any mis-declaration.

15.0 Transportation

15.01 VENDOR shall arrange transportation of GOODS from VENDOR's/SUB-VENDOR's works/warehouse(s) to BUYER's Store(s)/Site(s).

15.02 Charges for transportation of GOODS from VENDOR's works to Store(s)/Site(s) are included in total order value.

16.0 Transit Insurance

16.01 Transit Insurance shall be arranged by the Vendor.

16.02 DAMAGE/LOSS OF CARGO IN TRANSIT: Vendor shall be solely responsible for coordinating with the concerned insurance company for procuring insurance for material and/or Goods, processing claim lodgment and settlement. Notwithstanding the insurance cover, in case of loss/damage to material and/or Goods, in any manner and for any cause whatsoever, Vendor shall cause the damaged cargo to be replaced and delivered to the Purchaser with new material and/or Goods within 30 days of such loss/damage. The Vendor shall be solely responsible for all expenses in relation to the replacement and delivery in such circumstances.

17.0 Acceptance Of Goods

17.01 GOODS shall be accepted subject to Receipt of Material Dispatch Clearance Certificate.

17.02 The Purchaser shall not accept materials if LR/ RR / Bilty and the Original Tax Invoice (Transporter Copy) are not handed over at store/site. The Vendor shall draw all dispatch documents in favour of Purchaser as Consigned to and billed to.

17.03 The materials shall be supplied during working hours from 10AM to 5PM. No delivery shall be effected after this time unless prior intimation is given to the Purchaser.

17.04 The Vendor shall take signature of the authorized person at store/site with Purchaser's seal duly receipting the materials and the quantities in the absence of which payment shall not be made by the Purchaser.

17.05 The Vendor shall ensure exact quantities are supplied as per standard packaging and if the quantities are short-supplied, as per verification at the Vendor's store/site, the same shall be adjusted and net payment shall be made accordingly.

17.06 The Purchaser has the exclusive right to reject the goods if not supplied strictly as per the terms and conditions of this Order.

18.0 Prices/Rates/Taxes

18.01 **Price basis for supply of materials**
a) The rates finalized for this contract shall be firm for the entire duration of the contract and are not subject to any variation and escalation for any reason whatsoever.

b) The supply prices are inclusive of packing, forwarding, and loading at manufacturer's premises, payment of GST, Freight, and any other local charges. Octroi is presently not applicable in Delhi and however if applicable shall be reimbursed at actuals.
c) The supply prices shall also include unloading at BYPL Delhi/New Delhi stores/sites.
d) Transit insurance will be arranged by Vendor.

19.0 Taxes & Duties

19.01 Prices for Goods are on Ex- Works basis. For the Goods covered under the GST laws, all taxes that are applicable under CGST, SGST, UGST, IGST and GST Compensation Cess shall be payable extra.

19.02 For the Goods not covered in the GST laws, the applicable ED, VAT / CST shall be payable extra at applicable rates.

19.03 GSTIN of BSES YAMUNA POWER LTD - 07AABCC8569N1Z0
CST No of BSES YAMUNA POWER LTD -07740254593
TIN NO of BSES YAMUNA POWER LTD - 07740254593
PAN NO of BSES YAMUNA POWER LTD - AABCC8569N

19.04 At the end of each month, the SELLER must submit their detail of invoices and amount thereof to the concerned officer in charge, within 07 days after the close of the respective month to which supply relates. Non-submission of the said request would be treated as good as the SELLER has no requirement for reconciliation.

20.0 Variation in Taxes, Duties & Levies

20.01 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. In case of reduction in taxes, duties and levies, the benefits of the same shall be passed on to BUYER.

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

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

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

21.0 Taxes & Duties on raw materials & bought out components

21.01 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.

21.02 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.

22.0 Tax Indemnity Clause

22.01 Vendor (along with its affiliates in India or overseas including any agent/ third party contractor or any other person appointed by such affiliates for this agreement) agrees that it will be solely responsible for performing all compliances and making payments of all taxes (direct tax or indirect tax including but not limited to income-tax, transfer pricing, value added tax, SGST, CGST, IGST, UTGST, GST Compensation Cess custom duty, excise duty, Research and Development Cess, etc.), cesses, interest, penalties or any other tax/ duty/ amount/ charge/ liability arising either out of laws/ regulations applicable in India and overseas or because of a demand/ recovery initiated by any revenue authority under laws/ regulations applicable in India or overseas.

22.02 In case any tax liability (including but not limited to income tax, transfer pricing, value added tax, SGST, CGST, IGST, UTGST, GST Compensation Cess, custom duty, excise duty, Research and Development Cess, etc.), cesses, interest, penalties or any other tax/ duty/ amount/ charge/ liability becomes payable by Purchaser due to failure of the Vendor, or any of its affiliates in India or overseas including any agent/ third party contractor or any other person appointed by such affiliates for this agreement, to comply with the relevant laws/ regulations applicable in India or overseas, Vendor undertakes to indemnify Purchaser for an amount equal to amount payable by Purchaser.

22.03 Further, Vendor undertakes to keep Purchaser indemnified at all times against and from all other actions, proceedings, claims, loss, damage, costs and expenses which may be brought against Purchaser or suffered or incurred by Purchaser and which shall have arisen either directly or indirectly out of or in connection with failure of The Vendor, or any of its affiliates in India or overseas including any agent/ third party contractor or any other person appointed by such affiliates for this agreement, to comply with relevant obligations/ compliance under any law/ regulations applicable in India and overseas.

22.04 The parties agree to follow the following process in case any communication of demand, arising out of non-compliance by Vendor (along with its affiliates in India or overseas including any agent/ third party contractor or any other person appointed by such affiliates for this agreement), is received by Purchaser:

22.04.1 On Purchaser receiving any communication from a competent authority demanding tax liability (including but not limited to income tax, transfer pricing, value added tax, SGST, CGST, IGST, UTGST, GST Compensation Cess custom duty, excise duty, Research and Development Cess, etc.), cesses, interest, penalties or any other tax/ duty/ amount/ charge/ liability, Purchaser shall, within 5 common working days from the date of receipt of such communication (save where the period to respond to the relevant authority is less than five days, in which case, as soon as reasonably possible) inform Vendor in writing of such communication.

22.04.2 Pursuant to receiving communication from Purchaser, Vendor shall suggest to accept the communication and pay the demand amount to the competent authority. In such an event, Vendor shall reimburse such amount paid to Purchaser within 5 working days from the date of payment by Purchaser to the competent authority.

22.04.3 If Vendor advises in writing and Purchaser agrees to dispute the demand, then Purchaser shall dispute the matter with competent authority as per due process prescribed under the regulations and Purchaser shall not pay the Tax Demand. In such scenario, cost of litigation including but not limited to Counsel cost, filing fees, other related charges, should be reimbursed by Vendor to Purchaser. Additionally, If any coercive steps of recovery are initiated by the department, then Purchaser would pay such amount (including by way of adjustment of refunds due to it) and the same would be reimbursed by Vendor within 5 working days from date of such recovery from Purchaser. Purchaser will take all necessary steps to avoid such recovery measures.

22.04.4 On determination of the demand through an Order issued by a Tribunal or any other similar Authority, by whatever name called, under any law applicable in India or overseas, if the demand or any part thereof becomes payable and is paid by Purchaser, then Vendor undertakes to reimburse such amount to Purchaser within 10 days from the date of payment. Alternatively, if on determination of the demand through an Order, no amount is payable by Purchaser then any refund arising to Purchaser due to such an Order shall be passed on to Vendor within 10 days from the date of receipt of refund.

23.0 Invoicing Instructions

23.01 Invoices in triplicate [1) Original for recipient, 2) Duplicate for Transporter, 3) Triplicate for supplier] shall be made out and delivered to the following address: BSES YAMUNA POWER LIMITED, SHAKTI KIRAN BUILDING, KARKARDOOMA, DELHI-110032.
MDCC will be issued separately for Capex and Opex. The supplier will submit the invoice in accordance with the MDCC.

23.02 Vendor shall obtain GST registration in the State from where the supply will be carried out. Vendors supplying Goods to the Purchaser shall have a valid GST registration number and shall submit GST Tax Invoice and other documents as per SGST Act, CGST Act, IGST Act, UTGST Act, GST Compensation Cess Act and Rules made there under. Failure to submit GST Tax Invoice shall be liable for withholding SGST, CGST, IGST, UTGST, GST Compensation Cess amount charged by the vendor while releasing the payment.

23.03 Invoice will be in the name of BSES YAMUNA POWER LIMITED & address of the store/site mentioned in the MDCC. Invoice should contain all information as required under GST Invoice, Debit Note and Credit Rules. The government has notified rules of invoicing under GST along with a template of invoice(GST INV-01) covering the elements such as supplier's details, GSTIN No, HSN Codes, item details, GST tax rates, etc that need to be presented by the supplier.

23.04 Vendor to carefully examine and charge relevant CGST / SGST, UGST, IGST and GST compensation cess as applicable to the transactions.

23.05 Timely provision of invoices / Debit Notes / Credit Notes:

23.05.1 Vendor to timely provide invoice / Debit note / Credit note to enable Purchaser to claim tax benefit on or before stipulated time period. All necessary adjustment entries (Credit Notes, Purchase Returns, Debit Notes) shall be made within the timelines prescribed under the GST Laws.

23.05.2 In case of receipt of advance, the Vendor undertakes to raise the tax invoice. Purchaser, upon payment of advance, shall issue payment voucher as per applicable GST laws and rules. Four copies of the invoices need to be provided by suppliers and wherever the law requires, an Electronic Reference Number for each invoice. Documents and devices to be carried by a person-in-charge of a conveyance under.

23.06 E Way Bills/transit documents for movement of Goods:
Wherever applicable, the Vendor shall be responsible for issuing required transit documents/E Way Bills for movement of Goods and the logistic partner/transporter shall not be liable for any loss arising due to confiscation of goods by government agencies on account of lack of proper documents or any mis-declaration. The Supplier is responsible to comply with rules applicable for E-way bill. Any violation in provision of E-way Bill will attract penalty and seizure of Transit Material. Any Penalty and Pre-Deposit due to violation of rules/provisions shall be paid and borne by Supplier. Also, Supplier is responsible for releasing of goods from Authority whether CGST/SGST. Delay in supply from the contractual date due to seizure of goods shall also attract liquidated damages.

23.06 Any Vendors / Contractors / Service providers 'shall' mention the following minimum requirements in 'invoice' while furnishing Invoices with us:
a) Invoice / Credit Note Number and Date.
b) Address of supplier/service provider and GSTN.
c) Customer Name and Address as per GST Registration Certificate and GST registration Number.
d) 'Shipped to' and 'Billed to' addresses.
e) Place of Supply.
f) Description of Goods/Service along with unit of measurements.
g) HSN / SAC Code.
h) Taxable value (Gross & deduct Discount separately if allowed)
i) Rate and amount of Tax separately for CGST, SGST and IGST as applicable.
j) Signature of Supplier. (For e-invoices physical signature is not required)
k) Whether Reverse Charge is applicable or not.

24.0 Terms of Payment and Billing

24.01 **For Supply of equipment/item:**

Part 1) 90% of basic value with 100% taxes and duties shall be made within 45 days from the date of receipt & acceptance of material at site on against submission of following documents against dispatch of each consignment at our Vendor Support Cell (VSC):
a) Signed copy of accepted Rate Contract / Purchase Order (for first payment)
b) LR / RR / BL as applicable
c) Challan as applicable
d) One (01) copies of Supplier's detailed Recipient Invoice showing Commodity description, quantity, unit price, total price and basis of delivery, and being 100% of the value of the consignment claimed.
e) One (01) copies of Supplier's transporter invoice duly receipted by BYPL Store& Original certificate issued by BYPL confirming receipt of the subject material at Store/Site and acceptance of the same as per the provisions of the contract.
f) One (01) copies Packing List / Detailed Packing List
g) Approved Test certificates / Quality certificates, if applicable
h) Certificate of Origin, if applicable
i) Material Dispatch Clearance Certificate (MDCC)
j) Warranty / Guarantee Certificate, if applicable
k) Checklist for bill submission.

Part 2) Balance 10% of basic value shall be paid in 45 days from the date of successful testing, commissioning and handing over of individual Package Substation duly certified by BYPL Engineer-in-Charge.

In case of receipt of material at site/store and not erected or commissioned within 6 months from the date of receipt of material at site/store, Balance 10% of basic value shall also be released.

For Services of equipment/item:

Payment shall be made as under (PSS wise):
i) 100% payment shall be due after 45 days of submission of your bills, from the date of successful testing, commissioning and handing over of the entire installation along with work completion certificate at our office. The work completion certificate shall be issued by Engineer-In-Charge by certifying that the work has been completed to full satisfaction.

All bills shall be submitted to the Engineer In charge / Package Engineer for certification. Bills shall be complete in all respect including ESI / HR compliance, Quality compliance, HSE compliance,

Store compliance, Finance compliance etc. An established procedure is followed at site. Incomplete bills / invoices will not be considered for processing payments.

24.02 Purchaser has the right to recover tax loss, interest and penalty suffered due to any non-compliance of tax laws by the Vendor. In the event, Purchaser is not able to avail any tax credit due to any shortcoming on the part of the Vendor (which otherwise should have been available to Purchaser in the normal course), then the Vendor at his own cost and effort will get the shortcoming rectified. If for any reason the same is not possible, then the Vendor will make 'good' the loss suffered by Purchaser due to the tax credit it lost. In such event, any amount paid to the Vendors shall be first attributable to the tax (GST) charged in the invoice and the balance shall be considered towards the 'value' of supply of goods/ services.

24.03 Purchaser shall deduct "Tax Deducted at Source" wherever applicable and at the rate prescribed under the GST Laws or any other Indian law and remit the same to the Government. Necessary TDS certificates as per law shall be issued by the purchase to the vendor.

24.04 Any liability arising out of dispute on the tax rate, classification under HSN, calculation and payment of tax to the Government will be to the Vendor's account.

24.05 Where the supply of Goods is liable to GST under reverse charge mechanism, then the supplier should clearly mention the category under which it has been registered and also that "the liability of payment of GST is on the Recipient of Supply".

25.0 Performance Guarantee

25.01 To be submitted within twenty-eight (28) days from the date of issuance of the Letter of Intent/Award/PO. Bidder shall submit PBG equivalent to 10% of the PO value (including GST) valid for a period of 24 months from the date of Commissioning or 30 months from the date of receipt, whichever is earlier plus 3 months claim period.

25.02 Bank guarantee shall be drawn in favour of BSES Yamuna Power Ltd as applicable. The performance Bank guarantee shall be in the format specified by BYPL.

26.0 Forfeiture

26.01 Each Performance Bond established under Clause 25.0 shall contain a statement that it shall be automatically and unconditionally forfeited without recourse and payable against the presentation by BYPL of this Performance Bond, to the relevant bank referred to above, together with a simple statement that supplier has failed to comply with any term or condition outlined in the Contract.

26.02 Each Performance BG established under will be automatically and unconditionally forfeited without recourse if BYPL in its sole discretion determines that supplier has failed to comply with any term or condition outlined in the contract.

27.0 Release

27.01 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 25.0) except for the case outlined in Clause 26.0.

28.0 Defects Liability Period/Guarantee/Warranty

28.01 The bidder is to Guarantee the materials/items supplied against any defect or failure, which arises 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 at store(s)/site(s), whichever is earlier.

28.02 If during the Defects Liability Period, any GOODS are found to be defective, they shall be promptly replaced or rectified by BIDDER at its own cost (including the cost of dismantling and (reinstallation) on the instructions of BUYER and if removed from SITE for such purpose, shall be removed and re-delivered to SITE by BIDDER at its own cost.

29.0 Return, Replacement or Substitution

29.01 BYPL shall give Supplier notice of any defective Commodity promptly after becoming aware thereof. BYPL may at its discretion elect to return defective Commodities to Supplier for replacement, free of charge to BYPL, or may reject such Commodities and purchase the same or similar Commodities from any third party. In the latter case, BYPL 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. BYPL may set off such costs against any amounts payable by BYPL to Supplier. Supplier shall reimburse BYPL for the amount, if any, by which the price of a substitute Commodity exceeds the price for such Commodity as quoted in the Bid. BUYER at its sole discretion shall have the opinion to dispose of the material or GOODS so rejected and not taken back within forty-five days from the date of intimation of rejection.

30.0 Time - The Essence Of Contract

30.01 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.

31.0 Penalty for Delay

31.01 If supply of items/equipments is delayed beyond the supply schedule as stipulated in the 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 basic (ex-works) price for every week delay of undelivered units or part thereof for individual milestone deliveries.

31.02 The total amount of penalty for delay under the contract will be subject to a maximum of ten percent (10%) of the basic (ex-works) price of total undelivered units.

31.03 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.

31.04 If the Penalty is levied as per the Order terms & conditions; BYPL will raise the Invoice for the penalty amount along with applicable GST rates. Accordingly, after setting off the penalty Invoice amount, net payment shall be made.

32.0 Recoveries

32.01 Whenever under this contract any money is recoverable from and payable by the Vendor, 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 contract. Should the sum be not sufficient to cover the full amount recoverable the Vendor shall pay to the purchaser on demand the remaining balance.

33.0 The Micro, Small and Medium Enterprises (MSME)

33.01 If the VENDOR establishment is covered under the purview of The Micro, Small and Medium Enterprises Development Act, 2006 and its amendments, he shall declare so within the bid of its status failing which it will be presumed that it is a non-MSME unit. Also, submit a copy of Udyog Aadhaar (UA) & Udyam Registration Number with Pan no. mentioned.

34.0 Transfer and Sub-Letting

34.01 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.

34.02 Notwithstanding the subletting / subcontracting of any portion of the works, supplier shall remain wholly responsible for the carrying out, completion and satisfactory execution of Works in all respects in accordance with the Purchase Order, specification, approved drawings and data sheets.

35.0 Intellectual Property Rights and Royalties

35.01 The Supplier shall indemnify the Purchaser and the Purchaser's Representative from and against all claims and proceedings on account of infringement (or alleged infringement) of any patent rights, registered designs, copyright, design, trademark, trade name, know-how or other intellectual property rights (hereinafter collectively referred to as "**Intellectual Property Rights**") in respect of the Works, Supplier's Equipment, machines, Works method, Plant, Materials, or anything whatsoever required for the execution of the Works and from and against all claims, demands, proceedings, damages, costs, charges and expenses whatsoever in respect thereof or in relation thereto. In the event of an infringement of any Intellectual Property Rights of any third party as a result of the execution of the Works (or any part thereof) by the Supplier, the Supplier shall rectify, modify or replace, at its own cost, the Works, Plant or Materials or anything whatsoever required for the Works so that infringement ceases to exist or, in the alternative, the Supplier shall procure necessary rights/ licenses from the affected third party so that there is no infringement of Intellectual Property Rights.

35.02 The Supplier shall be promptly notified of any claim made against the Purchaser. The Supplier shall, at its cost, conduct negotiations for the settlement of such claim, and any litigation or arbitration that may arise from it. The Purchaser or the Purchaser's Representative shall not make any admission that might be prejudicial to the Supplier unless the Supplier has failed to take over the conduct of the negotiations, litigation or arbitration within a reasonable time after having been so requested. In the event of the Supplier failing to act at the Purchaser's Representative's notice, the Purchaser shall be at full liberty to deduct any such amount of pending claim from any amount due to the Supplier under the Contract or any other contract and the balance portion of claim shall be treated as debt due from the Supplier.

35.03 All Intellectual Property Rights in respect of any Plant, Materials, Drawings and Designs, plans, documents, specifications, data, materials, know-how, charts, information, etc., provided to the Supplier by the Purchaser pursuant to this Contract for the execution of the Works, belongs to and shall continue to belong to the Purchaser and the Supplier shall not have any rights in the same other than the limited right for its use for the purpose of execution of the Works.

35.04 Intellectual Property Rights in respect of any Plant, Materials, Drawings and Designs, plans, calculations, drawings, documents, know-how and information relating to the Works which are proprietary to the Supplier and/ or its third-party licensors ("**Supplier's IPR**") shall continue to vest with the Supplier and/ or its third-party licensors and the Supplier shall grant and/ or procure from its third party licensors, at its own cost, a worldwide, perpetual, royalty-free, non-exclusive license (along with the right to sub-license) to use and reproduce such Supplier's IPR for the use, operation, maintenance and repair of the Works.

35.05 If any patent, trademark, trade name, registered design or software is developed by the Supplier or its SubSupplier specifically for the execution of the Works, then all Intellectual Property Rights in respect of such design, trademark, trade name or software shall be the absolute property of the Purchaser and shall not be utilized or retained by the Supplier (or its SubSuppliers) for any purpose other than with the prior written consent of the Purchaser.

35.06 If the Supplier uses proprietary software (whether customized or off the shelf) for the purpose of storing or utilizing records in relation to the Works, the Supplier shall obtain at its own expense, the grant of a worldwide, royalty-free, perpetual licence or sublicence (including the right to sublicense) to use such software, in favour of the Purchaser provided that the use of such software under the licence or the sublicense may be restricted to use any such software only for the design, construction, reconstruction, manufacture, installation, completion, reinstatement, extension, repair and operation of the Works or any part thereof.

35.07 If any software is used by the Supplier for the execution of the Works over which the Supplier or a third party holds pre-existing title or other rights, the Supplier shall obtain for the Purchaser, a worldwide, royalty-free, perpetual license for the right to use and apply that software (together with any modifications, improvements and developments thereof).

36.0 Vendor Code of Conduct

36.01 Vendor confirms to have gone through the Policy of BYPL on legal and ethical code required to be followed by Vendors encapsulated in the "Vendor Code of Conduct" displayed on the official website of BYPL (www.bsesdelhi.com) also, which shall be treated as a part of the agreement/contract/PO/WO.

36.02 Vendor undertakes that he shall adhere to the Vendor Code of Conduct and also agrees that any violation of the Vendor Code of Conduct shall be treated as breach of the agreement/contract/PO/WO.

36.03 In event of any such breach, irrespective of whether it causes any loss/damage, company (BYPL) shall have the right to recover loss/damage including liquidated damages from Vendor .

36.04 The Vendor hereby indemnifies and agrees to keep indemnified the company (BYPL) against any claim/litigation/liability/penalty including litigation cost arising out of any violation of Vendor Code of Conduct by the Vendor or its officers, agents & representatives etc.

37.0 Limitation of Liability

37.01 Except for willful misconduct or gross negligence, neither Party shall be liable to the other Party for loss of use of any Works, loss of profit, loss of any contract or any other indirect or consequential loss or damage which may be suffered by the other Party in connection with the Contract. The total liability of the Supplier to the Purchaser under the Contract shall not exceed the Contract Value. Except that this Clause shall not limit the liability of the Supplier:

(a) In cases of fraud, willful misconduct or illegal or unlawful acts, or

(b) In cases of acts or omissions of the Supplier that are contrary to the most elementary rules of diligence that a conscientious Supplier would have followed in similar circumstances.

38.0 Liability of Suppliers

38.01 Subject to the due discharge of its obligations under the Contract and except in case of gross negligence or willful misconduct on the part of the Supplier or on the part of any person acting on behalf of the Supplier, with respect to any loss or damage caused by the Supplier to the Purchaser's property or the Site, the Supplier shall not be liable to the Purchaser for the following:

(a) For any indirect or consequential loss or damage; and

(b) For any direct loss or damage that exceeds:

(i) The total payments made and expected to be made to the Supplier under the Contract including reimbursements, if any; or

(ii) The insurance claim proceeds that the Supplier may be entitled to receive from any insurance purchased by the Supplier to cover such a liability, whichever is higher.

38.02 This limitation of liability shall not affect the supplier's liability, if any, for damage to third-party property or injury or death of a person due to negligence of the Contractor or any Person or firm acting on behalf of the supplier in executing the order.

