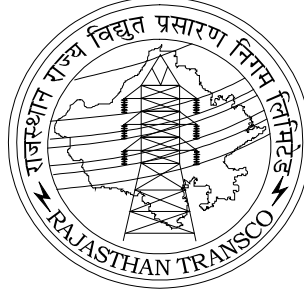


# RAJASTHAN RAJYA VIDYUT PRASARAN NIGAM LIMITED



**BID ENQUIRY NO.**

**BN-9016002228**

**BIDDING DOCUMENTS**

**FOR**

**PURCHASE OF 220 KV AND 132 KV TRANSFORMER, FEEDER &  
BUS COUPLER CONTROL & RELAY PANELS ON RATE  
CONTRACT FOR TWO YEARS**

**PURCHASE OF 220 KV AND 132 KV TRANSFORMER, FEEDER & BUS COUPLER  
CONTROL & RELAY PANELS ON RATE CONTRACT FOR 2 YEARS**

<b>PROC-II/NIB-08/2022-23/BN- 9016002228</b>	
<b>Bid No.: 9016002228</b> (specification NO. RVPN/SE/PROC.II/XEN-IV/A-III/BN- 9016002228)	
<b>Mode of Bid Submission</b>	Online through e-Procurement/ e-Tendering system at <a href="https://eproc.rajasthan.gov.in">https://eproc.rajasthan.gov.in</a>
<b>Procuring Authority</b>	SE(Procurement-II), RVPN Gate #3, Old Power House Premises, Near Ram Mandir, Banipark, Jaipur-302006 Landline No.: 0141-2208924
<b>Bid downloading Start Date &amp; Time</b>	30.12.2022 (15:00 Hrs.)
<b>Start Date &amp; Time of Submission of Bid</b>	07.01.2023 (15:00 Hrs.)
<b>Last Date &amp; Time of Submission of Bid</b>	23.01.2023 (18:00 Hrs.)
<b>Date &amp; Time of Opening of Technical Bid</b>	24.01.2023 (11:00 Hrs.)

<b>Name of the Bidding Company/ Firm</b>	
<b>Contact Person (Authorized Bid Signatory)</b>	
<b>Correspondence Address:</b>	
<b>Mobile No:</b>	
<b>Telephone No:</b>	
<b>E-Mail Address:</b>	
<b>Website/ E-mail Address:</b>	

**NIB No.** **PROC-II/NIB-08/2022-23/BN-9016002228**  
**Bid No.** **9016002228**

**INVITATION FOR BID (IFB) & NOTICE INVITING BID (NIB)**

<b>Name and Address of the Procuring Authority</b>	Rajasthan Rajya Vidyut Prasaran Nigam Limited Vidyut Bhawan, Janpath, Jyoti Nagar Jaipur-302005 (Rajasthan)		
<b>Name and Address of the Procurement Officer In-Charge</b>	Name: Sh. Manish Nath Sharma Designation: Superintending Engineer (Proc. II) Address: Gate #3, Old Power House Premises, Near Ram Mandir, Banipark, Jaipur 302006 E-mail: <a href="mailto:se.sspc@rvpn.co.in">se.sspc@rvpn.co.in</a> , Landline No.: 0141-2208924		
<b>GST/PAN/Bank Account Details</b>	GST No : 08AABCR8312A1ZT PAN No: AABCR8312A Bank Account Holder : Accounts Officer (P&C-1) RVPN, Jaipur Account No : 51093320750 IFSC Code : SBIN0031026 Bank & Branch : State Bank of India, Collectorate Branch, Jaipur		
<b>Subject Matter of Procurement</b>	PURCHASE OF 220 KV AND 132 KV TRANSFORMER, FEEDER & BUS COUPLER CONTROL & RELAY PANELS ON RATE CONTRACT		
	S. No	Particulars of Items	Indicative Approx. Quantity
	1	220 kV Feeder Control & Relay Panels (Type A-II)	11
	2	220 kV Transformer Control & Relay Panels (Type B-II)	7
	3	220 kV Bus Coupler Control & Relay Panels (Type C-II)	3
	4	132 kV Feeder Control & Relay Panels (Type J-II)	71
	5	132 kV Transformer Control & Relay Panels (Type K-II)	7
	6	132 kV Transformer Control & Relay Panels (Type K-III)	69
	7	132 kV Bus Coupler Control & Relay Panels (Type L-II)	24
	Note: The quantities are indicative only and no minimum quantity is guaranteed under rate contract.		
<b>Bidding Procedure</b>	Single Stage Two Part (open competitive bidding)		
<b>Bid Evaluation Criteria (Selection Method)</b>	Lowest evaluated technically responsive bid as defined in the bid document as per Clause 24, 25 & 26 of ITB.		
<b>Website for Downloading Bidding Document, Addendum/ Corrigendum</b>	<a href="https://eproc.rajasthan.gov.in">https://eproc.rajasthan.gov.in</a> <a href="http://energy.rajasthan.gov.in/rvpnl">http://energy.rajasthan.gov.in/rvpnl</a> <a href="https://sppp.rajasthan.gov.in">https://sppp.rajasthan.gov.in</a>		
<b>Cost of Bid Document</b>	<ul style="list-style-type: none"> <li>Rs. <b>10,000.00</b> (Ten Thousand only) Plus (+) GST @18% Non Refundable.</li> <li>Rs. <b>5,000.00</b> (Five Thousand only) Plus (+) GST @18% in case of micro, small and medium enterprises of Rajasthan on furnishing documentary evidence (Non Refundable)</li> </ul>		
<b>Bid Processing Fee</b>	Rs. 1000/- (One Thousand Only) + GST @18% (non-refundable) shall be deposited by DD/Banker's Cheque in favour of "Managing Director, RISL, Jaipur"		
<b>Estimated Procurement Cost</b>	<b>Rs. 913.13 Lakhs</b>		
<b>Bid Security</b>	<ol style="list-style-type: none"> <li><b>Rs. 18,26,000.00</b> (Rs. Eighteen Lakhs Twenty Six Thousand only) / Valid bid securing declaration for Departments &amp; Undertakings of the <b>Rajasthan State Government and Government Undertakings of the Central Government as mentioned in clause No. 13.2 of ITB</b></li> <li><b>Rs. 9,13,000.00</b> (Rs. Nine Lakhs Thirteen Thousand only) in case of sick industries, other than Small Scale Industries, whose cases are pending with Board of Industrial and Financial Reconstruction.</li> <li><b>Rs. 4,57,000.00</b> (Rs. Four Lakhs Fifty Seven Thousand only) in case of micro, small and medium enterprises of Rajasthan.</li> </ol>		
	OR		

	SUM of Rs.44,800.00 for 220 kV FDR C & R Panels (Type A-II) + Rs.27,300.00 for 220 kV Tr. C & R Panels (Type B-II) + Rs.5,500.00 for 220 kV Bus Coupler C & R Panels (Type C-II) + Rs.1,51,500.00 for 132 kV Feeder C & R Panels (Type J-II) +Rs.8,700.00 for 132 kV Tr. C & R Panels (Type K-II) + Rs.1,91,700.00 for 132 kV Tr. C & R Panels (Type K-III) +Rs.27,100.00 for 132 kV Bus Coupler C & R Panels (Type L-II) in case of SSI unit of Rajasthan.
<b>Manner, Start/End date for the submission of Bids</b>	Manner: On-Line on e-procurement website- <a href="http://eproc.rajasthan.gov.in">http://eproc.rajasthan.gov.in</a> Start Date: 07.01.2023 (15.00 Hrs.) End Date: 23.01.2023 (18.00 Hrs.)
<b>Submission of Banker's Cheque/ Demand Draft/ Bank Guarantee for Bidding Document Fee, Bid Security and Bid Processing Fees</b>	Up to 23.01.2023, 18.00 Hrs. in the office of Procurement Officer In-charge as mentioned above.
<b>Date/ Time/ Place of Techno commercial Bid Opening</b>	Date: 24.01.2023 Time: 11.00 Hrs. Place: Office of Procurement Officer In-charge as mentioned above.
<b>Date/Time/Place of Financial/Price Bid Opening</b>	Will be intimated later to the Technically qualified bidders
<b>Bid Validity</b>	120 days after the bid submission deadline
<p>Note:</p> <ol style="list-style-type: none"> <li>1) Bidder (authorised signatory) shall submit their offer on-line in Electronic format both for Techno-commercial and financial proposal. However, DD for Bidding Document Fees, RISL Bid Processing Fees <b>and Bid Security</b> should be submitted physically at the office of Bidding Authority/ Accounts Officer as prescribed in NIB and scanned copy of same should also be uploaded in the EMD Envelope/ Cover.</li> <li>2) In case, any of the bidders fails to physically submit the Banker's Cheque/ Demand Draft for Bidding Document Fee, <b>Bid Security</b> and RISL Bid Processing Fee as per timelines mentioned in NIB, its Bid shall not be accepted.</li> <li>3) To participate in online bidding process, Bidders must procure a Digital Signature Certificate (Type III) as per Information Technology Act-2000 using which they can digitally sign their electronic bids. Bidders can procure the same from any CCA approved certifying agency, i.e. TCS, Safecrypt, Ncode etc. Bidders who already have a valid Digital Signature Certificate (DSC) need not procure a new DSC. Also, bidders must register on <a href="http://eproc.rajasthan.gov.in">http://eproc.rajasthan.gov.in</a> (bidders already registered on <a href="http://eproc.rajasthan.gov.in">http://eproc.rajasthan.gov.in</a> before 30-09-2011 must register again).</li> <li>4) RVPN will not be responsible for delay in online submission due to any reason. For this, bidders are requested to upload the complete bid / shortfall well advance in time so as to avoid 11<sup>th</sup>hour issues like slow speed; choking of web site due to heavy load or any other unforeseen problems.</li> <li>5) Bidders are also advised to refer "Bidders Manual Kit" available at e Procurement website for further details about the e-Tendering process.</li> <li>6) Training for the bidders on the usage of e-Tendering System (e-Procurement) is also being arranged by DoIT&amp;C on a regular basis. Bidders interested for training may contact e-Procurement Cell, DoIT&amp;C for booking the training slot. Contact No: 0141-4022688 (Helpdesk 10 am to 6 pm on all working days) e-mail: <a href="mailto:eproc@rajasthan.gov.in">eproc@rajasthan.gov.in</a> Address : e-Procurement Cell, RISL, YojanaBhawan, TilakMarg, C-Scheme, Jaipur</li> <li>7) The procuring entity reserves the complete right to cancel the bid process and reject any or all of the Bids without giving any reason.</li> <li>8) No contractual obligation whatsoever shall arise from the bidding document/ bidding process unless and until a formal contract is signed and executed between the procuring entity and the successful bidder.</li> <li>9) The provisions of RTPP Act 2012 and Rules thereto shall be applicable for this procurement. Furthermore, in case of any inconsistency in any of the provisions of this bidding document with the RTPP Act 2012 and Rules thereto, the later shall prevail.</li> <li>10) Bidders who are participating first time in bid floated by RVPN after 2016 must furnish their complete details (i.e Bidding Company Name , Address, GST No, PAN No Ph No &amp; Email ID etc) to create vendor code in purchaser ERP before last date of submission of processing fee, bid document fee <b>&amp; bid security</b> to ensure their participation in bid without any fail.</li> <li>11) The web - link: <a href="http://ereceipt.rvpn.co.in:8080/epaymentportal/">http://ereceipt.rvpn.co.in:8080/epaymentportal/</a> may also be used for making payment of cost of bid document/specification and bid security. Vendors, who are participating first time in RVPN Bid and using this option for making payment, may contact to purchaser for creation of Vendor code and updation of Mail ID in vendor master. In this application, User ID will be same as vendor code and for getting first time password click on forget password link available on login page. An OTP will be sent on mail.</li> </ol>	
Superintending Engineer (Proc.-II),RVPN, Jaipur	

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**VOLUME-I**  
**PART-I**  
**INSTRUCTION TO BIDDERS (ITB)**

**Preamble**

This Part (Part-I) of the Bidding Document provides the information necessary for bidders to prepare responsive bids, in accordance with the requirements of the Nigam. It also provides information on bid submission, opening and evaluation and on contract award. This Part (Part-I) contains provisions that are to be used unchanged unless Part-II, which consists of provisions that supplement, amend or specify in detail, information or requirements included in Part-I and that are specific to each procurement and/or otherwise. If there is a conflict between the provisions of Part-I & Part-II, the provisions of Part-II shall prevail.

However, provisions governing the performance of the Contractor, payments under the contract or matters affecting the risks, rights and obligations of the parties under the contract are not included in this part but instead under Part – III: General Conditions of Contract and/or Part – IV: Special Conditions of Contract.

Further in all matters arising out of the provisions of this Part – I and the Part – II of the Bidding Documents, the laws of the Union of India shall be the governing laws and courts of Jaipur shall have exclusive jurisdiction.

**A. INTRODUCTION**

**1.0 Source of Funds and Procurement Method**

1.1 The Owner named in the **BDS** intends to use domestic funding (Owner’s Internal Resources/ Domestic Borrowings/Bonds) for this procurement.

All eligible payments under the contract for the packages, for which this Invitation for Bids is issued, shall be made by the Owner named in the **BDS**.

1.2 The procurement method is given in the BDS. In case of rate contract, the period of rate contract and maximum period for which it can be extended on the same terms and conditions with mutual consent is also given in the BDS.

**2.0 Eligible Bidders**

2.1 The eligibility criteria is given in Annexure-PQR.

**3.0 Eligible Plant, Equipment, and Services**

3.1 For the purposes of these Bidding Documents, the words “facilities,” “plant and equipment,” “installation services,” etc., shall be construed in accordance with the respective definitions given to them in the General Conditions of Contract.

3.2 All plant and equipment to be supplied and installed and services carried out under the contract shall have their origin in any country barring those countries against whom sanction for conducting business is imposed by Government of India and barring those firms with whom business is banned by the Nigam.

3.3 For purposes of this clause, “origin” means the place where the plant and equipment or component parts thereof are mined, grown or produced. Plant and equipment are produced when, through manufacturing, processing or substantial and major assembling of components, a commercially recognized product results that is substantially different in basic characteristics or in purpose or utility from its components.

3.4 The origin of the plant, equipment, and services is distinct from the nationality of the Bidder.

3.5 Plants and Equipments shall be standard items/ equipments of the manufacturer (s), which are produced in volume and used by large number of users in India/ abroad. The item/ equipments must be associated with specific make, model numbers/ item code with printed literature describing configuration and functionality.

#### **4. Cost of Bidding**

- 4.1 The Bidder shall bear all costs associated with the preparation and submission of its bid including post-bid discussions, technical and other presentations etc., and the Nigam will in no case be responsible or liable for these costs, regardless of the conduct or outcome of the bidding process.

### **B. THE BIDDING DOCUMENTS**

#### **5. Contents of Bidding Document**

- 5.1 The facilities required, bidding procedures, contract terms and technical requirements are prescribed in the Bidding Documents. The Bidding Documents comprise of the following and shall include amendments, if any, thereto:

### **NOTICE INVITING BID**

#### **VOLUME- I: Conditions of Contract**

Part-I	Instructions to Bidders (ITB)
Part-II	Bid Data Sheet
Part-III	General Conditions of Contract (GCC)
Part-IV	Special Conditions of Contract (SCC)
Part-V	Erection Conditions of Contract (ECC)
Part-VI	Forms, Schedules & Annexures

#### **I. Bid Proposal Form**

#### **II. Formats:**

Annexure-AP	Application for Payment
Annexure-BEC	Bidder Eligibility Certificate
Annexure-BGBIS	Bank Guarantee in lieu of BIS Certificate (if applicable)
Annexure-BSBG	Bank Guarantee against Bid Security
Annexure-BSD	Bid Securing Declaration
Annexure-CA	Contract Agreement Form
Annexure-CI	Compliance with code of integrity and no conflict of interest
Annexure-CR	Credit facilities: Certificate from bank
Annexure-DVA	Affidavit of self-certification regarding Domestic Value Addition in Iron & Steel Product/capital goods by Bidder
Annexure-MAF	Manufacturer's Authorisation
Annexure-MOA	Memorandum of Appeal Form-I
Annexure-MSME	Affidavit for MSME Unit
Annexure-MW	Manufacturer Warrantee Form
Annexure-NEFT	RTGS/ NEFT payment request
Annexure-PBG	Performance Bank Guarantee
Annexure-PBQ	Pre bid Queries
Annexure-PC	Performance Certificates from users
Annexure-PPP	Price preference or purchase preference
Annexure-PQR	Pre-Qualification Requirement of Bidder
Annexure-TTBSG	Bank Guarantee in lieu of Type Test
Annexure-CCA	Certificate from the chartered Accountant for Past Supply criteria

### III. Schedules:

Schedule-AI	Schedule of Additional Information
Schedule-ACC	Schedule of Additional Conditions of Contract
Schedule-BD	Schedule of Participating bidder's Details
Schedule-BOQ	Schedule of Prices
Schedule-DEL	Delivery Schedule
Schedule-DEV	Schedule of Deviations
Schedule-DRQ	Declaration by bidder regarding qualification
Schedule-FG	Schedule of Guaranteed Losses/ Functional Guarantees
Schedule-GTP	Schedule of Guaranteed Technical Particulars
Schedule-PEP	Schedule of Previous Experience & Performance
Schedule-PMTT	Schedule of Plant and Machinery, Tools & Tackles available
Schedule-PV	Schedule of Price Variation
Schedule-QD	Schedule of Qualification Data
Schedule-STT	Schedule of Special Tools & Tackles for Maintenance
Schedule-TP	Schedule of Technical Personnel of Bidder
Schedule-CRM	Certificate from Relay Manufacturer
Schedule-UP	Schedule of Unit Prices for 220 & 132 kV C&R Panels

### VOLUME -II: Technical Specification of material

- 5.2 The Bidder is expected to examine all instructions, forms, terms, specifications and other information in the Bidding Documents. Failure to furnish all information required by the Bidding Documents or submission of a bid not substantially responsive to the Bidding Documents in every respect will be at the Bidder's risk and may result in rejection of its bid.
- 5.3 Scope of Work is given in Volume-II of Bidding Documents titled "Technical Specifications for material"
6. **Clarification of Bidding Documents and Pre-Bid Meeting**
- 6.1 A prospective Bidder requiring any clarification of the Bidding Documents may notify the Nigam in writing or by cable (hereinafter, the term cable is deemed to include Electronic Data Interchange (EDI) or telefax) at the Nigam's mailing address indicated in the BDS. Similarly, if a Bidder feels that any important provision in the documents, such as those listed in ITB Sub-Clause 22.4.1, will be unacceptable, such an issue should be raised as above. The Nigam will respond in writing to any request for clarification or modification of the Bidding Documents that it receives not later than **the time period as specified in BDS**, prior to the original deadline for submission of bids prescribed by the Nigam. The Nigam shall not be obliged to respond to any request for clarification received later than the above period. Further, the mere request for clarification from the Bidders shall not be a ground for seeking extension in the deadline for submission of bids. Written copies of the Nigam's response (including an explanation of the query but without identifying the source of inquiry) will be sent to all prospective bidders that have received the Bidding Documents.
- 6.2 The Bidder's designated representative(s) is/are invited to attend a pre-bid meeting, which, if convened, will take place at the venue and time stipulated in the BDS. The purpose of the meeting will be to clarify any issues regarding the Bidding Documents in general and the Technical Specifications in particular. The Bidder is requested, as far as possible, to submit any question in writing, to reach the Nigam not later than one week before the meeting. It may not be practicable at the meeting to answer questions received late, but questions and responses will be transmitted as indicated hereafter. Minutes of the meeting, including the text of the questions raised (without



identifying name of the bidders) and the responses given, together with any responses prepared after the meeting, will be transmitted without delay to all purchasers of the Bidding Documents. Any modification of the Bidding Documents listed in ITB Sub-Clause 5.1, which may become necessary as a result of the pre-bid meeting shall be made by the Nigam exclusively through the issue of an Addendum pursuant to ITB Clause 7 and not through the minutes of the pre-bid meeting. Non-attendance at the pre-bid meeting will not be a cause for disqualification of a bidder.

## **7. Amendment of Bidding Documents**

- 7.1 At any time prior to the deadline for submission of bids, the Nigam may, for any reason, whether at its own initiative, or in response to a clarification requested by a prospective Bidder, amend the Bidding Documents.
- 7.2 The amendment will be notified on the websites for viewing/ downloading by all prospective bidders and will be binding on them. Bidders are required to check/ updated themselves for any amendments on specified websites and it will be assumed that the information contained therein will have been taken into account by the Bidder in its bid.
- 7.3 In order to afford reasonable time to the prospective Bidders to take the amendment into account in preparing their bid, the Nigam may, at its discretion, extend the deadline for the submission of bids, in such cases; the Nigam will notify all bidders through website notification of the extended deadline.

## **C. PREPARATION OF BIDS**

### **8. Language of Bid**

- 8.1 The bid prepared by the Bidder and all correspondence and documents exchanged by the Bidder and the Nigam related to the bid shall be written in the English language, provided that any printed literature furnished by the Bidder may be written in another language, as long as such literature is accompanied by English translation of its pertinent passages, in which case, for purposes of interpretation of the bid, the English translation shall govern.

### **9. Documents Comprising the Bid**

- 9.1 The bid submitted by the Bidder shall comprise of the following documents:
  - (a) Bid Proposal Form duly completed and signed by the Bidder, together with all Attachments (available in Part-VI). All Attachments have been identified in ITB Sub-Clause 9.3 below.
  - (b) Price Schedules (available in Part-VI) duly completed by the Bidder.
  - (c) Technical Data Sheets (available in Part-VI), if any, duly completed by the Bidder.
- 9.2 Bidders shall note that, they shall quote their proposals strictly conforming to the technical details, design as specified in the bidding document. Any offer based on the alternate design shall not be considered. Bid with alternative time schedule is not acceptable.
- 9.3 Each Bidder shall submit with its bid the following attachments:
  - (a) Attachment 1: Bid Security (Earnest Money Deposit)  
Copy of earnest money deposit furnished in accordance with ITB Clause 13.
  - (b) Attachment 2: Power of Attorney  
A power of attorney, duly notarized, indicating that the person(s) signing the bid has (ve) the authority to sign the bid and thus that the bid is binding upon the Bidder during full period of its validity, in accordance with ITB Clause 14.
  - (c) Attachment 3: Bidder's Eligibility and Qualifications  
In the absence of pre-qualification, documentary evidence establishing that the Bidder is eligible to bid in accordance with ITB Clause 2 and is qualified to perform the contract in accordance with Annexure-PQR, if its bid is accepted.

The documentary evidence of the Bidder's eligibility to bid shall establish to the Nigam's satisfaction that the Bidder, at the time of submission of its bid, is eligible as defined in ITB Clause 2.

The documentary evidence of the Bidder's qualifications to perform the contract, if its bid is accepted, shall establish to the Nigam's satisfaction that the Bidder has the financial, technical, production, procurement, shipping, installation and other capabilities necessary to perform the contract, and, in particular, meets the experience and other criteria outlined in the Qualification Requirement for the Bidders in Annexure-PQR.

As per Annexure-PQR, the bid can be submitted by a natural person, private entity or government-owned entity or a joint venture of not more than two firms. Bids submitted by a joint venture of not more than two firms as partners shall comply with the following requirements:

- i. The bid shall include all the information required for Attachment 3 as described above for each joint venture partner.
- ii. The bid shall be signed so as to be legally binding on all partners.
- iii. One of the partners responsible for performing a key component of the contract shall be designated as leader; this authorization shall be evidenced by submitting with the bid a power of attorney signed by legally authorized signatories.
- iv. The leader shall be authorized to incur liabilities and receive instructions for and on behalf of any and all partners of the joint venture, and the entire execution of the contract, including payment, shall be done exclusively with the leader, provided otherwise requested by the joint venture and agreed between the Nigam and the leader.
- v. All partners of the joint venture shall be liable jointly and severally for the execution of the contract in accordance with the contract terms.
- vi. A copy of the agreement entered into by the joint venture partners shall be submitted with the bid as per Annexure-IX, Part-VI Vol-I, including inter-alia delineation of responsibilities and obligations of each partners appended thereto, notwithstanding the joint and several liability.
- vii. The joint venture agreement should indicate precisely the responsibility of all members of JV in respect of planning, design, manufacturing, supply, installation, commissioning and testing. All members of JV should have active participation in execution during the currency of the contract. This should not be varied/modified subsequently without prior approval of the Nigam; and

In order for a joint venture to qualify, each of its partners or combination of partners must meet the minimum criteria listed in the Qualification Requirement for the Bidder in enclosed Annexure-PQR for an individual Bidder for the component of the contract they are designated to perform. Failure to comply with this requirement will result in rejection of the joint venture bid.