38.03 Notwithstanding anything contained in the Contract, the Supplier shall not be liable for any gross negligence or willful misconduct on the part of the Purchaser or any of its affiliates, any vendor, or any party, other than Supplier and/or, its directors, officers, agents or representatives or its affiliates, or SubSupplier, or the vendor or any third party engaged by it.

38.04 Notwithstanding anything contained in the Contract, including but not limited to approval by the Purchaser of any drawings, documents, vendor list, supply of information or data or the participation of the Purchaser in any meeting and/or discussion or otherwise, shall not absolve the Supplier from any of its liabilities or responsibilities arising in relation to or under the Contract.

39.0 Indemnification

39.01 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.

40.0 Events of Default

40.01 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 BYPL.

41.0 Consequences of Default.

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

(b) In the event of an Event of Default, BYPL 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 BYPL may incur as a result of Supplier's default.

42.0 Force Majeure

42.01 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 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 event 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 to comply with the above clause.

42.02 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 :

(i) The following events and circumstances :

a) Effect of any natural element or other acts of God, including but not limited to storm, flood, earthquake, lightning, cyclone, landslides or other natural disasters.

b) Explosions or fires

(ii) War declared by the Government of India.

(iii) Dangers of navigation, perils of the sea.

Note: Causes like power breakdowns/strikes, accidents etc do not fall under Force Majeure.

42.03 Notice of Events of Force Majeure If a force majeure event prevents a party from performing any obligations under the Contract in part or in full, that party shall:

i) Immediately notify the other party in writing of the force majeure events within 7(seven) working days of the occurrence of the force majeure event
ii) Be entitled to suspend performance of the obligation under the Contract which is affected by force majeure event for the duration of the force majeure event.
iii) Use all reasonable efforts to resume full performance of the obligation as soon as practicable
iv) Keep the other party informed of all such efforts to resume full performance of the obligation on a regular basis.
v) Provide prompt notice of the resumption of full performance or obligation to the other party.

42.04 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.

42.05 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.

42.06 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.
The Purchaser may terminate the contract after giving 7 (seven) days' notice if any of the following occurs:

i. Bidder fails to complete the execution of works within the approved schedule of works, terms and conditions.
ii. In case the Bidder commits any Act of Insolvency, or is adjudged insolvent
iii. Has abandoned the contract
iv. Has failed to commence work or has suspended the progress of works
v. Has failed to proceed with the works with due diligence and failed to make such due progress

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

42.08 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.

42.09 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 the failure to perform such obligations shall be due to an event of Force Majeure."

43.0 SEVERABILITY

43.01 If any provision of this Agreement is or becomes invalid or unenforceable by the courts of any jurisdiction to which it is subject, such invalidity or unenforceability shall not prejudice the remaining provisions of this Agreement, which shall continue in full force and effect.

44.0 Waiver of Rights

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

45.0 Termination for convenience of Purchaser

45.01 Purchaser at its sole discretion may terminate the contract by giving 30 days prior notice in writing or through email to the Supplier. Purchaser shall pay the Supplier for all the supplies/ services rendered till the actual date of contract termination against submission of invoice by the Supplier to that effect.

45.02 Payment of such compensation is the sole and exclusive remedy of the supplier for termination of this Agreement by Purchaser hereunder and the supplier shall not be entitled to, and hereby waives, claims for lost profits and all other damages and expenses.

45.03 Supplier hereby agrees that substantiation for settlement of any claims submitted by supplier shall be complete and in sufficient detail to allow Purchaser's evaluation. Terminate all sub-contracts except those that have been/ to be assigned to the Purchaser all rights, titles and benefits of the Suppliers/Vendor as the case may be.

46.0 Entire Agreement

46.01 This Agreement hereto contains the complete understanding between BYPL and VENDOR with respect to the matters contained herein and supersedes all other agreements, whether written or oral with respect to the matters contained herein.

47.0 Amendment

47.01 Any modification, amendment or other change to this Agreement shall be affected only by a written instrument signed by the authorized representatives of both BYPL and VENDOR.

48.0 Notice & Communication

48.01 Any notice or other formal communication to be given under this agreement shall be in writing and signed by or on behalf of the party giving it and shall be sent by registered post, A.D. to the addresses of Vendor or BYPL as mentioned herein above or to any other addresses as agreed by the parties, in writing from time to time.

48.02 Any notice or other formal communication can also be sent through the official e-mail ID of the authorized person of the Vendor or BYPL.

48.03 All communications, correspondence, and documentation related to the Purchase Order shall be directed as specified.

49.0 Cleanliness

49.01 All debris shall be removed and disposed of at assigned areas on daily basis. Surplus excavated earth shall be disposed of in an approved manner. In short, you shall be fully responsible for keeping the work site clean at all times. In case of non- compliance, company shall get the same done at Contractor's risk and costs.

50.0 Commissioning & Acceptance Test

50.01 After completion of the work, the Contractor shall conduct trial run/ operation in the presence of the Engineer In charge. During such trial run the system shall be operated under the supervision of the Contractor. If any rectification/modification is required during this period the Contractor shall do all necessary measures.

On satisfactory completion of the above, the system shall be deemed to have energized and placed in commercial operation. The Engineer In Charge will issue an acceptance certificate.

51.0 Work Completion Certification, Handing Over

51.01 The work carried out by the Contractor under this order has to be certified by Engineer In-charge for satisfactory completion of work allotted to the contractor with respect to specifications / Field Quality Procedures as per applicable standards. In case of modification/correction to be carried out, contractor shall carry out the said modifications/correction without additional cost. The Contractor shall remain in close contact with Engineer In-Charge at site to report the general findings of the fieldwork during the initial as well as later stages of the work at the site.

52.0 Safety Code

52.01 The Contractor shall ensure adequate safety precautions at site as required under the law of the land and shall be entirely responsible for the complete safety of their workman as well as other workers at site and premises. The contractor shall not deploy any worker below the age of 18 years.

Safety-related requirements as mentioned in our safety Manual put on the Company's website which can be accessed at https://www.bsesdelhi.com.

All contractors shall strictly abide by the guidelines provided in the safety manual at all relevant stages during the contract period.

The contractor shall observe the safety requirements as laid down in the safety manual/contract and in case of sub-contract (only after written approval of company), it shall be the responsibility of main contractor that all safety requirements are followed by the employees and staff of the sub-contractor.

The contractor employing two hundred employees or more, including contract workers, shall have a safety coordinator to ensure the implementation of safety requirements of the contract and a contractor with lesser number of employees, including contract workers, shall nominate one of his employees to act as safety co-ordinator who shall liaise with the safety officer on matters relating to safety and his name shall be displayed on the notice board at a prominent place at the work site.

The contractor shall be responsible for non-compliance of the safety measures, implications, injuries, fatalities and compensation arising out of such situations or incidents.

In case of any accident, the contractor shall immediately submit a statement of the same to the owner and the safety officer, containing the details of the accident, any injury or casualities, the extent of property damage and remedial action is taken to prevent recurrence and in addition, the

contractor shall submit a monthly statement of the accidents to the owner at the end of each month.

53.0 Statutory Obligations

53.01 The Contractor shall take all steps as may be necessary to comply with various Acts, Rules, including but not limited to The Child Labour (Prohibition & Regulation) Act, 1986, The Contract Labour (Regulation & Abolition) Act, 1970. The Employees Pension Scheme, The Employees Provident Funds and miscellaneous provisions Act, 1952 ,The Employees State Insurance Act,1948,The Equal Remuneration Act, The Industrial Dispute Act,1947, The Maternity Benefit Act , 1961, The Minimum Wages Act, 1948, The payment of Bonus Act ,1965, The Payment of Gratuity Act,1972, The Payment of wages Act, 1936, The Shops & Establishment Act, The Workmen's Compensation Act , 1923, Building and Other Construction Workers (Employment and Regulations) Act 1996, Building and Other Construction Workers (Cess) Act 1996, The Employers Liability Act,1938, Indian Electricity Act, 2003 and Indian Electricity Rules, VAT and Service tax etc., and all other applicable laws as amended and rules framed there under including any statutory approval required from the Central/State Govt. Ministry of Labour. Broadly, the compliance shall be as detailed below, but not limited to:

a) An Electrical license.
b) PF Code No. and all employees to have PF A/c No. under PF every Act, 1952.
c) All employees to have a temporary or permanent ESI Card as per ESI Act.
d) ESI Registration No.
e) Sales Tax registration number, if applicable.
f) PAN No.
g) Work Contract Tax Registration Number/ VAT Registration.
h) Labour License under Contract Labour Act (R & A) Act 1970.
i) Delhi Building and Other Construction Worker (Regulation of Employment and Conditions of Services) Rules, 2002(B.O.C.W.)

(Bidder responsible for execution of the job should obtain a copy of Labour License before start of the work by the contractor.)

The Contractor must follow:

a) Third party Insurance Policy before start of work.
b) To follow Minimum Wages Act prevailing in the state.
c) The Salary/wages to all deployed manpower is to be distributed through ECS only into the bank accounts of all individuals and not later than 7th of succeeding month. In case of unavoidable circumstances the payment may be made through crossed cheques in the name of the individual and information of all such cases need to be submitted to HR(CMC).
d) To maintain Wage- cum - Attendance Register.
e) To maintain First Aid Box at Site.
f) Latest P.F. and E.S.I. challans pertaining to the period in which work was undertaken along with a certificate mentioning that P.F. and E.S.I. applicable to all the employees has been deducted and deposited with the Authorities within the time limits specified under the respective Acts.
g) Workman Compensation Policy. {If applicable}.
h) Labour license before start of work. {If applicable}.

Before commencing the work it would be mandatory for the Contractor to furnish the Company the permanent PF code no and ESI of the employees.

54.0 Workman Compensation

54.01 The Contactor shall take insurance policy under the Workman Compensation Act to cover such workers who are not covered under ESI and PF by the Contractor however engaged to undertake

the jobs covered under this order and a copy of this insurance policy will be given to Company for reference and records. This insurance policy shall be kept valid at all times. In case there are no worker involve other than those who are covered under ESI and PF by the Contractor, the Contractor shall certify for the same.

The contractor shall keep the company indemnified at all times, against all claims of compensation under the provision of Workmen Compensation Act 1923 and as amended from time to time or any compensation payable under any other law for the time being workman engaged by the contractor/sub-contractor/sub-agent in carrying out the job involved under this work order and against costs and expenses, if any, incurred by the company in connection therewith and without prejudice to make any recovery.

The company shall be entitled to deduct from any money due to or to become due to the Contractor, moneys paid or payable by way of compensation as aforesaid or cost or expenses in connection with any claims thereto and the Contractor shall abide by the decision of the Company as to the sum payable by the Contractor under the provisions of this clause.

55.0 Staff And Workman

(I) It shall be responsibility of contractor:

(a) To obtain Contract Labour License from the concerned authorities and maintain proper liaison with them. Necessary Forms for obtaining Labour License would be issued by the company. However you will bear all expenses for obtaining Labour license and registration in PF Department for your scope of work. You will deposit PF of your staff/laborer each month and all related documents should be furnished to us.
(b) To obtain workman insurance cover against deployment of workers etc.

(II) To maintain, proper records relating to workmen employed, in the form of various Registers, namely.

(a) Register of workmen.
(b) Register of muster roll.
(c) Register of overtime.
(d) Register of wages.
(e) Any other register as per latest amendment Labour Act.

(III) To disburse monthly wages to your workers/ supervisors in time and in the presence of Company representatives or as directed by the Labour authorities.

(IV) To maintain proper liaison with the Project authorities, local police and all other government and local bodies.

(V) To pay your workmen at least not less than the minimum prescribed wages as per state/Central Labour laws as may be, applicable. The contractor shall, be responsible for compliance of all the provisions of Minimum Wages Act, PF, ESIC Act workmen Compensation Act and Contract Labour Regulation & Abolition Act the rules made there under. In case of non- Compliance of the statutory requirements. The company would take necessary action at the risk and cost of the Contractor.

(VI) To employ required number of skilled/semi-skilled and unskilled workmen as per site requirement to complete the entire project as per schedule. To provide safety shoes, safety helmets, safety belts, gloves etc. to your worker/staff as per requirement during erection work.

(VII) To employ necessary engineering and supervisory staff for completion of the Project in time. While day-to-day management of the site and supervision of the works shall be the

responsibility of your Engineer - In charge, he will report to the our Engineer in charge to assist him to discharge the overall responsibility of the execution of the project.

56.0 Third Party Insurance

56.01 Before commencing the execution of the work the Bidder shall take third party insurance policy to insure against any damage or loss or injury which may occur to any property / public property or to any person or any employee or representative of any outside Agency/ the company engaged or not engaged for the work of the company, by or arising out of the execution of the work or temporary work or in carrying out of this Agreement. For third party insurance policies, the Bidder shall be responsible for settlement of claims with the underwriters without any liability on the purchaser / owner and will arrange replacements / rectification expeditiously without a waiting settlement by insurance claim at Bidder's own cost.

57.0 Environmental, Health & Safety Plan

57.01 Contractor will make ensure that the Environment, Health & Safety (EHS) requirements are clearly understood and faithfully implemented at all levels at site as per instruction of Company. Contractors must comply with these requirements:

a) Comply with all of the elements of the EHS Plan and any regulations applicable to the work.
b) Comply with the procedures provided in the interests of Environment, Health and Safety.
c) Ensure that all of their employees designated to work are properly trained and competent.
d) Ensure that all plant and equipment they bring on to site has been inspected and serviced in accordance with legal requirement and manufacturer's or suppliers' instructions.
e) Make arrangements to ensure that all employees designated to work on or visit the site present themselves for site induction before the commencement of work.
f) Provide details of any hazardous substances to be brought onsite.
g) Ensure that a responsible person accompanies any of their visitors to site.

All contractor's staff are accountable for the following:

1. Use the correct tools and equipment for the job and use safety equipment and protective clothing supplied, e.g. helmets, goggles, ear protection, etc. as instructed.
2. Keep tools in good condition.
3. Report to the Supervisor any unsafe or unhealthy condition or any defects in plant or equipment.
4. Develop a concern for safety for themselves and for others.
5. Prohibit horseplay.
6. Not to operate any item of plant unless they have been specifically trained and are authorized to do so.

58.0 Test Certificate & Quality Assurance

58.01 The Contractor shall procure all equipment from genuine sources as approved by the Company and as per Company specifications. The Contractor shall submit all the test certificates and joint inspection reports related to major equipment wherever applicable. The contractor shall ensure for the strict compliance with the specifications and Field Quality Procedures issued by company / Engineer in-charge.

59.0 Measures Related To The Tree Pruning, Excavation Near Tree And Construction & Demolition

59.01 Notwithstanding anything stated in the tender document, work contract or any other communication issued related to the performance of the work order awarded, it is clarified that the vendor and its associate/employees/worker, during the performance of work under this tender, shall ensure full compliance of the provisions of all environment laws/rules/directions by any

authority including judicial authority/ regulation related to excavation near tree and construction & demolition activity, and shall mandatorily comply the following instructions:

A. <u>Tree Pruning, Planning, Installation and Maintenance of Utility Apparatus in proximity to trees shall be done mandatorily by ensuring the following prescribed measures:</u>

1) No excavation work shall be done within two (2) meters of the Tree Trunk.
2) Any exposed roots beyond 2 meters of the tree trunk, should be protected with dry sacking and backfilling must be done with a suitable manure mixture and/or the compost material mix as soon as possible on the completion of the works.
3) For any excavation to be carried out beyond the **prescribed distance of 2 meters but within 3 meter** from the tree trunk, **manual methods (by use of hand)** or by using trenchless techniques shall be preferred over use of a mechanical excavation.
4) No roots shall be cut during the excavation work.
5) Not to lean any materials against or chain mechanical plants to the trunk of the trees.
6) Avoid any soil contamination from oil, gasoline, paint and paint thinner or other chemicals.
7) No concrete or construction or repairing work shall be done at least within two (2) meter radius of the trunk of trees.
8) All the electric wires and high tension cables and other apparatus relating to supply of electricity shall permanently be removed from the trees branches.

<u>Records to be maintained by the supervisor to demonstrate adherence to the guidelines for excavation in Proximity to the Trees:</u>

1) Ensure pre and post photography and videography of the site demarcated for the excavation work and the same shall not be deleted/removed until securing the prior permission of the Circle head O&M.
2) While digging and upon exposure to the roots– take immediate photographs of the same and report the matter to senior officers for further guidance.
   If any unauthorized layering of other cables is being carried out at the digging site by some other agency/person, then immediately capture photographs of the same and inform the seniors, who shall take suitable legal actions, if required, which includes intimating to tree officer about such unauthorized laying of wires by such agency.

B. <u>DUST MITIGATION MEASURES FOR CONSTRUCTION & DEMOLITION ACTIVITIES</u>

Any construction/demolition/excavation related activity performed in furtherance of the performance of work under award, be undertaken only after ensuring the Dust Mitigation Measures prescribed as follows:

1) Dust/wind breaking walls of appropriate height around the periphery of the construction site.
2) Installation of Anti Smog Gun(s) (for >20,000 m2 built up area).
3) Tarpaulin or green net on scaffolding around the area under-construction and the building.
4) All vehicles including carrying construction material and construction debris of any kind should be cleaned and wheels washed.
5) All vehicles carrying construction material and construction debris should be fully covered and protected.

6) All construction debris and construction material of any kind should be stored on the site and not dumped on public roads or pavements.
7) No loose soil or sand or Construction & Demolition Waste or any other construction material which may cause dust, shall not be left uncovered.
8) No grinding and cutting of building materials in open area. Wet jet should be used in grinding and stone cutting.
9) Unpaved surfaces and areas with loose soil should be adequately sprinkled with water to suppress dust.
10) Roads leading to or at construction sites must be paved and blacktopped i.e., metallic roads (for >20,000 m2 built up area).
11) Construction and demolition waste should be recycled on-site or transported to authorized recycling facility and due record of the same should be maintained.
12) Every worker working on construction site and is involved in loading, unloading and carriage of construction material and construction debris should be provided with dust-mask to prevent inhalation of dust particle.
13) Arrangement should be provided for medical help, investigation and treatment to workers involved in the construction of building and carry of construction material and debris relatable to dust emission.
14) Dust mitigation measures shall be displayed prominently at the construction site for easy public viewing.
15) Ensure the compliance of all dust control measure.

It is clarified that BYPL has zero tolerance with respect to the non-compliance/breach of environment laws/rules/directions by any authority including judicial authority/ regulation. Accordingly, in case of breach by the vendor/its associate/employee/worker to the laws/rules as detailed above, shall be termed as serious breach to the terms of work order and BYPL shall be free to take all actions against vendor for such breach of contract including the termination of the said contract. Additionally, the vendor shall also be liable to indemnify BYPL/its Directors/Officers/Employees/Associates in full including the payment of all loss/penalties/compensation including environment compensation as imposed by any judicial/quasi-judicial citing/alleging such breach.

The vendor shall also be under a mandate to provide an Undertaking to BYPL, which includes that the excavation, tree pruning, construction and demolition work, if performed by such vendor, the same shall be in strict adherence of all environment laws/rules/directions by any authority including judicial authority/ regulation and all the measures provided in work order/tender under the head/title "**Measures related to the Tree Pruning, excavation near tree and construction & demolition**".

60.0 Acceptance

60.01 Vendor confirms to have gone through the Policy of BYPL on legal and ethical code required to be followed by vendors encapsulated in the "Vendor Code of Conduct" displayed on the official website of BYPL (www.bsesdelhi.com) also, which shall be treated as a part of the contract/PO/WO.

The vendor undertakes that he shall adhere to the Vendor Code of Conduct and also agrees that any violation of the Vendor Code of Conduct shall be treated as breach of the contract/PO/WO.
In the event of any such breach, irrespective of whether it causes any loss/damage, Purchaser (BYPL) shall have the right to recover loss/damage from Vendor.
The Contractor/Vendor hereby indemnifies and agrees to keep indemnified the Purchaser (BYPL) against any claim/litigation arising out of any violation of Vendor Code of Conduct by the Contractor/Vendor or its officers, agents & representatives etc.

60.02 Acceptance of the CONTRACT implies and includes acceptance of all terms and conditions enumerated in the CONTRACT in the technical specification and drawings made available to Contractor consisting of general conditions, detailed scope of work, detailed technical specification, detailed equipment drawing and complete scope of work.

60.03 Bidder and Company contractual obligations are strictly limited to the terms set out in the CONTRACT. No amendments to the concluded CONTRACT shall be binding unless agreed to in writing for such amendment by both parties.

60.04 We expect your services and supplies to be aligned to our Vision, Mission and Values. Please refer to the following link to know about our Vision, Mission and Values; https://www.bsesdelhi.com/web/bypl/about-bses.

BSES

QUANTITY AND DELIVERY REQUIREMENTS

Sl. No.	BYPL SAP Code	Item Description	Specification	Total Qty. (Nos)	Tentative Delivery Schedule	Destination
1	-	Supply, Installation, Testing & Commissioning of 11kV Smart Packaged Substation with 2000kVA Oil Type Transformer	SP-PSSE-216-R0	4	Delivery shall be completed within 04 Months from the LOI/PO date or completion as per the schedule provided by BYPL. ITC at each site shall be completed within 30 days from the date of issue or order / intimation of site	Delhi Store(s)/ Site(s) – Krishna Nagar Division

The delivery schedule shown above is tentative. PO(s) will be released as per the actual requirement. However, the supplier has to deliver the material within the delivery schedule provided.

Schemes may be executed in a phased manner.

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APPENDIX II

ANNEXURE – 2.01

FORMAT OF PERFORMANCE BANK GUARANTEE
(To be executed on a Non-Judicial Stamp Paper of appropriate value)

This Guarantee made at _____ this [___] day of [_____] 20XX

1. WHEREAS M/s BSES Yamuna Power Limited, a Company incorporated under the provisions of Companies Act, 1956 having its Registered Office at Shaktikiran Building, Karkardoa, Delhi 110032, India hereinafter referred to as the " Owner ", (which expression shall unless repugnant to the context or meaning thereof include its successors, administrators, executors and assigns).

2. AND WHEREAS the Owner has entered into a contract for _____(Please specify the nature of contract here) vide Contract No. _____dated _____(hereinafter referred to as the "Contract") with M/s._____, (hereinafter referred to as "the Supplier", which expression shall unless repugnant to the context or meaning thereof be deemed to mean and include each of their respective successors and assigns) for providing services on the terms and conditions as more particularly detailed therein.

3. AND WHEREAS as per clause ____of Conditions of Contract, the Suppliers are obliged to provide to the Owners an unconditional bank guarantee for an amount equivalent to ten percent (10%) of the total Contract Value for the timely completion and faithful and successful execution of the Contract from **[_____]** *pl. specify the name of Bank)* having its head/registered office at **[_____]** through its branch in _____*(pl. specify the name of Branch through which B.G is issued)* hereinafter referred to as "the Bank", (which expression shall unless it be repugnant to the context or meaning thereof be deemed to include its successors and permitted assigns).

4. NOW THEREFORE, in consideration inter alia of the Owner granting the Suppliers the Contract, the Bank hereby unconditionally and irrevocably guarantees and undertakes, on a written demand, to immediately pay to the Owner any amount so demanded (by way of one or more claims) not exceeding in the aggregate [Rs.].....(*in words)* without any demur, reservation, contest or protest and/or without reference to the Supplier and without the Owner needing to provide or show to the Bank, grounds or reasons or give any justification for such demand for the sum/s demanded.

5. The decision of the Owner to invoke this Guarantee and as to whether the Supplier has not performed its obligations under the Contract shall be binding on the Bank. The Bank acknowledges

that any such demand by the Owner of the amounts payable by the Bank to the Owner shall be final, binding and conclusive evidence in respect of the amounts payable by the Supplier to the Owner. Any such demand made by the Owner on the Bank shall be conclusive and binding, notwithstanding any difference between the Owner and the Supplier or any dispute raised, invoked, threatened or pending before any court, tribunal, arbitrator or any other authority.

6. The Bank also agrees that the Owner at its option shall be entitled to enforce this Guarantee against the Bank as a principal debtor without proceeding against the Suppliers notwithstanding any other security or other guarantee that the Owner may have in relation to the Supplier's liabilities.

7. The Bank hereby waives the necessity for the Owner first demanding the aforesaid amounts or any part thereof from the Suppliers before making payment to the Owner and further also waives any right the Bank may have of first requiring the Owner to use its legal remedies against the Suppliers, before presenting any written demand to the Bank for payment under this Guarantee.

8. The Bank's obligations under this Guarantee shall not be reduced by reason of any partial performance of the Contract. The Bank's obligations shall not be reduced by any failure by the Owner to timely pay or perform any of its obligations under the Contract.

9. The Bank further unconditionally and unequivocally agrees with the Owner that the Owner shall be at liberty, without the Bank's consent and without affecting in any manner its rights and the Bank's obligation under this Guarantee, from time to time, to:

(i) vary and/or modify any of the terms and conditions of the Contract;

(ii) Forebear or enforce any of the rights exercisable by the Owner against the Suppliers under the terms and conditions of the Contract; or

(iii) Extend and/or postpone the time for performance of the obligations of the Suppliers under the Contract;

and the Bank shall not be relieved from its liability by reason of any such act or omission on the part of the Owner or any indulgence shown by the Owner to the Suppliers or any other reason whatsoever which under the law relating to sureties would, but for this provision, have the effect of relieving the Bank of its obligations under this Guarantee.

10. This Guarantee shall be a continuing bank guarantee and shall not be discharged by any change in the constitution or composition of the Suppliers, and this Guarantee shall not be affected or

discharged by the liquidation, winding-up, bankruptcy, reorganization, dissolution or insolvency of the Suppliers or any of them or any other circumstances whatsoever.

11. This Guarantee shall be in addition to and not in substitution or in derogation of any other security held by the Owner to secure the performance of the obligations of the Suppliers under the Contract.

12. NOTWITHSTANDING anything herein above contained, the liability of the BANK under this Guarantee shall be restricted to _____*(insert an amount equal to ten percent (10%) of the Contract Value)* and this Guarantee shall be valid and enforceable and expire on _____*(pl. specify date)* or unless a suit or action to enforce a claim under this Guarantee is filed against the Bank on or before the date of expiry.

13. On termination of this Guarantee, all rights under the said Guarantee shall be forfeited and the Bank shall be relieved and discharged from all liabilities hereunder.

14. The Bank undertakes not to revoke this Guarantee during its validity except with the prior written consent of the Owner and agrees that any change in the constitution of the Bank or the Suppliers shall not discharge our liability hereunder.

15. This Guarantee shall be governed by the laws of India. Any suit, action, or other proceeding arising out of, connected with, or related to this Guarantee or the subject matter hereof shall be subject to the exclusive jurisdiction of the courts of **Delhi,** India.

Dated this …… day of …….. …20XX at ……..

(Signature)

.....

(Name)

.....

(Designation with Bank Stamp)
Attorney as per
Power of Attorney No.....
Date.....

BSES

ANNEXURE – 2.02

BYPL BANK DETAIL WITH IFSC CODE:

1. Name of the Bank:	Axis Bank Limited
2. Branch Name & Full Address:	C-58, Basement & Ground Floor, Preet Vihar, Main Vikas Marg, New Delhi 110092
3. Branch Code:	055
4. Bank Account No:	911030003596085
5. IFSC Code:	UTIB0000055
6. Swift Code:	AXISINBB055

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ANNEXURE – 2.03

FORMAT OF WARRANTY/GUARANTEE CERTIFICATE

BSES YAMUNA POWER LIMITED Shaktikiran Building, Karkardooma, Delhi -110032.

Ref. Purchase Order No. :

Dear Sir,

We hereby confirm that the.....dispatched to BSES YAMUNA POWER LTD vide invoice no..... DT.....is exactly of the same nature and description as per above mentioned Purchase Order.

We further confirm that we will replace/repair our.....free of cost if any manufacturing defect during.....months from the date of dispatch of material or.....months from the date of commissioning whichever is earlier.

Vendor Name & Signature

ANNEXURE – 2.04

UNDERTAKING GST

The Vendor shall give an undertaking in the following words on each invoice in the absence of which tax payment as on the Vendor's invoice may be withheld.

"The tax component as mentioned in the invoice shall be deposited with the GST Department as per law by way of actual payment or by way of legal set off as per law. The turnover billed shall be duly declared in my GST returns a copy of which shall be filed with the Purchaser. Should the input tax credit to the Purchaser be denied by way of any lapse on the part of the Vendor, the same shall be paid on demand and in any case the Purchaser is authorized to deduct the tax equivalent amount from the amount payable to the Vendor"

ANNEXURE – 2.05

SUMMARY OF COMMERCIAL TERMS AND CONDITIONS - SITC

SL NO	PARTICULARS	CLAUSE AS PER TENDER	BIDDER'S CONFIRMATION
1	Validity	Bid submitted shall remain valid for 120 days from the date of offer Submission.	
2	Price Basis	**"Firm"** on **FOR Delhi store/sites basis**. Prices must be inclusive of all applicable taxes and duties, freight, packing, forwarding, and all charges up to delivery at BYPL's designated site(s)/store(s) in Delhi. All tax components are to be computed in accordance with the prevailing GST regulations in India.	
3	Unloading	Unloading at stores/sites shall be in vendor's scope	
4	Transit Insurance	Transit insurance shall be in the vendor's scope.	
5	Payment Terms	**Supply:** **Part 1)** 90% of the basic value with 100% taxes and duties shall be paid in 45 days from the date of receipt and acceptance of GOODS at the store(s)/site(s) against submission of documents. **Part 2)** Balance of 10% of basic value shall be paid in 45 days from the date of successful testing, commissioning and handing over duly certified by BYPL Engineer-in-Charge. **Services:** 100% payment shall be due after 45 days of submission of your bills, from the date of successful testing, commissioning and handing over of the entire installation along with work completion certificate at our office.	
6	Delivery Schedule	- Vendor shall submit Transmittal Approval Documents (GTP/Drawings/QAP/etc.) within 15 days from the LOI/PO to the concerned BYPL officials. - BYPL shall review and either approve or provide comments on the submitted documents within 7 days of the initial submission. - If resubmission is required, vendor shall complete the resubmission within 5 days from the receipt of the comments. - For subsequent resubmissions, BYPL shall respond within 5 days. - Repeated rejections due to non-compliance is not desirable. **- Delivery shall be completed within 04 Months from the LOI/PO date or completion as per the schedule provided by BYPL.** **- ITC at each site shall be completed within 30 days from the date of issue or order / intimation of site**	
7	Defect Liability Period	60 months after commissioning or 66 months from the last date of dispatch, whichever is earlier.	
8	Penalty For Delay	1% (One) of the basic value (ex-works value) of undelivered units per week of delay or part thereof, subject to maximum of 10% (Ten) of the total basic value (ex-works value) of undelivered units.	
9	Performance Bank Guarantee	To be submitted within twenty-eight (28) days from the date of issuance of the Letter of Intent/Award/PO. Thereafter Supplier shall submit PBG on Purchase Order (PO) basis equivalent to 10% of the PO value (including GST) valid for 24 months after commissioning or 30 months from the last date of receipt, whichever is earlier plus 3 months towards claim period. Upon receipt of the PBG by BYPL against RC/PO, the EMD shall be released.	
10	Reverse Auction	Acceptance for participation in Reverse Auction event	

Seal of the Bidder: **Signature:** **Name:**

VOLUME – II

PRICE BID FORMAT

BSES

ALL PRICES IN INR (₹)

Package Name	Total Supply Prices (A)	Total Installation, Testing and Commissioning Prices (B)	Total Package Cost (C=A+B)
Supply, Installation, Testing & Commissioning of 11kV Smart Packaged Substation with 2000kVA Oil Type Transformer of various types			
In words ……..			

NOTE: Cost of all tests as per technical specification is to be included. No separate/extra charges will be paid.

The Un-priced bid should be marked as **"Quoted"** and be submitted with Part – A

We declare that the following are our quoted prices in INR for the entire package.

Date: Bidders Name:

Place: Bidders Address:

Signature: …… Designation: ……..

Printed Name: …… Common Seal: …….

BSES

SUPPLY (A)

ALL PRICES IN INR (₹)

S. No.	DESCRIPTION OF GOODS	HSN CODE (8 Digit Mandatory)	UoM	QTY **(A)**	UNIT BASIC PRICE INCL FREIGHT (₹) **(B)**	UNIT GST & CESS AS APPLICABLE (CGST & SGST/UTGST or IGST) (₹) **(C)**		UNIT LANDED RATE (All Inclusive) (₹) **(D = B+C)**	TOTAL LANDED VALUE (₹) **(E = DXA)**
						%	AMT		
1	Supply of 11kV Packaged Substation (PSS) with 2000kVA Oil Type Transformer Type-2		Nos	1					
2	Supply of 11kV Packaged Substation (PSS) with 2000kVA Oil Type Transformer Type-4		Nos	3					
GRAND TOTAL LANDED VALUE (₹)									
In words ……									

BSES

I/T/C (B)

ALL PRICES IN INR (₹)

S. No.	DESCRIPTION OF SERVICES	SAC CODE (8 Digit Mandatory)	UoM	QTY **(A)**	UNIT BASIC PRICE (₹) **(B)**	UNIT GST & CESS AS APPLICABLE (CGST & SGST/UTGST or IGST) (₹) **(C)**		UNIT LANDED RATE (All Inclusive) (₹) **(D = B+C)**	TOTAL LANDED VALUE (₹) **(E = DXA)**
						%	AMT		
1	I/T/C of 11kV Packaged Substation (PSS) with 2000kVA Oil Type Transformer Type-2		Nos	1					
2	I/T/C of 11kV Packaged Substation (PSS) with 2000kVA Oil Type Transformer Type-4		Nos	3					
GRAND TOTAL LANDED VALUE (₹)									
In words ……									

Optional Rate:

S. No.	DESCRIPTION OF SERVICES	SAC CODE (8 Digit Mandatory)	UoM	QTY **(A)**	UNIT BASIC PRICE (₹) **(B)**	UNIT GST & CESS AS APPLICABLE (CGST & SGST/UTGST or IGST) (₹) **(C)**		UNIT LANDED RATE (All Inclusive) (₹) **(D = B+C)**	TOTAL LANDED VALUE (₹) **(E = DXA)**
						%	AMT		
1	Transportation of PSS from stores to site may also be furnished in case the site is not ready (i.e., Loading, Transportation & Unloading)		01	PU					

NOTE

1) Item-wise cost for Installation, erection, testing & Commissioning for the items indicated in BOQ-SUPPLY and as per Scope of Work
2) In addition, Unit Rates shall be submitted as indicated in BOQ-ERECTION

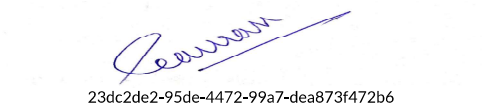
VOLUME – III

TECHNICAL SPECIFICATIONS

BSES

Specification of
11 kV Oil Type Smart Package Substation

Specification no – SP-PSSE-216-R0

Rev		
Date:		13/06/2025
Prepared by	Ashish Joshi	 28cf4d7d-6c91-4d53-be77-f490e198fb6b
Reviewed by	Puneet Duggal	 404db803-a91f-4234-85f0-0b2b5098ec32
Approved by	Gaurav Sharma	 23dc2de2-95de-4472-99a7-dea873f472b6

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Record of Revision

Revision No	Item / clause no.	Nature of Change	Approved By

1 Scope

1.1 Design, manufacture, testing at manufacturer works before dispatch, packing, and delivery of Packaged Substation (PSS) as per this specification

1.2 Supply of all installation/ commissioning accessories for PSS.

1.3 Submission of documentation of PSS with operating manuals of each equipment.

1.4 FRTU Licensed software for programming, configuration, troubleshooting and diagnosis of FRTU shall be provided.

1.5 If any item not specifically mentioned in scope but necessary for successful operation of substation shall be deemed to be included in bidder's scope.

2 Codes & standards

Materials, equipment and methods used in the manufacture of 11kV Packaged Substation shall conform to the latest edition of following:

S.no	Standard	Title
2.1	Indian electricity act	IE act 2003
2.2	CEA Regulations	Latest amendments
2.3		CBIP manual on transformers
2.4	IEC 60076	Power transformers
2.5	IEC:60616	Terminal and Tapping Markings for Power Transformers
2.6	IEC: 60529	Degrees of Protection Provided by Enclosures (IP Code).
2.7	IEC 60694	Specification for high voltage switchgear
2.8	IEC 60439-1	Low voltage switchgear & control gear assemblies
2.9	IEC 60529	Degree of enclosures provided by enclosures
2.10	IEC 60664-1	Insulation coordination for low voltage systems
2.11	IEC 62262	Degree of protection provided by enclosure against mechanical shocks
2.12	IEC 62271-202	High voltage switchgear & control gear - prefabricated substation
2.13	IEC 60044	Instrument transformers - Current & voltage transformers
2.14	IEC 60225	Electrical relays

2.15	IEC 60625	High voltage switches
2.16	IEC 60502	Power cables
2.17	IEC 60947-2	Low-voltage switchgear and control gear :Circuit breakers
2.18	IS 1180 Part 1	Outdoor type oil immersed distribution transformers upto and including 2 500 kVA, 33kV - specification part 1 mineral oil immersed (fourth revision) (including amendment no. 1, 2, 3 & 4)
2.19	IS 335	New Insulating Oils-Specification
2.20	IS 2026	Loading of power transformers
2.21	IS 13947	Low voltage switchgear & control gear
2.22	IS 2099	Bushings for voltages above 1000V
2.23	IS 3156	Voltage transformers
2.24	IS 2705	Current transformers
2.25	IS 1554	PVC cables
2.26	IS 7098	XLPE cables
2.27	IS 2629	Recommended Practice for Hot-Dip Galvanizing of Iron and Steel
2.28	IS 4759	Hot-dip zinc coatings on structural steel and other allied products
2.29	IS 13585	Shunt capacitors
2.30	IS 13340	Shunt capacitors
2.31	IS 3043	Code of practice for Earthing
2.32	IS 8130	Conductors for insulated cables
2.33	IS 5	Ready mixed paints

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 Electrical Distribution System Data

3.1	HT supply System	3 phase AC, 3 wire
3.2	Voltage	11000 volt ±10%
3.3	Frequency	50 Hz ± 5%
3.4	Fault level	350MVA – 18.5kA
3.5	System neutral	Solidly Earthed at upstream 11kV source
3.6	LT supply system	3 Phase, 4 Wire AC
3.7	Rated voltage	415V +/-10%
3.8	Rated frequency	50 Hz ± 5%
3.9	Fault level	35MVA – 50kA

4 PSS Configuration

S.no	PSS type	DT rating, kVA	RMU	LT Panel						APFC rating, kVAr @400 V
				Incomer, ACB		Bus coupler, ACB		Outgoing, MCCB		
				Rating, (A)	Qty, no's	Rating, (A)	Qty, no's	Rating, (A)	Qty, no's	
4.1	Type 1	2000	3Way	3200	1	NA	NA	800	10	NA
4.2	Type 2	2000	4Way	3200	1	NA	NA	800	10	NA
4.3	Type 3	2000	3Way	3200	1	3200	1	800	10	NA
4.4	Type 4	2000	4Way	3200	1	3200	1	800	10	NA
4.5	Type 5	1600	3Way	3200	1	NA	NA	800	10	NA
4.6	Type 6	1600	4Way	3200	1	NA	NA	800	10	NA
4.7	Type 7	1600	3Way	3200	1	3200	1	800	10	NA
4.8	Type 8	1600	4Way	3200	1	3200	1	800	10	NA
4.9	Type 9	1000	3Way	2000	1	NA	NA	630	7	300
4.10	Type 10	1000	4Way	2000	1	NA	NA	630	7	300
4.11	Type 11	1000	3Way	2000	1	2000	1	630	5	300
4.12	Type 12	1000	4Way	2000	1	2000	1	630	5	300
4.13	Type 13	630	3Way	1250	1	NA	NA	630	5	200
4.14	Type 14	630	4Way	1250	1	NA	NA	630	5	200
4.15	Type 15	630	3Way	1250	1	1250	1	630	5	200
4.16	Type 16	630	4Way	1250	1	1250	1	630	5	200
4.17	Type 17	400	3Way	800	1	NA	NA	630	3	200
4.18	Type 18	400	4Way	800	1	NA	NA	630	3	200
4.19	Type 19	400	3Way	800	1	800	1	630	3	200
4.20	Type 20	400	4Way	800	1	800	1	630	3	200

5 PSS Enclosure

5.1	Service conditions	PSS should designed to operate in outdoor environment mentioned in annexure 'A'.
5.2	Material for enclosure	Galvanised Sheet steel 2mm thick
5.3	Enclosure construction	Frame supported construction with all doors, covers welded with steel channel ribs at every 1000mm minimum
5.4	Lifting lugs for site handling / lifting by crane	Four numbers on top to enable lifting of total package unit.
5.5	Doors	a. Doors to be provided for all LT, HT and Transformer compartment. b. The door arrangement should be folded type design, the width of each folding section door is limited to 600mm. c. The doors should have internal/concealed anti-theft, minimum 03 no's hinges of minimum opening angle of 120º, with lockable handle & padlocking facility d. The door limits switch to be provided for status of door.
5.6	Top & other side walls of package substation enclosure	Welded sheet metal to main frame
5.7	Removable canopy above top cover	2mm thick sheet metal with 10º slope
5.8	Enclosure integral steel base frame	'I' section of suitable size to support total static and dynamic load
5.9	Base frame bottom support pads for fixing by bolt to foundation	Minimum six numbers to rest on foundation
5.10	Enclosure compartments	Separate compartments for RMU, transformer & LV switchgear/APFC
5.11	Separation between RMU & transformer compartment	By sheet steel 2mm thick

5.12	Separation between transformer compartment & LV compartment	By sheet steel 2mm thick
5.13	Degree of ingress protection against solids & water as per IS 62059	a. IP53 for RMU compartment b. IP23 for transformer compartment c. IP33 for LV compartment
5.14	Louvers on side covers of transformer compartment & side walls of LV compartment	To be provided with steel wire mesh welded from inside so as to meet IP requirement
5.15	Louver area on cover / side wall	1500 mm height x 1500mm desirable
5.16	Exhaust Fans	a. Mounted in LV compartment to discharge air in transformer compartment & Controlled by SPMCB & thermostat to operate above 35 deg C, 2x150 CFM, 220V DC. b. Rectifier to be provided for exhaust fan supply.
5.17	Gland plate for RMU compartment	3 mm thick MS plate suitable for 3x 3CX 400sqmm AYFY 11 kV cable
5.18	Gland plate for LV compartment	a. 3 mm thick MS plate suitable for rated LT outgoing as per the PSS type. b. Each LT outgoing is suitable for 2X 4CX 400 sq mm cable.
5.19	Class of enclosure as per IEC 62271-202	10 K Class
5.20	Internal Arc classification	IAC AB 20 KA, 1s
5.21	Limiting dimensions of package enclosure	
5.22	Type 1 to Type 8 configuration	4200(L) x 3000(W) x 3200(H)
5.23	Type 9 to Type 20 configuration	3400(L) x 2600(W) x 2600(H)

6 11KV Ring Main Unit

6.1	RMU Configuration	As per the PSS type,
6.1.1	3 Way RMU	All modules should be Vacuum Circuit Breaker
6.1.1.1	Cable feeder 1	a. Motorized VCB with manual operation facility. b. FPI and CBCT to be provided.
6.1.1.2	Cable feeder 2	a. Motorized VCB with manual operation facility. b. FPI and CBCT to be provided.
6.1.1.3	Transformer feeder	a. Motorized VCB with manual operation facility. b. Self-power relay with protection CTs to be provided.
6.1.2	4 Way RMU	All modules should be Vacuum Circuit Breaker
6.1.2.1	Cable feeder 1	a. Motorized VCB with manual operation facility. b. FPI and CBCT to be provided.
6.1.2.2	Cable feeder 2	a. Motorized VCB with manual operation facility. b. FPI and CBCT to be provided.
6.1.2.3	Transformer feeder 1	a. Motorized VCB with manual operation facility. b. Self-power relay with protection CTs to be provided.
6.1.2.4	Transformer feeder 2	a. Motorized VCB with manual operation facility. b. Self-power relay with protection CTs to be provided.
6.2	Extensibility	Non extensible type
6.3	Insulation Medium	

6.3.1	For panel	SF6 gas in sealed metallic tank
6.3.2	Breakers	Vacuum type (with dis-connector & earth switch)
6.1.4	Arc interruption chamber for breaker	Arc interruption chamber of breakers shall be separate from the main insulated tank.
6.1.5	Maximum dimensions of RMU	1250 mm(W) X 800 mm (D) X 2000 mm (H)
6.4	RMU Panel Construction	
6.4.1	Panel type	Metal enclosed, framed, Compartmentalized panel construction
6.4.2	Service Location	Indoor, non-air conditioned environment
6.4.3	Mounting	Free Standing
6.4.4	Overall Enclosure Protection	a. IP4X minimum, b. Vermin proof
6.4.5	Doors	a. Front access b. Internal/concealed, anti-theft at-least 03 no's hinge with minimum opening angle of 120º.
6.4.6	Covers	a. Bolted for rear access, with handles. b. Support for handle shall be provided at suitable place on RMU body. c. All the accessible bolts / screws shall be vandal proof. d. One set of required Special tools per RMU (if any) shall be in the scope of supply.
6.4.7	Construction	Sheet metal 2 mm thick CRCA
6.4.8	Base frame	a. Made of CRCA steel b. Base frame height should be 300 mm.
6.4.9	Power Cable Clamping Arrangement	a. Shall be provided for each power cable along-with HDPE cable clamps (to suit the cable size from 150 sq mm to 400 sq mm XLPE cable).

		b. Exact size shall be provided during drawing approval stage.
6.4.10	Lifting lugs	Four numbers
6.4.11	Cable Entry	Bottom
6.4.12	Gland plate	a. Separate for control cable & power cable. b. 3mm thick, metallic, removable type & split type in two parts, with 1 no ,90mm diameter knockout punch/ hole in the centre.
6.4.13	Cable termination	
6.4.13.1	Cable type & size	3C X 150/ 300/ 400 sq mm Aluminium conductor XLPE cable with armour & PVC outer sheath
6.4.13.2	Terminals for 11kV cable termination	.
6.4.13.3	Terminals	a. M16 size Set of required size of stud suitable for b. M 16 size Ring type lug & bimetallic washers. c. Bolt spring washers and washers shall also be provided.
6.4.13.4	Bimetallic washers	Required
6.4.13.5	Right angled boots	a. Minimum 20mm spacing between boots preferred. b. Test plug cap shall be fixed with main body of boot. c. Type test reports, maintenance replacement plan shall be submitted.
6.4.13.6	Cable Test Plug	Cable test plug shall be provided facility, without opening of cable compartment.
6.4.13.7	Termination type	Suitable for heat shrinkable type