A firm can be a partner in only one joint venture; bids submitted by joint ventures including the same firm as partner will be rejected.

In the case of a Bidder who offers to supply and/or install plant and equipment under the contract that the Bidder did not manufacture or otherwise produce and/or install, the Bidder shall (i) have the financial and other capabilities necessary to perform the contract; (ii) have been duly authorized by the manufacturer or producer of the related plant and equipment or component as per Performa in Attachment 7 to supply and/or install that item in the Nigam's country; and (iii) be responsible for ensuring that the manufacturer or producer complies with the requirements of ITB Sub-Clause 3.2 and meets the minimum criteria listed for an individual Bidder for that item.

(d) Attachment 4: Eligibility and Conformity of the Material

Documentary evidence established in accordance with ITB Clause 3 that the material offered by the Bidder in its bid or in any alternative bid (if permitted pursuant to ITB Sub-Clause 9.2) are eligible and conform to the Bidding Documents.

The documentary evidence of the eligibility of the material shall consist of a statement showing/ indicating the country of origin of the plant and equipment offered, which shall be confirmed by a certificate of origin issued at the time of shipment.

The documentary evidence of the conformity of the material to the Bidding Documents may be in the form of literature, drawings and data, and shall furnish:

- i. a detailed description of the essential technical and performance characteristics of the material;
- ii. a list giving full particulars, including available sources, of all spare parts, special tools, etc., necessary for the proper and continuing functioning of the material for a period of Fifteen (15) years following commissioning of material in accordance with provisions of contract; and
- iii. a commentary on the Nigam's Technical Specifications and adequate evidence demonstrating the substantial responsiveness of the material to those specifications. Bidders shall note that standards for workmanship, materials and equipment designated by the Nigam in the Bidding Documents are intended to be descriptive (establishing standards of quality and performance) only and not restrictive. The Bidder may substitute alternative standards, brand names and/or catalogue numbers in its bid, provided that it demonstrates to the Nigam's satisfaction that the substitutions are substantially equivalent or superior to the standards designated in the Technical Specifications.
- iv. All details regarding after sale & service support offered.
- v. All details regarding proposed training for Nigam's personnel.
- vi. Detailed answers to all the Questions in the Questionnaire, if prescribed in the Bidding Document.
- vii. Details establishing the responsiveness of the offer in accordance with Technical Specification, Volume-II.

(e) Attachment 5: Subcontractors/ Sub-Vendors [Not to be furnished in case of goods]  
Obligations of the bidder under this bid document cannot be assigned to any subcontractor/subvendor

(f) Attachment 6: Deviations

In order to facilitate evaluation of bids, deviations, if any, from the terms and conditions or Technical Specifications shall be listed in Attachment 6 to the bid. However, the attention of the bidders is drawn to the provisions of ITB Sub-Clause 22.4 regarding the rejection of bids that are not substantially responsive to the requirements of the Bidding Documents.

Bidder's attention is also drawn to the provisions of ITB Sub-Clause 22.4.1.

(g) Attachment 7: Manufacturer's Undertakings/ Authorization Certificate/ Form

(h) Attachment 8: Schedule of Delivery.

(i) Attachment 9: Guarantee Declaration.

(j) Attachment 10: Price Variation Data (if required)

(k) Attachment 11: The bidder, if is a Micro, Small or Medium enterprise as per the Micro, Small and Medium enterprise development act, 2006 (MSMED Act 2006) and registered with the authorities under the above Act for the items / services covered under this bid, then the bidder has to indicate the Entrepreneurs Memorandum No. (Twelve Digit) and scanned copy of the certificate issued by the Authorities under the MSMED Act, 2006 should be furnished with the bid. In order to seek price preference or purchase preference or both, an application, as prescribed at Form A at Annexure-PPP, shall be submitted by the local enterprise to the General Manager, District Industries Centre of the district concerned, or to the officer nominated by Industries Department, who, after due diligent examination, shall issue verification certificate for the same. A copy of the same should be furnished.

(l) Attachment 12: Compliance with code of integrity and no conflict of interest in Annexure-CI and RTGS/ NEFT payment request in Annexure-NEFT.

**10. Bid Form and Price Schedules**

- 10.1 The Bidder shall complete the Bid Form and the appropriate Price Schedules furnished in the Bidding Documents as indicated therein, following the requirements of ITB Clauses 11 and 12.

**11.0 Bid Price**

- 11.1 Unless otherwise specified in the Technical Specifications, bidders shall quote for the entire material on a “single responsibility” basis such that the total bid price covers all the Contractor’s obligations mentioned in or to be reasonably inferred from the Bidding Documents in respect of the design, manufacture, including procurement, delivery, unloading, stacking at stores including supply of mandatory spares (if any). This includes all requirements under the Supplier’s responsibilities for testing, pre-commissioning and commissioning of the facilities and, where so required by the Bidding Documents, the acquisition of all permits, approvals and licenses, etc.; and training services and such other items and services as may be specified in the Bidding Documents, all in accordance with the requirements of the General Conditions of Contract. Items against which no price is entered by the Bidder will not be paid for by the Nigam when executed and shall be deemed to be covered by the prices for other items.
- 11.2 Bidders are required to quote the price for the commercial, contractual and technical obligations outlined in the Bidding Documents. If a Bidder wishes to make a deviation, such deviation shall be listed in Attachment-6 of its bid.
- 11.3 The Bidder shall indicate on the appropriate Price Schedules attached to these documents, the unit prices of the goods and services including spares & special tools and tackles, if any, it proposes to provide under the Contract.

The total amount shall be summarized in a Price Proposal (Schedule BOQ) giving the total bid price(s) to be entered in the Bid Form.

Main Price Schedule-BOQ:

Sub-Price Schedules:

Schedule-BOQB1 (SUPPLY): Substation/ Line Equipments/ Items & Mandatory Spares, Testing/ Measuring Equipments and Tools & Tackles [Including of Local Transportation including of Port handling, port clearance, port charges (if applicable), Insurance and Other incidental services applicable with all taxes and duties]

Schedule-BOQB2 (SERVICES): [If applicable] Commissioning charges (if required) and other miscellaneous services such as Training & Handholding and other Services as specified in the bidding document.

- 11.3.1 The bid price for,
- (i) the items for which quantities have been indicated as lumpsum or lot or set and/or
  - (ii) where the quantities are to be estimated by the Bidder shall remain constant unless there is change made in the Scope of Work by Nigam.

The quantities and unit prices

- (i) subsequently arrived while approving the Bill of Quantities (BOQ)/Billing breakup of lumpsum quantities/lot/Set and/or
- (ii) estimated by the bidder shall be for on account payment purpose only.

In case additional quantities, over and above the quantities BOQ/billing breakup and /or estimated by the bidder, are required for successful completion of the scope of work as per Technical Specification, the Bidder shall execute additional quantities of these items for which no additional payment shall be made over and above the lumpsum bid price. In case quantities of these items supplied at site are in excess of that required for successful completion of scope of work, such additional quantities shall be the property of the bidders and they shall be allowed to take back the same from the site for which no deduction from the lumpsum bid price shall be made.

11.3.2 It shall be the responsibility of the bidders to pay all statutory taxes, duties and levies to the concerned authorities for such surplus material, which would otherwise have been, lawfully payable.

11.3.3 Set/Lot/Lumpsum shall be governed as per the requirement of the corresponding item description read in conjunction with relevant provisions of Technical Specifications.

11.4 In the schedules, Bidder shall give the required details and a breakdown of their price as follows:

(a) Plant and equipment shall also be quoted in Schedule-BOQB1.

In respect of direct transaction between the Nigam and the supplier or bought out off the shelf items **or** imported Equipments/items offered as 'Off the Shelf' **or** dispatched directly from the Indian Port of disembarkation, the Unit Rate is inclusive of all cost as well as duties and tax (viz., custom duties & levies, taxes and duties etc.) paid or payable on components, raw materials and any other items used for their consumption incorporated or to be incorporated in the Plant & Equipment.

The Unit Rate for equipment/ items as above shall not include GST (Goods & Service Tax). GST (Goods & Service Tax) for the Equipment/items as above shall be mentioned separately in the Schedule BOQB1. These amounts will be payable (along with subsequent variation in the scheduled delivery period if any), by the Nigam on the supplies made by the Contractor. Nigam shall, however, issue requisite tax declaration form, if applicable.

(b) Local transportation, insurance and other Services including unloading and stacking at Nigam's stores incidental to delivery of the Plant and Equipment including mandatory spares to be supplied shall be quoted separately in Schedule-BOQB1: Supply.

(c) Commissioning Charges shall be quoted separately (if required and shall include rates and prices for all labour, Contractor's equipment, temporary works, materials, consumables and all matters and things of whatsoever nature, provision of operations and maintenance manuals, etc. wherever identified in the Bidding Documents as necessary for the proper execution of all services except those priced in other Schedules.

(d) The break-up of Training & other miscellaneous Charges shall be furnished separately in Schedule-BOQB2 (if required).

(e) The bidder shall include any other taxes and duties not covered under the GST but applicable on Work contracts for supply and services to be performed in India, as applicable, is required to be included in Contract Price and Nigam would not bear any liability on this account. Nigam shall, however, deduct such taxes at source for supply and services and issue Tax Deduction at Source (TDS) Certificate to the Contractor, if applicable.

(f) The Bidder shall quote the charges for Services exclusive of applicable GST (Goods & Service Tax). The bidder shall give GST registration number. Depositing the GST with appropriate authority within stipulated period shall be the bidder's liability.

(g) The Income Tax, surcharge on income tax and other corporate taxes the bidder shall be responsible for such payment to the concerned authorities. Nigam shall deduct tax at source, required as per statutory provisions and issue necessary Certificate to the Contractor.

11.4.1 Discount(s)/rebate(s) offered by the bidder shall be indicated as a percentage of price component(s). Bidder shall also indicate in his bid, the price component(s) on which the discount is to be applied.

11.5 The prices shall be in accordance with the following:

Variable Price: Prices quoted by the Bidder shall be subject to variation during performance of the contract to reflect changes in the cost elements such as labor, material, etc. in accordance with the procedures specified in the bid document and incorporated in the contract. The Price Variation provision will not be taken into consideration in bid evaluation.

## **12. Bid Currencies**

12.1 Prices shall be quoted in Indian Rupees only.

**13. Bid Security (Earnest Money)**

13.1 The Bidder shall furnish, as part of its bid, a bid security in the amount and currency as stipulated in the **BDS**. The bid security must be submitted in the form provided in the Clause 13.2 to the officer of the Nigam as per BDS and obtain receipt thereof copy of which shall be furnished with the bid.

13.2 The bid security shall, at the bidder's option,

100% in the form of crossed bank Demand draft/Banker's cheque from a scheduled commercial bank in favour of Nigam or a bank guarantee from a scheduled commercial bank selected by the bidder and located in India as stipulated in the BDS.

The format of the bank guarantee shall be in accordance with the form of bid security included in the Bidding Documents. Bid security shall remain valid for a period of Sixty (60) days beyond the original bid validity period, and beyond any extension subsequently requested under ITB Sub-Clause 14.2.

**The Departments/Boards of the State Government or central Government; Government Companies as defined in clause (45) of section 2 of the Companies Act, 2013; Company owned or controlled, directly or indirectly, by the Central Government, or partly by the Central Government and partly by one or more State Governments which is subject to audit by the Auditor appointed by the Comptroller and Auditor General of India under sub-section (5) or (7) of section 139 of the Companies Act, 2013; or Autonomous bodies, Registered Societies, Cooperative Societies, Cooperative Societies which are owned or controlled or managed by the State Government or Central Government may furnish bid securing declaration. However, they have to upload copy of certificate/ documentary evidence in support of their being Govt. undertaking, with their bid.**

13.3 Any bid not accompanied by an acceptable bid security/ bid securing declaration shall be rejected by the Nigam and shall not be opened

13.4 The bid securities of unsuccessful bidders will be returned after the signing of contact agreement with the successful bidder.

13.5 The successful Bidder shall be required to keep its bid security valid for a sufficient period till the performance security(ies) pursuant to ITB Clause 32 are furnished to the satisfaction of the Nigam. The bid security of the successful Bidder will be returned when the Bidder has signed the Contract Agreement, pursuant to ITB Clause 31, and has furnished the required performance security pursuant to ITB Clause 32

13.6 The bid security may be forfeited

(a) If the Bidder withdraws its bid after submission and up to the period of bid validity specified by the Bidder in the Bid Proposal Form; or

(b) If a Bidder does not accept the corrections to arithmetical errors identified during preliminary evaluation of his bid pursuant to ITB Sub-Clause 22.2; or

(c) If the bidder breaches any provision of code of integrity prescribed for bidders specified in the Act and Chapter VI of RTPP Rules, 2013; or

(d) in the case of a successful Bidder, if the Bidder fails within the specified time limit

(i) to sign the Contract Agreement, in accordance with ITB Clause 31, or

(ii) to furnish the required performance security(ies), in accordance with ITB Clause 32 or

(iii) to commence supply of goods or services or execution of work as per supply/ work order

13.7 No interest shall be payable by the Nigam on the above Bid Securities.

**14. Period of Validity of Bid**

14.1 Bids shall remain valid for a period of 120 days after the date of opening of techno-commercial bids prescribed by the Nigam, pursuant to ITB Sub-Clause 17.1. A bid valid for a shorter period shall be rejected by the Nigam as being non-responsive.

- 14.2 In exceptional circumstance, the Nigam may solicit the Bidder's consent to an extension of the bid validity period. The request and responses thereto shall be made in writing or by cable. If a Bidder accepts to prolong the period of validity, the bid security shall also be suitably extended. A Bidder granting the request will not be required or permitted to modify its bid.

**15. Format and Signing of Bid**

- 15.1 The Bidder shall prepare bid in the digital/electronic mode for uploading on e-procurement website in the format/ type of file specified. All the documents uploaded should be digitally signed with the DSC of authorized signatory.
- 15.2 The bid, consisting of the documents listed in ITB Clause 9, shall be typed or written in legible ink and shall be signed/ digitally signed by the Bidder or a person (s) duly authorized to bind the Bidder to the contract. The letter of authorization shall be indicated by written power of attorney accompanying the bid and submitted as Attachment 2 to the Bid under ITB Sub-Clause 9.3. All pages of the bid, except for un-amended printed literature, shall be initialled/ digitally signed by the person signing the bid.
- 15.3 The bid shall contain no alterations, omissions or additions, unless such corrections are initialled/ digitally signed by the person(s) signing the bid.

**D. SUBMISSION OF BIDS**

**16. Sealing and Marking of Bids**

- 16.1 Bidders must submit their bids online at e-Procurement portal i.e. <http://eproc.rajasthan.gov.in>.
- 16.2 Documents in e-formats (as specified) shall be received online on the Government of Rajasthan e-procurement portal (<http://eproc.rajasthan.gov.in>) in following three Envelopes:
- First Envelope: Bid Security (Earnest Money Deposit) Documents, Bid Document Cost and Bid Processing fees.
- Second Envelope: Techno-Commercial Bid Documents
- Third Envelope: Financial/ Price Bid Documents

The above documents shall be in the e-format (as per type i.e. pdf, xls etc. as specified) and required to be uploaded on and before the prescribed bid submission date and time.

- 16.3 First Envelope documents i.e. copy of Bid Security (Earnest Money Deposit Documents), Bidding Document Cost and Bid Processing fees shall be uploaded with the Bid. The security/ cost/ fees etc. shall be submitted/ delivered and be addressed to the Nigam at the address given in the **BDS**, and receipts thereof be obtained and copies of these be uploaded with the bid.

**17. Deadline for Submission of Bids**

- 17.1 Bids shall be received online at e-Procurement portal and up to the time and date specified in the NIB. In the event of the specified date for the submission of bid being declared a holiday for the Nigam, the same will be received up-to the appointed time on the next working day.
- 17.2 The Nigam may, at its discretion, extend this deadline for submission of bids by amending the Bidding Documents in accordance with ITB Sub-Clause 7.3 for the reasons specified therein at any time prior to opening of bids by the Nigam pursuant to ITB Clause 20, in which case all rights and obligations of Nigam and bidders will thereafter be subject to the deadline as extended.

**18. Late Bids**

- 18.1 Any bid received by the Nigam after the bid submission deadline prescribed by the Nigam, pursuant to ITB Clause 17, will be rejected and returned unopened to the Bidder.

**19. Modification and Withdrawal of Bids**

- 19.1 If permitted on e-Procurement portal, a Bidder may withdraw its Bid or re-submit its Bid (techno commercial and/ or financial cover) as per the instructions/ procedure mentioned at e-Procurement website under the section "Bidder's Manual Kit".
- 19.2 Bids withdrawn shall not be opened and processed further.

**E. BID OPENING AND EVALUATION**

**20. Opening of Bids by Nigam**

20.1 The Nigam will open the bids in public/ online, including modifications made pursuant to ITB Clause 19, in the presence of bidders' designated representatives (not more than two persons) who choose to attend, at the time, date, and location stipulated in the BDS. The bidders' representatives who are present shall sign a register evidencing their attendance. In the event of the specified date for the submission of bid being declared a holiday for the Nigam, the same will be received up-to the appointed time on the next working day for opening of bids.

20.2 All the documents comprising of technical Bid/ cover shall be opened & downloaded from the e-Procurement website (only for the bidders who have submitted the prescribed fee(s) to RISL). For all Bids, the bidders' names, the techno-commercial bid, including deviation, the presence of bid security (Earnest Money Deposit), and any such other details as the Nigam may consider appropriate, will be announced by the Nigam at the opening.

No bid shall be rejected at bid opening except for late bids pursuant to ITB Clause 18 and bids not accompanied with bid security (earnest money deposit), proof of payment or instrument of the required price of bidding document and processing fee is found to be prima facie unacceptable. Such bids shall be returned to the Bidder unopened. However, opening of bid accompanied with the bid security shall not be construed to imply its acceptability which shall be examined in detail pursuant to ITB Clause 22.

20.3 The price bid of only technically & commercially qualified bidders shall be opened on subsequent dates in presence of representatives of qualified bidders. The time & date of price bid shall be conveyed to the qualified bidders.

20.4 The bidder's names, bid prices, any discounts and such other details as the Nigam, at its discretion, may consider appropriate will be announced at the opening of price bids.

20.5 No electronic recording devices will be permitted during bid opening.

**21. Clarification of Bids**

21.1 During bid evaluation, the Nigam may, at its discretion, ask the Bidder for a clarification of its bid. The request for clarification and the response shall be in writing, and no change in the price or substance of the bid shall be sought, offered or permitted.

**22. Preliminary Examination of Bids**

22.1 The Nigam will examine the bids to determine whether they are complete, whether any computational errors have been made, whether required sureties have been furnished, whether the documents have been properly signed, and whether the bids are generally in order.

22.2 Arithmetical errors will be rectified on the following basis.

- i) If there is a discrepancy between the unit price and the total price, which is obtained by multiplying the unit price and quantity, or between subtotals and the total price, the unit or subtotal price shall prevail, and the total price shall be corrected unless in the opinion of the Procuring entity there is an obvious misplacement of the decimal point in the unit price, in which case the total price as quoted shall govern and the unit price shall be corrected.
- ii) If there is a discrepancy between words and figures, the amount in words will prevail unless the amount expressed in words is related to an arithmetic error, in which case the amount in figures shall prevail subject to (i) above.
- iii) However, in case of items quoted without indicating any quantity or the items for which the quantities are to be estimated by the Bidder, the total price quoted against such items shall prevail.



The subtotal, total price or the total bid price, irrespective of the discrepancy between the amount indicated in words or figures shall be rectified in line with the procedure explained above. If the Bidder that submitted the lowest evaluated bid does not accept the correction of errors, its bid shall be disqualified and its Bid Security (earnest money deposit) shall be forfeited.

The prices of all such item(s) against which the Bidder has not quoted rates/amount (viz., items left blank or against which ‘-’ is indicated) in the Price Schedules will be deemed to have been included in other item(s).

If the discount(s)/rebate(s) offered by the Bidder is a percentage discount and the price component(s) on which the said discount is not indicated in the bid, the same shall be considered on the total bid price [i.e. proportionately on each price component], in the event of award. However, if lump-sum discount is offered, the same shall be considered in full on the Ex-works price component (by proportionately reducing Ex-works price of individual items), in case of award. Further, Conditional discounts/rebates, if any, offered by the bidder shall not be taken into consideration for evaluation. It shall, however, be considered in case of award.

In respect of taxes, duties and other levies indicated by the Bidder in the Bid, which are reimbursable in line with the provisions of the Bidding Documents, any liability arising due to inappropriate quotation of applicable rates of taxes & duties in price schedule by the bidder(s) shall be borne by respective bidder(s) in the manner below:

(a) For evaluation of the financial bid:

- i. In case the bidder quotes the taxes & duties higher than the prevailing rates, the evaluation of bid shall be done considering the applicable rates of taxes & duties keeping the ex-works price same as quoted by the bidder.
- ii. In case the bidder quotes the taxes & duties lower than the prevailing rates, unless it is specifically indicated with supporting document that lower taxes and duties are applicable to them as concessional rates, the evaluation of bid shall be done considering the applicable rates of taxes & duties and the ex-works price shall be reduced accordingly keeping the FORN prices same as quoted by the bidder.

In above case, the Purchase/ Work Order(s) shall be awarded to the successful bidder(s) on the basis of adjusted price with applicable rates of taxes & duties.

(b) In case any successful bidder quotes the prices with concessional rates of taxes & duties applicable to it, the Purchase/ Work Order shall be awarded with quoted concessional rates of taxes & duties. However, no variation in such concessional taxes & duties up to maximum current applicable rates shall be allowed.

The Bidder should ensure that the prices furnished in various price schedules are consistent with each other. In case of any inconsistency in the prices furnished in the specified price schedules to be identified in Bid Form for this purpose, the Nigam shall be entitled to consider the highest price for the purpose of evaluation and use the lowest of the prices in these schedules for the purpose of award of the Contract

22.3 The Nigam may waive any minor infirmity, nonconformity or irregularity in a bid that does not constitute a material deviation, whether or not identified by the Bidder in Attachment-6 to its bid, and that does not prejudice or affect the relative ranking of any Bidder as a result of the technical and commercial evaluation, pursuant to ITB Clauses 24 and 25.

22.4 Prior to the detailed evaluation, the Nigam will determine whether each bid is of acceptable quality, is complete and is substantially responsive to the Bidding Documents. Any deviations, conditionality or reservation introduced in Attachment-6 and/or in the Bid Form, Price Schedules & Technical Data Sheets and covering letter, or in any other part of the bid will be reviewed to conduct a determination of the substantial responsiveness of the bidder's bid. For purposes of this determination, a substantially responsive bid is one that conforms to all the terms, conditions and specifications of the Bidding Documents without material deviations, objections, conditionality or reservations. A material deviation, objection, conditionality or reservation is one (i) that affects in any substantial way the scope, quality or performance of the contract; (ii) that limits in any substantial way, inconsistent with the Bidding Documents, the Nigam's rights or the successful Bidder's obligations under the contract; or (iii) whose rectification would unfairly affect the competitive position of other bidders who are presenting substantially responsive bids.