6.4.13.8	Termination height	700mm minimum, from gland plate
6.4.14	Bus bar	Tinned copper with sleeve (Sizing Calculation to be submitted in support of its Guaranteed S.C. rating / Capability)
6.4.14.1	Bus bar continuous rated current	630amp
6.4.14.2	Bus bar short time withstand capacity	20 KA for 3 sec
6.4.14.3	Bus bar support insulator material	SMC / DMC resin
6.4.14.4	Maximum temperature rise above reference ambient	In line with Table 3 of IEC 60694
6.4.15	Earth bus bar	Aluminum / Copper sized for rated fault duty for 1 sec
6.4.15.1	Earth bus internal connection to all noncurrent carrying metal parts	a. By 2.5 sq mm copper flexible wire. b. Earth connection point maximum 1 meter away from cable test facility
6.4.15.2	Earth bus external connection to owners earth	Studs on both sides with holes for M10 bolt + hardware to readily receive purchaser earth connection
6.4.16	Cooling arrangement	By natural air without fan
6.4.17	Panel internal wiring	a. Multi strand flexible color coded PVC insulated Cu wire 1 sq mm (SCADA) b. 1.1kV, PVC insulated 2.5 sq mm cu cable for CT connection. c. Colour of wire (R phase - Red, Y phase – Yellow, B phase – Blue, AC- black, DC – grey, Earth – green) with crossed ferrules at both ends. d. All the internal control / auxiliary wiring shall be routed through proper conduit.
6.4.18	Hardware (Nut, bolts & handle)	Stainless steel (Except termination nut-bolts which are Brass / Tinned Copper)
6.4.19	Gasket	Neoprene rubber

6.4.20	Marshalling terminal blocks	a. Terminal block size should be suitable for 2.5 Sq mm, b. Nylon 66 material, c. screw driver operated type d. 20% spare shall be provided in each row of TB.
6.4.21	Panel cover fixing bolts	Allen head 6mm with hexagonal slot
6.4.22	Padlock facility	Required for all earth switches & all handles
6.4.23	Internal Arc classification	
6.4.23.1	Explosion vents	a. 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. b. Internal arc test report (for Cable compartment & other compartments) must be submitted to support above, along with RMU GA drawing indicating these vents. c. There shall not be any type of holes, gaps etc on the walls of cable termination compartment.
6.4.23.2	Internal Arc rating	20 kA for 1s
6.4.23.3	Internal arc classification	a. Shall comply to the requirements of IEC 62271-200, Accessibility type AFLR. b. Operators of equipment shall be protected against the effects of an arcing fault in any of the MV compartment at all times , including while carrying out the maintenance works on other compartments

6.4.23.4	SF6 Gas Annual Loss	a. < 0.1% of total mass. b. Pressure of SF6 gas shall be above the operating limit throughout the life of the equipment.
6.5	Circuit breaker	
6.5.1	Type	Three pole, operated simultaneously by a common shaft
6.5.2	Arc interruption medium	Vacuum Bottle
6.5.3	Operating mechanism	Motorized spring charged stored energy type with facility for manual charging
6.5.4	Motor rated voltage	24V DC
6.5.5	Emergency trip / open push button	On panel front with Protective flap to prevent any accidental tripping of breaker.
6.5.6	Continuous rating	630amp
6.5.7	Short time withstand capacity	20 KA for 3 sec
6.5.8	Minimum number of operations at rated current (as per IEC 62271-100)	Mechanical Endurance – Class M1(2000 operations) Electrical Endurance – Class E2
6.5.9	Fault making capacity	50 KA peak
6.5.10	Fault breaking capacity	20 KA Minimum
6.5.11	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
6.5.12	Breaker status auxiliary contact	2NO + 2NC wired to terminal block
6.6	Earth switch	
6.6.1	Type	Three Pole, operated simultaneously by a common shaft for each Circuit breaker.
6.6.2	Dielectric medium	SF6 gas
6.6.3	Operating mechanism for close & open	Manual
6.6.4	Fault making capacity	50 kA (Desirable)

6.6.5	Auxiliary contacts	1NO+1NC wired to terminal block
6.6.6	Disconnect switch (if provided in series with vacuum bottle)	Desirable to be located on purchaser cable connection side of vacuum bottle
6.6.7	Minimum number of operations at no load (as per IEC 62271-102)	Mechanical Endurance – Class M0 (1000 operations)
6.6.8	Making capacity endurance of earth switch (as per IEC IEC 62271-102)	Class E2 (Min 10 operations)
6.7	For Cable Feeder circuit breaker module	
6.7.1	Protection Relay	Not required
6.7.2	Fault passage indicator (FPI)	a. To be provided on each cable feeder for RMU. FPI shall be earth fault protection type. b. Digital type and shall operate as the current exceeds the set value. c. Flash indication for identifying faults with red LED with one flash for every one sec. Test & reset 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. d. FPI shall be powered with 24V DC
6.7.2.1	CBCT	a. CBCT – Split open type suitable for mounting without disconnection of cable for Earth Fault. b. Cable connection of FPI with CBCT shall be of pre moulded type on the CBCT side. c. Cable shall be 2.5 sq.mm cu cable or fiber cable.
6.7.2.2	Earth Fault Settings	

6.7.2.2.1	Sensing Current	50 to 400A
6.7.2.2.2	Sensing Time	30 to 100 ms in steps of 10ms.
6.7.2.2.3	Reset Time	0.5 -1-2-3-4 hr
6.7.2.2.4	Resetting Facility	a. Self rest after reset time b. Self rest after restoration of voltage c. Manual d. Remote resetting
6.7.2.2.5	Contact Rating	1A at 230 V
6.7.2.2.6	Degree of Protection	IP 54
6.7.2.2.7	Mounting Arrangement	Surface or Flush Mounting
6.7.2.2.8	Ambient Temperature	-20 to 55 Deg C
6.7.2.3	Data by Purchaser	Following system data shall be considered while offering FPI.
6.7.2.3.1	System Fault Level	2kA – 8.75kA
6.7.2.3.2	Type of Grounding	Solidly Grounded
6.7.2.3.3	Fault clearing time	100ms
6.7.2.3.4	Cable Type	XLPE , 70 sq.mm to 400 sq.mm
6.8	For Transformer circuit breaker module	
6.8.1	Current transformer	a. 75-150-400 / 1 amp b. Accuracy class: 5P10 minimum c. Burden: CT burden should be 20% higher than the connected relay burden. d. Resin Cast Ring type e. 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.) f. Disconnecting type terminal block shall be provided for CT Circuit. g. Change in CT ratio shall be possible from the disconnecting type TB. Any change in CT ratio from CT secondary will not be acceptable.
6.8.2	Protection relay	a. Dual-powered (Self powered and Auxiliary 24V DC powered), Microprocessor based Numerical relay with backlit LCD display, manual reset type, flush mounted on panel front. b. IDMT over current and earth fault protection with high set element. c. The relay should record at-least 10 faults on FIFO basis. d. In addition to faults, relay should have event recorder. e. RS-485 Port to be provided on the Relay for communication with SCADA through FRTU on Modbus RTU protocol. f. All relay parameters including fault records should be accessible from SCADA. g. Necessary internal wiring also shall be done between Relay and FRTU. h. Licensed software for programming shall be provided for Relay communication.
6.8.2.1	Protections Required	Over current, Instantaneous & earth fault
6.8.2.2	Tripping characteristic	Inverse definite minimum time characteristics for Over current and earth fault protection
6.8.2.2.1	Over current relay setting	10% - 250% of In, steps of 1%.

6.8.2.2.2	Overcurrent Setting time delay	25ms – 1500ms in steps of 10 ms
6.8.2.2.3	Instantaneous Over current setting	100% - 2500% of In & OFF
6.8.2.2.4	Instantaneous over current Setting time delay	0 ms- 100 s in steps of 10 ms
6.8.2.2.5	Earth fault setting	5%- 250 % of In, steps of 10%
6.8.2.2.6	Earth fault setting time delay	25 ms – 1500 ms in steps of 10 ms
6.8.3	Shunt trip 24V DC (for WTI trip & door limit switch & for remote trip from SCADA.)	To be wired to terminal blocks
6.9	FRTU Panel	a. To be integral part of RMU with all the items as per mentioned in subsequent clauses. b. FRTU enclosure should be 2.0 mm thick GI sheet. c. The cabinet shall have adequate space for installation of other hardware's like modem, battery charger and battery as well as shall have at least 10% spare space. d. The component and accessories to be mounted on mounting plate of FRTU. e. Enclosure should have proper illumination, universal type socket and laptop stand and Drawing pocket.
6.9.1	Battery	a. Battery Type: Li-ion battery b. Battery Rating: 24V DC, 26AH c. Location: Battery shall be kept in shielded compartment in FRTU panel and fixed with rivet and nut bolt. Battery enclosure should be concealed and not visible.

		d. Individual battery terminal shall be wired upto terminal blocks mounted in FRTU cabinet.
6.9.2	Battery Health Monitoring Unit (BHMU)	a. BHMU will have Auto / Manual test facility. In Auto Mode it ensures battery automatic discharge at preset period with 100W discharge resister along with suitable algorithm to check the healthiness based on rate of discharge. b. In manual Mode PB to be provided for battery testing. c. Provision for Bypass mode of BHMU shall also be provided. d. Output contacts :230V/24V DC -5A • Battery Fail: 1 CO • Test in process e. Indications: • BHMU healthy • Battery Fail • Battery Low • Test On f. Remote monitoring of Battery voltage and current on Modbus RTU protocol
6.9.3	Battery charger	2 no's chargers with auto change over using 10A diodes. Maximum 55 deg C above ambient of 40 deg C
6.9.3.1	MCBs at charger input & output supply	a. Required 2nos DP MCB for AC Incoming supply b. All the MCBs shall be easily accessible for operation, with proper labeling. c. MCB location shall be preferably away from Battery charger location.

6.9.3.2	Charger temperature rise at heat sink at full load for 2 hours	Maximum 55 deg C above ambient of 40 deg C
6.9.3.3	Battery charger cooling method	Natural without any fans
6.9.3.4	Individual CBs DC control	Required with MCB
6.9.4	FRTU	a. FRTU shall be provided and integrated with RMU and LV compartment with completely wired along with modem suitable for communicating over GSM network and also have facility to communicate with fiber network. b. Bidder shall demonstrate the data communication of FRTU modem with MCC/BCC for the proposed modem for approval of owner in the Pre Order technical evaluation stage. c. For detailed specification of FRTU, I/O requirements, refer standard specification of Annexure F.
6.9.5	Modem	a. Modem should be dual sim 4G and shall also have compatibility of 3G/2G network. b. For detailed technical specification of modem, please refer Annexure E.
6.9.6	Transducer	DC voltage transducer (4-20mA) for monitoring of DC battery bus voltage.
6.9.7	Surge Protection Devices (SPDs)	c. Type 3 Pluggable Surge Protection Device in accordance with IEC 61643 with KEMA & UL approval must be installed at the incoming power supply of FRTU. d. DIN Rail Mounted Suitable Surge Protection must be installed on all communication lines (i.e. on Ethernet/RS 485 lines)

6.9.8	Interfacing of FRTU system with RMU	a. RMU signal connections should be terminated in RMU module wise and extension of the signals from the each equipment TB (Terminal Block) to FRTU TB through cable connectors, module wise. b. Separate multi-core cable for Interconnection of FRTU with RMU with suitable size and length. c. Male and female connector with cable for interconnection should be provided in FRTU panel. d. Minimum 2.5/ 4 sqmm multi-strand copper wire/ cable of suitable length for connecting the battery bank and battery charger placed in FRTU cabinet. e. Supply and dressing of inter-connecting cables through suitable size PVC duct are in the supplier scope. f. Interconnections should have proper lugs, crossed ferrules etc. g. 1 Meter Standard Ethernet (Straight) data cable with metallic connector (SS/MS) to and Ethernet SPD
6.10	Requirements of sealed housing live parts (RMU SF6 gas chamber)	
6.10.1	Enclosure	Stainless steel enclosure suitable for IP67
6.10.2	SF6 gas pressure low alarm	To be given
6.10.3	Provision for SF6 gas filling	To be given (For 'sealed for life' design of RMU, this is not applicable)
6.10.4	Provision for SF6 gas pressure indication	Manometer with non return valve
6.10.5	Arc interruption method for SF6 breaker / Load break switch	Puffer type / rotating arc type

6.10.6	Potential free contacts for SF6 gas pressure low	1NO +1NC (Desirable)
6.11	RMU operation interlocks	
6.11.1	Circuit breaker & respective earth switch	Only one in 'close' condition at a time
6.11.2	Prevent the removal of respective cable covers if circuit breaker is 'ON'	Electrical / Mechanical
6.11.3	Prevent the closure circuit breaker if respective cable cover is open	Electrical / Mechanical
6.11.4	Cable test plug for CB accessible only if Earth switch connected to earth	Mechanical
6.11.5	Prevent motorized operation of CB during manual operation	Electrical / Mechanical a. Electrical signal shall cut-off completely during manual operation. b. If CB fail to operate, the supply to motor shall be disconnected after certain time period to prevent burning of motor due to continuous supply.
6.11.6	Prevent motorized operation of more than one CB at a time	Necessary feature (Electrical)
6.12	Indication & signals	Local
6.12.1	Operation counter on front / Inside the RMU LT chamber	To be provided for each Circuit breaker, with minimum four digits & non resettable type
6.12.2	Cable charge status indication for all CB	Capacitor type voltage indicators with LED on all the phases (Shall be clearly visible in day light)
6.12.3	Spring charge status indication	On front for breaker
6.12.4	Circuit breaker On/OFF indication	Green for OFF / Red for ON

6.12.5	Earth switch closed indication (For Each CB)	On front
6.12.6	Circuit breaker protection relay operated on fault	Flag
6.12.7	Fault passage indication on CB	Flag
6.13	Status signals to SCADA-to be wired to marshalling terminal block	2NO + 2NC
6.13.1	CB close / open	potential free contacts
6.13.2	CB Earth Switch close /open	potential free contacts
6.13.3	Battery charger Fail	potential free contacts
6.13.4	CB close / open	potential free contacts
6.13.5	Protection relay operated	potential free contacts
6.13.6	FPI operated	potential free contacts
6.13.7	SF6 gas pressure low	potential free contacts
6.13.8	Ready to close signal to control centre to indicate all interlocks are OK	Potential free contacts. Signal to indicate Ready for remote operation from SCADA required for entire closing and entire tripping ckt. with all interlocks accounted for (Make : Gogate with P Card / Eqvt after approvals)
6.13.9	Local / Remote Switch	a. A manual Local / Remote selector switch shall be provided for each FRTU to disable all control outputs by breaking the power supply connection to the control outputs. b. When in the “Local” position, the Local/ remote switch shall allow testing of all the control outputs of FRTU without activating the control outputs to field devices. A status input indication shall be provided for the Local/ Remote switch to allow the

		SCADA system to monitor the position of the switch. c. The status of Local/ Remote switch should be wired and configured in FRTU.
6.13.10	Commands from SCADA- to be wired to marshalling terminal block	Cable feeder close / open
		Cable feeder close / open
		FPI Reset
		Transformer feeder Trip
6.14	Mimic diagram, labels & finish	a. Mimic diagram (Shall not be accepted with Stickers) b. On panel front with description of function & direction of operation of handles/buttons
6.14.1	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.
6.14.2	Name plate on panel front	Fixing by rivet only
6.14.2.1	Material	Anodized aluminum 16SWG / SS
6.14.2.2	Background	SATIN SILVER
6.14.2.3	Letters, diagram & border	Black
6.14.2.4	Process	Etching
6.14.2.5	Name plate details	Month & year of manufacture, equipment type, input & output rating, purchaser name & order number, guarantee period
6.14.3	Labels for meters & indications	Anodized aluminum with white character on black background OR 3 ply lamicoid
6.14.4	Danger plate on front & rear side	Anodized aluminum 16 SWG with white letters on red background
6.14.5	Painting surface preparation	Shot blasting or chemical 7 tank process

6.14.6	Painting external finish	Powder coated epoxy polyester base grade A, shade -RAL 7032, uniform thickness 60 micron minimum
6.14.7	Painting internal finish	Powder coated epoxy polyester base grade A, shade -white, uniform thickness 60 micron minimum
6.15	Cyber Security	a. Integration should comply all the cyber security guidelines issues by CEA, NCIIPC and CERT-IN. b. he FRTU shall comply to IEC62351- 3 for cyber security in communication between FRTU and master station and IEC62443-4-2 for cyber security for product including testing requirement as per MoP order no 12/34/2020-T&R dtd 08.06.21 & CEA /PLG/R&D/MII/2021 dtd 11.6.21 and any amendment from time to time. c. All the eligible equipment's should complied to requirement of Mandatory Testing and Certification of Telecom Equipment (MTCTE) vide MoP order No. 14/02/2021-UR&SI-II-Part(1)(E-258136).

7 11KV XLPE Cable & termination kit

The 11kV XLPE cable connection from RMU to distribution transformer shall be conforming to IS 7098 and shall have all the following features –

7.1	Cable type & size	XLPE insulated armoured / un armoured cable 3C x 150 sqmm Aluminium conductor
7.2	Cable voltage grade	11KV
7.3	XLPE insulation thickness	3.14 mm minimum
7.4	Aluminium conductor no of strands	As per Table 2 of IS 8130
7.5	Insulation screen	With semi conducting extrusion, copper tape & water swellable tape
7.6	Type of armour	GI flat as per table 4 of 7098 part 2
7.7	11KV end termination at RMU	By 11kv grade end termination kit, heat shrink type
7.8	11KV end termination at Distribution transformer	By 11kv grade end termination kit, heat shrink type
7.9	Cable support from RMU to transformer HT side cable box	GI cable tray 300mm wide

8 Oil Type Transformer:

8.1	Major Design Criteria	
8.1.1	Voltage variation on supply side	+ / - 10 %
8.1.2	Frequency variation on supply side	+/ - 5 %
8.1.3	Combined variation of voltage and frequency	- 20 % or + 10 %
8.1.4	Service Condition	Refer Annexure A
8.1.5	Insulation level	
8.1.5.1	One minute power frequency withstand voltage	3KV for 415V system & 28 KV for 11KV system
8.1.5.2	Lightning impulse withstand voltage	75 kV peak for 11KV system
8.1.6	Short Circuit withstand level	

8.1.6.1	Three phase dead short circuit at secondary terminal with rated voltage maintained on the other side	For 3 sec				
8.1.7	Overload capability	As per IS 2026				
8.1.8	Noise level	Shall not exceed limits as per NEMA TR-1 with all accessories running measured as per IEC 551 / NEMA standard running measured as per IEC 551 / NEMA standard				
8.1.9	Radio Influence Voltage	Maximum 250 microvolt				
8.1.10	Harmonic currents	Transformer to be designed for suppression of 3rd, 5th, 7th harmonic voltages and high frequency disturbances.				
8.1.11	Partial Discharges	Transformer to be free from partial discharge up to 120% of rated voltage as the voltage is reduced from 150% of rated voltage i.e. there shall be no significant rise above background level.				
8.1.12	Parallel operation with existing transformer	Shall be designed to operate in parallel				
8.2	Major Parameters					
8.2.1	Rating	400kVA/630kVA/1000KVA/ 1600kVA/2000kVA				
8.2.2	Voltage Ratio	11kV / 415 V				
8.2.3	Vector Group	Dyn11				
8.2.4	Impedance at 75 deg C	a. 4.5% for 400kVA & 630kVA tolerance as per IS b. 5% for 1000 kVA tolerance as per IS c. 6.25% for 1600kVA& 2000kVA tolerance as per IS				
8.2.5	Losses at 75 deg C	With ONAN cooling				
8.2.5.1	Total Loss –Max in KW at 50% Load	400 kVA	630 kVA	1000 kVA	1600 kVA	2000 kVA

		1.225	1.86	2.79	4.2	5.05
8.2.5.2	Total Loss –Max in KW at 100% Load	400 kVA	630 kVA	1000 kVA	1600 kVA	2000 kVA
		3.45	5.30	7.70	11.8	15
8.2.6	Temperature rise top oil – without enclosure	30 Deg C max over ambient 40 Deg C				
8.2.7	Temperature rise winding – without enclosure	35 Deg C max over ambient 40 Deg C				
8.2.8	Flux density	1.6 Tesla at 100% rated voltage 1.9 Tesla at 112.5% rated voltage				
8.2.9	Current density	3 amp / sqmm for HV & LV winding				
8.2.10	Tapping on HV winding	Off circuit + 10% to -10% in 2.5% step				
8.2.11	Design Clearances	Design Clearances	Phase – phase	Phase – earth		
		11kV system	180mm	120mm		
		415V system	25mm	25mm		
8.3	Transformer construction					
8.3.1	Type	Double Copper wound, three phase, oil immersed, with ONAN cooling				
8.3.2	Tank	Type tested design				
8.3.2.1	Design	a. Completely sealed type with corrugated fins and without conservator b. Completely oil filled or N2 cushion at top filled with positive pressure. N2 shall be technical grade in accordance with IS:1747 c. With bolted / welded cover				
8.3.2.2	Plate / Corrugated fin / tank features	a. Adequate for meeting mechanical & electrical withstand requirements, as per applicable standard.				

		b. The tank and its sealing (gaskets, o-rings, etc.) shall be of adequate strength to withstand positive and negative pressures built-up inside the tank while the transformer is in operation. The maximum pressure generated inside the tank should not exceed 40kPa, positive or negative. c. Corrugated fins shall be built up of CRCA sheets of minimum 1.2mm thick. d. The corrugated tank wall shall ensure sufficient cooling of the transformer and compensate for the changes in the oil volume during operation. e. The transformer shall be capable of giving continuous rated output, without exceeding the specified temperature rise. f. Internal clearance of tank shall be such that, it shall facilitate easy lifting of core with coils from the tank and HV & LV bushings mounted on Top cover. g. All joints of tank and fittings shall be oil tight. The tank design shall be such that the core and windings can be lifted freely with cover. The tank plate shall be of such strength that the complete transformers when filled with oil may be lifted bodily by means of lifting lugs. h. Tanks with corrugations & without conservator shall be tested for leakage

		at a pressure as per the applicable standard.
8.3.2.3	Material of Construction	Mild steel plate with low carbon
8.3.2.4	Plate Thickness	To meet the requirements of pressure and vacuum type tests as per CBIP manual
8.3.2.5	Welding features	a. All seams and joints shall be double welded b. All welding shall be stress relieved for sheet thickness greater than 35 mm c. All pipes, stiffeners, welded to the tank shall be welded externally d. All corrugated fins or expansion bellows provided shall be double welded.
8.3.2.6	Tank features	a. Bottom with stiffeners & adequate space for collection of sediments b. No external pocket in which water can lodge c. Tank bottom provided with welded skid base d. Strength to prevent permanent deformation during lifting, jacking, transportation with oil filled. e. Minimum disconnection of pipe work and accessories for cover lifting f. Tank to be designed for oil filling under vacuum g. Tank cover should be fitted with lifting lug
8.3.3	Inspection cover for bushing & Core / Wind	As per manufacturer standard

8.3.4	Fittings and accessories on main tank	As per clause 8.8
8.3.5	Core	
	Material	High grade , non ageing, low loss, high permeability, grain oriented, cold rolled silicon steel lamination
8.3.5.1	Grade	Minimum M3 or better
8.3.5.2	Core Design Features	a. Magnetic circuit designed to avoid short circuit paths within core or to the earthed clamping structures. b. Magnetic circuit shall not produce flux components at right angles to the plane of lamination to avoid local heating. c. Least possible air gap and rigid clamping for minimum core loss and noise generation. d. Adequately braced to withstand bolted faults on secondary terminals without mechanical damage and damage/ displacement during transportation and positioning. e. Percentage harmonic potential with the maximum flux density under any condition limited to avoid capacitor overloading in the system. f. All steel sections used for supporting the core shall be thoroughly sand blasted after cutting, drilling, welding. g. Provision of lifting lugs for core coil assembly. h. Supporting framework designed not to obstruct complete drainage of oil from transformer

		i. Core shall be in the form of step and stack in three limb format. j. Note: No wound core shall be acceptable
8.3.6	Winding	
8.3.6.1	Material	Electrolytic Copper
8.3.6.2	Max Current Density allowed	Maximum 3 amp / sqmm
8.3.6.3	Winding Insulating material	Thermally Upgraded Paper (TUP)
8.3.6.4	Winding Insulation	Uniform
8.3.6.5	Design features	a. Type of winding : - LV: Spiral/Helical - HV: Crossover/Disc Note: No foil winding shall be acceptable b. Stacks of winding to receive adequate shrinkage treatment. c. Connections braced to withstand shock during transport, switching, short circuit, or other transients. d. Minimum out of balance force in the winding at all voltage ratios. e. Conductor width on edge exceeding six times its thickness. f. Transposed at sufficient intervals. g. Coil assembly shall be suitably supported between adjacent sections by insulating spacers + barriers. h. Winding leads rigidly supported, using guide tubes if practicable. i. Winding structure & insulation not to obstruct free flow of oil through ducts. j. Delta connection shall be done using Flexible cable.