- 22.4.1 Bids containing deviation on following critical provisions will be considered non-responsive.
- a) Terms of Payment: Clause 1.42 Part GCC, Volume-I
  - b) Bid Security (Earnest Money Deposit): Clause 13.0, Part ITB Volume-I and Part-II BDS
  - c) Contract Performance: Clause 32.0, Part ITB, Volume-I & Clause 1.40 Part GCC Volume-I
  - d) Delivery Time Guarantee: Clause 1.23 & 1.24, Part GCC, Volume-I
  - e) Price Basis and Payment: Clause 11.0, Part ITB, Volume-I and Clause 1.42 Part General Conditions of Contract.
  - f) Guarantee: Clause 1.40, Part GCC, Volume-I.
- 22.4.2 Regarding deviations, conditionality or reservations introduced in the bid, which will be reviewed to conduct a determination of substantial responsiveness of the Bidder's bid as stated in ITB Sub-Clause 22.4, the order of precedence of these documents to address contradictions, if any, in the contents of the bid, shall be as follows:

- I. Covering Letter
- II. Bid Form
- III. Attachment-6: Deviations
- IV. Price Schedule
- V. Technical Data Sheet
- VI. Any other part of the bid

Contents of the document at Sr. No. I above will have overriding precedence over other documents (Sr. No. II to VI above). Similarly, contents of document at Sr. No. II above will have overriding precedence over other documents (Sr. No. III to VI above), and so on.

- 22.5 If a bid is not substantially responsive, it will be rejected by the Nigam, and may not subsequently be made responsive by the Bidder by correction of the nonconformity. The Nigam's determination of a bid's responsiveness is to be based on the contents of the bid itself without recourse to extrinsic evidence.

### **23. Conversion to Single Currency**

- 23.1 This shall not be applicable as the prices are to be quoted in Indian Rupees only.

### **24. Techno-Commercial Evaluation**

- 24.1 The Nigam will first carry out a detailed evaluation of the techno-commercial bids (First Part of Two Part Bid) of the bidders found meeting the requirements of bid security (earnest money deposit) and other instructions mentioned in the bid document in order to determine whether the technical & commercial aspects are in accordance with the requirements set forth in the Bidding Documents. In order to reach such a determination, the Nigam will examine and compare the Qualification Requirements and technical & commercial aspects of the bids on the basis of the information supplied by the bidders, taking into account the following factors, for which the Nigam reserves the right to request for any additional information during the techno-commercial evaluation:

- (a) Meeting of Qualification Requirements

In the absence of pre-qualification, the Nigam will determine to its satisfaction whether the Bidder is qualified, as per the Qualification Requirement specified in Annexure-PQR to satisfactorily perform the contract. The Nigam shall be the sole judge in this regard and the Nigam's interpretation of the Qualification Requirement shall be final and binding.

- (b) overall completeness and compliance with the Technical Specifications and Drawings; deviations from the Technical Specifications & Commercial Requirements as identified in Attachment-6 to the bid and those deviations not so identified; suitability of the facilities offered in relation to the environmental and climatic conditions prevailing at the site; and quality, function and operation of

any process control concept included in the bid. The bid that does not meet minimum acceptable standards of completeness, consistency and detail will be rejected for non-responsiveness.

- (c) achievement of specified performance criteria by the Equipment/ facilities
  - (d) type, quantity and long-term availability of mandatory and recommended spare parts and maintenance services,
  - (e) any other relevant factors, if any, listed in the **BDS**, or that the Nigam deems necessary or prudent to take into consideration.
- 24.2 Alternatives unless not permitted, but have in any event been offered, may be ignored for evaluation. However, permitted alternatives shall be evaluated as per provisions in the **BDS**
- 24.3 The price part (Second Part of Two Part Bid) of the bids of the techno-commercially qualified bidders i.e. found suitable/ responsive after scrutiny/ evaluation as per Clause 24.1 ITB shall only be opened.

## 25. Price Evaluation

25.1 The comparison shall be on the total price in Price Schedule BOQB1

The comparison shall also include the applicable taxes, duties and other levies, which are reimbursable/ Levyable in line with the provisions of the Bidding Documents.

The Nigam's comparison will also include the costs resulting from application of the evaluation procedures described in ITB Sub-Clause 25.2 & 25.3.

25.2 The Nigam's evaluation of a Price bid will take into account, in addition to the bid prices indicated in Price Schedule -BOQ, the following costs and factors that will be added to each Bidder's bid price in the evaluation using pricing information available to the Nigam, in the manner and to the extent indicated in ITB Sub-Clause 25.3 and in the Technical Specifications:

- (a) the performance of the equipment offered;
  - (i) Bidder shall state the guaranteed performance or efficiency of the Equipments, named in the **BDS**, in response to the Technical Specifications. Equipment offered shall have minimum performance specified in Technical Specification to be considered responsive. Bids offering Equipment with a performance less than the specified may be rejected.
  - (ii) For the purpose of evaluation, the adjustment on the basis of per unit of differential loss in terms of Indian Rupees indicated in the **BDS** will be added to the bid price.

The best parameter of loss quoted at rated parameters for the equipment by any technically responsive bidder shall be taken as basis and that quoted by the particular bidder shall be used to arrive at differential price to be applied for the bid.

- (b) any other relevant factors listed in **BDS**.

The estimated effect of the Price Variation provisions of the Conditions of Contract, applied over the period of execution of the contract, shall not be taken into account in bid evaluation.

25.3 Pursuant to ITB Sub-Clause 25.2, the following evaluation methods will be followed:

- (a) Time schedule (program of performance)

The plant and equipment covered by this bidding shall have the 'Taking Over' by the Nigam after successful delivery within the period specified in BDS. Bidders are required to base their prices on the time schedule specified as above. No credit will be given to earlier delivery. Bids offering delivery beyond the specified period will be rejected.

- (b) Guaranteed Performance Efficiency/ Parameters of the Equipments

- (i) Bidder shall state the guaranteed performance parameters or efficiency of the Equipments, named in the **BDS**, in response to the Technical Specifications. Equipment offered shall have a minimum (or a maximum, as the case may be) level of guarantees specified in the Technical Specifications to be considered responsive. Bids offering plant and equipment with guarantees less (or more) than the minimum (or maximum) specified shall be rejected.

- (ii) For the purposes of evaluation, the adjustment specified in the **BDS** will be added to the bid price for each drop (or excess) in the guarantees offered by the Bidder.
- 25.4 Any adjustments in price that result from the above procedures shall be added, for purposes of comparative evaluation only, to arrive at an “Evaluated Bid Price.” Bid prices quoted by bidders and rectified as per ITB Sub Clause 22.2 shall remain unaltered.

**26. Purchase/Domestic Preference**

- 26.1 Price/ Purchase preference or both in procurement shall be given to eligible bidders as per provisions at **BDS**.

**27. Contacting the Nigam**

- 27.1 From the time of bid opening to the time of contract award, if any Bidder wishes to contact the Nigam on any matter related to its bid, it should do so in writing.
- 27.2 Any effort by a Bidder to influence the Nigam in the Nigam’s bid evaluation, bid comparison or contract award decisions may result in rejection of the Bidder’s bid. The Nigam shall be the sole judge in this regard.

**F. AWARD OF CONTRACT**

**28. Award Criteria& Quantities**

- 28.1 Subject to ITB Clause 29, the Nigam will award the contract to the successful Bidder (also referred to as the L1 Bidder) whose bid has been determined to be substantially responsive and to be the lowest evaluated bid. The Nigam shall be the sole judge in this regard.

The Nigam reserves the right to waive minor deviations if they do not materially affect the capacity and capability of the Bidder to perform the contract.

- 28.2 Bidder would be required to comply with all other requirements of the Bidding Documents except for those deviations which are accepted by the Nigam.

- 28.3 The Nigam reserves the right to vary the quantity of any of the spares and/or delete any items of spares altogether at the time of Award of Contract.

- 28.4 The mode of contracting with the successful bidder will be as per stipulation outlined in Clause GCC 1.2 and briefly indicated below:

- 28.4.1 The award shall be made as follows:

The contract shall be awarded as single indivisible contract having separate price schedules for supply and services (if applicable).

- 28.5. Quantities

- (a) The quantities are indicative only. No minimum purchase quantity is guaranteed.  
If the procuring entity does not procure any subject matter of procurement or procures less than the quantity specified in the bidding documents the bidder shall not be entitled for any claim or compensation.
- (b) The quantity material shall be divided among two qualified bidders, as detailed in BDS, whose bid is accepted and the bidder who accepts the counter offered prices respectively, if there are sufficient number of bidders who match the lowest acceptable prices after negotiations with the L-1 bidder. For this purpose, counter offer may be given to all qualified bidders (other than L-1 bidder). However, the bidder whose original bid was lowest amongst those who accept the counter offer, shall be selected for placing the order apart from L-1 bidder.
- (c) The bidder shall quote for full NIB quantity failing which the offer will be considered non responsive.

**29. Nigam’s Right to Accept any Bid and to Reject any or all Bids**

- 29.1 The Nigam reserves the right to accept or reject any bid, and to annul the bidding process and reject all bids at any time prior to award of contract, without thereby incurring any liability to the affected

Bidder or bidders or any obligation to inform the affected Bidder or bidders of the grounds for the Nigam's action.

**30. Notification of Award**

30.1 Prior to the expiration of the period of bid validity and extended validity period, if any, the Nigam will notify the successful bidder in writing by registered letter or by cable or telex or FAX, to be confirmed in writing by registered letter, that its bid has been accepted.

30.2 The notification of award will constitute the formation of the contract.

30.3 Upon the successful Bidder's executing contract agreement and furnishing of the performance security pursuant to ITB Clause 31, 32, the Nigam will promptly discharge the bid securities, pursuant to ITB Sub-Clause 13.4 & 13.5.

**31. Signing the Contract Agreement**

31.1 At the same time as the Nigam notifies the successful bidder that its bid has been accepted, the Nigam will send the bidder the detailed letter of Award, incorporating all agreements between the parties.

31.2 Within 15 days of receipt of the detailed letter of Award, the successful bidder shall sign and date the same and return it to the Nigam.

31.3 The bidder will prepare the Contract Agreement (in two originals) and the same will be signed within 30(thirty) days **from the** issue of detailed letter of award. The Supplier shall be provided with one signed original and the rest will be retained by the Nigam.

31.4 In case the Bid Inquiry is for Rate Contract, the detailed letter of award may not include a Purchase Order, which may be placed separately through one or more orders depending on requirement during the validity of the rate contract. The Nigam does not guarantee any minimum quantity for purchase and its decision in this regards would be final and shall not be called into question. Nigam reserves the sole discretion in the matter.

**32. Performance Security**

32.1 Within thirty (30) days from the issue of the letter of award, the successful Bidder shall furnish the performance security for 10 % (Ten percent)/ 5% (Five percent)/2% (Two percent)/1% (One percent) as detailed in GCC clause 1.41.1(b) of the estimated total value of the procurement to be made under rate contract in case of rate contract or contract price plus additional performance securities, if any, in line with the requirement of Qualification Requirements and in the form provided in Part-VI, Annexures, of the Bidding Documents. The Stamp Duty and Surcharge will be applicable as per Rajasthan Stamp Act **and amendments therein**.

32.2 The Performance Guarantee shall cover additionally the following guarantees to the Owner:

a) The successful bidder guarantees the successful and satisfactory operation of the equipment supplied under the contract as per the specifications and documents.

b) The successful bidder further guarantees that the equipment provided by him shall be free from all defects in design, material and workmanship and shall upon written notice from the Nigam fully remedy free of expenses to the Nigam such defects as developed under the normal use of the said equipment within the period of guarantee specified in the relevant clause of the GCC/SCC.

32.3 The contract performance guarantee is intended to secure the performance of the entire contract. However, it is not to be construed as limiting the damages under clause entitled "Equipment Performance Guarantees" in Technical Specifications and damages stipulated in other clauses in the Bid documents.

**33. Graft & Commission etc.**

Any graft, commission, gift or advantage given promised or offered by or on behalf of the contractor or his partner, agent, officers, director, employee or servant or any one on his or their behalf in relation to the obtaining or to the execution of this or any other contract with the Nigam, shall in addition to any criminal liability which it may incur, subject the contractor to the cancellation of this and all other contracts and also to payment of any loss or damage to the

Nigam resulting from any cancellation. The Nigam shall then be entitled to deduct the amount so payable from any monies otherwise due to contractor under the contract.

### **34. Code of Integrity and no conflict of interest**

#### **34.1 Code of integrity**

Any person participating in a procurement process shall:

- a) not offer any bribe, reward or gift or any material benefit either directly or indirectly in exchange for an unfair advantage in procurement process or to otherwise influence the procurement process;
- b) not misrepresent or omit that misleads or attempts to mislead so as to obtain a financial or other benefit or avoid an obligation;
- c) not indulge in any collusion, Bid rigging or anti-competitive behaviour to impair the transparency, fairness and progress of the procurement process;
- d) not misuse any information shared between the procuring Entity and the bidders with an intent to gain unfair advantage in the procurement process;
- e) not indulge in any coercion including impairing or harming or threatening to do the same, directly or indirectly, to any party or to its property to influence the procurement process;
- f) not obstruct any investigation or audit of a procurement process;
- g) disclose conflict of interest, if any; and
- h) disclose any previous transgressions with any entity in India or any other country during the last three years or any debarment by any other entity.

#### **34.2 Conflict of Interest**

A Bidder may be considered to be in conflict of interest with one or more parties in a bidding process, if, bidder, including but not limited to:

- a) have controlling partners / shareholder in common; or
- b) receive or have received any direct or indirect subsidy from any of them; or
- c) have the same legal representative for purposes of the Bid; or
- d) have a relationship with each other, directly or through common third parties, that puts them in a position to have access to information about or influence on the bid of another bidder; or influence the decisions of the procuring entity regarding the bidding process; or
- e) the bidder participates in more than one bid in a bidding process. Participation by a bidder in more than one bid will result in the disqualification of all bids in which the bidder is involved. However, this does not limit the inclusion of the same sub-contractor, not otherwise participating as a bidder, in more than one Bid, or
- f) the bidder or any of its affiliates participated as a consultant in the preparation of the design or technical specifications of the Goods, works or Services that the subject of the Bid; or
- g) Bidder or any of its affiliates has been hired (or is proposed to be hired) by the procuring entity as engineer-in-charge / consultant for the contract.

The Bidder shall have to give a declaration regarding compliance of the Code of Integrity prescribed in the Act, the Rules and stated above in this Clause along with its Bid, in the format specified in Annexure-CI.

Breach of Code of Integrity by the Bidder: - Without prejudice to the provisions of Chapter IV of the Rajasthan Transparency in Public Procurement Act, in case of any breach of the Code of Integrity by a Bidder or prospective Bidder, as the case may be, the Procuring Entity may take appropriate action in accordance with the provisions of sub-section (3) of section 11 and section 46 of the Act.

### **35. Grievance Redressal during Procurement Process**

Any grievance of a Bidder pertaining to the procurement process shall be by way of filing an appeal to the First or Second Appellate Authority, as the case may be, as specified in the BDS, in accordance with the provisions of chapter III of the Act and chapter VII of the Rules and as given hereunder.

35.1 Filing of appeal

If any bidder or prospective bidder is aggrieved that any decision, action or omission of the procuring entity is in contravention to the provisions of the Act or the Rules or the Guidelines issued there under, he may file an appeal to First Appellate Authority, as specified in the Bidding Document with a period of ten days from the date of such decision or action, omission, as the case may be, clearly giving the specific ground or grounds on which he feels aggrieved:

Provided that after the declaration of a bidder as successful the appeal may be filed only by a Bidder who has participated in procurement proceedings:

Provided further that in case a Procuring Entity evaluates the Technical Bids before the opening of the Financial Bids, an appeal related to the matter of Financial Bids may be filed only by a Bidder whose technical bid is found to be acceptable.

35.2 The officer to whom an appeal is filed under Section 38 shall deal with the appeal as expeditiously as possible and shall endeavour to dispose it of within thirty days from the date of the appeal.

35.3 If the officer designated under Section 38 fails to dispose of the appeal filed within the period specified, or if the Bidder or prospective bidder or the Procuring Entity is aggrieved by the order passed by the First Appellate Authority, the bidder or prospective bidder or the procuring entity, as the case may be, may file a second appeal to Second Appellate Authority specified in the Bidding Document in this behalf within fifteen days from the expiry of the period specified or of the date of receipt of the order passed by the First Appellate Authority, as the case may be.

35.4 Appeal not to lie in certain cases:

An appeal shall not lie against any decision of the Procuring Entity relating to the following matters, namely:

- a) Determination of need of procurement;
- b) Provisions limiting participation of bidders in the bid process;
- c) The decision of whether or not to enter into negotiations;
- d) Cancellation of a procurement process;
- e) Applicability of the provisions of confidentiality.

35.5 Form of Appeal

- a) An appeal shall be in the annexed form along-with as many copies as there are respondents in the appeal.
- b) Every appeal shall be accompanied by an order appealed against, if any, affidavit verifying the facts stated in the appeal and proof of payment of fees.
- c) Every appeal may be presented to First Appellate Authority or Second Appellate Authority, as the case may be, in person or through registered post or authorized representative.

35.6 Fee for Filing appeal

- a) Fee for first appeal shall be rupees two thousand five hundred and applicable GST and for second appeal shall be Rupees ten thousand and applicable GST, which shall be non-refundable.
- b) The fee shall be paid in the form of bank demand draft or banker's cheque of a scheduled bank in India payable in the name of Appellate Authority concerned or as named in **BDS**

35.7 Procedure for disposal of appeal

- a) The First Appellate Authority or Second Appellate Authority, as the case may be, upon filing of appeal, shall issue notice accompanied by copy of appeal, affidavit and documents, if any, to the respondents and fix date of hearing.
- b) On the date fixed for hearing, the First Appellate Authority or Second Appellate Authority, as the case may be, shall :
  - i) Hear all the parties to appeal present before him; and
  - ii) Peruse or inspect documents, relevant records or copies thereof relating to the matter.
- c) After hearing the parties, perusal or inspection of documents and relevant records or copies thereof relating to the matter, the Appellate Authority concerned shall pass an order in writing and provide the copy of order to the parties to appeal free of cost.

The order passed under sub-clause the above shall also be placed on the State Public Procurement Portal.

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**Volume-I (PART-II)**  
**BID DATA SHEET (BDS)**

The following bid specific data for the Plant and Equipment to be procured shall amend and/or supplement the provisions in the Instructions to Bidders (ITB):

S. No.	ITB Clause Ref. No.	Bid Data Details
1.	ITB 1.1	The Owner/Nigam is: Rajasthan Rajya Vidyut Prasaran Nigam Limited, Jaipur-302005. Kind Attn.: Superintending Engineer (Procurement-II), Gate #3, Old Power House Premises, Near Ram Mandir, Banipark, Jaipur 302006 Telephone Nos.:- 0141-2208924 Fax Nos.:- 0141-2208924 E-mail Address: se.sspc@rvpn.co.in
2.	ITB 1.2	May be read as: The Rate contract shall be for two year w.e.f. date of issue of letter of award extendable by a maximum period of three months. The procurement method shall be Single Stage Two Part Open Competitive bidding.
3.	ITB 5.1,	<b>Deleted Followings:</b> Volume-I:- Part V Part VI:- Annexure-AP, Annexure-BGBIS, Schedule-AI, Schedule-FG <b>Added Following:</b> Annexure-CL
4.	ITB 6.1	The time period:- Twenty (20) days
5.	ITB 6.2	Pre-Bid Meeting Date, time and Venue is as under: 04.01.2023, 11:00 Hrs. (subject to furnishing bid document cost), Conference Room, RVPN, Gate #3, Old Power House Premises, Near Ram Mandir, Banipark, Jaipur-302006.
6.	ITB 9.3 (a)	May be read as: Copy of receipt of <b>Bid Security</b> , Bid document cost and Bid Processing Fee deposited.
7.	ITB 9.3 (c)	<b>Addition:</b> Bids furnished by Joint Venture or partner in one Joint Venture are not allowed.
8.	ITB 9.3 (e)	Attachment 5 is not to be furnished
9.	ITB 11.3	Schedule BOQB2 is not applicable for the bid item.
10.	ITB 11.4 (c)	Deleted
11.	ITB 11.4 (d) (e) & (f)	Deleted
12.	ITB 11.4.1	Deleted
13.	ITB 11.5	Base date for Price Variation shall be 01.12.2022 irrespective of actual technical bid opening date.  The prices quoted shall be variable without any ceiling as per IEEMA price variation formula for Switchgear & control gear indicated in Schedule-PV with respect to prescribed base date irrespective of the date of opening of bid. The price variation shall be applicable on Ex-Works prices which includes packing and forwarding charges. Price variation shall not be applicable on freight & insurance charges and unloading charges unless otherwise specified.  The detailed provision made for standardizing PV claim are enclosed with PV formula (Schedule-PV)

S. No.	ITB Clause Ref. No.	Bid Data Details
14.	ITB 13.1	<p><b>Amount of Bid Security (Earnest Money Deposit):</b></p> <ol style="list-style-type: none"> <li><b>Rs. 18,26,000.00</b> (Rs. Eighteen Lakhs Twenty Six Thousand only) / Valid bid securing declaration for Departments &amp; Undertakings of the <b>Rajasthan State Government and Government Undertakings of the Central Government as mentioned in clause No. 13.2 of ITB</b></li> <li><b>Rs. 9,13,000.00</b> (Rs. Nine Lakhs Thirteen Thousand only) in case of sick industries, other than Small Scale Industries, whose cases are pending with Board of Industrial and Financial Reconstruction.</li> <li><b>Rs. 4,57,000.00</b> (Rs. Four Lakhs Fifty Seven Thousand only) in case of micro, small and medium enterprises of Rajasthan.</li> </ol> <p>OR</p> <p>SUM of Rs.44,800.00 for 220 kV FDR C &amp; R Panels (Type A-II) + Rs.27,300.00 for 220 kV Tr. C &amp; R Panels (Type B-II) + Rs.5,500.00 for 220 kV Bus Coupler C &amp; R Panels (Type C-II) + Rs.1,51,500.00 for 132 kV Feeder C &amp; R Panels (Type J-II) +Rs.8,700.00 for 132 kV Tr. C &amp; R Panels (Type K-II) + Rs.1,91,700.00 for 132 kV Tr. C &amp; R Panels (Type K-III) +Rs.27,100.00 for 132 kV Bus Coupler C &amp; R Panels (Type L-II) in case of SSI unit of Rajasthan.</p>
15.	ITB 13.2	<p>The Bid Security Demand Draft/ Banker's Cheque shall be in favour of <b>Accounts Officer (P&amp;C-I), RVPN Ltd., Jaipur</b> payable at Jaipur. The Bid security BG shall be in favour of <b>Chief Engineer (Procurement), RVPN., Jaipur</b> on Non Judicial Stamp of Rajasthan State in name of BG issuing Bank.</p> <p><u>Para 2 of 13.2 of ITB modified and may be read as</u></p> <p>The format of the bank guarantee shall be in accordance with the form of bid security included in the Bidding Documents. Bid security shall remain valid for a period of Sixty (60) days beyond the original bid validity period, and beyond any extension subsequently requested under ITB Sub-Clause 14.2.</p>
16.	ITB 15.2	<p>Supplement the clauses with:</p> <p>“The bidder shall prepare electronic bid consisting of the documents listed at ITB clause 9 &amp; 11.4, in the formats prescribed in NIB published on website <a href="http://eproc.rajasthan.gov.in">http://eproc.rajasthan.gov.in</a>”</p>
17.	ITB 16.2	<p>All documents should be submitted online in PDF Format only except envelop III (financial bid which shall be in .XLS format).</p>
18.	ITB 16.3	<p>Bidding Document Cost shall be furnished to the AO (P&amp;C-I), RVPN, Jaipur in the form of Demand Draft/ Banker's Cheque payable in favour of <b>Accounts Officer (P&amp;C-I), RVPN Ltd., Jaipur</b> payable at Jaipur. Bid Processing fees shall be furnished to the Assistant Engineer (Proc.II), RVPN, Jaipur in the form of DD payable in favour of <b>MD, RISL, Jaipur</b> payable at Jaipur.</p>
19.	ITB 20.1	<p>Address for Bid Opening: Online on Website: <a href="http://eproc.rajasthan.gov.in">http://eproc.rajasthan.gov.in</a></p> <p>Superintending Engineer (Proc-II) Rajasthan RajyaVidyutPrasaran Nigam Limited, Gate #3, Old Power House Premises, Near Ram Mandir, Banipark, Jaipur 302006 Time and date for Bid Opening : As specified on Website: <a href="http://eproc.rajasthan.gov.in">http://eproc.rajasthan.gov.in</a></p>
20.	ITB 24.1(e)	None
21.	ITB 24.2	Not applicable
22.	ITB 25.1	<p>Supplement the clauses with:</p> <p>The items wise package (including mandatory spares) position of bidders (Technically Qualified) in the ascending order statement shall be worked out considering all inclusive unit F.O.R. Destination price of bid item quoted by bidder in Schedule-BOQ. However if any notification/guidelines regarding comparison of prices notified by the Rajasthan State Government before actual date of opening of technical Bid, the same shall be considered.</p>