8.3.7	Transformer Oil	a. Mineral oil b. Oil should be in accordance with specification as per Annexure D of this document
8.3.8	Bushings and Terminations	
8.3.8.1	Type of HV side bushing	Outdoor, Porcelain type, 12kV voltage class and creepage 31mm/KV. Brass lug shall be provided for cable termination.
8.3.8.2	Type of LV side bushing	Outdoor, Porcelain type, 1kV voltage class and creepage 31mm/KV
8.3.8.2.1	Essential provision for LV side line bushing	It shall be complete with copper palm suitable for tinned copper bus bar of size 100x12 mm
8.3.8.2.2	Essential provision for LV side neutral bushing	In case of neutral bushing the stem and bus bar palm shall be integral without bolted, threaded, brazed joints. Bus bar size shall be 100x12 mm
8.3.8.3	Arcing Horns	Not required
8.3.8.4	Support insulators inside HV cable box if provided	Epoxy resin cast, 12KV rated voltage
8.3.8.5	Termination on HV side bushing	By Heat Shrinkable Termination Kit
8.3.8.6	Termination of LV side bushing	Bus bar connection
8.3.8.7	Minimum creepage distance of all bushings and support insulators.	31 mm/kV
8.3.8.8	Protected creepage distance	At least 50 % of total creepage distance
8.3.8.9	Continuous Current rating	Minimum 20 % higher than the current corresponding to the minimum tap of the transformer
8.3.8.10	Rated thermal short time current	26.3 kA for 3 sec
8.3.8.11	Atmospheric protection for clamp and fitting of iron and steel	Hot dip galvanizing as per IS 2633

8.3.8.12	Bushing terminal lugs in oil and air	Tinned copper
8.3.8.13	Sealing washers /Gasket ring	Nitrile rubber/ Expanded TEFLON (PTFE) as applicable
8.3.9	HV cable box	N.A
8.3.9.1	Material of Construction	N.A
8.3.9.2	Cable entry	As per design
8.3.9.3	Cable size for HV	3C X150sqmm A2XWY 11KV
8.3.9.4	Connection on LV phase	Bus bar 100x12mm copper
8.3.9.5	Bus bar size for LV Neutral	Same as phase bus
8.3.9.6	Detachable Gland Plate material for HV cable box	N.A
8.3.9.7	Gland plate thickness for HV	N.A
8.3.9.8	Cable gland for HV	N.A
8.3.9.9	Cable lug for HV	Suitable for cable 3CX150 mm^2 11KV
8.3.9.10	Essential parts for HV cable box	N.A
		a. Flange type removable front cover with handles min two no's b. Tinned Cu Bus bar c. Earthing boss for the HV cable box. d. Earthing link for the gasketed joints at two point for each joint e. Earthing provision for cable Armour/ Screen f. Drain plug g. Danger / caution plate
8.3.9.11	Terminal Clearances HV phase – phase & phase -earth	180mm / 120mm
8.3.9.12	Termination height required for cable termination	750mm
8.3.10	Current Transformers	
8.3.10.1	Requirement	All three phases and neutral on LV side

8.3.10.2	Mounting	LV side bushings on all three phases and neutral with the help of fibre glass mounting plate affixed to main tank by nut bolt arrangement
8.3.10.3	Maintenance requirements	Replacement should be possible by removing fixing nut of mounting plate without disturbing LT bushing
8.3.10.4	Accuracy Class & ISF	0.5s / 10
8.3.10.5	Burden	5 VA
8.3.10.6	Type	Resin Cast Ring type suitable for outdoor use
8.3.10.7	CT ratio	a) 400/630KVA -1000/5 Amps b) 1000KVA -1500/5 Amp c) 1600kVA- 2500/5 amp d) 2000kVA-3000/5 amp
8.3.11	Off Circuit tap Switch	On HV winding
8.3.11.1	Range /Step	+ 10 % to -10% in steps of 2.5 %
8.3.11.2	Type	Rotary type, 3 pole gang operated,
8.3.11.3	Operating Voltage	11kV
8.3.11.4	Rated Current for tap Switch	a. 60 amps for 400KVA b. 100amp for 1000KVA /630KVA c. 150amp for 1600kVA/2000kVA
8.3.11.5	Operating Handle	External at suitable height to be operated from ground level.
8.3.11.6	Tap position indicator	With direction changing facility, locking arrangement, caution plate metallic fixed by rivet.
8.3.12	Pressure Relief Device	Required
8.4	Hardware	
8.4.1	External	Stainless Steel
8.4.2	Internal	Cadmium plated except special hardware for frame parts and core assembly as per manufacturer's design

8.5	Gasket	
8.5.1	For Transformer, surfaces interfacing with oil like inspection cover etc.	Nitrile rubber based / cork
8.5.2	For Cable boxes, Marshalling box, etc.	Neoprene rubber
8.6	Valves	
8.6.1	Material of construction	Brass / gun metal
8.6.2	Type	Both end flanged gate valve / butterfly valve depending on application
8.6.3	Size	As per manufacturer's standard
8.6.4	Essential provision	Position indicator, locking rod, padlocking facility, valve guard, cover plate.
8.7	Painting of transformer.	
8.7.1	Surface preparation	By shot blasting method
8.7.2	Finish on internal surfaces of the transformer	Bright Yellow heat resistant and oil resistant paint two coats. Paint shall neither react nor dissolve in hot transformer insulating oil.
8.7.3	Finish on outer surface of the transformer-frame parts	Battle ship Grey shade 632 Poly urethane paint two coats, minimum dry film thickness 80 microns
8.8	Fittings & accessories	
8.8.1	Rating and Diagram Plate	Required
8.8.1.1	Material	Anodized aluminium 16SWG
8.8.1.2	Background	SATIN SILVER
8.8.1.3	Letters, diagram & border	Black
8.8.1.4	Process	Etching
8.8.1.5	Rating and Diagram Plate details	a. Following details shall be provided on rating and diagram plate as a minimum. b. BIS license c. Energy Efficiency Level as per IS

		d. Type/kind of transformer with winding material. e. IS/IEC standard to which it is manufactured. f. Manufacturer's name. g. Transformer serial number. h. Month and year of manufacture. i. Rated frequency in HZ. j. Rated voltages in KV. k. Number of phases. l. Rated power in KVA. m. Type of cooling (ONAN). n. Rated currents in Amp. o. Vector group connection symbol. p. 1.2/50µs wave impulse voltage withstands level in KV. q. Power frequency withstands voltage in KV. r. Impedance voltage at rated current and frequency in percentage at principal, minimum and maximum tap s. Load loss at rated current. t. No-load loss at rated voltage and frequency u. Continuous ambient temperature at which ratings apply in deg c v. Top oil and winding temperature rise at rated load in deg c; w. Winding connection diagram with taps and table of tapping voltage, current and power x. Transport weight of transformer y. Weight of core and windings

		z. Total weight aa. Volume of oil bb. Weight of oil cc. Name of the purchaser dd. PO no and date ee. Guarantee period
8.8.2	Terminal marking Plate for Bushing, anodized aluminium black lettering on satin silver background both inside cable boxes near termination and on cable box cover (all fixed by rivet)	Required
8.8.3	Company Monogram Plate fixed by rivet	Required
8.8.4	Lifting Lug to lift complete transformer with oil	Required
8.8.5	Lifting lug for top cover	Required
8.8.6	Lashing Lug	Required
8.8.7	Jacking Pad with Haulage hole to raise or lower complete transformer with oil	Required
8.8.8	Detachable Bidirectional flat roller Assembly	Required
8.8.9	Pockets for ordinary thermometer on tank cover with metallic identification plate fixed by rivet.	Required
8.8.10	Drain valve (gate valve) for the main tank with cork above ground by 150mm minimum with padlocking and valve guard with	As per manufacturer design

	metallic identification plate fixed by rivet.	
8.8.11	Filter valve (gate valve) at top with padlocking and valve guard with metallic identification plate fixed by rivet.	As per manufacturer design
8.8.12	Air Release Plug on tank cover with metallic identification plate fixed by rivet.	As per manufacturer design
8.8.13	Oil level indicator with low level switch	As per manufacturer design
8.8.14	Earthing pad on tank for transformer earthing complete with non ferrous nut bolt, washers, spring washers etc. with metallic identification plate fixed by rivet	Required
8.8.15	Rain hood for vertical gasket joints	Desirable
8.8.16	Earthing bridge by copper strip jumpers on all gasket joints at at least two points for electrical continuity	Required
8.8.17	Skid base welded type with haulage hole	Required
8.8.18	Core , Frame to tank Earthing	Required
8.8.19	Danger plate made of Anodized aluminum with white letters on red background on Transformer, cable boxes (all fixed by rivet)	Required
8.8.20	Caution plate for Off Circuit tap changer fixed by rivet.	Required
8.8.21	Pressure Relief Device	Required

8.8.22	BEE Star Label	Required
8.8.23	Protection relay for internal parameters that is pressure, temperature, liquid level and gas detection	Required
8.8.24	Oil filling hole having (1-1/4" nominal size thread) with cover	Required
8.8.25	An extended pipe connection on upper end with welded cover. Pipe shall be suitably threaded over a sufficient length to enable use of refilling /siphon connection after removing the welded connection or any other similar arrangement capable of reuse.	Required
8.8.26	User manual for Hermetically Sealed Transformers must be provided for review as a part of the technical proposal. The manual must be provided with, but not limited to, maintenance schedule, frequency & method of oil- sampling, procedures for oil-filling & oil-filtration, etc.	Required

9 LV Switchgear Panel

9.1	LV busbar system	Configuration of LV system shall be as per clause no 4 of this specification.
9.1.1	Type of connection on transformer	By flexible copper link rated size as per the transformer size.
9.1.2	Busbar material	High conductivity electrolytic grade aluminium
9.1.3	Main Bus bar	a. Suitable for carrying rated continuous current depending upon the incomer ACB rating. Current density should be less than 1A per sqmm. b. Busbars shall be continuous throughout the panel. c. Size of neutral busbar should be same as phase busbar.
9.1.4	Vertical/ Dropper Busbar	a. Bus bars rating should be same as the rating of respective ACB/MCCB. Current density should be less than 1A per sqmm. b. Size of neutral busbar should be same as phase busbar. c. Bus bars shall be colour coded with heat resistant colour tapes. d. Flexible tinned copper braid / flexible strips with terminal lug to be provided for connection of ACB / MCCB terminal with aluminum dropper/riser of main busbar.
9.1.5	Busbar Joints	a. Shall be silver plated. Adequate contact pressure shall be ensured b. Bimetallic connectors shall be provided, as necessary c. Length of overlap shall be more than the width of Busbar
9.1.6	Temperature Rise	20 degrees over ambient (maximum)

9.1.7	Insulation	a. Bus bar shall be provided with colour coded PVC insulating heat shrinkable sleeves rated for maximum operating voltage b. Insulating shroud should be provided on all joints
9.1.8	Bus insulator	Non-hygroscopic, Flame retardant, Track resistant type with high creepage surface (25 mm/kV), epoxy resin insulators
9.1.9	Phase barrier	All cable termination shall be provided with phase barriers.
9.1.10	Neutral link	Bolted disconnecting links shall be provided for all incoming and outgoing feeders for isolation of neutral, if necessary
9.1.11	Outgoing Cable Termination Compartment	a. Cable Termination should be provided on front side of the panel b. Cable entry should be from bottom c. Detachable 3mm MS gland plate with appropriate arrangement for sealing unused cable entries d. Bakelite/FRP sheet to be provided for segregation between phase to phase, phase to neutral, phase to panel body and neutral to panel body e. Front Cover shall be provided on the compartment f. Cable termination shall be suitable for 2R x 4C x 400 sqmm cable. Back to back cable termination on one busbar dropper is not acceptable. Two separate busbar dropper shall be provided in each phase and neutral for cable termination. Busbar Droppers shall be of 100 mm (minimum) in length. Busbar droppers shall be

		staggered such that the bottom dropper shall be atleast 100mm longer than the top dropper. Appropriate clearances shall be maintained between droppers for ease of cable termination. Please refer annexure C for details. g. Appropriate clamping arrangement shall be provided in base frame for all outgoing cables to avoid any stress on the switchgear assembly. Shape of cable clamps shall be such that clamping should not damage the outer sheath of cable. h. Material of Cable Clamps shall be Nylon/HDPE. i. Cable termination height should be 450 mm from gland plate of the compartment j. Termination Nut, bolt, plain washer and spring washer shall be provided for two hole lug.
9.1.12	Phase sequence shall be RYB	a. Left to Right, when viewing from Front b. Top to bottom c. Front to rear
9.1.13	Minimum clearances	25mm between phases and phase to earth for the entire run of horizontal and vertical bus bars
9.1.14	Outgoing Feeder Earthing	Provision for connection of earthing braids of all incoming and outgoing cables shall be provided.
9.2	Air Circuit Breaker	
9.2.1	General Features	
9.2.1.1	Rated Current at 40 deg C	Rating of ACB as per the configuration table. De-rating @50 deg C shall be mentioned separately.
9.2.1.2	Number of Poles	4 Pole ACB

9.2.1.3	ACB mounting	Fixed type
9.2.1.4	Line-Load Reversibility	Required
9.2.1.5	Terminals	Suitable for connection with aluminium busbars with phase barriers & shrouds
9.2.1.6	Operating mechanism	Electrical and manual spring charging, stored energy type
9.2.1.7	Operation counter	4 digit minimum, non-reversible
9.2.1.8	Operating handle	Required
9.2.1.9	ACB indications	Separate ON / OFF / TRIP, L/R in remote & spring charge status
9.2.1.10	Closing coil	Closing coil shall operate correctly at all values of voltage between 85% & 110% of the rated voltage.
9.2.1.11	Tripping coil	Shunt trip shall operate correctly at all values of supply voltage between 70% & 110% of rated voltage.
9.2.1.12	ACB auxiliary contacts	6 NO + 6 NC minimum
9.2.1.13	ACB operating knob sealing	Possible in OFF condition
9.2.1.14	CT Requirement	All phase and neutral
9.2.1.15	Access to releases, coils & add on type replaceable parts to ACB	From front only
9.2.1.16	ACB indications	a. Separate ON / OFF / TRIP b. Spring charge status
9.2.1.17	ACB ingress protection (without enclosure)	IP2X minimum
9.2.1.18	Pollution degree as per IS	2 – non conductive pollution
9.2.1.19	ACB temperature rise limits	As per table 2 & 3 of IS 60947-1
9.2.2	Operation Features	
9.2.2.1	Number of phases	Three phase & neutral
9.2.2.2	Rated Operational Voltage(V)	415V
9.2.2.3	Rated Insulation Voltage (V)	1000V
9.2.2.4	Rated Impulse Voltage	8 kV for main circuit

9.2.2.5	Category of utilization	B
9.2.2.6	Rated Ultimate breaking capacity at rated voltage	a. Icu = 50kA minimum (up to 2000A rating ACB) b. Icu = 65kA minimum (above 2000A rating ACB)
9.2.2.7	Rated Service breaking capacity at rated voltage Ics	Ics =100% Icu
9.2.2.8	Rated short term withstand current for 1 sec at rated voltage – Icw	Icw = 100% Icu
9.2.2.9	Rated making current capacity – Icm	Icm = 220% Icu
9.2.2.10	Number of operating cycles at rated current (open + close) without changing arcing contact	5000
9.2.2.11	Number of mechanical operating cycles (open + close)	20000
9.2.2.12	Product Information marking on ACB	As per clause 5 of IS 60947 Part-I. In addition name of purchaser shall be marked on front of device
9.2.2.13	Measurement and Protection Requirement	
9.2.3	Microprocessor release	a. Microprocessor based release with true RMS based sensing. b. Self powered, tapped from incoming side of supply, setting panel with locking arrangement
9.2.3.1	Protections Required	Overload, short-circuit & earth fault
9.2.3.2	Tripping characteristic	Inverse definite minimum time characteristics for Short circuit and earth fault protection
9.2.3.3	Overload setting	40% -100% In, steps of 10%.
9.2.3.4	Overload setting time delay	2.5 s to 40 s minimum three settings

9.2.3.5	Short Circuit Setting	100% - 800% of In, steps of 10%.
9.2.3.6	Short Circuit Setting time delay	50 ms - 400 ms in steps of 50ms
9.2.3.7	Instantaneous setting	200% - 1500% of In & OFF
9.2.3.8	Earth fault setting	10- 100 % of In, steps of 10%
9.2.3.9	Earth fault setting time delay	50ms - 400 ms in steps of 50ms
9.2.3.10	Neutral unbalance	Earth fault function should not operate during neutral unbalance. Same will be verified during inspection.
9.2.3.11	Measurements required in release	a. Phase wise current b. Phase wise voltage c. Power factor d. Maximum current with date and time e. Instantaneous Power: Active, Reactive and apparent power f. Power Demand g. Energy
9.2.3.12	Metering measurement accuracy	a. 1% for current and voltage b. 2% for Power and energy
9.2.3.13	Other release requirements	a. Release should have backlit display. b. Release should be plug-in type and easily replaceable in field. c. Separate fault indication shall be provided for each protection stage i.e overload, short circuit and earth-fault d. Release should store 10 fault records on FIFO basis with date and time stamp. e. Release should have 2 Digital Inputs. CB On and Off status shall be wired to DIs through auxiliary switch. f. Release should have RS485 port for SCADA communication on open Modbus protocol. It should be able to transmit all

		measured, monitored and recorded data to SCADA including status of DIs. g. Remote time synchronization through SCADA should be possible
9.3	MCCB	
9.3.1	General Features	
9.3.1.1	Standard current rating at 40 deg C	As per the PSS configuration (De-rating @50 deg C shall be mentioned separately)
9.3.1.2	Construction	The MCCBs shall comprise of Four poles in a single construction. All the parts shall be enclosed in a moulded insulating material housing.
9.3.1.3	Type	The MCCBs shall be trip free type with quick make and break design.
9.3.1.4	Terminals	Suitable for connection with aluminium busbars with phase barriers & shrouds
9.3.1.5	CT Requirement	All phase and neutral
9.3.1.6	Access to releases, coils & add on type replaceable parts to MCCB	From front only
9.3.1.7	Indications	MCCBs shall be provided with mechanical position indicator with shrouded terminals. MCCB's shall have ON/OFF/trip positions.
9.3.1.8	MCCB ingress protection (without enclosure)	IP2X minimum
9.3.1.9	Pollution degree as per IS	2 – non conductive pollution
9.3.1.10	MCCB temperature rise limits	As per table 2 & 3 of IS 60947-1
9.3.2	Operation Features	
9.3.2.1	Number of phases	Three phase & neutral
9.3.2.2	Rated Operational Voltage(V)	415V
9.3.2.3	Rated Insulation Voltage (V)	1000V
9.3.2.4	Rated Impulse Voltage	8 kV for main circuit
9.3.2.5	Category of utilization	B

9.3.2.6	Rated Ultimate breaking capacity at rated voltage	Icu = 50kA minimum
9.3.2.7	Rated Service breaking capacity at rated voltage Ics	Ics =100% Icu
9.3.2.8	Rated short term withstand current for 1 sec at rated voltage – Icw	Icw = 100% Icu
9.3.2.9	Rated making current capacity – Icm	Icm = 220% Icu
9.3.2.10	Number of operating cycles at rated current (open + close) without changing arcing contact	5000
9.3.2.11	Number of mechanical operating cycles (open + close)	20000
9.3.2.12	Product Information marking on MCCB	As per clause 5 of IS: 13947 Part-I. In addition name of purchaser shall be marked on front of device
9.3.3	Measurement and Protection Requirement	
9.3.3.1	Microprocessor release	a. Microprocessor based release with true RMS based sensing. b. Self powered, tapped from incoming side of supply, setting panel with locking arrangement
9.3.3.2	Protection	Overload, short-circuit & earth fault
9.3.3.3	Tripping characteristic	Inverse definite minimum time characteristics for Short circuit and earth fault protection
9.3.3.4	Overload setting	40% -100% In, steps of 10%.
9.3.3.5	Overload setting time delay	2.5 s to 40 s minimum three settings
9.3.3.6	Short Circuit Setting	100% - 800% of In, steps of 10%.
9.3.3.7	Short Circuit Setting time delay	50 ms - 400 ms in steps of 50ms
9.3.3.8	Instantaneous setting	200% - 1500% of In & OFF
9.3.3.9	Earth fault setting	10- 100 % of In, steps of 10%

9.3.3.10	Earth fault setting time delay	50ms - 400 ms in steps of 50ms
9.3.3.11	Neutral unbalance	Earth fault function should not operate during neutral unbalance. Same will be verified during inspection.
9.3.3.12	Measurements required in release	a. Phase wise current b. Phase wise voltage c. Power factor d. Maximum current with date and time e. Instantaneous Power: Active, Reactive and apparent power f. Power Demand g. Energy
9.3.3.13	Metering measurement accuracy	a. 1% for current and voltage b. 2% for Power and energy
9.3.3.14	Other release requirements	a. Release should have backlit display. b. Release should be plug-in type and easily replaceable in field. c. Separate fault indication shall be provided for each protection stage i.e overload, short circuit and earth-fault d. Release should store 10 fault records on FIFO basis with date and time stamp. e. Release should have 2DIs for MCCB On and Off status shall be wired to DIs through auxiliary switch. f. Release should have RS485 port for SCADA communication on open Modbus protocol. It should be able to transmit all measured, monitored and recorded data to SCADA including status of DIs. g. Remote time synchronization through SCADA should be possible

9.3.3.15	Common RS 485 port	a. Communication ports of all MCCBs and ACBs shall be looped and connected to a common RS485 port provided in the panel for interfacing with SCADA on open modbus protocol. b. If any additional communication device is required for looping/combining of ACB and MCCB data is to be provided.
9.3.3.16	Serial Port surge protection device	To be provided

10 Automatic Power Factor Correction system

The APFC equipment shall be located in LV compartment of package enclosure either as a separate panel or integrated along with LV Switchgear and shall have all the following features

10.1	APFC Output	a. As per the PSS configuaration clause 4.0 b. APFC should be rated at 440V. c. Manufacturer need to specify the rated output at 440V.
10.2	APFC mounting	All components mounted in shelf type arrangement on package substation enclosure LV compartment wall or RMU compartment wall or Part of LT Panel
10.3	APFC relay & data logger	Mounted on base plate supported on compartment wall by three hinges
10.4	APFC system bus bar power connection to transformer LT side	a. By 4CX300sqmm AYFY 1100V grade cable to or Bus Bars for 200kVAR/300kVAR APFC rating b. By 2X4CX300sqmm AYFY 1100V grade cable to or Bus Bars for 600kVAR/800kVAR APFC rating
10.5	APFC system bus bar size	a. 50x10mm tinned copper mounted on SMC insulators 1100V grade for 200kVAR/300kVAR APFC rating

		b. 100x10mm tinned copper mounted on SMC insulators 1100V grade for 200kVAR/300kVAR APFC rating
10.6	APFC system CT input signal	From CT on transformer LV side by 7CX2.5sqmm YY 1100V grade cable
10.7	APFC capacitor modules	As per the requirement
10.8	Capacitor duty contactor for each capacitor module	Utilization category 6b as per IS
10.9	MCCB for each capacitor module	100amp, Three Pole, Ics=Icu=35kA
10.10	Connection to each MCCB from APFC system bus	By 35sqmm copper wire double insulated with tinned copper lugs
10.11	APFC control supply	Through 415/240v transformer, 2amp / 6amp SP MCB
10.12	APFC relay	Microprocessor based relay for automatic control of minimum 12 capacitors in sequential or cyclic switching fashion with settable time delay 0 -180 sec.
10.13	APFC relay LCD display with self monitoring feature	To show no. of capacitors energized, actual PF & target PF, voltage & current
10.14	Target power factor setting range	0.8 lag to 0.9 lead in steps of 0.1
10.15	APFC relay sensing	3 phase CT input 5 amp to sense max load current
10.16	No volt protection in relay	To switch OFF all capacitors
10.17	Capacitor unit 25KVAR type	Double layer All Poly Propylene (APP) or Mixed Poly Propylene (MPP)
10.18	Capacitor unit construction	1.5mm thick sheet metal welded tank or Al cylindrical construction
10.19	Capacitor unit impregnant	Dry type filler or non PCB liquid
10.20	Capacitor unit conducting layer	Al foil or metalized film
10.21	Capacitor sealing	Hermetic sealing after vacuum process

10.22	Capacitor unit safety	Pressure sensitive dis-connector or internal fuse for each element
10.23	Discharge resistor	Between all three phases of capacitor unit, to reduce the voltage across the capacitor to 50V or less in one minute
10.24	Terminal bushings	For rated voltage class 1 KV Suitable wires / terminals brought out from capacitor unit is also acceptable.
10.25	Earth connection for individual capacitor container	To be done & connected to main earth bus bar of the panel
10.26	APFC Operational features	
10.26.1	Automatic power factor correction	To achieve target lagging power factor without hunting
10.26.2	Operation for rated output	At continuous rated voltage (440 V) & frequency (50 Hz)
10.26.3	Operation with over voltage	115% of rated voltage for 12 hours in a day
10.26.4	Operation with harmonic distortion	THD voltage – 5% & THD current 3%
10.26.5	Maximum permissible over current	1.3 times rated current, continuous
10.26.6	Dielectric loss	0.2 watt per KVAR maximum
10.26.7	Temperature Category & Maximum temperature rise	- 5 / 60 deg C Not exceeding 10 deg C over 60 deg C.
10.26.8	Residual voltage after disconnection from mains	50 volts maximum after 60 seconds
10.26.9	Design life of capacitor unit	Minimum 10 years
10.26.10	Data Logger	
10.26.11	General	Accuracy class 0.5, microprocessor based with LCD display, with 3 CTs for measurement of cumulative KWH, power factor, voltage & current of transformer secondary, THD of voltage.