S. No.	ITB Clause Ref. No.	Bid Data Details						
23.	ITB 25.2	None						
24.	ITB 25.3(a)	The delivery schedule shall be as per Schedule-DEL						
25.	ITB 25.3(b)	This shall be applied as per the provision of Technical Specification (Volume-II) of the bidding documents and clause No. 25.2(a) of ITB						
26.	ITB 26.1	<p>Price/Purchase preference or both in procurement shall be given to eligible bidders as under:</p> <p>Purchase preference in procurement shall be given to local enterprises (Local enterprise means an industrial undertaking or a business concern or any other establishment by whatever name called, engaged in the manufacture or production of goods, in any manner, pertaining to any Industry specified in the first schedule to the Industries (Development and Regulation) Act, 1951, situated and have received their acknowledgement of Entrepreneurs Memorandum-II/ UdyogAadhaar Memorandum and registered in the State of Rajasthan) in case, the bidding enterprises from outside the state is adjudged lowest.</p> <p>Any further notification in respect of purchase preference if notified by the Rajasthan State Government before actual date of opening of technical Bid shall be considered in the evaluation of bids and award of contract.</p> <p>In order to seek purchase preference , an application, as prescribed at Form A at Annexure-PPP, shall be submitted by the local enterprise to the General Manager, District Industries Centre of the district concerned, or to the officer nominated by Industries Department, who, after due diligent examination, shall issue verification certificate for the same.</p> <p>Provided that, in case of any grievance in this regard, an appeal on plain paper may be filed by the aggrieved applicant to the Commissioner, Industries Department or to an officer nominated by him for the purpose.</p> <p>Every Micro, Small and Medium Enterprise shall be required to submit an affidavit, in Form B, along with the duly filled bid document, to the procuring entity.</p>						
27	ITB 28.5 (a)	<p><b>May be read as:</b></p> <p>If the procuring entity does not procure any subject matter of procurement or procures less than the quantity specified in the bidding documents the bidder shall not be entitled for any claim or compensation.</p>						
28	ITB 28.5 (b)	<p>The quantities for 132 kV C&amp;R Panels (Type- JII &amp; KIII) shall be divided among two qualified bidders as under: (In order to seek purchase preference, an application, as prescribed at Form- A at Annexure-PPP, shall be submitted as per provision of RTPP Rule)</p> <table border="1"> <thead> <tr> <th>S.No</th> <th>Scenario</th> <th>Distribution of quantities</th> </tr> </thead> <tbody> <tr> <td>1.</td> <td>If there are no qualified bidders who are MSME of Rajasthan or none of qualified MSME of Rajasthan bidder (s) match L1 price or the prices of the local bids are found competitive or quantities remained un-allocated in Scenario at S.no.2 below</td> <td>Among two qualified bidders in 60:40. For this purpose, next ranked bidders other than L1 in original order of ascending order of prices shall be offered to match L1 prices. In case no other bidder agrees to match L1 price then 100% quantity shall be awarded to L1 bidder.</td> </tr> </tbody> </table>	S.No	Scenario	Distribution of quantities	1.	If there are no qualified bidders who are MSME of Rajasthan or none of qualified MSME of Rajasthan bidder (s) match L1 price or the prices of the local bids are found competitive or quantities remained un-allocated in Scenario at S.no.2 below	Among two qualified bidders in 60:40. For this purpose, next ranked bidders other than L1 in original order of ascending order of prices shall be offered to match L1 prices. In case no other bidder agrees to match L1 price then 100% quantity shall be awarded to L1 bidder.
S.No	Scenario	Distribution of quantities						
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S. No.	ITB Clause Ref. No.	Bid Data Details	
		2.	<p>In case, the bidding enterprise from outside the State is adjudged lowest.</p> <p>Opportunity shall be given to local enterprises to supply 80% of the Bid quantity (with 20% order to be given to the original lowest bid enterprise). Out of this 80%, minimum of 60% would be required to be purchased from the local micro &amp; small enterprises, in case they have also bid, and within this 60%, 4% shall be earmarked for procurement from local micro and small enterprises owned by member of Scheduled Caste or Scheduled Tribe. The remaining quantity, out of the above mentioned 80% and to the maximum limit of 20%, shall be procured from the local medium enterprises in case they have also bid</p> <p>In case, a bidder offering to supply the goods is a dealer located in Rajasthan and the bid prices are equal to the rates offered by local enterprises of Rajasthan and the quality and specifications of the goods are the same, the local enterprises shall be given Purchase Preference over such dealer.</p> <p>100 % quantities for 220 kV Feeder (Type-AII), 220 kV Tr. (Type-BII), 220 kV Bus-coupler (Type- C-II), 132 kV Transformer (LV side of 220/132 kV Tr.) (Type- K-II) and 132 kV Bus-coupler (Type- L-II) C&amp;R Panels shall be awarded to lowest ranked bidder subject to purchase preference as per S. No. 2 above</p>
29.	ITB 32.1	<p>May be read as:</p> <p>Within thirty (30) days from the issue of the letter of award, the successful Bidder shall furnish the performance security for 5 % (Five percent)/ 2.5% (Two and Half percent)/1% (One percent)/0.5% (Half percent) as detailed in GCC clause 1.41.1(b) of the estimated total value of the procurement to be made under rate contract in case of rate contract or contract price plus additional performance securities, if any, in line with the requirement of Qualification Requirements and in the form provided in Part-VI, Annexures, of the Bidding Documents. The Stamp Duty and Surcharge will be applicable as per Rajasthan Stamp Act and amendments therein.</p> <p><b>Note: In case of the total procured value is less than the awarded value of rate contract, the successful Bidder shall be allowed to reduce the performance security accordingly on successful execution</b></p>	
30.	ITB 32.1	<p>As per article 13– A of Rajasthan Stamp Act, the present rate Stamp duty and Surcharge will be @ 0.25% of Amount of BG security subject to maximum limit of Rupees 25,000.00. However Bidders may also confirm the prevailing rates of Stamp duty and surcharge.</p>	
31.	ITB 35	<p>First Appellate Authority: Chairman (Discoms) Second Appellate Authority: Energy Deptt., GoR</p>	
32.	ITB 35.6	<p>First Appeal : Rs. 2500 + GST @18% Second Appeal: Rs. 10,000 + GST @18% Fee payable to the Accounts Officer (P&amp;C-I), RVPN Ltd., Jaipur</p>	

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## VOLUME-I

### PART-III GENERAL CONDITIONS OF CONTRACT

Notwithstanding anything contained to the contrary in the specification or bid or any subsequent exchange of correspondence, these General Conditions of Contract shall prevail and shall be binding on the Contractor and any change or variation expressed or impressed howsoever made shall be inoperative, unless otherwise sanctioned by the Nigam. The Contractor shall be deemed to have fully informed himself and to have specific knowledge of the provisions of the General Conditions of Contract mentioned hereunder.

#### 1.1 DEFINITION OF TERMS:

- 1.1.1 In constructing these general conditions and the annexed specification, the following words shall have the meaning herein assigned to them unless there is anything in the subject of context inconsistent with such construction.
- 1.1.2 The "Purchaser" shall mean the Rajasthan RajyaVidhyutPrasaran Nigam Ltd. represented by Chairman & Managing Director and shall include their legal personal representative, successors and assignees. The "Nigam", "Owner" or "Customer" shall mean the "Purchaser".
- 1.1.3 The "Bidder" shall mean and include one or more persons or any firm or any company or body incorporate who has submitted the bid in response to "Invitation of Bid".
- 1.1.4 The "Contractor" shall mean the bidder whose bid has been accepted by the "Purchaser" and shall include the bidder's heirs, legal representative, successors and assignees approved by the purchaser.
- 1.1.5 The "Sub-Contractor" shall mean the firm or the person named in the contract for any part of the work or any person to whom any part of the contract has been sublet with the consent in writing of the purchaser and shall include his heirs, legal representative, successors and assignees approved by the purchaser.
- 1.1.6 The "Chairman and Managing Director" shall mean the Chairman and Managing Director, Rajasthan RajyaVidhyutPrasaran Nigam Ltd. Jaipur.
- 1.1.7 The "Engineer" shall mean the Chief Engineer, Addl. Chief Engineer, Rajasthan RajyaVidhyutPrasaran Nigam Ltd. or other Engineer or Officer for the time being or from time to time duly authorized and appointed in writing by the purchaser to act as Engineer or Inspector for the purpose of the contract. In case where no such Engineer has been so appointed, the word "Engineer" shall mean the purchaser or his duly authorized representative.
- 1.1.8 "Plant", "Material", "Stores", "Works", shall mean and include the plant and material to be provided and work or works to be done by the contractor under the contract.
- 1.1.9 The "Contract" shall mean and include the following. -
- (i) Invitation of bid
  - (ii) Instructions to bidders.
  - (iii) Bid form including schedule of prices.
  - (iv) Bid security.
  - (v) Letter of Intent and its acknowledgement.
  - (vi) Performance Security.
  - (vii) Formal Purchase Order.
  - (viii) Guaranteed Test Performance and Penalty.
  - (ix) General Conditions of Contract.
  - (x) Special Instructions.
  - (xi) Site Conditions.
  - (xii) Specification, specific conditions, schedules and drawings.
  - (xiii) Addenda which may hereafter be issued by the purchaser to the contractor on web or in the form of letter and covering letters and schedule of prices as agreed between the contractor and the purchaser.
  - (xiv) The agreements to be entered into under clause 1.6 of these General Conditions.

- 1.1.10 The "Specification" shall mean the specification, specific conditions annexed to the General Conditions, the contract and the schedule there to, if any.
- 1.1.11 The "Month" shall mean, English calendar month i.e. period of 30 days and "Week" shall mean a period of 7 days.
- 1.1.12 The "Site" shall mean the place or places named in the contract and include, wherever applicable, the lands and buildings upon or in which the works are to be executed.
- 1.1.13 The "Place of delivery" shall mean the place of delivery at which the contractor / supplier is responsible to deliver the material at the contract price.
- 1.1.14 The "Test of Completion" shall mean such tests prescribed in the contract to be made by the contractor before the plant is taken over by the purchaser as per these General Conditions.
- 1.1.15 "Commissioning" shall mean the satisfactory operation of the plant or equipment specified herein after all necessary initial checks, adjustments, trials, cleaning and assembly required at site, if any, have been completed and the plant has been in continuous and un-restricted commercial use specified for at least thirty (30) days or as otherwise.
- 1.1.16 "Commercial Use" shall mean that use of the work, which the contract contemplates or of which it is to be commercially capable.
- 1.1.17 "Letter of Intent" shall mean the purchaser's letter conveying his acceptance of the bid subject to such reservations as may have been stated therein.
- 1.1.18 The "Contract Price" shall mean the sum named in or calculated in accordance with the provisions of the contract/ purchase or any amendments thereto.
- 1.1.19 "Formal Purchase Order" shall mean the purchaser's letter which may be issued in way of letter of intent containing detailed terms and conditions of the work / supply and such other particulars which the purchaser may like to convey to the contractor/supplier pending execution of a formal written agreement in accordance with Clause 1.6.
- 1.1.20 "Consignee" shall mean and include the Controller of Stores, Central Stores Officer, Asstt. Controller of Stores, Stores Superintendents and / or any other officer / official of the Rajasthan Rajya Vidhyut Prasaran Nigam Ltd or of other Nigam assigned by the purchaser all over Rajasthan performing the duties of consignee.
- 1.1.21 "Writing" shall include any manuscript, type written or printed statement under or over signature or seal, as the case may be.
- 1.1.22 The "work codes" shall mean the Indian Boiler Regulation and the rules made there under applicable on the date of letter of intent with such special modification which may be agreed upon by the Chief Inspector of Boiler, Rajasthan from time to time. It shall also include the Indian Electricity Rules, code of practice and Factory Rules & Regulations applicable in the State of Rajasthan on the date of issue of the letter of intent or such modification thereof as may be specially stipulated by competent State Authorities i.e. Electrical Inspector and Chief Inspector of Factories, Rajasthan.
- 1.1.23 The word "Trial Run" shall mean two (2) weeks continuous and satisfactory operation under full load to furnish proof of satisfactory and trouble free working.
- 1.1.24 Words importing "Person" shall include firms, companies, corporations and other bodies whether incorporated or not.
- 1.1.25 Words importing the "singular" only shall also include the plural and vice versa where the context requires.
- 1.1.26 Terms and expressions not herein defined shall have the same meaning as one assigned to them in the Indian Sale of Goods Act (No. III or 1930) fulfilling that in the Indian Contract Act (Act IX of 1872) and falling that in the General Clause Act, 1897.

## **1.2 CONTRACT:**

The Contractor / Supplier and purchaser shall as soon as possible, unless otherwise agreed upon enter into a sealed agreement for the proper fulfillment of the contract. The expenses of completing and stamping the, agreement shall be paid by the supplier and the purchaser shall be furnished free of charge within executed

counter part of the agreement with three copies after the bid has been accepted by the purchaser. All orders / instructions to the contractor shall except as herein otherwise provided, be given by the Engineer on behalf of the purchaser.

### **1.3 CONTRACTOR TO INFORM HIMSELF FULLY:**

The contractor shall be deemed to have carefully examined the General conditions, specifications, schedules and drawings also to have satisfied himself as the nature and character of the work to be executed and where necessary, on the site conditions and other relevant matters and details. Any information there had or otherwise obtained from the purchaser or the Engineer shall not be in any way relieve the contractor from his responsibility for the supplying of information of the plant and equipment and executing the work in terms of the contract including all details and incidental works and supply all accessories or apparatus which may not have specifically been mentioned in the contract but necessary for ensuring complete erection and safe and efficient working of the plant and equipment if he shall have any doubt as to the meaning of any portion of the general and any special conditions of contract and specifications, he shall before signing the contract or commencement of work, whichever is earlier, set forth the particulars thereof and submit them to the engineer in writing in order that such doubt may be removed.

### **1.4 COMPLETENESS OF CONTRACT:**

The equipment shall be complete in every respect with all mountings, fittings, fixtures and standard accessories normally supplied with such equipment even though not specifically detailed in the specification unless included in the list of excluded items. The contractor shall not be eligible for any extra payment in respect of such mounting, fittings, fixtures and standard accessories etc. which are needed for the safe operation of the equipment as required by applicable codes only as per contract, and they may not have been included specifically in the contract.

### **1.5 BID FORM AND ACCEPTANCE OF BID: [ DELETED]**

### **1.6 CONTRACT DOCUMENTS AND AGREEMENTS:**

1.6.1 The order placed under this specification shall be governed by the terms and conditions as incorporated in this section of the specification and as given in the purchase order and its Annexure(s). The terms and conditions as specified in this section if differ from the terms as indicated in the purchase order and its Annexure(s) the latter shall prevail. The contract shall for all purposes be constructed according to the laws of India and subject to jurisdiction of courts in Rajasthan only. For the due fulfillment of the contract, the supplier shall execute an agreement, in triplicate, in the prescribed form (to be obtained from the purchaser) on non-judicial stamp paper as per stamp duty applicable of Govt. of Rajasthan. Such agreement shall be executed and signed by the competent authority of the supplier on each page with seal thereof. The original copy is only to be executed on the stamp paper. The remaining two copies may be executed on simple paper. Such complete agreement form alongwith the contract documents shall be required to be returned to the purchaser within a period of 30 days from the receipt of the order duly signed on the each page. One copy of the executed agreement duly signed by the purchaser shall be sent to the supplier for his reference. The contract documents shall mean and include the following.

1. Contract Agreement
2. Purchase order & its Annexures.
3. Terms and conditions of the specification.
4. General Conditions of Contract of the specification.

1.6.2 The charges in respect of vetting and execution of the contract shall be borne by the contractor. The contractor shall be furnished with an executed counterpart of the agreement.

1.6.3 After the bid has been accepted by the purchaser all orders or instructions to the, contractor shall except as herein otherwise provided be given by the Engineer in writing on behalf of the purchaser.

1.6.4 Any bid, drawing, technical data or correspondence which forms the basis of an order of a contract as aforesaid or which may be furnished by the contractor for the purchaser's approval or information as provided under the said order or contract, shall be in English and if it is in any other

language a complete translation in English shall be duly furnished. The purchaser shall not be bound to consider any bid, drawings, technical data or correspondence which is not furnished in the English language.

### **1.7 CONSULTING ENGINEER:**

The consulting Engineer may co-ordinate, supervise and approve the technical portion .of the work of the contractor and his sub- contractor excluding decision involving financial liabilities to the purchaser for which approval of the engineer shall be obtained.

### **1.8 DESIGN EQUIPMENTS :**

- 1.8.1 All equipment and materials shall be designed and all work executed conforming to codes.
- 1.8.2 Structures and outdoor equipment shall be designed to withstand wind load as set forth in the 'Indian Standards875 unless otherwise specified in the technical specification.
- 1.8.3 Structural parts and equipment shall be designed to resist lateral inertia forces developed in each corresponding mass center due to seismic ground motion. The structural parts and their anchorages shall be designed on the basis of the conventional acceleration method. The lateral inertia forces will be determined from the expression where ' F' is the force on the part of the lateral direction 'W' is the weight of the part with probable existing service load at the time of the earthquake and "C" is the seismic coefficient i.e. the ratio of seismic coefficient shall be obtained from the Indian Standard IS: 893 unless otherwise specified in the technical specification.
- 1.8.4 The contractor shall provide adequate guards for all couplings by wheels and other moving parts which could be considered as a safety hazard, safety sentinel and relief valves are to be locked or piped in such a manner as to safeguard personnel and property.
- 1.8.5 All safety devices shall be in accordance with the prevailing statutory regulations and requirements.
- 1.8.6 Special attention shall be given to the design arrangement and assembly of all equipment to ensure case of maintenance and renewal of part.

### **1.9 STANDARD**

- 1.9.1 The equipment covered by specification shall, unless otherwise specified be built to conform to the requirements of relevant standards issued by any of the following and the bidder should specifically mention in each case the applicability of the relevant specifications. : -
  - 1. Indian Standard Institution's Standard code, wherever applicable.
  - 2 Indian Electricity Rules 1916, wherever applicable.
  - 3. British Standard Specification relevant codes and British Electrical Standard Association. .
  - 4. American Society of Mechanical Engineer's Power Test Codes.
  - 5. American Society of Materials Testing Codes
  - 6. American Standards Association / U.S.A. Standards Institute and Edison Electric Institute.
  - 7. Standard of Hydraulic Institute, U.S.A.
  - 8. Heat Exchange Manufacturer's Standards, U.S.A.
  - 9. Bladder Heat Manufacturer's Association Standard, U.S.A.
  - 10. Appropriate National Standard Specification of the country of manufacture on approval by the purchaser.
  - 11. Indian Boiler Regulation Act.
  - 12. Other Standards approved by Purchaser.
- 1.9.2 The equipment conforming to any other national standard which ensure equivalent quality are also acceptable. In such cases the bidder shall clearly indicate the standard adopted and furnish a copy of the English translation of the standard along with the bid.
- 1.9.3 The performance figures quoted shall be guaranteed with the tolerances permitted by relevant standard unless specifically stipulated in the specification. In case of failure of the equipment to meet the guarantee, the purchaser reserves the right to reject the equipment.
- 1.9.4 The bidders are requested to bid for their standard equipment, as far as possible, provided it meets the service requirements mentioned in the specification.



- 1.9.5 Should the bidder wish to depart from the provision of these specification either on account of manufacturing practice or for any other reason, he shall clearly mention the departures and submit complete justification supported by information, drawings etc. as will enable the relative merits of his proposals to be fully appreciated. The engineer shall have the right to reject them and decision of the engineer shall be final and binding on the contractor.
- 1.9.6 In the event of the Specification and Contractor's drawing and tables etc. being found to disagree the erection of the contract equipment, the annexed specification shall be held binding unless the departures have been duly approved in writing by the purchaser.

**1.9.7 INDIAN ELECTRICITY ACT:**

All the supplies covered by the contract shall be in accordance with the Indian Electricity Act, 2003 with the latest amendments and the Indian Electricity Rules, 1956 made there under.

**1.10 SYSTEM OF UNITS DIMENSIONS, MEASURES AND CALIBRATION: -**

All dimensions, measures etc. shall be as per Metric and CGS system of units. All instruments, recorders etc. shall also be calibrated in Metric and CGS system of units

**1.11 INDEMNITY:**

In the event of any claim or demand being made or action being brought against the purchaser for infringement or alleged infringement of latter's patent in respect of any machine, plant, work or thing used or supplied by the contractor / supplier under this contract or in respect of any method of using or working by the purchaser of such machine, plant, works or thing the contract will indemnify the purchaser against such claim or demand and all cost and expenses arising from or incurred by reasons of such claim or demand provided that the purchaser shall notify the contractor within reasonable time any claim is made and that the contractor shall if he so desires with the assistance of the purchaser, if required, by the contractor's own expense, to conduct all negotiations for the settlement of the same or any litigation that may arise there from and provided that no such machine, plant work or thing shall be used by the purchaser for any purpose or in any manner other than that for which they have been supplied by the contractor and specified under this contract.

**1.12 SUBMISSION AND APPROVAL OF DRAWINGS:**

- 1.12.1 Within thirty (30) days of the date of receipt of the purchaser's letter of intent, the contractor shall submit to the consulting engineers as well as to the purchaser, the following drawings of plant and technical data for approval as per distribution schedule attached with the specification: -
- (i) Dimensional general arrangement / outline drawings of the plant and equipment to be supplied under the contract and all data including floor plan, loading data, location of foundation bolts etc. relating to foundation structures to enable the purchaser to arrange for civil construction work.
  - (ii) Dimensional drawing showing individual equipment being supplied under the contract, method and sizes of connections to the purchaser's other equipment, giving also the limits of variation of the dimensions.
  - (iii) All efficiency and characteristic curves and technical particulars required under the specification.
  - (iv) Schedule drawings of all writings, connection and interlock diagrams showing the points where connections have to be made by the purchaser.
  - (v) Necessary structural and other calculations and data required for approval.
- 1.12.2 Nigam's Engineer/ the consulting Engineer shall return to the contractor one set of all these drawings, plants and technical data after marking them with their comments / corrections if any, either (a) stamped approved or (b) marked up with the comments. In case of (a), no further submission of drawings will be required. In case of (b) the contractor shall correct his original drawings and will be required to conform to the comments made by the consulting engineers and resubmit within two (2) weeks of receipt of comments in the same manner as stated in the distribution schedule. After approval of the drawings a reproducible of each drawings shall be supplied, final drawings shall be certified as "Approved for constructions". Should any minor

revision be made after 'Approval', the contractor shall redistribute prints and reproducible as per the distribution schedule. Every revision shall be marked by a number, date and subject in a revision block provided in the drawings. The consulting engineer's approval shall not relieve the contractor from any of his obligations and responsibility to fabricate and erect the materials conforming to the specification, unless a written amendment to the specification is issued by the purchaser. In case of 220kV/132 transmission line towers 16 sets of bill of material shall be furnished after approval of proto type model assembly of these towers for field use, along with one set of reproducible prints.

- 1.12.3 Reproducible shall be of quality to produce clear and legible prints and any inferior reproducible will be returned by the purchaser for replacement with suitable reproducible. All reproducible shall be mailed rolled (not folded) on the outside of regular mailing tubes except small sizes can be mailed unfold in an envelope with a card board backing. The prints and reproducible shall be mailed in the most expeditious manner and shall be accompanied with a letter of transmittal.
- 1.12.4 One (1) copy each of the drawings marked as built shall be returned immediately upon completion of the job by the contractor and duly marked with the needed modifications / alterations made at site, in accordance with engineer's approval. Similarly, one set of 'As Built' drawings alongwith the reproducible for drawings prepared by the contractor immediately upon completion of the corresponding work / works shall be furnished.
- 1.12.5 Any work shown on the drawing and not particularly described in the specification or specified in the specification and not shown on the drawing shall be included by the contractor in his bid and the omission either from the drawings or specification of any details of work necessary and obviously intended, shall not relieve the contractor from performing such work.
- 1.12.6 The contractor shall take approval of designs and drawings before commencement of manufacture of the equipment. Any manufacturing done prior to approval of drawings shall be rectified by the contractor at his own cost if any discrepancy arises. No extension of delivery period shall be granted on this account.
- 1.12.7 The purchaser shall have the right to request the contractor to make any change in the design / drawing which may be necessary to make the equipment conforming to the provision and interests of the contract.
- 1.12.8 The contractor shall be responsible for and shall pay for any alterations of the work due to any discrepancies, errors and omissions in the drawings or other particulars, supplied by him, whether such drawings or particulars have been approved by the engineer or not, provided that if such discrepancies errors or omissions are due to inaccurate information or particulars furnished to the contractor by the engineer, any alterations in the work necessitated by reasons of such in-accurate information or particulars shall be paid for by the purchaser.
- 1.12.9 If any dimensions figured upon a drawing or a plan differ from those obtained by scaling the drawing or plan, the dimensions as figured upon the drawing or plan shall be taken as correct.

### **1.13 ERRECTION, DRAWINGS AND INSTRUCTION MANUAL:**

The contractor shall submit to the engineer & purchaser within a reasonable time but at least three (3) months before dispatch of equipment the following drawings and instruction manual etc. in accordance with the distribution schedule attached:

- (i) Erection drawing along with reproduction print.
- (ii) Instruction books, for proper erection and assembly of all equipment and necessary instructions for checking, and recording proper assembly of the plant.
- (iii) Instruction sheets for proper balancing alignment, adjustment, checking, calibration as may be necessary.
- (iv) Descriptive literature and drawings to illustrate the working principles method of assembly and dismantling.
- (v) Operation and maintenance manual.

#### **1.14 SPARE PARTS AND TOOLS:**

- 1.14.1 The contractor shall furnish eight (8) sets of spare parts hand books with details and diagrams wherever necessary. The contractor shall recommend separately along with the bid, the spare parts required for three (3) years satisfactory operation and maintenance of the offered equipment together with item wise price and should furnish the manufacturing drawings of the spare parts, which the particular company is not manufacturing. The contractor shall also recommend with item wise prices separately along with this price, spare parts required for five (5) years satisfactory operation and maintenance of the offered equipment parts requiring frequent replacement shall be listed separately from parts, required for ensuring reliability in unforeseen emergencies. The list shall be accompanied with full position indicating the reduction from the stock list price if these spares are ordered at one time.
- 1.14.2 The contractor shall also indicate facilities existing or under planning to ensure the ready availability of spare parts other than those already being manufactured indigenously.
- 1.14.3 The contractor shall be responsible for the subsequent availability of spares to ensure continued trouble free service.
- 1.14.4 In the event of an order, the contractor shall guarantee that spare parts for the equipment will be made available as and when required by the purchaser on the following terms: -
- (a) The contractor shall guarantee that he will supply spare if and when required on an agreed basis for the life time of the plant. The agreed basis shall be a discount to be stated in the bid over the published catalogue prices at the time of supply of the spare parts.
  - (b) The contractor shall warrant that before going out of production of the spare parts he will give adequate advance notice to the purchaser so that the latter may order his requirement of spares in one lot, if he so likes.
  - (c) The contractor shall further guarantee that if he goes out of production of spare parts then he will make available blue prints, drawings of spare parts and specification of material at no cost to the purchaser, if and when required in connection with the equipment to enable the purchaser to fabricate or procure spare parts from either sources.
- 1.14.5 One complete set of maintenance tools and tackles required for complete assembly dismantling and maintenance of equipment shall be quoted separately giving the item wise prices.
- 1.14.6 All tools shall be of best quality and specially protected against rusting in tropical climate. The tools shall be furnished neatly arranged in special portable tool cabinets. An item wise price list shall be furnished with the bid of the recommended erection tools and tackles.

#### **1.15 INTERCHANGEABILITY OF PARTS:**

All parts shall be made accurately to standard gauges so as to facilitate replacement and repairs. All corresponding parts of similar apparatus including the spare parts shall be interchangeable.

#### **1.16 SPECIAL TOOLS AND TACKLES:**

- 1.16.1 The bidder shall furnish to the purchaser a complete and unused set of all special tools, tackles which are necessary or convenient for erection, commissioning, maintenance and overhauling of any of the equipment covered under the specification.
- 1.16.2 The tool shall be despatched in separate package clearly marked with the name of the equipment for which they are intended.
- 1.16.3 The bidder shall clearly indicate separately in his' bid item wise quotation of the list of tools he proposes to furnish.

#### **1.17 MATERIALS AND WORKMANSHIP:**

- 1.17.1 All materials used in the construction of the equipment shall be originally new and unused and will comply with the standards and codes specified above and shall be selected from the best available considering strength, durability and best engineering practice, it will not deteriorate or distort under the prevailing extremes of atmospheric conditions. The workmanship and design shall be in accordance with the best engineering practice and shall be such as have been proved suitable for the

intended purpose and for giving satisfactory performance under the prevailing climatic conditions and proposed system of supply. Liberal factors of safety shall be used throughout the design and special consideration shall be given on parts subject to alternating stresses or shocks or most severe operating conditions.

#### **1.17.2 MINOR ACCESSORIES FITTINGS:**

The contractor shall supply all such minor accessories, fittings, apparatus required for the completion of the supply which have not been specifically mentioned in this specification or bid offer but which are usual or necessary for the equipment.

#### **1.17.3 PATENT AND RIGHTS:**

The supplier shall give indemnity and keep indemnified the purchaser against liability of any kind, including the cost and expenses for the order on account of any copyright and / or secret or process (es) adopted by the supplier including their use by the purchaser.

#### **1.18 REPLACEMENT OF DEFECTIVE WORK FOR MATERIALS:**

If during the progress of the work, the Engineer decides and notify in writing to the contractor that the contractor has executed any unsound or imperfect work or has supplied any plant inferior in quality to that specified, the contractor on receiving details of such defects or deficiency shall at his own expense, within such time as may be reasonably necessary for making it good, proceed to reconstruct or remove such work or supply fresh material up to the standard of the specification and in case the contractor fails to do so, the purchaser may on giving the contractor seven days notice in writing of his intention to do so proceed to remove the work complained if and, at the cost of the contractor, perform all such work of supply all such material provided that nothing in this clause shall be deemed to deprive the purchaser or effect any right under the contract, which he may otherwise, have in respect of such defects or deficiencies.

#### **1.19 NAME PLATES AND MARKING OF PARTS:**

1.19.1 All equipment shall have metal name plates fixed in suitable position with full particulars engraved thereon.

1.19.2 In order to facilitate identification the parts of the equipment shall be suitably marked.

#### **1.20 PAINTING:**

1.20.1 All surfaces interior and exterior of the equipment shall be shot blasted to remove all rust, scale, grease or other adhering foreign matter. Surface shall be painted inside and outside with two (2) coat of high quality approved primers and two (2) coats of finish paint in approved colour.

1.20.2 All metal parts not accessible for painting shall be made of corrosion resisting metal. All finished surface subject to list, shall be coated with a suitable rust preventive compound. Surface shall be putty filled and rubbed down to ensure first quality glossy finish.

1.20.3 Paints shall be carefully selected to withstand tropical heat and extremes of weather specified herein. It shall not scale off or crinkle or be removed by abrasion in handling.

1.20.4 The contractor shall also supply adequate quantities of varnish etc. for the use of finishing coat and for touching up any scratches during transport, handling, erection, testing and commissioning.

#### **1.21. POWER TO VARY OR OMIT WORK:**

1.21.1 No alterations, amendments, omissions, additions, suspensions or variations of the plant or work hereinafter referred to as variations under the contract as shown in the contract drawing or the specification shall be made by the contractor except as directed in writing by the Engineer but the Engineer shall have full power, subject to the provision hereinafter contained from time to time during the execution of the contract by notice in writing to instruct the contractor to make such variation without prejudice to the contract and the contractor shall carry out such variations and shall be bound by the same conditions as far as applicable as though the said variations occurred in the contract.

- 1.21.2 If any suggested variation would, in the opinion of the contractor if carried out prevent him from fulfilling any of his obligations or guarantees under the contract, he shall notify the Engineer thereof in writing and the Engineer shall decide forthwith whether or not the same shall be carried out and if the Engineer confirms his instructions the contractual obligations and guarantee shall be modified to such extent as may be justified.
- 1.21.3 The difference of cost, (if any) occasioned by such variation shall be added to or deducted from the contract prices as the case may require. The amount of such difference, if any shall be ascertained and determined in accordance with the rates specified in the schedules of prices so far as the same may be applicable and where the rates are not contained in the said schedules or are not applicable, they shall be settled by the Engineer and contractor jointly, as far as possible for such variation carried out provided that the purchaser shall not become liable for the payment of any charges in respect of any such variations, unless the instructions for the payment of the same shall have been given in writing by the Engineer.
- 1.21.4 In every case, in which the contractor has received instructions from the Engineer for carrying out any work which either then or later will in the opinion of the contractor involve a claim for additional payment for extra work or for extra materials, the contractor shall as soon as reasonably possible after receipt of such instructions inform the Engineer to that effect. But the purchaser shall not be liable for payment of any charge in respect of any such variation unless instructions for making the same have been given in writing by the Engineer after receipt of such information from the contractor.
- 1.21.5 In case the Engineer refuses to admit that any variation directed by him involves extra work or extra materials entitling the contractor to claim extra payment, the contractor shall nevertheless if so required by the Engineer carry out the same and matter in difference shall be decided by purchaser.
- 1.21.6 In the event of the Engineer requiring any variations such reasonable and proper notice shall be given to the contractor as will enable him to make his arrangement accordingly and in case where goods or materials have already been prepared or any designs, drawings or pattern have been made or work done that required to be altered, a reasonable sum in respect thereof shall be allowed by the Engineer provided that no such variation shall, except with the consent in writing of the contractor be such as will involve a net increase or decrease of the total price payable under the contract by more than 10(Ten) percent thereof.

## **1.22 PROGRESS REPORT AND PHOTOGRAPHS:**

- 1.22.1 The contractor shall furnish six (6) prints each of photographs of progress of the work done in his workshop. Photographs shall be taken when and where indicated by the Engineer or his representatives. Photographs shall be approximately 8 inches by 10 inches in size, including margin on one 10 inches side for binding, adequate number of photographs shall be submitted indicating various stages of manufacture. Each photograph shall contain the date, the name of the contractor and the title of the view taken.
- 1.22.2 Monthly progress report shall be submitted. The progress report shall be submitted in such a form as may be required by the purchaser. These shall detail the status of design, procurement of raw material, approval of contractor's drawings, manufacture of the equipment and statement showing position of payment. Further, the following information should be incorporated: -
- (a) The contractor shall attach a proposed bar or PERT CHART indicating from the date of issue of purchase order, time required for the following: -
- (i) Commencement and completion of all engineering and design works including (2) two weeks for consulting engineers & comments.
  - (ii) Procurement of all raw materials showing placing of all raw material indents, processing, expected dispatch and receipt at his works.
  - (iii) Commencement & completion of all sub-contracts indicating expected manufacture and shipment time upto receipt at his works.
  - (iv) Manufacturing components and sub-assemblies.
  - (v) Assembling, testing, dispatch and receipt at site. allowing two (2) weeks for the purchaser's inspection and minimum three (3) weeks for transportation to site.

- (vi) An overall 'Force Majeure' or unforeseen conditions causes delay of not more than 120 days.

### **1.23 DELIVERY AND TIME FOR COMPLETION:**

- (a) The part of delivery as mentioned in the purchase order should be strictly adhered to by the supplier. The date for the purpose of reckoning the delivery to the consignees in case of despatch by Railway shall be the date of R/R. In case however, if the despatches are effected by way of road transport, the date of GTR shall be reckoned as date of delivery for the purpose of calculation of penalty for delay in delivery provided that the material is received within 10 days from the date of GTR in respect of despatches made from outside the State and within 3 days from the date of GTR in respect of despatches made from within the State. Beyond this period, the date of receipt of the material by the Consignee at his Stores shall be the date of delivery. Any equipment is considered to have been delivered only when all the components are also delivered in full. If certain parts are omitted to be delivered in time so as to make the unit not fit for being put into use the whole unit of the equipment will be considered as delayed till the time missing parts are also delivered.
- (b) The purchaser reserves the right to defer the delivery period as indicated in the purchase order. However the material already manufactured should be accepted. The period during which the supplies have been so deferred shall not be reckoned as delay in delivery in terms of clause 'Delay In Delivery'.

### **1.24 DELAY IN DELIVERY:**

- a) The time for and date of delivery specified shall be deemed to be the essence of the contract and supplies shall have to be completed not later than the date (s) specified. Should the supplier failed to deliver the material/equipment or any part thereof within the specific delivery period, the Purchase Officer shall be entitled for the following:
- 1 To effect recovery in case of orders placed by Procurement Wing or project related orders placed by Contract Wing for delay in delivery /execution @  $\frac{1}{2}$  % percent per week or part thereof for first 4 weeks and thereafter 1 % per week or part thereof subject to a maximum of 10%. In case of orders placed by other Wings of RVPN, recovery shall be affected for delay in delivery/execution @  $\frac{1}{2}$  % per week or part thereof subject to a maximum of 10% of delayed / un executed supply/works. The amount of recoveries will be worked out on the basis of applicable ex-works price. The above recoveries will be recovered with applicable GST. In cases where Ex-works prices have not been indicated, then the recovery shall be worked out on the basis of prices as shown in the purchase order. The extent of delay beyond 15 days from the date of receipt of notice in the office of the purchasing authority or readiness of material (whichever later) for inspection to issue of despatch instruction shall be to the purchaser's account.
  - 2 In case the supplier fails to deliver the ordered quantity of material/equipment's or any part thereof even after 3 months of expiry of the schedule delivery period, Nigam shall have right to cancel the order to that extent and to forfeit the security amount and recover the damages from the financial hold available against the contract and sever the business relationship with the supplier for a period of two (2) years.
- b) The adjustment in regard to the amount recoverable, if any, in terms of para 1.24(a) shall be made from the cash deposits/dues of the firm or by operating the Bank Guarantees as may be available with the Nigam and/or in any other manner as may be deemed appropriate by the purchaser.
- c) Any financial liability i.e. increase in rate of GST, cost of raw material, freight charges, Insurance tariff etc. arising consequent upon failure of the supplier to adhere to the stipulated delivery schedule shall be to his (Supplier's) account.

### **1.25 FORCE MAJEURE CONDITIONS:**

If at any time during the currency of the contract the performance in whole or in part be prevented or delayed by reason of any war hostility acts of public enemy, civil commotion, sabotage, fire, floods, explosion, epidemics, quarantine restrictions, strikes, lockouts or acts of God (hereinafter referred to as 'Events') then provided Notice and adequate proof of the production / despatch having suffered

on account of these events, is given within 21 days from the date of occurrence thereof the provision of sub paras (a), (b) and (c) of clause 1.24 shall not be invoked by the purchaser provided further that the deliveries under the contract shall be resumed, as soon as practicable after such event (s) has ceased to exist and the decision of the purchaser as to whether the deliveries have been so resumed or not shall be final and conclusive provided further that in case the strike / lockout prolongs beyond a period of thirty days, the supplier shall immediately inform about to the purchaser in which case the purchaser reserves the right to procure the material /equipment on order or part thereof from any other source at the risk and cost of the supplier.

#### **1.26 SUSPENSION OF WORKS:**

The purchaser shall not be liable to pay the contractor any compensation whatsoever arising from suspension or for idle labour.

#### **1.27 INSPECTION AND TESTING:**

- 1.27.1 The Engineer and his duly authorized representative shall have at all reasonable times access to the contractors premises of works and shall have the power at all reasonable time to inspect drawing of any portion of the work or examine the materials and workmanship of the plant, if being manufactured on other premises, the contractor shall obtain for the Engineer and for his duly authorized representative permission to inspect it as if the plant was manufactured on the contractor's own premises.
- 1.27.2 The Engineer shall on giving seven days, notice in writing to the contractor setting out any grounds of objections which he may have in respect of the work, be at liberty to reject any drawing and' all or any plant, or workmanship connected with such work which in his opinion are not in accordance with the contract or are in his opinion, defective for any reason whatsoever.
- 1.27.3 The bidder shall state in his bid the places of manufacture, testing and inspection of various equipment offered by him. Unless specifically provided otherwise, all tests shall be made at the contractor's works before shipment.
- 1.27.4 (A) The supplier shall intimate at least 15 days in advance through notice(s) about the readiness of material so as to enable the purchaser to depute his representative for inspection, testing and checking of the material/ equipment. In case, material/equipment is not found ready by the representative of the purchaser deputed for inspection to the extent of the quantity indicated in the inspection call with tolerance of ( +/- ) 10% or if the inspection is not got carried out by any reason(s) on account of the supplier, an amount of Rs. 3000/- only with applicable GST for the supplier's work located in Rajasthan and an amount of Rs. 10000/- only with applicable GST for the supplier's works located outside Rajasthan will become payable by the supplier on this account to the Accounts Officer (P&C-I ), RVPN, Jaipur. The supplier will deposit the amount with the Accounts Officer (P&C-I), RVPN, Jaipur immediately under intimation to the purchasing authority, failing which the subsequent call for inspection shall not be entertained.
- 1.27.4 (B) The material/equipment shall be offered duly packed so as to enable the inspecting officer to seal.
- 1.27.5 In all cases where the contract provides for tests, whether at the premises of works of the contractor or any sub-contractor, test at site the contractor except where otherwise specified shall provide free of charge to the purchaser, such labour, materials, electricity, fuel, water, stores, apparatus and instruments as may reasonably be demanded to carry out efficiently such tests of the plant, in accordance with the contract and shall give facilities to the Engineer or his authorized representative to accomplish such testing.
- 1.27.6 The purchaser reserves to himself the right of having any inspection or special test of a reasonable nature at contractor's premises or at sites in addition to those prescribed in applicable standards and the enclosed technical specification.
- 1.27.7 When the tests have been satisfactorily completed at the contractor's or sub-contractor's works the Engineer shall issue a certificate to that effect but if the tests were not witnessed by the Engineer or his representative, the certificate would be issued after the receipt of test certificate by the Engineer. No plant shall be shipped before such a certificate has been issued. The satisfactory completion of

these tests or the issue of this certificate, shall not bind the purchaser to accept the plant, should it on further tests after erection, be found not to comply with the contract.

- 1.27.8 The authorized representative of the purchaser shall have at all reasonable times access to the works and premises of the supplier and / or his associates if any, and shall be free to inspect the works, examine and test the product(s) including raw material used and the workmanship employed during / after manufacture.
- 1.27.9 The supplier shall also furnish the latest calibration certificate of the testing instruments / equipment used for the testing of the materials / equipments as covered in the purchase order to the inspecting officer. The testing instruments / machines should be got calibrated by the supplier from time to time from the manufacture of the testing instruments or any Govt. recognized testing laboratory. The calibration certificate should not in any case be older than one- year at the time of presenting the same to the Inspecting Officer. In case however, the supplier fails to comply with the conditions as aforesaid, a certificate in writing of the inspector / representative of the purchaser that the supplier has failed to provide the facilities shall be conclusive. -.
- 1.27.10 Unless the inspection is specifically waived no material shall be dispatched without inspection and clearance for dispatch by the purchaser's representative.
- 1.27.11 The purchaser reserves the right to reject all or any part of the material being manufactured or awaiting dispatch, due to any defect or deviations from the standard specifications prescribed as observed during the Inspection. In case of any dispute / difference in this regard the decision of the Chief Engineer (Proc.) shall be final and binding.
- 1.27.12 The purchaser also reserves the right to get the material/equipment tested in any recognized Government Laboratory & claiming any compensation or rejecting the material/equipment, if not found in accordance with the specification. All charges consequent to such rejection and replacement / rectification shall be borne by the supplier.

#### **1.28 TEST CERTIFICATE :**

- 1.28.1 Original/attested Photostat copies of the latest type test certificate from any recognized Government Laboratory, for all the type tests wherever prescribed in the relevant latest addition of 188 (as applicable) shall be furnished alongwith the bid.
- 1.28.2 In case of any specific alternative requirement of type tests, the same shall be furnished as per Section-3.
- 1.28.3 The bid not accompanied by the type test certificate in terms of para 1.28.1 above, are liable to be ignored.
- 1.28.4 The supplier shall be required to furnish the routine / manufacturer(s) factory test certificate(s) for the tests carried out during manufacture in accordance with the relevant standard specifications.

#### **1.29 ACCEPTANCE OF PLANT FOR DESPATCH:**

When all tests to be performed in the contractor's or sub-contractor's premises, under the terms of this contract, have been successfully carried out, and test report approved, the dispatch instructions will be given by the Engineer to the contractor for immediate despatch and will not unreasonably be withheld.

#### **1.30 PACKING AND MARKING:**

- 1.30.1 The equipment with its accessories shall be packed in accordance with the manufacturer's standard practice in suitable sizes of packing cases worthy of Rail/Road Transport and will be marked legibly to avoid any possibility of goods being lost or wrongly dispatched elsewhere on account of faulty marking, it must be ensured that no damage is caused to the equipment as a result of defective packing.
- 1.30.2 Any equipment or part thereof, that develops defects not disclosed prior to the final acceptance by the purchaser but are disclosed within one year after the material is placed in service or within 18 months from the date of receipt of the last consignment, whichever is earlier shall be promptly replaced by supplier free of charge and all expenses for the transportation and other incidental charges for such replacement shall be borne by the supplier.



- 1.30.3 The contract shall include and provide for securely protecting and packing the plant so as to avoid loss or damage during transport by Sea, Rail and Road.
- 1.30.4 All packing shall allow for easy removal and checking at site, whenever necessary, proper arrangements for attaching lugs for lifting shall be provided and all packages shall be clearly marked with signs showing up and down side of boxes and handling and unpacking instructions as considered necessary. Special precaution shall be taken to prevent rusting of steel and iron parts during transit by sea, gas seals or other methods proposed to be adopted for protection against moisture during transit shall be subject to the prior approval of the Engineer.
- 1.30.5 The cases containing easily damageable material shall be very carefully packed and marked with appropriate caution symbols i.e. FRAGILE, HANDLE WITH CARE, USE NO HOOK, ETC.
- 1.30.6 Each bale or package delivered under the contract shall be marked by and at the expense of the contractor and such marking must be distinct (all previous irrelevant marking being carefully obliterated). Such marking shall show the description and quantity of contents, the name of the consignee and address, the gross weight of the package, the name of the contractor with a distinctive number of mark sufficient for purpose of identification. All marking shall be carried out with such materials as to ensure quickness of drying, fastness and indelibility.
- 1.30.7 Each bale or package shall contain a packing note quoting specifically the name of the contractor, the number and date of contract or order and the name of the office placing the contract, nomenclature of the stores and include a schedule of parts for each complete equipment giving the parts Nos. with reference to the assembly drawing & the quantity of each part, drawing numbers and tag numbers. The gross and net weight of each package shall 'be clearly marked on it.
- 1.30.8 The shipment dimensions of each package shall not exceed the maximum dimensions for a package which can be accepted for transport over the broad gauge system of Indian Railways.
- 1.30.9 After delivery of the material at site, all packing shall become the property of the purchaser.
- 1.30.10 Notwithstanding anything stated in this clause the contractor shall be entirely responsible for any loss, damage or depreciation of the material to the stores due to improper and insecure packing.