10.26.12	Data logging and Software	Data logging of KWH value at every 30 minutes to give cumulative reading of KWH for 45 days minimum, data downloadable in ASCII-II or MS Excel format. Software for downloading the data from data logger to be provided by data logger vendor.
10.26.13	Display and communication	Display of DATE, TIME, station ID -Display & log power parameters phase wise & total (load current, kVA, kW & PF). -Display & log kVAr phase wise & total. -Display TDH V or current. -The logger shall be with built in communication facility of RS485 to down load all parameters on demand. Integration of APFC relay with FRTU for SCADA monitoring and control.

11 Energy Meter Box

11.1	Energy meter	In the scope of purchaser
11.2	Location	To be provided mounted on enclosure wall in LV compartment.
11.3	Energy meter box Size	650 mm height x 450 mm width x 275 mm depth.
11.4	Box door design	With antitheft hinge, padlock facility, door fixed by stainless steel Allen screw M6 size.
11.5	Fixing of energy meter within box	On slotted horizontal channel 40 x 12 mm size, channel shall be movable on vertical slotted angle 40 x 40 mm size at two ends.
11.6	Meter reading window	Front door shall be with acrylic sheet for viewing the energy meter.
11.7	Sealing arrangement	02 no's sealing arrangement shall be provided on meter box's door.
11.8	Data downloading port	Slot shall be provided on door of meter box for fixing 9 pin DB connector.
11.9	Test Terminal Block	No Test terminal block shall be provided.

11.10	Cables and wires	PVC insulated, extruded PVC inner sheathed, armored, extruded PVC outer sheathed 1100 V grade control cable as per latest edition of IS 1554 part 1 minimum 2.5 sq mm for PT and 4 sq mm for CT with multi strand copper conductor.
11.11	Cable Glands	Nickel plated brass double compression weatherproof cable gland.
11.12	Wiring diagram	To be fixed on the back of door along with CT spec. etched on Anodised Aluminium plate fixed by rivet.
11.13	CT Secondary/VT wires	All CT secondary wire and VT wires shall be routed through metallic conduit. All secondary wires shall be bunched and kept for termination without any terminal/ TTB in between.

12 Other Provisions: illumination, Hooter & Fire extinguisher

12.1	RMU, transformer & LV compartment illumination	By 36w CFL fixture controlled through SPMCB & door limit switch
12.2	RMU, transformer & LV compartment power socket	5/15amp 3 pin socket through 32 amp SPMCB
12.3	Smoke Detector in each compartment	Minimum 02 no's Smoke Detectors in each LV, HV and Transformer compartment , wiring to be provided for RMU tripping and SCADA indication.
12.4	Energy meter box	To be provided on transformer LT side along with wiring.
12.5	Portable Modular Fire Extinguisher for HV, LV and Transformer compartment	a. The Portable modular FE, ABC (Stored Pressure) shall conform IS 13849. b. The powder in the extinguisher must be MAP 90%. c. The Dry powder used in FE shall conform IS 4308.

		d. The internal and external surface of the body shall be epoxy powder coated of minimum 0.050mm thickness. e. The wall thickness shall be as per IS 13849 f. All Internal and external surface of the body shall be completely coated with lead-tin alloy (tin not less than 10%) by means of hot dipping or by electrolytic process to a thickness not less than 0.012 mm. The thickness of the coating shall be measured as given in IS 3203:1982. Epoxy powder coating can also be used for anti-corrosive treatment with 0.050 mm thickness. g. The extinguisher body and valve assembly shall be capable of withstanding the Internal hydraulic pressure of 3 0 MN/m2 (30 kgf/cm2) without rupture, leakage or visible distortion for a period of 2 minute".
12.6	Other requirements	Substation internal cabling, lighting & earthing system along with required hardware, gaskets, gland plates etc.

13 PSS Enclosure Earthing

13.1	Earth bus connection brought out of package substation enclosure to earth pad for connection to earth pit	a. Two earth pads for RMU, transformer & LV compartment each. b. Two earth pads for transformer neutral
13.2	Earth bus size	a. 50x6 GI flat up to 1000kVA rating of PSS b. 2X50x6 GI flat for 1600kVA and 2000kVA rating of PSS
13.3	Earth bus fault current capacity	a. 26.3kA for 1 sec up to 1000kVA rating b. 43KA for 1 sec up to 1600kVA rating and 2000kVA rating of PSS

13.4	Earth connection of all covers, doors & structural parts to GI bus	By metallic jumper connection
13.5	Earth connection of RMU, ACB & transformer body parts to GI bus	By two numbers of 50x6mm GI flat per equipment
13.6	Earth bus identification	Shown by letter 'E'

14 Labels & painting

14.1	Name plate on package enclosure	Fixing by rivet only
14.1.1	Material	Anodized aluminum 16SWG / Stainless Steel (SS)
14.1.2	Background	SATIN SILVER
14.1.3	Letters, diagram & border	Black
14.1.4	Process	Etching
14.2	Name plate details	a. Month & year of manufacture b. transformer rating c. Purchaser name & order number d. Guarantee period e. Ref. IS / IES No. Shall be provided inside enclosure as well as outside enclosure.
14.3	Labels for meters & indications	Anodized aluminium with white character on black background OR 3 ply Lamicoid
14.4	Danger plate on doors of RMU compartment & LV compartment	Etched on 16 swg anodised aluminium / SS plate with white letters on red background
14.5	BSES Insignia	a. 02 no's b. HV and LV side of PSS enclosure. c. Shall be etched on anodized aluminium 16SWG / SS plate. d. Details shall be finalized during drawing approval.

14.6	Enclosure painting surface preparation	Shot blasting or 7 tank chemical process
14.7	Enclosure painting external finish Powder coated epoxy polyester base	Hot dip galvanizing – 80 micron thick grade A, shade - RAL 7032, uniform thickness 60 micron minimum .
14.8	Enclosure painting internal finish	Powder coated epoxy polyester base grade A, shade -white, uniform thickness 80 micron minimum

15 Approved makes

15.1	RMU	ABB/Schneider/Siemens/Eaton/Lucy
15.2	Transformer	Voltamp/MEI/CGL/Danish/ Schneider
15.3	Transformer Oil	Savita/ Apar/ Raj-Patro
15.4	FRTU	ABB/Schneider/Siemens/Phoenix/ Ashida
15.5	FPI	EMG/Siemens/C&S/ Schneider
15.6	Protection Relay	Ashida / ABB / Seimens/ C&S/ Schneider
15.7	Battery charger and BHMU	Allan/Gagate
15.8	Bushings make	Baroda bushing / CJI / Jaipur Glass
15.9	Winding Temperature Indicator	Precimeasure/ Pecon
15.10	ACB	Schneider /Siemens / ABB/ Lauritz- Knudsen
15.11	MCCB	ABB/Schneider/Siemens/ Lauritz- Knudsen
15.12	APFC- Capacitor	ABB/Schneider/Epcos/Lauritz-Knudsen/ Seimens
15.13	Switch	ABB / Siemens / L&T (Salzer)
15.14	HRC Fuse Links	Alstom / Siemens / L&T / GE
15.15	Load manager	L&T / Enercon / AE / DUCATI / Phasetrac M-40 / TAS POWERTECH
15.16	APFC relay	Beluk / ABB / Fraco / Ducati/ TAS / POWERTECH
15.17	AC Contactors	ABB / Schneider
15.18	Push buttons / Actuator	L&T / Teknic / Siemens
15.19	MCCB	ABB / L&T / Siemens/Schneider –MG
15.20	Capacitors	FRACO / DUCATI/ABB/shrim
15.21	Fans	EBM Nadi

15.22	Terminals	Connectwell / Elmex / Phoenix
15.23	Transformer Bushings (HV side)	Baroda/CJI/ any other make approved by BSES
15.24	Termination kits for RMU	3m/ Raychem/ Denson
15.25	Termination kits for Transformer	3M/ Raychem/ Denson / any other make approved by BSES
15.26	Cold applied cable boots	3M/ Raychem/KD joshi
15.27	Interposing relay	ABB / Tyco/OEN
15.28	Modem	Niseva/Lantronix/Pheonix/ Nombus
15.29	CT and Aux PT	Narayan Power Tech (NPT)/Gilbert Maxwell, Pragati, Nortex
15.30	CBCT (Both for Earth fault and Over current protection)	EMG/Schneider/SIEMENS/C&S
15.31	Battery	HBL/Exide
15.32	Protocol converter	ABB/Tyco/OEN
15.33	DC power connector	Wago/Havells/Connectwell
15.34	Surge protector	Phoenix
15.35	Vacuum Interrupter	CG/ABB/Schneider/BEL
15.36	PRD/ PRV	Sukrut/ Viat
15.37	Protection Relay for transformer Internal parameters	VIAT/ IDEF Systems/
15.38	GI Sheet	Tata/ Sail/ JSW
15.39	Meters	Rishabh, Schneider, Secure
15.40	Indication Lamp	Vasho/ Binay/ Teknik/ C&S/ MIMIC/ Seimens

Note- Any other make of component offered by the bidder shall be subject to approval of BSES.

16 Quality assurance Inspection & testing

16.1	Vendor quality plan	To be submitted for purchaser approval for all components listed in clause 4.0 For transformer, RMU & APFC panel sub vendor quality plan to be submitted.
16.2	Inspection points in quality plan	To be mutually identified & agreed

16.3	Quality – Process Audits	BSES shall carryout vendor process audits.
16.4	Type test as per IS / IEC	a. Only type tested quality equipment(s) shall be offered. b. Type test certificates shall be submitted along with offer for scrutiny. c. The test reports should not be more than 5 years old.
16.4.1	Package substation assembly	All type tests to be provided as per as per IS 62271-202
16.4.2	11 kV RMU, ACB, MCCB, APFC system and capacitor units	All type tests to be provided as per as per relevant IS/ IEC
16.4.3	Transformer	a. All type tests to be provided as per IS 1180 Part 1 including short-circuit withstand test.
16.5	Routine tests	
16.5.1	Routine tests of PSS	As per IEC 62271-202
16.5.2	Routine tests of transformer, RMU, LT panel & APFC	As per relevant IS/ IEC
16.6	Inspection and acceptance testing	a. Purchaser reserves the right to inspect /witness all tests at manufacture's works at any time, prior to dispatch, to verify compliance with the specification/ standards. b. Manufacturer should have all the facilities/ equipments to conduct all the acceptance tests during inspection. All the testing equipment should be calibrated. c. Stage and / or final inspection call intimation shall be given at least 15 days in advance to the purchaser.
16.6.1	Stage inspection of transformer	Purchaser shall inspect transformers at the core and coil assembly stage at the manufacturer's premises.
16.6.2	Final inspection of transformers	The sequence of testing shall be as follows

		a. Visual and dimension check for completely assembled transformer. b. Measurements of voltage ratio. c. Measurements of winding resistance at principal tap and two extreme taps. d. Vector Group and polarity test. e. *Measurements of insulation resistance and polarization index. f. Separate sources voltage withstand test. g. Measurement of iron losses and exciting current at rated frequency and 90%, 100% and 110% rated voltage. h. Induced voltage withstand test. i. Load losses measurement. j. Impedance measurement of principal tap (HV and LV) of the transformer. k. Measurement of Iron loss (to be repeated if type test are conducted). l. Measurement of capacitance and Tan Delta for HV and LV bushings and Tan Delta for transformer oil (for all transformers). m. Oil leakage test on assembled transformer n. Magnetic balance test. o. Power frequency voltage withstand test on all auxiliary circuits p. Measure of zero seq. impedance (Cl. 16.10 IS 2026 Part I). q. Measurement of acoustic noise level (Cl. 16.12 of IS 2026 Part I). r. Measurement of harmonic level on no load current. s. Partial discharge test

		*Insulation resistance measurement shall be carried out at 5kV for HV and 1kV for LV. Value of IR should not be less than 1000 Mohms. Polarization Index (PI = IR10min/IR1min) should not be less than 1.5 (If one minute IR value is above 5000 Mohms and it is not be possible to obtain an accurate 10 minutes reading, in such cases polarization index can be disregarded as a measure of winding condition.)
16.6.3	Final Inspection of package substation after complete assembly	As per IEC 62271-202 and relevant IS/ IEC of equipment. a. Visual check b. Dimensional and sheet thickness check c. Verification of Wiring & BOM d. Paint thickness inside and outside of PSS enclosure. e. Functional test i. Operation of switchgear and control gear. ii. Mechanical operation and alignments of PSS doors. iii. Fixing of insulating barriers. iv. Voltage indication check v. Checking of temperature and liquid level of the transformer. vi. Fitting of earthing devices. vii. Cable testing viii. Replacement of LTCT ix. Operation of transformer tap changer x. Operation of illumination system xi. Trip function of HV switchgear. f. IR test g. HV test on power circuit h. HV test on auxiliary circuits

		i. Operational and interlocks check
16.6.4	Acceptance Test of RMU	a. Physical inspection , BOM & wiring checks b. Insulation Resistance test c. HV Test for one minute d. Operation & Interlock check e. Measurement of resistance of main circuit f. Voltage indication check of VPI g. Functional testing of FPI for alarm h. Primary current injection test for circuit breaker feeder on both ration's of all CT's with relay i. Breaker closing and opening time measurement
16.6.5	Acceptance Test of LT Panel / APFC Panel	a. Visual, dimension, wiring & BOM check. b. Operational check. c. IR Test. d. HV Test
16.7	Special acceptance tests	
16.7.1	Transformer	Temperature rise test shall be carried out on 01 no transformer of each rating randomly selected from the offered lot.
16.7.2	PSS	Temperature rise test of PSS along with transformer as per IEC 62271-202.
16.8	Right to waive off tests	Reserved by Purchaser

17 Shipping, Handling and Site support

17.1	Packing Protection	Against corrosion, dampness, heavy rains, breakage and vibration
17.2	Packing for accessories and spares	Robust wooden non returnable packing case with all the above protection & identification Label
17.3	Packing Identification Label (Anodized Aluminum Plate)	On each packing case, following details are required:
		a) Individual serial number

		b) Purchaser's name
		c) PO number (along with SAP item code, if any) & date
		d) Equipment Tag no. (if any)
		e) Destination
		f) Manufacturer / Supplier's name
		g) Address of Manufacturer / Supplier / it's agent
		h) Description of PSS.
		i) Country of origin
		j) Month & year of Manufacturing
		k) Case measurements
		l) Gross and net weights in kilograms
		m) All necessary slinging and stacking instructions
17.4	Shipping	The seller shall be responsible for all transit damage due to improper packing.
17.5	Handling and Storage	a) Manufacturer instruction shall be followed. b) Detail handling & storage instruction sheet / manual to be furnished before commencement of supply.

18 Deviations

18.1	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, it will be assumed that the bidder complies fully with this specification.

19 Drawings Submission

Drawing submission shall be as per the matrix given below.

a. All documents/ drawing shall be provided in soft copy only in returnable Pen drives

b. Language of the documents shall be English only.

c. Incomplete submission shall be liable for rejection.

d. Document check sheet compliance shall be the first sheet for each submission stage i.e. Technical bid, Drawing Approval, Pre Dispatch
e. No submission is acceptable without check list compliance.
f. Order of documents shall be strictly as per the check list.
g. Any drawing not included in the below table but necessary for detailed engineering shall be deemed to be included in bidder's scope.

S No.	Description	Bid	For Approval	Pre Dispatch
19.1	Copy of specification along with company seal & signature on each page.	Required		
19.2	Duly filled GTP as per Annexure 'B'.	Required	Required	
19.3	GA drawing (Complete assembly, RMU, transformer, LT panel + other items)	Required	Required	
19.4	BOM of Packaged substation	Required	Required	
19.5	Valid type test reports	Required		Required
19.6	Transformer BIS license	Required	Required	Required
19.9	Calculation for sizing of Transformer	Required	Required	
19.10	Sizing Calculation of busbar in support of its Guaranteed S.C. rating / Capability	Required	Required	
19.11	Deviation Sheet (if any)	Required	Required	
19.12	Catalogues & manuals for Package substation + RMU + Transformer + LT switchgear items + APFC			Required
19.13	User manual for Hermetically Sealed Transformers. The manual must be provided with, but not limited to, maintenance schedule, frequency & method of			Required

S No.	Description	Bid	For Approval	Pre Dispatch
	oil- sampling, procedures for oil-filling & oil-filtration, etc.			
19.14	Quality plan for Packaged substation	Required	Required	
19.15	Installation, commissioning manual for all items in Packaged substation. (for information)		Required	Required
19.16	Operation & maintenance manual for all items in Packaged substation. (for information)			Required
19.17	Transport / Shipping dimensions with weights, wheel base details, un tanking height		Required	
19.18	Recommended spare parts list as per annexure G.	Required	Required	
19.19	Inspection and test reports carried out in manufacturers works			Required
19.20	Test certificates of all bought out items.			Required

Annexure A - Service Conditions

The package substation shall be designed & tested to operate satisfactorily under following conditions

Sr No	Description	Data by purchaser
1.	Location	Delhi
2.	Reference design ambient temperature	40°C for Delhi
3.	Maximum ambient temperature	50°C for Delhi
4.	Relative humidity	85% for Delhi
5.	Seismic zone	Zone IV for Delhi

Annexure B - Guaranteed Technical Particulars (Data by Supplier)

a. Bidder shall furnish the GTP format with all details against each clause.

b. Bidder shall not change the format of GTP or clause description.

c. Bidder to submit duly filled GTP in hard copy format with company seal.

Sr. No.	Description	Data to be filled by Supplier
1	Manufacturer Name	
2	Manufacturer Address	
2.1	Telephone no	
3	Manufacturer contact person	
4	Manufacturer brand name (Give catalogue reference)	
4.1	Conformance to specification	Yes/No
4.2	If NO for above, Submission of clause wise deviation sheet	Yes/No
5	RMU	
5.1	Equipment make	
5.2	Equipment type / brand name	
5.3	Panel overall dimensions in mm	
5.3.1	Width (measured from front)	
5.3.2	Depth	
5.3.3	Height	
5.4	Panel weight in kg	
5.5	Panel enclosure protection offered	
5.6	Panel tested for internal arc	Yes / No

Sr. No.	Description	Data to be filled by Supplier
5.7	Insulation level for complete panel	
5.7.1	Impulse withstand	(KV peak)
5.7.2	Power frequency withstand	(KV rms)
5.8	Bus bar	
5.8.1	Material & grade	
5.8.2	Bus bar cross section area in sq mm	
5.8.3	Bus bar rated current in amp	
5.8.4	Max temperature rise above reference ambient	
5.8.5	Short time current withstand capacity for 3 seconds (in KA)	
5.8.6	Bus bar clearances in mm P-P / P-E	
5.8.7	Bus bar with insulation sleeve / barriers	
5.8.8	Bus bar support insulator type	
5.8.9	Bus bar support insulator voltage class	
5.8.10	Bus bar support insulator minimum creepage distance / mm	
5.9	Earth bus bar	
5.9.1	Earth bus bar material & grade	
5.9.2	Earth bus bar cross section area in sq mm	
5.9.3	Bus bar rated current in amp i) at designed 40 deg.C ambient ii) at 50 deg.C ambient	
5.9.4	Max temperature rise above reference ambient of 40 deg C	
5.9.5	Short time current withstand capacity for 3 seconds (in KA)	
5.9.6	Bus bar clearances in mm P-P / P-E	
5.9.7	Bus bar with insulation sleeve / barriers	
5.9.8	Bus bar support insulator type	
5.9.9	Bus bar support insulator voltage class	

Sr. No.	Description	Data to be filled by Supplier
5.9.10	Bus bar support insulator minimum creepage distance / mm	
5.9.11	Earth bus bar material	
5.9.12	Earth bus bar size	
5.9.13	Cable compartment	
5.9.13.1	C-C distance between bushings	
5.9.13.2	Phase to Phase Clearance (Min)	
5.9.13.3	Phase to Earth (Min) Clearance	
5.9.13.4	Impulse Withstand Voltage of design tested	
5.9.13.4	IAC level – Cable compartment / RMU Tank	
5.10	Circuit breaker type –VCB	
5.10.1	Rated voltage & frequency	
5.10.2	Rated current in amp	
5.10.3	Rated breaking current – KA rms symmetrical	
5.10.4	Short time withstand capacity in KA for 3 sec	
5.10.5	Rated making current - KA peak	
5.10.6	Breaker total opening time at rated breaking capacity (in milliseconds)	
5.10.7	Number of breaks per pole	
5.10.8	Total length of contact travel in mm	
5.10.9	No of circuit breaker operation cycles (close & open) guaranteed at rated current, Electrical endurance class	
5.10.9.1	25% rated current -	
5.10.9.2	50% rated current -	
5.10.9.3	75% rated current -	
5.10.9.4	100% rated current -	
5.10.10	No of breaker opening operations guaranteed at rated fault current, Electrical Endurance class	