### **1.31 DESPATCHES:**

#### **(A) DESPATCH OF INDIGENOUS PLANT**

- 1.31.1 Equipment / material shall be dispatched at the consignee stores anywhere in Rajasthan as per dispatch instructions (if any shall be issued by the Engineer) as per clause 1.29.
- 1.31.2 Notification of delivery or dispatch in regard to each and every consignment shall be made to the purchaser immediately after dispatch or delivery. The supplier shall further supply to the consignee a priced invoice and packing account of all stores, delivered or dispatched by him. All packages, containers, bundles and loose materials forming part of each and every consignment shall be described fully in the packing account and full details of the contents of package and quantity of material shall be given.
- 1.31.3 A list in duplicate containing details of equipment verification at site shall also be placed inside each package and shall correspond with the advice note.

#### **(B) SHIPMENT OF IMPORTED PLANT:**

- 1.31.4 The contractor shall advise the purchaser, the C.I.F. value of each consignment as soon as the goods are ready for shipment. The contractor shall ship the equipment on behalf of the purchaser as far as possible on board, a vessel belonging to an Indian shipping line. In the event of such a course being likely to lead to serious delay, shipment may be effected by the first available vessel belonging to any other shipping line provided the freight rates charged are not higher than the conference rates applicable to the shipping route at the time of shipment and all rebates and refunds available for Government consignments are duly taken into account. In either case the contractor shall be responsible for the correct appraisal of freight rates (structural or machinery as the case may) weight and volumes. In no case will the purchaser be liable to pay any warehouse wharfage charges.
- 1.31.5 In the event of the shipment being effected through any of the Indian shipping companies, the freight charges shall be paid by the purchaser direct to the company in India but in case the

shipment is effected through any other shipping line, the freight charges shall have to be prepaid by the contractor on behalf of the purchaser. This amount shall be reimbursed to the contractor against invoice duly supported by original voucher from the shipping companies in quadruplicate.

- 1.31.6 Shipping document shall be made available at least two (2) weeks in advance of the arrival of the vessel at the port entry. They shall not be forwarded through a bank necessitating payment before the documents are surrendered by the purchaser. Documents forwarded in this manner will not be collected by the purchaser. Any claim, demurrage etc. arising from delay in collecting shipment documents from the bank shall be payable by the contractor.
- 1.31.7 After shipment is effected, the following documents shall be forwarded direct to the purchaser by the first and second registered airmail:
- (a) Bill of loading in original and to non-negotiable copies.
  - (b) F.O.B. invoices in six triplicate for customs purchase.
  - (c) Packing list in six duplicate.
  - (d) Certificate of original in triplicate.
  - (e) Acceptance Certificate by the purchaser in triplicate.
- 1.31.8 When the equipment is imported, the manufacturer is to intimate atleast two (2) months in advance the size of over dimensioned packages to enable Nigam for arranging special wagons and obtaining railway permission including arrangement of special handling equipment.

### **1.32 INSURANCE:**

- 1.32.1 On receipt of an order the supplier shall be required to get' material / equipment fully insured from General Insurance Corporation of India or any other insurance company against loss, damage and / or pilferage in transit, from the place of dispatch to the destination and for a further period of thirty (30) days towards storage after receipt of material / equipment at destination. The insurance could be done through the underwriters by the supplier provided that the charges are lower than those of Insurance Companies.
- 1.32.2 The supplier shall be responsible for safe arrival at destination and receipt of the material/equipment by the consignee (s).
- 1.32.3 In case of any loss / damage / pilferage, etc. the supplier shall replace free of cost such missing /damaged or lost material on receipt of the report thereof from the consignee(s). Such reports shall be made to the supplier by the consignee(s) within a period of thirty (30) days from the date of receipt of each consignment by him / them.
- 1.32.4 The replacement of shortages / damages / losses shall be dispatched or defects rectified at the consignee (s) stores within a period of thirty (30) days or mutually agreed period from the date of such report failing which the purchaser reserves the right to forfeit security deposit and / or operate the performance security if any, and / or take any other appropriate action as may be expedient.
- 1.32.5 The defective damaged material/equipment shall be returned to the supplier at his cost only after replacement, thereof, have been arranged to the satisfaction of the consignee(s) / purchaser.
- 1.32.6 In case, the damaged / defective material/equipment or part thereof warrants return to the supplier's work for necessary rectification, the supplier may be required to furnish a bank guarantee from any scheduled bank equivalent to the value of such material plus taxes as claimed by the supplier and the amount already paid for. The period for return of rectified material/equipment as well as validity of the bank guarantee, shall be as mutually agreed upon and any time taken beyond the aforesaid period shall be treated as delay in delivery in terms of clause No.1 .24 of this specification.
- 1.32.7 If the supplier /contractor has not incurred the cost towards insurance charges, the payment towards insurance charges will not be paid.

### **1.33 DELIVERY, CUSTOMS, OCTROI, DUTIES ETC. :**

- 1.33.1 The period of delivery will be a factor in deciding the award of the contract and timely delivery to meet the schedules is of vital importance.
- 1.33.2 The contract prices shall include the cost of delivering the whole of the equipment F.O.R. consignee /railway station / siding, inclusive of packing anywhere in Rajasthan.

1.33.3 The contract prices shall include all incidental and statutory charges, loading and unloading, freight, customs, duty clearance, octroi, terminal taxes, corporation and municipal taxes(if any) leviable at destination.

1.33.4 GOODS AND SERVICE TAX (IGST/CGST & SGST):

The payment of Goods and Service Tax (IGST/CGST & SGST) shall be made only on furnishing the following certificate which may be affixed on the bills preferred or the material supplied.

Goods and Service Tax (IGST/CGST & SGST) Certificate

- (i) Certified that the goods on which GST (IGST/CGST & SGST) has been charged have not been exempted under the applicable GST law and that the charges on account of GST on these goods are correct under the provisions of the relevant act or the rules made there under and the GST has been deposited by us to the related authority. Nigam will not be responsible for the payment of GST to the related authority.
- (ii) Certified further that we \_\_\_\_\_are registered under GST as dealers in the state of \_\_\_\_\_under registration No. \_\_\_\_\_ for the purpose of GST (IGST/CGST & SGST).

**1.34 TESTS AT SITE:**

1.34.1 In all cases where the contract provides for tests at the site, the contractor except where otherwise specified, shall provide free of charge such labour materials, electricity, fuel, water stores, apparatus and instruments as may be required from time to time as may reasonably be demanded to carryout efficiently such tests of the material or workmanship in accordance with the contract.

1.34.2 In case of contractor requiring electricity for test at site, such electricity shall be supplied to the contractor in the convenient form available, on payment, except specifically exempted

1.34.3 Purchaser reserves the right to carry out any site tests he may decide upon at his own expenses. In case equipment / material is not found as per purchase order all expenses incurred during the testing will be to supplier's account and material shall be replaced by supplier at site free of cost.

**1.35 TEST ON COMPLETION:**

Where possible all tests shall be carried out before shipment should however, if become necessary for the final tests as to performance and guarantees to be held over until the plant is erected at site, they shall be carried out in the presence of the contractor's representative within such time as may be considered reasonable by the purchaser. If equipment fails to meet guarantees, the contractor shall make necessary changes and corrections and assure full responsibility and take necessary steps to ensure compliance by the equipment of the prescribed guarantees within two (2) months from the date of notification or within such reasonable time as may be decided by the purchaser. If however the defect is of the contractor, he shall repay to the purchaser all reasonable expenses which he may put by such retests over and above the rejection of defective plant as stated hereunder.

**1.36 REJECTION OF DEFECTIVE PLANT:**

1.36.1 If the complete plant or any portion thereof, before it is taken over is found defective or fails to fulfill the requirements of the contract, the Engineer shall give the contractor, the particulars of such defects or failure and the contractor shall forthwith make the defective plant good or after the same, make it comply with the requirements of the contract. Should he fail to do so within a reasonable time, purchaser may reject and replace at the cost of the contractor, the whole or any portion of the plant, as the case may be, which is defective or fail to fulfill the requirement of the contract. Such replacement shall be carried out by the purchaser within a reasonable time and at a reasonable price and where reasonably possible to the same specification and under competitive conditions. In case of such replacement by the purchaser, the contractor shall be liable to pay to the purchaser, the extra cost if any of such replacement delivered and / or erected as provided for the original contract, such extra cost being the ascertained difference between the price paid by purchaser under the provisions above mentioned, for such replacement and the contract price for the plant so

replaced and also to repay the sum paid by the purchaser to the contractor in respect of such defective plant. The purchaser shall have the right to operate any and all equipment as soon as and as long as it is in operating conditions, whether or not such equipment has been accepted and complete and satisfactory, except that this shall not be constructed to permit operation of any equipment which may become damaged by such operation before any required alterations or repairs have been made. All repair and alterations required of the contract shall be made by the contractor at such times as directed and in such manner as will cause the minimum interruption in the use of the equipment by the purchaser. If the contractor does not so, replace the rejected plant within a reasonable time the contractor's full and extreme liability under this clause will be satisfied by the repayment of all money paid by the purchaser to him in respect of such plant.

- 1.36.2 In the event of such rejection the purchaser shall be entitled to the use of the plant in a reasonable and proper manner for a time reasonably sufficient to enable him to obtain other replacement plant. During the period the rejected plant is used commercially, the contractor shall not be entitled to a sum as payment of such use.
- 1.36.3 Nothing in this clause shall be deemed to deprive the purchaser for or affect any rights under the contract which he may otherwise have in respect of such defects of deficiencies or in any way relieve the contractor from his obligation under the contract.

**1.37 LATENT DEFECTS:**

- 1.37.1 Any equipment or part thereof that develop defects not disclosed prior to the final acceptance by the purchaser or they are in service upto stipulated guarantee period, shall be promptly replaced by the supplier free of charge and all expenses, transportation and other incidental charges for such replacement shall be borne by the supplier.

**1.38 TAKING OVER:**

- 1.38.1 Where the specification calls for performance tests before shipment and which have been successfully carried out, the plant shall be accepted and taken over when it has been satisfactorily put into operation on site or within one (1) month of its being ready to be put into operation whichever shall be earlier and the Engineer shall forthwith issue a taking over certificate.
- 1.38.2 In the event of final, any outstanding tests being held over until the plant is erected, such taking over certificate shall be issued subject to the results of such final or outstanding tests to be carried out in accordance with clause 1.35.
- 1.38.3 When the specification calls for tests on site, the plant shall be taken over and the taking over certificate is issued immediately after such tests have been satisfactorily carried out.
- 1.38.4 If for any reason other than the default of the contractor such last mentioned tests on site are not carried out within one (1) month of notice by the contractor to the purchaser, of the plant being ready for test, the plant shall be deemed to have been taken over as on the last day of such period and payments due to the contractor on taking over shall be made, but nevertheless, the contractor shall if called upon to do so by the purchaser, at the purchaser's expense make the said tests during the maintenance period and accept as aforesaid under the same obligation as specified in clause 1.35.
- 1.38.5 The Engineer shall not delay the issue of any taking over certificate contemplated by this clause on account of minor deficiencies of material or defects in the plant which do not materially effect the commercially safe and efficient use thereof, provided that the contractor shall undertake to make good the same in due course.
- 1.38.6 Such certificate, however, shall be deemed to be on account and shall in no way release the contractor from his liabilities and responsibilities in respect of such plant including the satisfactory performance of the test on completion.

**1.39 LIABILITY FOR ACCIDENTS AND DAMAGES:**

- 1.39.1 The contractor shall be responsible for loss, damage or depreciation of the plant until the same is taken over under clause 1.38 or is deemed under that clause to have been taken over provided always that the contractor shall not be responsible for any such loss, damage and depreciation occurring during such period that the plant is operated by the purchaser's staff prior to being taken over in accordance with clause 1.38.
- 1.39.2 Until the plant is taken over or is deemed to have been taken over as aforesaid, the contractor shall also be liable for and shall indemnify the purchaser in respect of all injury to person or damage to property resulting from the negligence of the contractor or his workman or sub-contractor or from defective design or work but not from any other cause.
- 1.39.3 Provided that the contractor shall not be liable for any loss of contract or any other claim made against the purchaser not already provided for in the contract, not for any injury or damage caused by or arising from the acts of the purchaser or of any other person due to circumstances over which the contractor has no control, he shall bear his total liability for loss, damage or injury under this clause exceed the total value of the contract.
- 1.39.4 The contractor will indemnify and save the purchaser harmless against all actions, suits, claims, demands, costs or expenses arising in connection with injuries (other than such as may be attributable to the purchaser or his employees) suffered prior to the date when the plant shall have been taken over under clause 1.38 hereof by person employed by the contractor or his sub-contractor on the work, whether at common law or under the Workmen's Compensation Act, 1923, or any other statute in force at the date of contract relating to the question of liability of employees for injuries suffered by employees and will if called upon to do so take out the necessary policy or policies of insurance to cover such indemnity.

**1.40 MAINTENANCE AND GUARANTEE:**

- 1.40.1 Whether or not the equipment has been installed under his supervision, the contractor shall give the following guarantees in respect of the equipment to be furnished by him:-
  - (a) All equipment shall be free from any defect due to faulty design, material and/or workmanship;
  - (b) The equipment shall operate satisfactorily and reliably and the performance and efficiency of the equipment shall not be less than the respective guarantee values.
- 1.40.2 The contractor/supplier shall guarantee among other things the following:
  - (i) Quality and strength of the material(s) used together with workmanship and finish corresponding to the most modern practice(s).
  - (ii) Safe electrical and mechanical stresses on all parts of the equipment under all specified conditions.
  - (iii) Performance figures in respect of guaranteed technical particulars as finally agreed upon.
  - (iv) Satisfactory performance of material/equipment during the guarantee period.

Should the factory test(s) carried out at site arranged by the purchaser in exercising his option under clause No.1.27.12 on the material/ equipment/plant or part thereof for its/their operation under service conditions for a period of guarantee as specified, show that the material/plant/equipment does not meet these guarantees as aforesaid, it shall be optional for the purchaser to reject the material/plant(s)/equipment or part thereof and direct the supplier to at once rectify/replace the material/plant/equipment so rejected so as to make it meet the guarantee of equipment, to the satisfaction of the purchaser. All expenses in this connection shall be borne by the supplier.

The replacement/rectification carried out in accordance with clause No. 1.32 (4 to 6),

The performance period for the items indicated below shall be considered as indicated against each.

- i) Transformer (including station Transformer) and Control & Relay Panels:  
36 months from the date of supply of last consignment or 30 months from the date of commissioning whichever is earlier.
- ii) Capacitor Banks, Battery set: 60 months from the date of receipt of consignment at site.

- iii) Battery charger, LT Panel, DC control & distribution board: 24 months from the date of supply of last consignment.
- iv) Testing and measuring Instruments-24 months from the date of supply.
- v) Other Items: 18 months from the date of supply of last consignment or 12 months from the date of commissioning whichever is earlier unless otherwise specified

1.41 **MODE OF GUARANTEE:**

1.41.1 In order to ensure compliance of the provisions contained in clause No.1.40 the contractor shall be required to furnish the following:-

(a) A manufacturer warrantee on the Rajasthan State Non-Judicial Stamp Paper for the value as required under the Rajasthan Stamp duty Act in the proforma prescribed. Such warrantee shall be attested either by a First Class Magistrate or by Notary Public.

(b) A performance security for an amount equivalent to the 5% (in case of established suppliers)/ 1% (In case of Micro, Small and Medium Scale Industries of Rajasthan)/ 2% (in case of sick industries, other than Small Scale Industries, whose cases are pending before the Board of Industrial and Financial Reconstruction (BIFR))/ 10% (in case of others)of the contract value as the case may be with validity for a period of 60 (sixty) days beyond the guarantee period, specified in clause No.1.40.2 above, the date of completion of all contractual obligations of the bidder including warranty obligations and defect liability period. However, the contractor may adopt the option, after approval of purchaser, to withheld required amount in lieu of performance security from each bill on pro-rata / proportionate basis.

**The Departments/Boards of the State Government or central Government; Government Companies as defined in clause (45) of section 2 of the Companies Act, 2013; Company owned or controlled, directly or indirectly, by the Central Government, or partly by the Central Government and partly by one or more State Governments which is subject to audit by the Auditor appointed by the Comptroller and Auditor General of India under sub-section (5) or (7) of section 139 of the Companies Act, 2013; or Autonomous bodies, Registered Societies, Cooperative Societies, Cooperative Societies which are owned or controlled or managed by the State Government or Central Government are exempted from furnishing of performance security, however they are required to furnish performance security declaration.** In case of Micro, Small and Medium Scale Industries of Rajasthan the amount of performance security shall be 1 (one) percent, of the amount of quantity ordered for supply of goods and in case of sick industries, other than Small Scale Industries, whose cases are pending before the Board of Industrial and Financial Reconstruction (BIFR), it shall be 2(two) percent of the amount of supply order. The Micro, Small and Medium Scale Industries of Rajasthan and sick industries, other than Small Scale Industries, whose cases are pending before the Board of Industrial and Financial Reconstruction (BIFR) shall furnish self-attested documentary evidence to claim the above.

1.41.2 Performance security shall be furnished in any one of the following forms-

- (a) Bank Draft or Banker's Cheque of a scheduled bank payable in the name of Accounts Officer (P&C-I), RVPN Ltd., Jaipur payable at Jaipur;
- (b) National Savings Certificates and any other script/instrument under National Savings Schemes. They shall be accepted at their surrender value at the time of bid and formally transferred in the name of Accounts Officer (P&C-I), RVPN Ltd., Jaipur with the approval of Head Post Master;
- (c) Bank guarantee/s in prescribed proforma of any scheduled bank in India on the Rajasthan State Non-Judicial Stamp Paper for the value as required under the Rajasthan Stamp duty Act, duly authenticated by a 1st Class Magistrate or Notary Public or directly confirmed by the issuing banker along with a certificate with regard to stamp duty, shall be furnished
- (d) Fixed Deposit Receipt (FDR) of a scheduled bank. It shall be in the name of Accounts Officer (P&C-I), RVPN Ltd., Jaipur and discharged by the bidder in advance. The Fixed Deposit

Receipt shall be accepted after ensuring that the bidder has furnished an undertaking from the bank to make payment/premature payment of the Fixed Deposit Receipt on demand to the Accounts Officer (P&C-I), RVPN Ltd., Jaipur without requirement of consent of the bidder concerned.

In the event of forfeiture of the performance security, the Fixed Deposit shall be forfeited along with interest earned on such Fixed Deposit.

- 1.41.3 The supplier shall have to extend the validity period of the bank guarantee if required on intimation from the purchaser. Such bank guarantee should remain valid upto the last day of the calendar month and be furnished in whole rupees.
- 1.41.4 If for rectification or replacement of any part of equipment for work due to defective materials, manufacturer or design, the service of the contractor's personnel are requisitioned within the guarantee period, these services shall be made available free of any cost to purchaser.
- 1.41.5.1 If it becomes necessary for the contractor to replace or renew any defective parts of the plant under this clause, the provision of this clause shall apply to the parts of the plant so replaced or renewed until the confirmation of six (6) months from the date of such replacement or renewal or until the end of the guarantee period, specified in clause No.1.40.2 above, whichever may be later. If any defect is not remedied within a reasonable time, the purchaser may proceed to do the work at the contractor's risk and expenses, but without prejudice to any other right which the purchaser may have against the contractor in respect of such defects.
- 1.41.5.2 In case of Transformer (including Station Transformer) and Control Relay panels:
- (a) If it becomes necessary for the contractor to replace or renew any defective parts of the plant/equipment under this clause, the provision of this clause shall apply to the parts of the plant/equipment so replaced or renewed until the confirmation of six (6) months from the date of such replacement or renewal or until the end of the above mentioned period of thirty (30) months after commissioning whichever may be later.
  - (b) If it becomes necessary for the contractor to replace or renew of the failed plant/equipment under this clause the provision of this clause shall apply to the plant/equipment so replaced or renewed until the confirmation of eighteen (18) months from the date of such replacement or renewal or until the end of the above mentioned period of thirty (30) months after commissioning whichever may be later.
- 1.41.6 If the replacement or renewal are of such character as may affect the efficiency of the plant, the purchaser shall have the right to give to the contractor within one (1) month of such replacement or renewal, notice in writing that "tests on completion" be made in which case such tests shall be carried out as provided in clause 1.34 and 1.35 hereof the cost of the tests payable by either parties shall be mutually decided and the decision of the Chief Engineer (Proc.) shall be final and binding.
- 1.41.7 All replacement or renewals to be carried out by the contractor during the maintenance period shall be subject to such clause of these general conditions as may be considered reasonable by the Engineer.
- 1.41.8 Until the final certificate has been issued, the contractor shall have the right to entry at his own risk and expense by himself or his duly authorized representative whose name shall have previously been communicated in writing to the Engineer at all reasonable working hours upon necessary parts of the works for the purpose of inspecting the working and the records of the plant and taking notice there from any if he desires at his own expense making any tests, subject to the approval of the Engineer, that will not be unreasonably withheld.
- 1.41.9 The issue of Engineer's certificate referred to in clause 1.27.7 shall in no way exempt the contractor from the provisions of this clause.
- 1.41.10 At the end of the maintenance and guarantee period, the contractor's liability ceases. In respect of goods not covered by the first sentence of this clause, the purchaser shall be entitled to the benefit of any guarantee given to the contractor by the original supplier of manufacturer of such goods.
- 1.41.11 The contractor shall indemnify the purchaser against any infringement of patent rights.

1.41.12 If the supplier fails or neglect to observe or perform any of his obligation under the contract, it will be lawful for the purchaser to forfeit either in whole or in part in his absolute discretion the performance security furnished by the supplier.

**1.42 PRICES AND TERMS OF PAYMENT:**

1.42.1 The prices shall be quoted for supply and delivery of the stores/plant FOR destination. The prices shall be quoted in Indian Currency "Rupees only" on variable/firm basis.

1.42.2 In case of price variation clause quoted by the bidders the basic prices for materials and labour, and the alterations in the prices due to change in the price of basic material and labour shall be clearly stated in the bid. The bidder shall also state the official authority for the basis of raw materials and labour given in the bid and any alteration in the basic price should be based on such official authority's publication.

1.42.3 The price shall be quoted for plants of Indian manufacturer only, however if due to unavoidable reasons some imported components are required, the contractor/supplier shall indicate the foreign currency required for import of the components with CIF value, rate of customs duty and exchange.

1.42.4 The contractor/supplier shall be entitled to receive payment for imported materials at the exchange rate prescribed by Government of India at the time of bid.

1.42.5 Bill shall be presented by contractor/supplier for each item of work separately as per schedule of prices. Subject to any deduction which the purchaser may be authorised to make in accordance with the terms of the contract, the contractor shall on presentation of bills and the certificate of the Engineer, be entitled to payment generally as follows :

- (i) 95% payment of the cost of each consignment in case of established suppliers, 99% payment of the cost of each consignment in case of Micro, Small and Medium Scale Industries of Rajasthan, 98% payment in case of sick industries other than Small Scale Industries whose cases are pending before the Board of Industrial and Financial Reconstruction (BIFR) and 90% payment in case of others plus 100% taxes & duties, if payable extra, shall be made against receipted challans through Bank or directly.
- (ii) The balance payment (5% / 1% / 2% / 10% as the case may be) after ascertaining satisfactory performance of the material/equipment for the guarantee period specified in clause No.1.40.2 above, subject to completion of the contractual formalities incorporated in the purchase order and after effecting recovery of all dues from the firm/contractor under the contract.
- (iii) In case there is reason to believe that the suitability of supplies of stores can be determined by inspection of material after receipt of the same by the consignee without waiting for performance, the last balance payment (5% / 1% / 2% / 10% as the case may be) may be considered to be released after expiry of 30 days from receipt of material by consignee subject to completion of other contractual formalities. etc.
- (iv) In case the condition of the successful bidder for furnishing a performance security from a nationalized /scheduled bank has been accepted by the competent authority/ committee, incorporation of furnishing performance security to the extent of 5% / 1% / 2% / 10% as the case may be of the contract value in the proforma as prescribed by the purchaser shall be made and in that case the balance 5% / 1% / 2% /10% payment can be considered for release earlier on completion of other contractual obligations/ formalities incorporated in the purchase order.

1.42.6 The Bank commission charges, if any, shall be borne by the supplier.

1.42.7 In the event, if the request of the successful bidder for releasing 100% value of the equipment with full amount of taxes/duties etc. against presentation of receipted challans/RR/Goods/ transport receipt of Bank approved transporters through Bank or directly is accepted by the competent Purchase Authority/Committee, subject to furnishing of performance security in prescribed proforma for a value agreed to between the purchaser and the supplier, the terms of payment clause in the purchase order shall be incorporated accordingly.



1.42.8 Suitable provisions in the purchase order shall also be incorporated for the following:-

- (a) In the event of consignment/material for which advance payment has been made is found defective/damaged/not according to prescribed specification if any, the balance payment will be withheld until the defective material has been replaced or advance payment in respect thereof recovered in full.
- (b) In case any damage, shortage etc. are noticed on receipt of material by the consignee, claims shall be lodged by the consignee(s) with the supplier under intimation to the purchaser and the payments due or the bank guarantees shall not be released till the claims are satisfactorily settled by the supplier.
- (c) As the performance security is to remain valid for the entire currency of the contract including the currency of the contract guarantee period, the supplier should be asked to get validity of the Bank Guarantee suitably extended for the amount so as to safeguard the Nigam interest to cover any extension in the delivery period or warranty period agreed upon by purchasing authority/ committee or where any claim of the Nigam against him is still pending, it shall be responsibility of the concerned purchasing officer to ensure that the Bank Guarantee is got extended in time where any officer has been made responsible for the work of Bank Guarantees, it would be the responsibility of the concerned officer to ensure that the Bank Guarantee is got extended in time wherever warranted by circumstances.
- (d) In case of defects/damages etc. are noticed at any time including the guarantee period, claims shall be lodged with the supplier to make good the defects/damages or replace the material within the reasonable period preferably not exceeding 45 days from the date of notification of defect to the supplier. The supplier failing to do so, the damages/defects may be got rectified by the Nigam and the cost be adjusted from the supplier's pending dues and/ or security deposit against this or any other contract in force and the balance if any, be made good by the supplier.

Alternatively, the Nigam may dispose of the damaged/defective material and set off the sale proceeds against its claim against the supplier.

#### **1.42.9 MODE OF PAYMENT:**

The invoices shall be correctly prepared in quadruplicate in the name of consignee(s) and shall be submitted as under:-

- (i) The invoices/ challans (PV Bills after approval PV from the purchaser) shall be correctly prepared in six copies in the name of consignee and shall be submitted to the consignee, after uploading on RVPN's Vendor Bill Tracking ("VBT") Portal, who will verify all the copies of invoices/ challans in token of acceptance of material in good condition and as per the specification. The consignee will retain one copy and endorse one copy each to Supplier, Procurement Wing and Circle Accounts Officer. Remaining two copies of receipted challans & invoices (including original challan/ bill) will be forwarded to the Sr. Accounts Officer (CPC), RVPN, Jaipur for arranging the payment to the Supplier.
- (ii) In case documents are to be sent through bank, the supplier shall be required to send the proforma invoice(s) for each consignment to the concerned Accounts Officer at least 7 days in advance of the date of the booking to enable him to arrange necessary funds.
- (iii) Following documents shall be submitted along with the invoice(s)/ proforma invoice(s).
  - (a) GST certificate as per Clause 1.33.4.
  - (b) A certificate regarding inspection in the following proforma:  
Certified that the material/equipment covered by the proforma invoice have been inspected and cleared for dispatch by the authorized representative of the purchaser (Inspector's clearance report be enclosed). The inspections for such items have been specifically waived by the purchaser Vide letter No. \_\_\_\_\_ dated \_\_\_\_\_.
  - (c) A certificate/undertaking to the effect that proof of GST (IGST/CGST & SGST) at actual has been claimed and other relevant documents for reimbursement of charges paid by the supplier on behalf of the purchaser, have been enclosed with the original invoice.
  - (d) Intimation about the dispatch of material/ equipment shall be given to the consignee(s) and the concerned Accounts Officer.

- (iv) The supplier shall intimate to the bank to convey the details of the consignment(s) to the concerned Accounts Officer.
- (v) Unless otherwise mutually agreed upon, the R.R., shall be drawn in the name of the consignee(s) and shall be dispatched immediately. Any demurrage/ wharfage charges leviable consequent upon failure of the supplier to adhere to any of the specified stipulation/procedure shall be to his account.
- (vi) In case of purchase cases for the supply of 220 kV/132 kV Towers  
“For the purpose of payment the supply of tower material shall be regulated in the following sequence:
  - i) Complete footing(stub and stub cleats)
  - ii) Complete super structures including extension & accessories.

The Sr. Accounts Officer (CPC), shall make the payment of the consignments consisting of footing/complete super structures/combination of (i) or (ii) on receipt of physically verified challans along with a certificate of receipt of material in the form of completed towers from the consignee. The unloading & stacking of the tower material at the consignee's store will be arranged by the supplier at his cost and a certificate to this effect will be attached by the supplier along with the invoice indicating details of R/R(s)/GTR(s), Challan /invoice(s), if any, which constitutes to the completion of the quantity of the structures classified above.

1.42.10 The payment of material supplied shall be made by the Sr. Accounts Officer (CPC), RVPN, Jaipur and copy of Bill along with all required documents shall be sent to him.

- a. For claiming 100% payment , completion of following formalities are essential:
  - i) Execution of contract Agreement.
  - ii) Inspection Clearance.
  - iii) Dispatch Instructions.
  - iv) Acceptance of Performance Security.
  - vi) Furnishing of Manufacturer's Warranty on non judicial stamp paper as per clause No. 1.41 of General Conditions of Contract.
  - vii) Proof of Insurance as per clause No. 1.32 of General Conditions of Contract.
  - viii) All the payment shall be made to the supplier/contractor through RTGS/NEFT/RPP for quick and safe transfer of funds across the country. The charges for transfer through RTGS/NEFT/RPP shall be on the part of the supplier/contractor. In order to make the payment through RTGS/NEFT/RPP Supplier shall furnish particulars to the Sr. Account Officer (CPC), RVPN, Jaipur in prescribed format.
- b. If the firm supplying material to the purchaser or executing any works, obtain finance from the bank by way of discounting of the bills, in such cases purchaser shall not at all be responsible for arranging the payments to bank nor shall bear any liability towards the bank in such cases. This is to safeguard interest of the RVPN against the firms/ supplier taking advantage of bank finance.
- c. The 10% payment against the supply of quantities included in the last lot as per contractual delivery schedule be made after furnishing of the complete claim for price variation along with relevant documents by the firms & cleared by the purchaser.
- d. For price variation claim the necessary calculations and authenticated documentary evidence/ proof based on IEEEMA circular(s) in support of claim shall be submitted to Purchaser for his approval. On approval of such price variation calculations the claim shall be submitted to the paying authority either separately for payment or along with despatch documents as the case may be as per applicable procedure for bill submission at that time.

### 1.43 DUE DATES OF PAYMENT:

The Payment shall be made by the payment authority as per prevailing payment policy of RVPN after receipt of the complete documents and completion of all contractual formalities as per requirement of the purchase / work order, however no interest on delayed payment shall be payable and such delay will not entitle supplier / contractor for any compensation or extension in time.

**1.44 DEDUCTION FROM CONTRACT PRICE:**

All costs, damages or expenses which the purchaser may have paid under the contract, for which the contractor is liable, may be deducted by the purchaser from any money due or becoming due by him to the contractor under this or any other contract or may be recovered by suit or otherwise from the contractor. Any sum of money due and payable to the contractor (including security deposit returnable to him) under this contract may be appropriated by the purchaser and set off against any claim of the purchaser for the payment of a sum of money arising out of or under any other contract made by the contractor with the purchaser.

- 1.44.1 The supplier shall be required to deposit the amount of recoveries finalized within a period of 30 days of receipt of intimation failing which the dues shall be recovered from the financial hold of the supplier available with the Nigam. In case, where the amount of recoveries against a firm or supplier exceed its financial hold, the Nigam will be at liberty to effect such recoveries out of the financial hold/ pending payments of the supplier available with other successor Companies of erstwhile RSEB.

**1.45 CERTIFICATES OF ENGINEER AND CERTIFICATE NOT TO EFFECT THE RIGHTS OF THE PURCHASER OR THE CONTRACTOR:**

- 1.45.1 Every application to the Engineer for a certificate must be accompanied by a detailed invoice (in quadruplicate) setting forth in the order of schedule of prices, particulars of the work executed and of the plant supplied and or plant ready for dispatch to the date of claim and the certificates as to such plant and work as in the reasonable opinion of the Engineer in accordance with the contract shall ordinarily be issued within 13 days if possible or ( for other than the first payment) within such time of the application for the same as is reasonably necessary for communication with the site.

- 1.45.2 The Engineer may make any correction or modification in any previous certificate which may have been issued by him and payment will be regulated and adjusted accordingly.

- (i) No certificate of the Engineer on account of any sum paid on account by the purchaser nor any extension of time granted under clause 1.22 shall effect or prejudice the rights of the purchaser against the contractor either under this agreement or under the law or relieve the contractor of his obligation for the due performance of the contract or be interpreted as approval of the work done or of the material supplied.
- (ii) No certificate of the Engineer shall create a liability for the purchaser to pay for any alteration, amendments, variation or additional work not ordered in writing by the Engineer or absolve the contractor of his liability for the payment of damaged whether due, ascertained or certified or any sum against the payment of which he is bound to indemnify the purchaser neither shall any such certificate nor the acceptance by him of any sum paid on account or otherwise effect or prejudice the rights of the contractor against the purchaser under the agreement under the law.

**1.46 SUB LETTING OF CONTRACT:**

The contractor shall not, without the consent in writing of purchaser, which shall not be unreasonably withheld, assign or sublet this contract or any substantial part thereof or entrust therein or benefit or advantage whatsoever other than for raw materials for minor detail or for any part of the work of which the makers are named in the contract provided that any such consent shall not relieve the contractor from any obligation, duty or responsibility under the contract.

**1.47 CORRESPONDANCE :**

- 1.47.1 The purchaser/engineer/consulting engineer shall ordinarily correspond with the bidder/contractor at the address furnished by the bidder/contractor. The bidder/contractor shall ordinarily address all correspondence intended for the purchase to the purchaser or representative who has invited bid at the address given in the bid notice.

- 1.47.2 All correspondence shall be furnished in duplicate and copies of all the correspondence shall also be endorsed in duplicate to the consulting engineer.

- 1.47.3 All correspondence pertaining to the purchase order in respect of any clarification required on the terms and conditions, dispatch instructions, contract drawing, test certificates, etc should be addressed to the purchaser.

**1.48 CO-OPERATION WITH OTHER MANUFACTURERS AND CONSULTING ENGINEER:**

- 1.48.1 The contractor shall fully co-operate with the purchaser's other contractors for associated plant and freely exchange all technical information with them to obtain the efficient and economical design to avoid unnecessary duplication of work or equivalent. No remuneration shall be payable by the purchaser for such technical co-operation.
- 1.48.2 The contractor shall also fully co-operate and carry out all reasonable direction of the purchaser's consulting engineer in technical matters but Nigam's engineer's decision shall be final. No remuneration shall be payable by the purchaser for such technical co-operation.
- 1.48.3 The contractor shall forward to the Engineer two (2) copies of all correspondence and drawings so exchanged with other contractors and the consulting Engineer for coordinating properly. The Engineer and the consulting Engineer shall be provided with two (2) copies each of all correspondence with other contractors.
- 1.48.4 If any part of the contractor's work depends for proper execution on the work of any other contractor, the contractor shall inspect and promptly report in writing to the Engineer any defects in such work that render it unsuitable for such proper execution and result. His failure to do so shall constitute an acceptance of other contractor's work as fit and proper for the execution of his work, except as to defects which may develop in the other contractor's work after the proper execution of his work.

**1.49 ENGINEER'S DECISION:**

- 1.49.1 In respect of all matters which are left to the decision of the Engineer or consulting Engineer as the case may be including the granting or withholding of certificates, the Engineer shall give in writing a decision thereon.
- 1.49.2 If the contractor neglects to execute the work with due diligence and expedition or refuses or neglects to comply with any reasonable orders given to him in writing by the Engineer in connection with the work or contravene the provisions of contract, the purchaser may give notice in writing to the contractor calling upon him to make good the failure or neglect/ contravention complained of.
- 1.49.3 Should the contractor fail to comply with such notice within a period considered reasonable by the purchaser from the date of service thereof, in the case of being made

good within the time otherwise within such time as may in the opinion of the purchaser be reasonably necessary for making it good, then and in such case the purchaser shall have the option and be at liberty to complete the work envisaged in the contract either by himself or his agents or may re-contract at reasonable price with any other person or persons to execute the same or any part thereof and provide any other materials, tools tackle or labour for the purpose of completing the works or any part thereof.

In such event the purchaser shall without being unreasonable to the contractor, for fair wear and tear of the same be entitled to exercise and take possession and have free use of all materials, tackle or other things which may be on site for use at any time in connection with the work to the exclusion or any right of the contractor over the same. The purchaser shall be entitled to retain and apply and balance sum which may otherwise be then due on the contract by him to the contractor such part thereof as may be necessary to the payment of the cost of execution of such work aforesaid.

- 1.49.4 If the cost of executing the work as aforesaid exceeds the balance due to the contractor and contractor fails to make good the defects, the said materials, tools, tackles, construction plant or

other things, the property of the contractor as may not have been used up in the completion of works may be sold by the purchaser and proceeds applied towards the payment of such difference and the cost incidental to such sale. Any outstanding balance existing after crediting the proceeds of such sale shall be indicated as balance against the contractor on the certificate of the engineer but when all expenses costs and charges incurred in the completion of the work are paid by the contractor, all such materials, tools, tackles, constructions plant or other things not used up in the completion of the works and remaining unsold shall be removed by the contractors. If the proceeds of the above sale of the contractors materials, tools, tackles, construction plant etc. are insufficient to cover the cost of executing the aforesaid work, the balance remaining after crediting the proceeds of such sale shall be recoverable from the contractor by the action of law or operating bank guarantees furnished or security deposits available with the purchaser.

#### **1.50 DEATH, BANKRUPTCY ETC.:**

1.50.1 If the contractor dies or dissolve or commit any act of bankruptcy or being a corporation commences to be wound up except for reconstruction purpose or carry on his business under a receiver, the executors, successors or other representatives in law of the state of the contractor or any such receiver, liquidator or any person to whom the contract may become vested shall forthwith give notice thereof in writing to the purchaser and shall for one (1) month during which he shall take all reasonable steps to prevent stoppage of the work have the option of carrying out the contract subject to his or their providing such guarantee as may be required by the purchaser but not exceeding the value of the work for the time being remaining relieve unexecuted provided however that nothing above said shall be deemed to relieve the contractor or his successors of his or their obligations under the contract under any circumstances. In the event of stoppage of the work the period of the option under this clause shall be fourteen (14) days only. Provided that, should the above option be not exercised, the contract may be terminated by the purchaser by notice in writing to the contractor and the same power and provisions reserved to the purchaser in clause 1.4 in the event of taking the work out of the contractor's hands shall immediately become operative.

1.50.2 Change of name of the bidder/supplier at any stage after bidding it to the purchaser, shall deal with the purchaser only in the name and at the address under which he has submitted the bid. All the liabilities/responsibilities for due execution of the contract shall be of the contractor and in no circumstances he shall be relieved of any obligation under the contract. The purchaser may, however at his discretion deal with Agents/Representatives/ Distributors/ Manufacturers/ Associates Principals/Sister Concerns and such dealing shall not absolve the supplier(s) from his responsibilities/obligations/ liabilities to the purchaser under the contract. Any change/alteration of name/constitution/ organization of the supplier shall be duly notified to the purchaser and the purchaser reserves the right to determine the contract in case of any such notification in the event of such determination the purchaser may effect the purchase of the material not supplied from elsewhere at the risk and cost of the bidder/supplier.

#### **1.51 BRIBES/COMMISSION ETC:**

Any bribes, commission, gift or advantage given, promised or offered by or on behalf of the contractor or his partners agent or servant or anyone on his or on their behalf to any officer, servant, representative or agents of the purchaser or any person on his or their behalf, in relation to the obtaining or to the execution of this or any other contract with the purchaser shall in addition to any criminal liability which he may incur, subject the contractor to the cancellation of this and all other contracts and also to payment of any loss or damages resulting from any such cancellation. The purchaser shall then be entitled to deduct the amounts so payable from any money otherwise due to the contractor under this or any other contract, any question or dispute as to the commitment of any offence under the present clause shall think fit and sufficient and his decision shall be final and conclusive.

**1.52 NOTICE TO CONTRACTOR:**

Any notice to the contractor, may if the purchaser thinks it fit, be given by registered post to the registered office/site office of the contractor. Such postings shall be deemed good service of such notice and the time mentioned in the conditions for doing any act after notice shall be reckoned from the date on which such notice should reach the contractor in normal course.

**1.53 SUPERVISION OF ERECTION OF EQUIPMENT BY THE CONTRACTOR:**

All the work shall be carried out under the direction and to the satisfaction of the Engineer. The purchaser shall have the option to direct the contractor to undertake supervision of erections of equipment, in which case he shall pay to the contractor such sums of money as may be provided under the contract. The contractor shall then be entirely responsible for satisfactory erection, testing, commissioning and maintenance of the plant, notwithstanding that he may have been assisted by the Engineer in setting out of the same.

**1.54 AFTER SALES SERVICES:**

The equipment supplied against this order shall be attended to by contractor when referred to by the purchaser at. contractor's expense within the guarantee period.

**1.55 BREAK CLAUSE:**

1.55.1 The purchaser shall in addition to his power under other clause to determine this contract, have power to terminate his liability there under at any time by giving three (3) months (or such shorter period as may be mutually agreed notice in writing to the contractor if purchaser's desire to do so upon the expiration of the notice, the contract shall be determined without prejudice to the rights of the parties accrued to the date of determination but subject to the operation of the following provisions of this clause.

1.55.2 In the event of such notice being given, the purchaser shall be entitled to exercise as soon as may be reasonably practicable within that period the following power or any of them :-

(a) To direct the contractor to complete in accordance with the contract all or any articles, parts of such articles or components in course of manufacture at the expiration of the notice and to deliver the same at such rate of delivery as may be mutually agreed on or in default of agreement at the contract rate. All articles delivered by the contractor in accordance with such directions and accepted shall be paid for at a fair and reasonable price assessed on the basis of the contract price when it exists.

(b) To require the contractor on the receipt of the notice of termination:-

(i) Immediately to take such steps as will ensure that the production rate of the articles specified in the schedule and parts thereof is reduced as rapidly as possible.

(ii) As far as possible consistent with (i) above to concentrate work on the completion of parts already in a partly manufactured state.

(iii) To terminate on the best possible terms, such order for material and parts brought out in a partly manufactured state of wholly manufactured state as have not been completed, observing in this connection any direction given under paragraph (a) and (b) (i) and (ii) above as far as this may be possible.

1.55.3 In the event of such notice being given, provided the contractor has reasonably performed all the provisions of the contract binding upon him down to the date of the notice.

(a) The purchaser may take over from the contractor at a fair and reasonable prices (assessed on the basis of the contract price) of the completed articles all unused, undamaged and acceptable materials, bought-out components and articles in course of manufacture in the possession of the contractor at the expiration of the notice and properly provided by or supplied to the contractor for

the performance of the contract except such material, bought out components and articles which the purchaser may refuse to take over shall be taken over by the contractor. Provided that in case the materials/components are supplied to the contractor through the intervention of the purchaser or on his behalf:-

The said fair and reasonable price shall be assessed on the basis of cost price of such materials and or components.

If the contractor elects to retain any materials, bought out components and articles as in this clause provided, he shall settle all claims of supplier in respect of the material and/or components supplied to him as aforesaid including any claims to any extra charge and shall keep the purchaser indemnified against the same.

(b) The contractor shall deliver in accordance with the direction of the purchaser all such unused, undamaged and acceptable materials, bought out components and articles in course of manufacture (except as aforesaid) taken over by or previously belonging to the purchaser and the purchaser shall pay to the contractor fair and reasonable handling and delivery charges thereof.

(c) The purchaser shall indemnify the contractor against any commitments, liabilities or expenditure which in the opinion of the purchaser are reasonable and properly chargeable by the contractor in connection with the contract to the extent to which the purchaser is satisfied that such commitments, liabilities or expenditure would otherwise represent an unavoidable loss by the contractor by reason of the termination of the contract.

(d) Provided that in the event the contractor not having observed any direction given to him under sub-clause (ii) hereof, the purchaser shall not be liable under this sub-clause pay any sum in excess of those for which the purchaser would have been liable and the contractor observed that direction.

1.55.4 If in any particular case, exceptional hardship arises to the contractor from the operation of this clause, it shall be open to the contractor to refer the circumstances to the Engineer who on being satisfied that such hardship exists shall make such allowance if any as in his opinion is reasonable.

1.55.5 The purchaser shall not in any case be liable to pay under the provisions of this clause or any sub clause which when taken together with any sums paid or due or becoming due to the contractor under this contract shall exceed the total prices of the articles specified in the schedule payable under the contract.

1.55.6 The contractor shall in any substantial order or sub-contract placed or made by him in connection with or for the purposes of this contract take power wherever possible by securing the acceptance of the sub-contractor to terminate such substantial or sub-contract in the event of the termination of this contract by the purchaser of this clause upon the terms of the forgoing sub clause of this clause and save only that:-

(a) The name of the contractor shall be substituted for the purchase, throughout except in sub-clause 3 (c) where it occurs for the second and third times.

(b) The period of the notice of termination shall be two (2) months or such shorter period as may be mutually agreed upon.

1.55.7 Substantial orders or sublet contracts shall in this context mean orders or sublet contracts of or over Rs. 25,000 (Rupees Twenty Five Thousand only) in value.

## **1.56 JURISDICTION OF COURT TO DEAL WITH DISPUTES:**

1.56.1 The contract shall be governed by the laws of India for the time being in force and be subject to the court of competent jurisdiction at Jaipur (Rajasthan) India. All disputes, differences, questions whatsoever arising between the purchaser and contractor upon or in relation to or in connection with the contracts shall be deemed to have arisen at Jaipur only and no court other than courts at Jaipur (Rajasthan) shall have jurisdiction to entertain or try the same.

1.56.2 A settlement committee has been constituted by the Nigam to settle the old disputed purchase cases where the firm(s) do not agree with the Nigam's viewpoint and have given their representations.

The settlement committee will be empowered to decide all old disputed cases. The committee is also authorized to settle such cases which are either sub-judice or under reference to arbitrator(s), in case firm make formal request in this regard. In case of disagreement amongst committee members, the case with full details shall be put-up before Chairman & Managing Director for decision.

1.56.3 The RVPN has constituted the centralized standing committee for settlement of disputed claims under conditions of contract relating to RVPN.

The committee shall consider all cases for settlement of disputed claims relating to purchases, works, turnkey contracts and labour contracts, civil works etc. The committee shall also take decision whether a particular matter is required to be referred to the Board for approval before settlement. The matter for settlement shall only be referred to the centralized standing committee of RVPN by following the guide lines detailed below:

Disputes will be referred contract wise.

Disputes involving amount above Rs.1.00 lacs only will be referred / entertained.

Non-refundable fee shall be deposited by the contractor / firm @ 2% of disputed amount as claimed by the contractor/firm subject to maximum fee of Rs.1.00 lac with applicable GST.

In case of disputes, Application for settlement (only in prescribed format) may be collected from the purchaser office.

The centralized standing committee fees shall be deposited in cash/ demand draft/ pay order with the Account Officer (P&C-I), RVPN, Jaipur and the firm(s)/Contractor(s) shall furnish receipt thereof with a request for referring their disputes to the centralized standing committee for decision.