Sr. No.	Description	Data to be filled by Supplier
5.10.11	No of breaker mechanical operation cycles (close & open) guaranteed at zero current, Mechanical endurance	
5.10.12	Contact material	
5.10.13	Operating mechanism – trip free	
5.10.14	Motorized/Manual Sprig charge type	
5.10.15	Spring charging motor rating - Watt	
5.10.16	Spring charging motor rated DC voltage	
5.10.17	Closing coil wattage & rated DC voltage	
5.10.18	Trip coil wattage & rated DC voltage	
5.11	Minimum permissible SF6 gas pressure (For SF6 type RMU only)	
5.12	Capacitor type cable voltage indication provided?	Yes / No
5.13	Operation counter provided – Yes/ No	
5.14.1	Disconnect switch continuous rating (Amp)	
5.14.2	Disconnect switch Short time withstand rating -20kA for 3 sec minimum	Yes / No
5.15	Earth Switch	
5.15.1	Minimum number of operations at no load- Mechanical Endurance class	
5.15.2	Making capacity endurance of earth switch – Electrical endurance class	
5.16	Self Powered Relay (Transformer VCB module)– Make / Model	
5.16.1	CT Input	
5.16.2	IDMT Setting Range 4 element – Over Current & Earth fault & steps	Overcurrent- Earth Fault- Instantaneous O/C Instantaneous E/F-
5.16.3	Operating Time	Over Current – Curves Instantaneous

Sr. No.	Description	Data to be filled by Supplier
5.16.4	Pick up Current	
5.16.5	Resetting Current	
5.16.6	Relay Burden	
5.16.7	Time Accuracy	
5.16.8	Tripping Coil O/P – type & duration	
5.16.9	Fault Current Display	
5.16.10	No of Fault Current Latching with time stamping	
5.16.11	Display Facility / Type	
5.16.12	Operational Indicators	
5.16.13	Potential Free Output Contacts	
5.16.14	Thermal Withstand Capacity of Relay	
5.17	Fault Passage Indicator (for Cable feeder module 1 & 2)	
5.17.1	CBCT	
5.17.1.1	Type	
5.17.1.2	Mounting Arrangement	
5.17.1.3	CT to indicator connection	
5.17.1.4	ID of sensor	
5.17.2	Earth Fault Indicator	Make / Model
5.17.2.1	Sensing Current	
5.17.2.2	Sensing Time	
5.17.2.3	Indication	
5.17.2.3	Reset Time	
5.17.2.4	Resetting Facility	
5.17.2.5	Output Contact	
5.17.2.6	Contact Rating	
5.17.2.7	Aux Power Supply	
5.17.2.8	Degree of Protection	
5.17.2.9	Mounting Arrangement	
5.17.2.10	Ambient Temperature	

Sr. No.	Description	Data to be filled by Supplier
5.18	DC charger rating in amps – min 10 Amp Dual	Yes/No
5.18.1	MCB rating at 230V AC input of charger	Amp
5.18.2	MCB rating at 24V DC output of charger	Amp
5.18.3	Charger heat sink temperature rise (max 55 deg C above ambient 40 deg C)	
5.18.4	Voltage variation in 24v Dc output for FRTU	(Max +/-1 V)
5.18.5	Charger with natural cooling (no cooling fans)	Yes/No
5.18.6	Charger tested for input supply voltage regulation test (input variation 150v-250v, output DC voltage variation +/- 1 volt max)	Yes/No
5.18.7	Charger temperature rise test certificate submitted	Yes/No
5.19	DC battery rating in Ah – 26Ah (mini) OR as approved battery sizing during detail engineering ,whichever is higher.	
5.20	DC charger changeover – Diode rating 10A min	Yes/No
5.21	HT Cable termination - 3cX300sqmm AYFY cable– Height of power terminal from gland plate	mm
5.22	Mimic diagram, labels & finish as per specification	Yes / No
5.23.1	Cable termination – Height of power terminal from gland plate	Mm
5.23.2	Torque required for tightening terminal lug	
5.24	Submission of RMU / component catalogue	Yes/No
5.25	Unit price for Conversion kit offered separately for converting the RMU from single cable	Yes/No

Sr. No.	Description	Data to be filled by Supplier
	termination design to double cable termination design	
5.26	FRTU Panel	
5.26.1	FRTU	
5.26.1.1	Make & Model No	
5.26.1.2	No of DI Modules	
5.26.1.3	No of DO Modules	
5.26.1.4	No of AI Modules	
5.26.1.5	Make of Protocol converter	
5.26.2	Modem	Ethernet Type
5.26.2.1	Make	
5.26.2.2	Serial port Isolator provided	Yes / No
5.26.2.3	Type – 4G Back compatible to 3G & 2G Refer FRTU Specifications	Yes / No
5.26.3	Interposing relay with freewheeling diode	
5.26.3.1	Make	
5.26.3.2	Capacity	
5.26.3.3	Model	
5.26.4	AC & DC MCB	
5.26.5	Terminal Blocks	
5.26.6	Disconnecting type fuses	
5.26.7	Enclosure	
5.26.7.1	Sheet steel thickness	
5.26.7.2	Painting process	
5.26.7.3	Construction of steel according to IEC 529 , index of protection	
5.26.7.4	Shade	
5.26.7.5	Louvers with filters	
5.26.8	Dimensions & Weight of FRTU	
5.28	Submission of RMU / component catalogue	Yes/No
6.0.0	11kv cable	from RMU to transformer

Sr. No.	Description	Data to be filled by Supplier	
6.1.0	Cable size 3CX150 sqmm AYFY	Yes/No	
6.2.0	Cable rated voltage - 11000v	Yes/No	
6.3.0	Cable short circuit current capacity for 1 sec	kA	
6.4.0	Type of insulation - XLPE	Yes/No	
6.5.0	Outer insulation sheath – PVC with armor	Yes/No	
6.6.0	Cable termination type & make		
7.0.0	Oil Type Transformer		
7.1.0	Make		
7.2.0	Type- Mineral Oil Transformer	Yes	
7.3.0	Transformer continuous rating when placed in package substation enclosure	HV winding	LV winding
		KVA	KVA
7.4.0	Rated voltage (kV)	HV winding	LV winding
		11 KV	0.433 KV
7.5.0	Rated current	HV winding	LV winding
		Amps	Amps
7.6.0	Transformer vector group – Dyn11	Yes / No	
7.7.0	Impedance at principal tap rated current and frequency, ohm @75 °C	As per the specification	
7.7.1	Impedance at lowest tap	Ω	
7.7.2	Impedance at highest tap	Ω	
7.7.3	X/R Ratio		
7.8.0	Resistance of the winding at 75°C in ohm	HV winding	LV winding
		Ω	Ω
7.10.0	Zero sequence impedance in ohm	HV winding	LV winding
		Ω	Ω
7.10.0	Guaranteed maximum losses at principal tap at 75°C without any positive tolerance, kW	50 % Load (kW)	100 % Load (kW)
7.10.1	No load losses (max.)		
7.10.2	Load losses (max.)		
7.10.2	Total losses (max.),		
7.10.4	No load loss at maximum permissible voltage and frequency (approx.),		

Sr. No.	Description	Data to be filled by Supplier
7.11.0	Temperature rise over reference ambient	
7.11.1	Winding by resistance: Outside the PSS enclosure / inside the PSS enclosure 0 C	
7.11.2	Top Oil by thermometer: Outside the PSS enclosure / inside the PSS enclosure 0 C	
7.11.3	Maximum hot spot temperature, Deg. C	°C
7.12.0	Efficiency	at 75°C and unity power factor
7.12.1	at 110% load	%
7.12.2	at 100% load	%
7.12.2	at 80% load	%
7.12.3	at 60% load	%
7.12.4	at 40% load	%
7.12.5	at 20% load	
7.13.0	Maximum hot spot temperature, Deg. C	at 75°C and 0.8 power factor lag
7.13.1	Efficiency	%
7.13.2	at 110% load	%
7.13.3	at 100% load	%
7.13.4	at 80% load	%
7.13.5	at 60% load	%
7.13.6	at 40% load	%
7.14.0	Maximum efficiency at 75°C	%
7.14.1	% Load and power factor at which it occurs	
7.15.0	Regulation at full load at 75°C	
7.15.1	at unity power factor	
7.15.2	at 0.8 power factor lagging	
7.16.0	Regulation at 110% load at 75^0 C	
7.16.1	at unity power factor	
7.16.2	at 0.8 power factor lagging	

Sr. No.	Description	Data to be filled by Supplier
7.17.0	Core	
7.17.1	Core material grade	Premium grade minimum M3 or better
7.17.2	Thickness of lamination mm	mm
7.17.3	Insulation of lamination	
7.17.4	Design Flux Density at rated condition at principal tap, Tesla- 1.7 Tesla (Max)	
7.17.5	Maximum flux density at 12.5 % over excitation /overfluxing, Tesla -1.9 Tesla (Max)	
7.17.6	Equivalent cross section area	
7.18.0	Guaranteed No Load current At 100% rated voltage , Amps	
7.18.1	HV	
7.18.2	LV	
7.110.0	Guaranteed No Load current At 110% rated voltage, Amps	
7.110.1	HV	
7.110.2	LV	
7.20.0	Type of Winding	
7.20.1	HV	
7.20.2	LV	
7.20.3	Conductor material	
7.20.4	Current density Amps/sqmm	
	HV winding	
	LV winding	
7.20.5	Gauge/area of cross section of conductor, sqmm	
	HV	
	LV	
7.21.0	Tapping - Off Ckt	Yes / No
7.21.1	Capacity	Full Capacity

Sr. No.	Description	Data to be filled by Supplier	
7.21.2	Range- steps X % variation		
7.21.3	Taps provided on HV winding	Yes / No	
7.21.4	Tap link Current rating , A		
7.22.0	Insulating material and thickness	Material	Thickness
7.22.1	HV Turn		mm
7.22.2	LV Turn		mm
7.22.3	LV to Core		mm
7.22.4	HV to LV		mm
7.23.0	Minimum design clearance, mm		
7.23.1	HV to earth in Air	mm	
7.23.2	LV to earth in Air	mm	
7.23.3	Between HV & LV in Air	mm	
7.23.4	Top winding and yoke	mm	
7.23.5	Bottom winding and yoke	mm	
7.24.0	Bushing / Support Insulator		
7.24.1	Make		
7.24.2	Type		
7.24.3	Reference Standard		
7.24.4	Voltage class, kV		
7.24.5	HV side Bushing / Support insulator		
7.24.6	LV side line and neutral bushing / Support insulator		
7.24.7	Creepage factor for all bushing	mm / KV	
7.24.8	Weight	KG	
7.24.9	HV bushing / Support insulator		
7.24.10	LV line and neutral bushing / Support insulator		
7.24.11	Free space required for bushing / Support insulator removal, mm		
7.24.12	HV bushing / Support insulator		
7.24.13	LV line and neutral bushing / Support insulator		

Sr. No.	Description	Data to be filled by Supplier
7.25.0	Insulating Oil	
7.25.1	Quantity of Oil Ltrs	
7.25.2	10% excess oil furnished	
7.25.3	Type of Oil	
7.25.0	HV Termination arrangement	Suitable for 3CX150 mm^2 AYFY 11KV
7.25.1	Phase to phase clearance	mm
7.25.2	Phase to earth clearance	mm
7.25.3	HV side bus bar size	
7.25.4	HV Termination height	mm
7.26.0	L.V termination arrangement	Suitable to 100x12 mm for phase & neutral
7.26.1	Phase to phase clearance,	25 mm minimum
7.26.2	Phase to earth clearance ,	25 mm minimum
7.26.3	LV side bus bar size	
7.26.4	LV Termination Height	mm
7.27.0	Current Transformer on LV phases	
7.27.1	Type	
7.27.2	Make	
7.27.3	Reference Standard	
7.27.4	CT Ratio	
7.27.5	Burden, VA	
7.27.6	Class of Accuracy	
7.28.0	WT scanner terminal box size	
7.210.0	Alarm and Trip contact ratings of protective devices	
7.210.1	Rated / making/ breaking currents , Amp @ Voltage for	
7.210.2	Winding temperature scanner	
7.30.0	Fittings and Accessories as per Cl. 8.9 provided	(YES / NO)
7.31.0	Over all transformer dimensions	

Sr. No.	Description	Data to be filled by Supplier
7.31.1	Length	mm
7.31.2	Width	mm
7.31.3	Height	mm
7.32.0	Weight data	
7.32.1	Core	KG
7.32.2	Frame parts, kG	KG
7.32.3	Core and frame, kG	KG
7.32.4	Total Winding, kG	KG
7.32.5	Core , Frame, Winding, kG	KG
7.32.6	Enclosure, kG	KG
7.32.7	Total Transport weight of the transformer, kG	KG
7.32.8	Total weight of the transformer with all accessories	KG
7.33.0	Shipping Data	
7.33.0	Weight of heaviest package, kG	KG
7.33.0	Dimensions of the largest package (L x B x H)	mm
7.34.0	Surge Arrestor requirement	
7.34.1	Type	
7.34.2	System Voltage , kV rms	
7.34.3	Rated Voltage of Arrestor, kV rms	
7.34.4	Continuous operating voltage , kV rms	
7.34.5	Maximum Continuous operating voltage, kV rms	
7.34.6	Nominal Discharge Current, kA peak	
7.34.7	Energy Absorption Capability, kJ/kV	
7.34.8	Creepage factor	
7.34.9	Reference std	
7.35.0	OTI/ WTI Scanner Details	
7.35.1	Make	
7.35.2	Model no.	

Sr. No.	Description	Data to be filled by Supplier
7.35.3	No of Channel / Input	
7.35.4	Manual submitted	
8.0.0	Low voltage bus bar system	To connect transformer LV side to ACB & to MCCB
8.1.0	Bus bar material tinned copper	Yes / No
8.2.0	Bus bar size	sqmm
8.3.0	Bus bar continuous current rating	Amp
8.4.0	Bus bar insulator voltage class	kV
8.5.0	Bus bar droppers size from ACB to MCCB (50X10 tinned copper)	
8.6.0	Maximum bus bar temperature rise	
9.0.0	ACB, MCCB	As per IS 13947
9.1.0	ACB make	
9.1.1	ACB rated voltage 415v +/- 10%	
9.1.2	ACB type 4 pole with isolable neutral link	Yes / No
9.1.3	ACB continuous current capacity at 415v 50Hz, at 50 deg C	amp
9.1.4	ACB short circuit breaking capacity Ics =Icu = 50kA minimum	kA
9.1.5	ACB SC making current capacity 100kAp	kA peak
9.1.6	ACB short time current withstand capacity for 1 sec (Icw= 50kA)	kA
9.1.7	ACB rated impulse withstand voltage for main & aux circuit in kv	
9.1.8	ACB closing time in ms	
9.1.9	ACB opening time in ms	
9.1.10	Guaranteed number of close & open operations at no load	
9.1.11	Guaranteed number of close & open operations at rated load	
9.1.12	ACB dimensions	

Sr. No.	Description	Data to be filled by Supplier
9.1.13	ACB operating mechanism -Trip free, anti pumping type, manual as well as motor	Yes / No
9.1.14	Spring charging motor supply	volt
9.1.15	Close & trip coil supply	volt
9.1.16	ACB utilization category -B as per IS	
9.1.17	ACB indications - ON, OFF & TRIP	
9.1.18	ACB operation - manual - ON, OFF by push buttons	
9.1.19	ACB operation – electrical - ON, OFF by TNC switch	
9.1.20	L/R switch for remote operation	Yes / No
9.1.21	ACB overload, short circuit & earth fault protection - By static or micro processor based releases	
9.1.22	Inbuilt CT burden, ration & class	
9.1.23	Overload release setting range	
9.1.24	Short circuit release setting range	
9.1.25	Earth fault release setting range	
9.2.0	MCCB make	
9.2.1	MCCB type -4 pole, double break / pole	Yes / No
9.2.2	MCCB - On & OFF by Manual handle and electrical	Yes / No
9.2.3	L/R switch for remote operation	
9.2.4	MCCB Neutral connection - Fully isolable link sized for rated current	
9.2.5	MCCB rated voltage 415v +/- 10% at 50Hz	
9.2.6	MCCB rated continuous current (630/800/1250 A) As per the type of PSS enquiry)	
9.2.7	MCCB 3 ph short circuit breaking capacity Ics = Icu =35kA	

Sr. No.	Description	Data to be filled by Supplier
9.2.8	MCCB 3 ph short circuit withstand capacity, Icw =8kA for 1 sec	
9.2.9	MCCB SC making current capacity	
9.2.10	MCCB rated insulation level	
9.2.11	MCCB mechanical & electrical endurance as per IS 13947 / IEC	
9.2.12	MCCB category of duty - B as per IS / IEC 947	Yes / No
9.2.13	MCCB indications -ON, OFF ,TR & L/R switch	
9.2.14	MCCB protection - Microprocessor release + earth fault	
9.3.0	Connection to ACB main bus by Cu bar with double PVC insulation	Yes / No
9.3.1	MCCB	
9.4.0	Connection to outgoing cables by bus bar terminals suitable for 2x4CX400sqmm AYFY 1100 volt grade cable	
9.4.1	No.of LT Outgoings as per the PSS type	
9.4.2	Only for Type 5 & 6- Provisions in LT panel to increase LT outgoing by 02 no's by adding MCCB's in future.	(YES/ NO)
10.0.0	APFC system	
10.1.0	Rating of APFC system	KVAR
10.2.0	Rated voltage & frequency	Volts at 50Hz
10.3.0	Rated line current of APFC system	Amp
10.4.0	Rated capacitance	micro Farad
10.5.0	Capacitor steps – Type I: 12x25KVAR? Type II: 8 X 25 KVAR?	Yes / No
10.6.0	Rated current of each 25KVAR unit	Yes / No
10.7.0	Rated capacitance – 25KVAR unit	micro Farad

Sr. No.	Description	Data to be filled by Supplier
10.8.0	Three phase connection – star / delta	
10.9.0	Capacitor dielectric type –	APP / MPP
10.10.0	No of series group / capacitor unit	
10.11.0	No. of parallel elements / series group	
10.12.0	Thickness of PP film in micron	
10.13.0	Thickness of Al foil in micron	
10.14.0	No. of PP film layers	
10.15.0	Maximum voltage stress per each PP film layer	
10.16.0	Discharge device material	
10.17.0	Capacitor tank steel thickness	mm
10.18.0	Capacitor unit dimension (L x D x H)	
10.19.0	APFC dimensions in mm (L x D x H)	
10.20.0	APFC system weight in kg	
10.21.0	Heat generated by APFC in Kw with all capacitor steps ON	
10.22.0	Operation with over voltage 115% of rated voltage for 12 hours in a day	
10.23.0	Operation with harmonic distortion THD 5% voltage & current	
10.24.0	Maximum permissible over current of	
10.25.0	1.3 times rated current continuous	
10.26.0	Dielectric loss less than 0.2w / KVAR	
10.27.0	Guaranteed minimum capacitor switching operations (ON/OFF) per year	
10.28.0	Maximum temperature rise above ambient of 45 Deg C	Deg C
10.29.0	Residual voltage after de-energiszation & at 60 seconds	
10.30.0	Design life of capacitor unit	
10.31.0	APFC panel insulation level	
10.32.0	1 minute power frequency withstand	KV

Sr. No.	Description	Data to be filled by Supplier
10.33.0	Impulse withstand voltage	KVp
10.34.0	Main bus bar material / size (sqmm)	
10.35.0	Main bus bar rated current	
10.36.0	Main bus bar short time withstand	
10.37.0	CT make & accuracy class	
10.38.0	CT ratio & burden (VA)	
10.39.0	APFC relay make / type	
10.40.0	APFC relay catalogue enclosed?	Yes / No
10.41.0	Data logger make / type	
10.42.0	Data logger catalogue enclosed?	Yes / No
10.43.0	AC contactor make	
10.44.0	AC contactor rating	Amp
10.45.0	AC contactor utilization category as per IS	
10.46.0	100amp MCCB make	
10.47.0	100amp MCCB current breaking capacity Ics=Icu=35kA	
10.48.0	Copper wire size from MCCB to contactor & capacitor – 35sqmm Cu	
11.0.0	Energy meter box as per specification provided?	Yes / No
12.0	Enclosure for package substation	
12.1	Service conditions for outdoor use	Yes / No
12.2	Material for enclosure – Galvanised Sheet steel 2.5mm thick CRCA for all side doors, covers with painting	Yes / No
12.3	Enclosure construction -Frame supported construction with all doors, covers welded with steel channel ribs at every 1000mm minimum	Yes / No
12.4	Lifting lugs for site handling / lifting by crane - qnty	

Sr. No.	Description	Data to be filled by Supplier
12.5	Doors for RMU compartment, Transformer compartment & LV compartment with anti theft hinge minimum 3 nos., with lockable handle & with padlocking facility	Yes / No
12.6	Top & other side walls of enclosure welded sheet metal	
12.7	Removable canopy above top cover -2.5mm thick sheet metal with 10º slope	Yes / No
12.8	Enclosure integral steel base frame 'I' section size	
12.9	Base frame bottom support pads for fixing by bolt to foundation - minimum six numbers to rest on foundation	Yes / No
12.10	Enclosure compartments -separate compartments for RMU, transformer & LV switchgear/APFC	Yes / No
12.11	Separation between RMU & transformer compartment by sheet steel 2.5mm thick	Yes / No
12.12	Separation between transformer compartment & LV compartment by sheet steel 2.5mm thick	Yes / No
12.13	Degree of ingress protection against solids & water as per IS12063	
12.13.1	IP53 for RMU compartment	
12.13.2	IP23 for transformer compartment	
12.13.3	IP33 for LV compartment	
12.14	Louvers on side covers of transformer compartment & side walls of LV compartment with steel wire mesh welded from inside so as to meet IP requirement as above	Yes / No

Sr. No.	Description	Data to be filled by Supplier
12.15	Louver area on cover / side wall -1500mm height x 1500mm minimum	
12.16	Exhaust fans mounted for APFC system to discharge air in transformer compartment - Controlled by SPMCB & thermostat to operate above 35 deg C, 2x150CFM, 1 ph 230v 50Hz	
12.17	Gland plate for RMU compartment - 2.5mm thick MS plate suitable for 3x3c300sqmm AYFY 11kv cable	
12.18	Gland plate for LV compartment -2.5mm thick MS plate suitable for 10x4c400sqmm cable + 10x7c2.5sqmm cable	
12.19	Class of enclosure as per IEC 62271-202 = 10K	Yes / No
12.20	Overall dimensions of package substation (LxWxH)	In mm
12.21	Overall weight of package substation	Kg
13.0	Enclosure earthing & illumination	
13.1	Two earth bus connection brought out of package substation enclosure to earth pad for connection to earth pit -Two earth pads for RMU, transformer & LV compartment each -One earth pads for transformer neutral	
13.2	Earth bus size 50X 6 mm GI flat	
13.3	Earth bus fault current capacity 26.3kA for 1 sec	
13.4	Earth connection of all covers, doors & structural parts to GI bus by metallic jumper connection	Yes / No

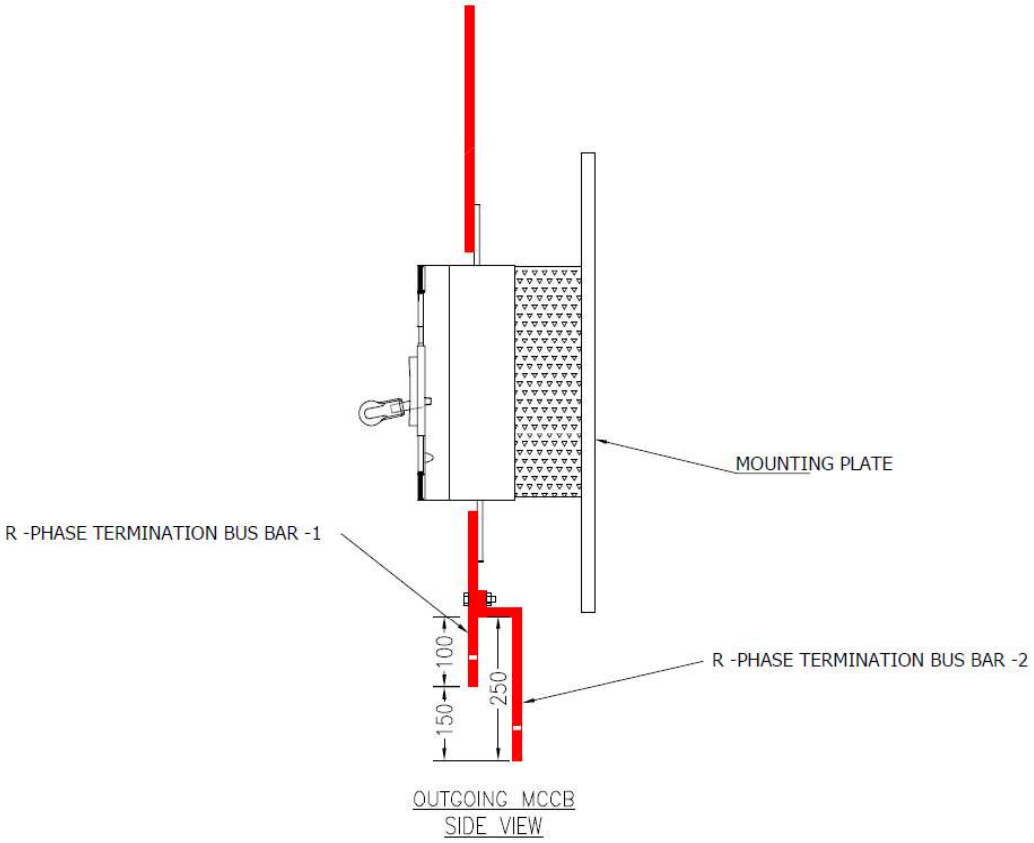
Sr. No.	Description	Data to be filled by Supplier
13.5	Earth connection of RMU, ACB & transformer body parts to GI bus by two numbers of 50x6mm GI flat per equipment	
13.6	Earth bus identification shown by letter 'E'	Yes / No
13.7	RMU, transformer & LV Compartment illumination by 36w CFL fixture controlled through SPMCB & door limit switch	
13.8	RMU, transformer & LV compartment power socket - 5/15amp 3 pin socket controlled through 15 amp SPMCB	
13.9	Paint shade external for enclosure	
13.10	Paint shade internal for enclosure	
13.11	Paint material & thickness	
13.12	Name plate & labels as per specification provided?	Yes / No
13.13	Smoke Detector	Yes / No
13.13.1	Make	
13.13.2	No Of Aux Contacts	
13.14	Hooter	Yes / No
14.0	Type test report submitted with GTP for RMU, transformer, ACB, MCCB, APFC system?	Yes / No
14.1	GA drawing of package substation submitted with GTP?	Yes / No
14.2	Bill of material submitted with GTP?	Yes / No
14.3	Clause wise deviation to technical specification submitted?	Yes / No

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

Name of the bidder	
Address of bidder	
Name of contact person	

Telephone no & email id	

Annexure C - MCCB Double Termination Details



Annexure D - Technical Specification for transformer oil

S. No.	Item description	Specification requirement
1.1	Appearance of oil	Clear, free from sediment and suspended matter
1.2	Viscosity Max.	15 mm2 /s at 40°C 1800 mm2 /s at 0°C
1.3	Pour Point, Max	-10°C
1.4	Water content, Max	30 mg/Kg
15	Breakdown voltage	
i)	New unfiltered oil. Min.	30 kV
ii)	After filtration Min.	70 kV
1.6	Density Max.	0.895 g/ml at 20°C
1.7	Dielectric dissipation factor Max	0.005 at 90 °C,
1.8	Particle Content	Value to be provided by the vendor
1.9	Acidity Max	0.01 mg KOH/g
1.10	Interfacial tension at 27°C Min	40 mN/m
1.11	Total sulphur content	Value to be provided by the vendor
1.12	Corrosive sulfur	Not-corrosive
1.13	Potentially Corrosive sulfur	Not-corrosive
1.14	DBDS	Not detectable (<5 mg/kg)
1.15	Inhibitor	Not detectable (<0.01%)
1.16	Metal Passivator	Not detectable (<5 mg/kg)
1.17	Other addivites	Type and concentration of additives to be provided by the vendor
1.18	2-furfural and related Compounds content	Not detectable (<0.05 mg/kg) for each individual compound
1.19	Oxidation stability	
a)	Total acidity, Max	1.2 mg KOH/g
b)	Sludge Max	0.8%
c)	DDF at 90 °C, Max	0.5

1.20	Gassing Tendency	Value to be provided by the vendor
1.21	ECT	Value to be provided by the vendor
1.22	Flash point Min.	135°C,
1.23	PCA content Max	3%
1.24	PCB content	Not detectable (<2 mg/Kg)
1.25	Test	As per IS 335-2018

Annexure E - Specification of 4G Ethernet Modem for FRTU

SL	Parameter	Details
1.0	Operating Frequency Band	a. 4G Dual SIM with automatic fall back on 3G and 2G (GPRS): b. FDD LTE: B1 (1920-1980/2110-2170)/B3 (1710-1785/1805-1880) / B8 (880-915/925-960) / B20 (800) MHz c. TDD LTE: B38 (2570-2620) / B39 (1880-1920) / B40 (2300-2400) / B41 (2496-2690) d. HSPA / UMTS: B1 (2100) / B8 (900)/800/850/1900 MHz e. GSM: 900/1800/ MHZ Class 10
2.0	WAN Protocol	PPP/IPCP over Asynchronous HDLC with PAP/CHAP Authentication.
3.0	Compatibility	with IPv4 & IPv6 scheme.
4.0	Console Interface	RS232 on RJ45 connector
5.0	LAN Interface	10/100 Base-T complying to IEEE 802.3 / ANSI 8802-3 on RJ45 connector.
6.0	Network Protocols	PPP, IPCP, PAP, CHAP, ARP, IP, ICMP, TCP, UDP, IPSEC, SNTP, TFTP.
7.0	Management	Serial, HTTP, HTTPS, Telnet & via SMS, Port Mapping, Event Log & Upload. Firmware Upgrade
8.0	Status Monitoring	ICMP to 4 destinations for Keep Alive & Self Heal. Signal Strength & LEDs.
9.0	Features	a. Support for SCADA Protocols in transparent pass through mode

SL	Parameter	Details
		b. Support for NAT and Port forwarding c. Modem shall have self healing capability to recover from dead lock situation
10.0	SIM Interface	External with locking provision
11.0	AT Commands Interface	Supporting AT commands for dialing from FRTU through RS-232 serial port to modem
12.0	Communication Interface	Remote management features like telnet & remote download facility
13.0	LED Indications	Power ON, Network–Signal strength, SIM availability, Ethernet link
14.0	Connectors	a. RJ45 Ethernet Port, b. SIM Card Holder, c. DC power connector, SMA Antenna connector
15.0	Power Supply	a. 24V DC (with reverse current protection) with 2 numbers Terminal Block without adapter. b. Modem functionality shall not affect during DC voltage supply range of 18 to 30V DC.
16.0	Enclosure	Metallic Extrusion
17.0	Mounting	DIN Rail Mounting
18.0	Temperature	Operating (-10 to 70 Degree Centigrade), 95% Humidity
19.0	Antenna	a. 2 Nos to be provided b. 12dB High Gain omnidirectional Antenna with SMA connector and 15m wire length. c. 7dB High Gain Antenna with SMA connector and 5m wire length. d. It shall be ensured that the male pin SMA Connector of Antenna is of copper at the Antenna base and also at the point of modem connection.
20.0	Accessories	a. 1 Meter cable for connecting to external DC power source (24 V)

SL	Parameter	Details
		b. 1 Meter Standard Ethernet (Straight) data cable with metallic connector (SS/MS). This cable shall be metallic shielded. c. Standard Console cable for diagnostic port of Modem d. 1 Meter serial cable for dialing modem from FRTU
21.0	Certification	
21.1	Conducted Immunity: IEC61000-4-6	a. Measure emission of the device (referenced to earth) on power mains and to compare them with specified limits to ascertain that the device will not disturb other equipment b. Frequency: 0.15MHz to 80MHz c. Modulation: 80% AM at 1 KHz d. Test Voltage: 3V
21.2	Electrostatic Discharge (ESD): IEC61000-4-2	a. Check immunity against discharge of static electricity that may occur when a charged operator touches the device b. Contact Discharge: 4KV c. Air Discharge: 8KV d. No. of Discharge: 10 at pre-selected spots e. Positive & Negative Polarity
21.3	EN55022 CLASS B	a. Immunity characteristics of the device when subjected to continuous conducted noise b. Conducted Emission: Frequency - 150 KHz - 30 MHz c. Radiation Emission: Frequency – 30 MHz - 1000 MHz
21.4	MTCTE	a. Modem should complied to the requirement of Mandatory Testing and Certification of Telecom Equipment (MTCTE) vide MoP order No. 14/02/2021-UR&SI-II-Part(1) (E-258136). b. Certification should be enclosed along with the bid for offered modem.

Annexure F - Specification for Feeder Remote Terminal Unit for RMU

1.0 FRTU Technical requirement

1.1	FRTU Functionalities	a. FRTU system should be modular and expandable.

		b. It should be capable of handling minimum 500 DP (data point). c. FRTU shall have serial port, configurable RS485/RS232 for MODBUS RTU. d. FRTU shall have TCP/IP port for Modbus TCP/IP. e. Ethernet ports for interfacing with IEC 60870-5-104 protocol to communicate with MCC and BCC. f. Ethernet port should be configured for IEC 60870-5-104 protocol as a slave. g. Built in optical couplers to isolate the field signals and field communication channels. h. FRTU shall support event storage capacity as measured events (500), system events (50), alarms (50) and normal events (250). Events should be stored on the basis of FIFO. i. Local viewing of all events shall be possible. j. FRTU DI/ DO communication channel capacity should be such that it can fulfill automation of complete substation system. k. FRTU shall support web based monitoring from remote as well as local. l. All DI/ DO communication channels should have individual LED indications. m. FRTU shall support feature of remote configuration as well as diagnosis over secure and authenticated web interface. FRTU Configuration should also be downloadable from same interface. n. FRTU system shall support communication with 4 Nos. master stations simultaneously. o. All DI/DO communication card installed in FRTU shall support HOT swap feature. p. As the SCADA/ DMS system will use public domain such as RF/ Cellular etc., therefore it is mandatory to guard the data/

		equipment from intrusion/ damage/ breach of security & shall have SSL VPN based security. q. FRTU shall support SNMP (Simple Network Management Protocol). r. It should have capability of time synchronization with GPS receiver and SCADA MCC/ BCC. s. FRTU should be capable to store the configuration program in detachable flash memory card. t. FRTU shall have console port with console cable.
1.2	Communication Ports	u. Each RS 485 port should be capable of handling minimum 10 Nos. devices on the network with same communication settings. v. Media settings of Ethernet and serial ports (Both RS 485 and RS 232) should be programmable. w. System should have the capability to increase TCP/ IP Ethernet and serial ports for communication by addition of communication modules. x. Refer Table 2 of of this annexure for details.
1.3	MCC/ BCC Communication Protocol	a. FRTU system shall be configured to communicate with MCC/ BCC simultaneously on IEC 60870-5-104 protocol with configurable TLS 1.2. b. In addition to IEC 104 protocol, FRTU shall also able to communicate all data over secure MQTT with latest version. c. FRTU shall support periodic reporting of analog data that shall be configurable upto 1-hour poling delay. d. Digital status data shall have higher priorities as compared to the analog data. e. Dead band for reporting analog values shall be programmable for the full scale value.
1.4	Communication between FRTU, MFMs and Protection Relays	a. FRTU can acquire analog values from MFMs/FPIs and protection relay through RS485 serial communication port using MODBUS RTU.

		b. Communication of ACB/ MCCBs on Modbus RTU protocol. Bidder can also offer Modbus TCP over Modbus RTU. c. MFM/ FPI and protection relay will act as slaves to the FRTU. The FRTU shall transmit these analog values to master station by using IEC 60870-5-104 protocol. d. To protect the serial communication port(s), optical isolation is required which is mandatory to avoid damage to FRTU channels
1.5	Digital Input Module	a. FRTU shall be capable of accepting isolated potential free contact status inputs. b. FRTU shall provide necessary sensing voltage, current, optical isolation for each status input. c. FRTU shall be capable to configure re-bounce filtering for each input. d. The sensing voltage of input module should be 24V DC. e. The FRTU shall accept two types of status input: Single point and double point. f. Single point status input represented by 1 Bit in the protocol message whereas double point status input represented by 2 Bits in the protocol message. g. FRTU configuration software shall have the capability to invert the DI signal value required in the configuration. h. There shall be channel wise visual indication on all DI module installed in the FRTU panel for troubleshooting problems. i. Digital Input module should have hot swap compliance

1.6	Digital Output Module	a. FRTU shall provide the capability for master station to select and change the state of Digital output points. b. These control outputs shall be used to control power system devices such as circuit breakers, isolators and other two state devices which shall be supported by FRTU. c. FRTU should also support single command output to reset FPI operation. d. The output contact shall be rated to operate RMU motor, ACB, LT MCCB, APFC and other signals used in substation. e. Incase control output module of FRTU does not provide potential free control output of required rating then separate control output relays shall be provided. f. There shall be channel wise visual indication of DOs available in FRTU panel and command issued for any digital channel for troubleshooting the problem. g. DO modules should have the capability to configure for a single as well as double command output. h. Digital Output module should have hot swap compliance
1.7	Troubleshooting	a. FRTU should be configurable using web based configuration and maintenance tool. b. FRTU shall have proper diagnosis tool for troubleshooting the failures related to the following from remotely as well as locally. Supplier shall consider all required configuration and diagnosis cable and software with each supplied FRTU with license if any. c. Communication of FRTU with master d. Communication of MFM with FRTU e. Communication of DI/ DO f. Communication with Protection Relay
1.8	Programmable Logic Control (PLC)	a. FRTU shall be provided with the PLC license. b. FRTU should have the functionality of logic development and perform the task using its own CPU.

		c. FRTU should have the capability to run more than one PLC tasks at a time.
1.9	Cyber Security	a. The FRTU shall comply to IEC62351- 3 for cyber security in communication between FRTU and master station and IEC62443-4-2 for cyber security for product including testing requirement as per MoP order no 12/34/2020-T&R dtd 08.06.21 & CEA /PLG/R&D/MII/2021 dtd 11.6.21 and any amendment from time to time. b. All the eligible equipment should complied to requirement of Mandatory Testing and Certification of Telecom Equipment (MTCTE) vide MoP order No. 14/02/2021-UR&SI-II-Part(1) (E-258136). c. FRTU should have following features: • User level configuration • User wise authentication like system admin, configuration admin, control, operator. • Disabling the DNS • Disabling, enabling & configuration of TCP/ IP and UDP ports. • Door lock alarm integration with FRTU.
1.10	FRTU Power Supply	a. Power supply for FRTU shall be on 24V DC system which would be made wired from Battery Charger/batteries housed in FRTU cabinet. b. The main DC circuits shall be protected by incoming circuit breakers. c. Each circuit shall be tapped through single pole MCB so as to provide an individual DC feed to each of the I/O modules, modems and protocol converters. d. Bidder shall provide maximum power consumption data of each of the type of FRTU. e. Power supply system should have redundant battery charger to provide the supply to FRTU system as well as to charge the battery.

1.11	Software / Firmware	a. The term software is used in this Technical Specification to mean software or software implemented through firmware. b. All software shall be implemented according to the Bidder's latest established design and coding standards. c. Complete and comprehensive documentation shall be provided for all software. d. Bidder should provide windows based software as it is preferred for its user friendliness.
1.12	General	a. A real-time non-proprietary operating system that is capable of managing the FRTU applications shall be provided. b. This software shall provide automatic restart of the FRTU upon power restoration, memory parity errors, hardware failures, and manual request. The software shall initialize the FRTU and begin execution of the FRTU functions without intervention by the SCADA/DMS master station. All restarts shall be reported to the SCADA/DMS. c. The software shall be prepared in a high level language and shall be documented in detail. No separate licensing charges or agreements shall attach to the FRTU software or its underlying operating system. d. In order to easily support the system under continuously changing site conditions all protocol, configuration, and application data must be contained in easily programmable non-volatile memory such as Flash EPROM. e. The FRTU design shall be independent of any communication protocol that would impose restrictions on the flexibility or functionality of the FRTU. Protocol changes shall be accomplished by software/firmware changes only.
1.13	Diagnostic Software	a. Software shall be provided to continuously monitor operation of the FRTU and report FRTU hardware errors to the SCADA/DMS. b. The software shall check for memory, processor, and input/output errors and failures.

		c. It is desirable that internal diagnostics be sufficiently detailed to detect malfunctions to the level of the smallest replaceable component. d. The FRTU shall facilitate isolation and correction of all failures and shall include features that promote rapid fault isolation and component replacement. e. All functional module nodes shall be designed with integrated on-line diagnostic functions. f. The results of these diagnostics shall be reported to the central processing module. g. The central module shall store this information and report it to the SCADA/DMS as permitted by the protocol. h. FRTU shall be able to access from remote (BCC/MCC) for downloading configuration.

2.0 Communication Ports details

S. No.	Communication With	Communication Protocol	Physical Layer		Connecting Cable	Required Physical Port Qty.
			Interface	Port		
2.1	Master station(s)	IEC 60870-5-104	Ethernet	RJ45	CAT VI	1
2.2	Local Configuration	–	RS232	USB/DB9	Console Cable	1
2.3	Protection relays/FPI/VPI	MODBUS	RS485	Terminal Block	Shielded RS485 Twisted Copper Cable	1
2.4	MFM/ LV panel/Transformer	MODBUS	RS485	Terminal Block	Shielded RS485 Twisted Copper Cable	1
	Total					4

3.0 FRTU DI/DO/AI list

FRTU configuration DI/ DO Channel requirement is indicated in the Table given below

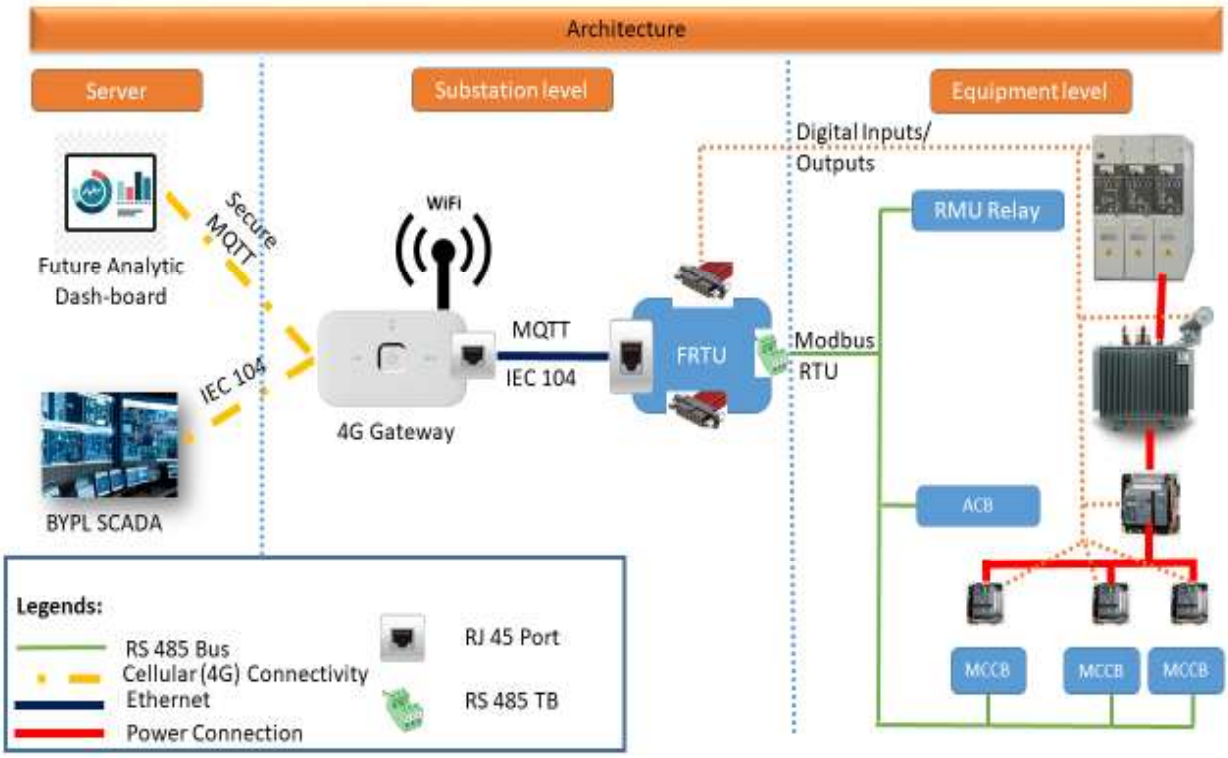
3.1	FRTU configuration	DI-64 no's DO-16 no's
3.2	Digital Inputs	
3.2.1	Cable feeder VCB module 1 & 2	CB ON
		CB OFF
		Dis-connector ON position
		Dis-connector OFF position
		Earth position ON position
		Earth position OFF position
		Fault Passage Indicator ON Status
		Fault Passage Indicator OFF Status
		L/R switch in local(Common all VCBs modules)
		L/R switch in remote (Common all VCBs modules)
		Control circuit Healthy
3.2.2	Transformer VCB 3 & 4	CB ON
		CB OFF
		Dis-connector ON position
		Dis-connector OFF position
		Earth position ON position
		Earth position OFF position
		Auto Trip
		Control circuit Healthy
3.2.3	Common Signals	SF6 Low
		Battery Charger 1 Fail
		Battery Charger 2 Fail
		Battery low(BHMU & Charger)
		Battery Unhealthy/fail
		Battery Test in progress
		Command Acknowledgement

		Door Open/Close (Both Transformer and FRTU)
3.2.4	Transformer signals	Transformer Oil level low
		OTI Alarm from field
		WTI Alarm from field
		WTI trip
		Transformer pressure relay operated
3.2.5	LT ACB	LT ACB ON
		LT ACB OFF
		LTACB Trip
		L/R switch in remote
		Control supply healthy
3.2.5	Outgoing MCCB	LT Outgoing MCCB ON
		LT Outgoing MCCB OFF
		L/R switch in remote
		Control supply healthy
3.3	Digital Outputs (Commands)	
3.3.1	Cable feeder VCB module 1 & 2	CB ON
		CB OFF
		FPI Reset
3.3.2	Transformer VCB module 3 & 4	CB ON
		CB OFF
3.3.3	LT ACB	LT ACB ON
		LT ACB OFF
3.4	Measuring inputs	
3.4.1	Energy Meter (energy meter in purchaser scope)	IR
		IY
		IB
		VAR
		W
		VA
		PF
		VRN

		VYN
		VBN
		VBN
		IN
3.4.2	ACB release	IR
		IY
		IB
		VR
		VY
		VB
		W
		VA
		VAR
		PF
3.4.3	MCCB release	IR
		IY
		IB
		VR
		VY
		VB
		W
		VA
		VAR
		PF
3.4.4	WTI Scanner	Oil temperature
		Winding temperature
3.4.5	Protection relay	IR
		IY
		IB
		R phase Fault current
		Y phase Fault current
		B phase Fault current

		Earth Fault current
		Fault Record
3.4.6	Battery monitoring	Battery Voltage
		Battery current

4.0 Communication Architecture



Annexure G - Recommended spares (Data by supplier)

List of recommended spares as following:

S. No.	Description of spare part	Unit	Quantity
1		No	
2		No	
3			
4			
5			