For settlement, the firm shall furnish their application (only in prescribed format) indicating the details of dispute/grievances along with requisite settlement fee, within a period of six months, after receiving communication from Procurement Wing giving rise to cause of dispute/ grievances.

In case, RVPN revises the settlement application fees, then revised fees shall be applicable.

#### **1.57 CONSTRUCTION OF CONTRACT:**

The contract shall in all respects be deemed to be and shall be constructed and shall operate as on Indian contract as defined in the Indian Contract Act, 1872 and all payments there under shall be made in Rupees unless otherwise specified.

#### **1.58 ACCEPTANCE OF THE ORDER:**

The acceptance of the order shall be conveyed to the Superintending Engineer (PROC-I/II) Rajasthan RajyaVidhyutPrasaran Nigam Ltd., Jaipur within ten (10) days of the receipt of the order in the prescribed proforma failing which it will be presumed that the terms and conditions incorporated in the order have been accepted by the supplier/contractor.

#### **1.59 PRICE FALL CLAUSE**

The price fall clause shall be made applicable w.e.f. the date of opening of 'Techno-Commercial Bid' of the subsequent bid when the supplies under the running contracts, are delayed beyond the overall stipulated delivery schedule provided that the supplier itself has quoted or accepted lower rates in the subsequent bid of the same item **in the state**. In other cases, the price fall clause shall be made applicable w.e.f. the date of opening of 'price bid' of the subsequent bid of the same item. If the bidder does not agree for lower rates finalized in subsequent bid, the remaining supplies of running contracts at higher rates as on the date of price bid opening of the subsequent bid will be cancelled as per provisions of price fall clause.

If the stipulated delivery schedule of the running contract expires on the date of opening of techno commercial bid of subsequent bid or thereafter before opening of price bid and bidder himself have quoted lower rates in subsequent bid, in that case the delayed-supplies made during the period of techno-commercial bid opening date and price bid opening date of subsequent bid will be paid at such lower rates if any, as are quoted /accepted by him (whichever is lower) in subsequent bid as against current contract price minus recovery towards delay in delivery, if it is so economical to RVPN Payment equivalent to 10% of the FORD price of the delayed supplies will be withheld till finalization of price of subsequent bid.



1.59.1 In case delivery schedule is already over:- The pending supplies against previous order w.e.f. the date of opening of techno commercial bid or price bid of subsequent bid as per preceding para shall be accepted at such lower rate, if any, as are quoted/finalized in subsequent bid as against subtracting recovery towards delay in delivery on old rate, if it is so economical and the bidder agrees to it. If they are not agreeable, supply shall not be taken and order for balance supply shall be cancelled as per provision of the purchase order.

1.59.2 When delivery schedule is not over:-

(a) If any previous successful bidder has also participated in a new bid enquiry and accepted the lower rate as received in the subsequent bid then pending supply against previous order shall be taken at the lower rate as is finalized in the subsequent bid.

(b) If the supplier has not participated or participated but he is not agreeable to supply the balance quantity at lower rate received in the subsequent bid, the balance supply against previous order shall be acceptable to the extent of ordered quantity as per delivery schedule up to three months (but not beyond the overall delivery schedule) from the date of opening of price bid of new bid on the following conditions:-

1. The rate will be as per the purchase order against which supplies are to be made within the delivery schedule.
2. The back log, if any, of supplies according to delivery schedule on the date of opening a new bid shall be acceptable on effecting the recovery towards delay in supply at prescribed rates, if leviable under the circumstances.
3. No supply in excess of quantity as per the delivery schedule during the 3months period after opening of "Price bid" of new bid shall be acceptable in any circumstances. No preponment of original delivery schedule will be made.
4. The old purchase order(s) in respect of balance un-supplied quantity shall stand cancelled after 3 months from the opening of "Price bid" of new bid.

1.59.3 (a) If subsequent bid is decided on differential rates and a firm has also participated in subsequent bid, the price fall clause would be applicable with respect to the pricequoted/accepted by the firm in the new bid provided this quoted / accepted price is lower than firm's previous updated price minus recovery towards delay in delivery.

(b) In case, firm has not participated or not agreed to lower rates in subsequent bid, then price fall clause would be applicable with respect to highest differential price, decided under new bid, provided this highest price is lower than firm's previous updated price minus recovery towards delay in delivery.

1.59.4 **Deleted**

1.59.5 **Deleted**

1.59.6 If the material has been got inspected and cleared for dispatch within overall delivery schedule of total ordered quantity but material is not received at site within overall delivery schedule and techno-commercial bid/price bid of subsequent bid has been opened before or during this intervening period, then price fall clause shall not be made applicable on such supplies.

NOTE: -For the operation of price fall provision, the rates decided for procurement of material with World Bank assistance will not be considered.

## 1.60 DEFERMENT OF DELIVERY:

Supplies due for delivery by a supplier against any purchase order can be deferred with the approval of whole time directors in unforeseen or unavoidable circumstances or force majeure conditions. During deferment, if there happens any price escalation, the same shall be considered a price variation clause if so provided in the purchase order. For deferment of supply, a seven days notice shall be served upon the supplier by the purchase officer. One month notice shall also be served for

lifting the deferment intimating the date of deferment being lifted. Extension in delivery period equal to the period of deferment shall be allowed.

**1.61 DEBARMENT FROM BIDDING:**

- 1.61.1 A bidder shall be debarred from participating in any procurement process for a period not exceeding three years commencing from the date on which he was debarred:
- a) if he has been convicted of an offence under the prevention of corruption Act, 1988 (Central Act No, 49 of 1988); or
  - b) if he has been convicted of an offence under the Indian Penal Code, 1860 (Central Act No,45 of 1860) or any other law for the time being in force, for causing any loss of life or property or causing a threat to public health as part of execution of a public procurement contract; or
  - c) a bidder has breached the code of integrity prescribed in terms of Code of integrity for bidder' specified in ITB; or
- 1.61.2 A bidder may be debarred from participating in any procurement process for a period not exceeding three years commencing from the date on which he was debarred, where the entire bid security or the entire performance security or any substitute thereof, as the case may be, of a bidder has been forfeited by the procuring entity in respect of any procurement process or procurement contract.
- 1.61.3 The procuring entity shall not debar a bidder under this clause unless such bidder has been given a reasonable opportunity of being heard.

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**VOLUME-I**  
**PART-IV**  
**SPECIAL CONDITIONS OF CONTRACT (SCC)**

The following bid specific data for the Plant and Equipment to be procured shall amend and/or supplement the provisions in the General Conditions of Contract (GCC):

S.No.	GCC Clause Ref. No.	Bid Data Details
1.	GCC 1.41.1(b)	<p>May be read as:</p> <p>A performance security for an amount equivalent to the 2.5% (in case of established suppliers)/ 0.5% (In case of Micro, Small and Medium Scale Industries of Rajasthan)/ 1% (in case of sick industries, other than Small Scale Industries, whose cases are pending before the Board of Industrial and Financial Reconstruction (BIFR))/ 5% (in case of others) of the contract value as the case may be with validity for a period of 60 (sixty) days beyond the guarantee period, specified in clause No.1.40.2 above, the date of completion of all contractual obligations of the bidder including warranty obligations and defect liability period. However, the contractor may adopt the option, after approval of purchaser, to withheld required amount in lieu of performance security from each bill on pro-rata / proportionate basis.</p> <p>The Departments/Boards of the State Government or central Government; Government Companies as defined in clause (45) of section 2 of the Companies Act, 2013; Company owned or controlled, directly or indirectly, by the Central Government, or partly by the Central Government and partly by one or more State Governments which is subject to audit by the Auditor appointed by the Comptroller and Auditor General of India under sub-section (5) or (7) of section 139 of the Companies Act, 2013; or Autonomous bodies, Registered Societies, Cooperative Societies, Cooperative Societies which are owned or controlled or managed by the State Government or Central Government are exempted from furnishing of performance security, however they are required to furnish performance security declaration. In case of Micro, Small and Medium Scale Industries of Rajasthan the amount of performance security shall be 0.5 (Half) percent, of the amount of quantity ordered for supply of goods and in case of sick industries, other than Small Scale Industries, whose cases are pending before the Board of Industrial and Financial Reconstruction (BIFR), it shall be 1(One) percent of the amount of supply order. The Micro, Small and Medium Scale Industries of Rajasthan and sick industries, other than Small Scale Industries, whose cases are pending before the Board of Industrial and Financial Reconstruction (BIFR) shall furnish self-attested documentary evidence to claim the above.</p> <p><b>Note: In case of the total procured value is less than the awarded value of rate contract, the successful Bidder shall be allowed to reduce the performance security accordingly on successful execution.</b></p>
2.	GCC 1.42.5	<p>May be read as:</p> <p>Bill shall be presented by contractor/supplier for each item of work separately as per schedule of prices. Subject to any deduction which the purchaser may be authorised to make in accordance with the terms of the contract, the contractor shall on presentation of bills and the certificate of the Engineer, be entitled to payment generally as follows :</p> <p>(i) 97.5% payment of the cost of each consignment in case of established suppliers, 99.5% payment of the cost of each consignment in case of Micro, Small and Medium Scale Industries of Rajasthan, 99% payment in case of sick industries other than Small Scale Industries whose cases are pending before the Board of Industrial and Financial Reconstruction (BIFR) and 95% payment in case of others plus 100% taxes &amp; duties, if payable extra, shall be made against received challans through Bank or directly.</p> <p>(ii) The balance payment (2.5% / 0.5% / 1% / 5% as the case may be)after ascertaining satisfactory performance of the material/equipment for the guarantee period specified in clause No.1.40.2 above, subject to completion of the contractual formalities incorporated in the purchase order and after effecting recovery of all dues from the firm/contractor under the contract.</p> <p>(iii) In case there is reason to believe that the suitability of supplies of stores can be determined by inspection of material after receipt of the same by the consignee without waiting for performance, the last balance payment (2.5% / 0.5% / 1% / 5% as the case may be) may be considered to be released after expiry of 30 days from receipt of material by consignee subject to completion of other contractual formalities. etc.</p> <p>(iv) In case the condition of the successful bidder for furnishing a performance security from a nationalized /scheduled bank has been accepted by the competent authority/ committee, incorporation of furnishing performance security to the extent of 2.5% / 0.5% / 1% / 5% as the case may be of the contract value in the proforma as prescribed by the purchaser shall be made and in that case the balance 2.5% / 0.5% / 1% /5% payment can be considered for release earlier on</p>

S.No.	GCC Clause Ref. No.	Bid Data Details
		completion of other contractual obligations/ formalities incorporated in the purchase order.
3.	--	<p><b>Additional Performance Security-</b></p> <p>(1) In addition to Performance Security as specified in GCC clause No. 1.41.1 an Additional Performance Security shall also be taken from the successful bidder in case of unbalanced bid. The Additional Performance Security shall be equal to fifty percent of Unbalanced Bid Amount. The Additional Performance Security shall be deposited in lump sum by the successful bidder before execution of Agreement. The Additional Performance Security shall be deposited through e-Grass, Demand Draft, Banker's Cheque, Government Securities or Bank Guarantee.</p> <p><b>Explanation :</b> For the purpose of this rule,-</p> <ul style="list-style-type: none"> <li>(i) Unbalanced Bid means any bid below more than fifteen percent of Estimated Bid Value.</li> <li>(ii) Estimated Bid Value means value of subject matter of procurement mention in bidding documents by the Procuring Entity.</li> <li>(iii) Unbalanced Bid Amount means positive difference of eighty five percent of Estimated Bid Value minus Bid Amount Quoted by the bidder.</li> </ul> <p>(2) The Additional Performance Security shall be refunded to the contractor after satisfactory completion of the entire work. The Additional Performance Security shall be forfeited by the Procuring Entity when work is not completed within stipulated period by the contractor.</p>
4	1.42.8 (e)	<p>The following clause is added:-</p> <p>In case of defects/damages noticed during guarantee period are not rectified by the supplier within 45 days from the date of intimation of such defects/damages by the consignee/purchaser through registered letter or email /toll free number available on the name plate of the equipment, penalty @ 0.5% per week or part thereof for delay in rectification of the defects/damages subject to maximum 5% of the unit ex-works price of the defective equipment will be levied during the whole guarantee period.</p> <p>If the defects/damages is required to be rectified at manufacturer's works, the lifting permission will be sought by the supplier within a period of 45 days along with security bank guarantee (lifting BG) equivalent to the cost of the equipment failing which the supplier will be liable to pay penalty as detailed above. After rectification of the defects/damages and required inspection/testing, the equipment will be delivered anywhere in the Rajasthan as per dispatch instructions issued by the purchaser within mutually agreed time period as given in the lifting permission issued by the purchaser failing which the supplier will be liable to pay penalty as detailed above beyond the time period allowed in the lifting permission.</p> <p>The above penalty shall be in addition to, and without prejudice to, the other rights and remedies provided under this agreement.</p>

**VOLUME-I  
PART-V  
ERECTION CONDITIONS OF CONTRACT (ECC)**

**DELETED**

**PART-VI**  
**(BID PROPOSAL FORM, ANNEXURES, SCHEDULES)**

**BID PROPOSAL FORM**

The Superintending Engineer (Proc.-II),  
RVPN, Gate #3, Old Power House Premises,  
Banipark, Jaipur-302006

Dear Sirs,

With reference to your invitation to bid against specification No. RVPN/SE/ Proc-II/ XEN-IV/ AEN-III / BN-9016002228, we agree to supply the following quantities.

S. No.	Particulars	Bid Tentative / Approx. Quantity in Nos.	Whether quoted
1	220 kV Feeder Control & Relay Panels (Type A-II)	11	Yes/No
2	220 kV Transformer Control & Relay Panels (Type B-II)	07	Yes/No
3	220 kV Bus Coupler Control & Relay Panels (Type C-II)	03	Yes/No
4	132 kV Feeder Control & Relay Panels (Type J-II)	71	Yes/No
5	132 kV Transformer Contro& Relay Panels (Type K-II)	07	Yes/No
6	132 kV Transformer Contro& Relay Panels (Type K-III)	69	Yes/No
7	132 kV Bus Coupler Control & Relay Panels (Type L-II)	24	Yes/No

Note: The bidder shall quote item wise full NIB quantity failing which the offer will be considered non responsive.

We also agree that:

1. The offer is valid for a period of 120 days after the date of opening of this bid.
2. We agreed to the conditions of PV claim as enumerated at Schedule-PV of bid document and as mentioned in BDS.

The unit Ex-works prices quoted shall be variable without any ceiling as per IEEMA price variation formula indicated in Schedule-PV with respect to prescribed base date i.e. 01.12.2022 irrespective of the date of opening of bid. The price variation shall be applicable on Ex-Works prices, which includes packing and forwarding charges. Price variation shall not be applicable on freight and insurance charges. The detailed provision made for standardizing PV claim are enclosed with PV formula (Schedule-PV).

In case IEEMA changes the applicable formula/indices for price variation during the pendency of the contract for any item, the same shall be applicable, provided if during pendency of the contract when both old and new price indices are being circulated, in such circumstances the lower of the price variation evaluated as per both old and new formula/indices, whichever is beneficial to Nigam, shall be admissible to the supplier(s), and for the period from which the old indices are discontinued, the price variation shall be admissible as per the new PV formula with new indices.

3. The unit Ex-works prices are variable with base date as 01.12.2022 irrespective of date of opening of bids, as specified in the bid document.
4. The quantities as mentioned in the bid document are approximate and we agree to supply any quantity as per your requirement. I/we have understood that under rate contract minimum quantity is not guaranteed.

5. The delivery shall strictly be in accordance with your delivery clause as given in Schedule-DEL of this bid document. In case we fail to deliver the material as indicated in Schedule-DEL of this bid document, we shall pay penalty as per clause No.1.24 of GCC (Part – III of Volume-I) of this bid document.
6. The material shall confirm to Technical Specification (Volume-II) of bid document and as per relevant ISS in all respects.
7. The statutory variation in existing taxes under the GST Act and financial liability due to introduction of new taxes/ duties applicable on quoted prices within stipulated delivery/ completion period shall be to RVPN's account. All taxes/duties within stipulated delivery/ completion period shall be paid at actuals.

Any additional financial liability due to revision/ changes in taxes/ duties beyond stipulated delivery/ completion period and any liability arising due to inappropriate quotation of applicable rates of taxes & duties in price schedule shall be borne by us.

8. The position of bidders in the ascending order statement shall be worked out considering all inclusive unit F.O.R. Destination price. However if any notification/guidelines regarding comparison of prices notified by the Rajasthan State Government before actual date of opening of technical Bid, the same shall be considered.
9. Bidder shall indicate in their bid the Ex-works prices of 220 kV & 132 kV Control and Relay Panels (Type-AII, BII, CII, JII, KII, KIII & LII), applicable IGST/CGST & SGST with their applicable rates in Schedule-BOQ (Price schedule) of Bid Specification. Bidder shall also indicate in their bid, the Freight & Insurance charges (inclusive of insurance& unloading) and applicable taxes, if any excluding GST. The GST (IGST/CGST & SGST) with their applicable rates on F&I charges of Control and Relay panels shall also be indicated separately in Schedule-BOQ (Price schedule)of Bid Specification.
10. We confirm that we agree to all the terms and conditions as well as the technical stipulations of Technical Specification (Volume-II) of bid document and there are no deviations other than as specified in Schedule-DEV.
11. We confirm that the performance of equipment shall be guaranteed for a period of 30 months from the date of commissioning or 36 months from the date of receipt of last consignment at the site/store, whichever is earlier irrespective of guarantee period indicated in GCC (Part-III of Volume-I).
12. We have after sales service organization and services of our organization will be available to the purchaser as and when required by him.
13. We comply the terms & conditions of order no.F.2(1)FD/G&T-SPFC/2017 Jaipur dated 15.01.2021 issued by Finance (G&T) Department, GoR regarding requirement of mandatory prior registration of bidders from the countries sharing land border with India-Restrictions under Rule 13 of the RTPP Rules, 2013.

Yours faithfully,

(Signature)

Name & Designation with seal of the bidder



**APPLICATION FOR PAYMENT**

**DELETED**

**BIDDER ELIGIBILITY CERTIFICATE**

*(To be issued on the non-judicial stamp paper of Rajasthan worth Rs.50/-)*

We hereby certify that we have read and understood the provision of order No. F. 2(1) FD/G&T-SPFC/2017 Jaipur, dated: 15.01.2021 issued by Finance (G&T) Department, Government of Rajasthan regarding requirement of mandatory prior registration of bidders from the countries sharing land border with India.

As per Finance (G&T) Department, GOR order dated 15.01.2021 regarding prior registration of the bidders from countries sharing land border with India-Restrictions under Rule 13 of the Rajasthan Transparency in Public Procurement Rules 2013, any bidder belongs to or with beneficial ownership from countries sharing a land border with India will be eligible to bid in any procurement only if the bidder is prior registered with the competent authority of GoI of GoR.

- (i) In view of GoR order dated 01.01.2021 “Beneficial owner” means-
- a) In case of a company or Limited Liability Partnership, the “beneficial owner” is the natural person or persons who, whether acting alone or together, or through one or more juridical person, has a controlling ownership interest or who exercises control through other person,
  - b) “Controlling ownership interest” is the ownership of, or entitlement to, more than twenty-five per cent of shares or capital or profits of the company,
  - c) “Control” all include the right to appoint the majority of the directors or to control the management or policy decisions, including by virtue of their shareholding or management rights or shareholders agreements or voting agreements;
  - d) In case of a partnership firm, the “beneficial owner” is the natural person or persons who, whether acting alone or together, or through one or more juridical person, has ownership of entitlement to more than fifteen percent of capital or profits of the partnership;
  - e) In case of an unincorporated association or body of individuals, the “beneficial owner” is the natural person or persons, who, whether acting alone or together, or through one or more juridical person, has ownership of or entitlement to more than fifteen percent of the property or capital or profits of such association or body of individuals;
  - f) Where no natural person is identified under sub-clause (a), (b), (c), (d) or (e) above, the “beneficial owner” is the relevant natural person who holds the position of senior managing official;
  - g) In case of a trust, the identification of beneficial owner or owners shall include identification of the author of the trust, the trustee, the beneficiaries with fifteen percent or more interest in the trust and any other natural person exercising ultimate effective control over the trust through a chain of control or ownership.
- (ii) Further, “Bidder from a country which shares a land border with India” means,
- a) An entity incorporated, established or registered in such a country;
  - b) A subsidiary of an entity incorporated, established or registered in such a country;
  - c) An entity substantially controlled through entities incorporated, established or registered in such a country;
  - d) An entity whose beneficial owner’s situated in such a country;
  - e) An Indian (or other) agent of such an entity;
  - f) A natural person who is a citizen of such country;
  - g) A consortium or joint venture where any member of the consortium or joint venture falls under any of the above.

We also certify to have understood the FD, GOR notification dated 01.01.21 issued in compliance of order No. F.No. 6/18/2019-PPD dated 23.07.20 issued by public procurement division department of expenditure, Ministry of Finance, Government of India, New Delhi regarding conditions and restrictions as a bidder.

We, \_\_\_\_\_ (Bidder Name to be inserted) certify that as bidder in Bid having Unique ID No. \_\_\_\_\_ (insert details), we fully comply with the above referred order and notification conditions as bidder. The requirement of registration certificates under these order and notification do not apply on us.

We certify and accept that if the information as above found to be false, this would be a ground for immediate termination and further legal action on us in accordance with law.

I [Mr. \_\_\_\_\_ (Name of Authority)] am fully authorized to issue this certificate on behalf of M/s \_\_\_\_\_.

Name of issuing Authority \_\_\_\_\_

Signature of Issuing Authority \_\_\_\_\_

Address of Issuing Authority \_\_\_\_\_

Phone No. of Issuing Authority \_\_\_\_\_

Fax no. of Issuing Authority \_\_\_\_\_

**BANK GUARANTEE IN LIEU OF BIS CERTIFICATE**

**NOT APPLICABLE/DELETED**

**PERFORMA OF BANK GUARANTEE FOR BID SECURITY**

(Bank Guarantee in lieu of Bid security on non-judicial Stamp Paper of Rajasthan State of appropriate value)

BG Issuing Bank: \_\_\_\_\_

Address: \_\_\_\_\_

E-mail & fax: \_\_\_\_\_

To,  
The Chief Engineer (Procurement),  
RVPN, Gate #3, Old Power House Premises,  
Banipark, Jaipur-302006

1. Whereas ..... (name of the Bidder) (hereinafter called "the Bidder") has submitted its bid dated.....(date of submission of bid) for .....(name of contract/ Name of the material with Bid no.) (hereinafter called "the Bid").

2. KNOW ALL PEOPLE by these presents that WE..... (name of bank) of ..... (name of country), having our registered office at ..... (address of bank) (hereinafter called "the Bank"), are bound unto ..... (name of Purchaser) (hereinafter called "the Purchaser") in the sum of Rs.\*\_\_\_\_\_ 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.....

3. THE CONDITIONS of this obligation are:

- (i) If the Bidder withdraws its Bid during the period of bid validity specified by the Bidder in the Bid Form; or
- (ii) If the bidder refuses to accept the correction of error in his Bid; or
- (iii) 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 Agreement within the time specified in purchase/work order, if required, or
  - (b) Fails or refuses to furnish the performance security within the time specified in purchase/work order in accordance with the GCC, or
  - (c) Fails to commence supply of goods or services or execute work as per purchase/work order within time specified.
- (iv) If the bidder breaches any provision of the Code of Integrity specified in the RTTP Act and Chapter VI of the RTTP Rules.

4. 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 in its demand the Purchaser will note that the amount claimed by it is due to it owing to the occurrence of one or all of the four conditions specifying the occurred condition or conditions.

5. The decision of the CHIEF ENGINEER (Procurement), RAJASTHAN RAJYA VIDYUT PRASARAN NIGAM, JAIPUR shall be final whether breach has been committed on the right to demand the amount of guarantee from us which has accrued to the purchaser.

6. This guarantee shall not cease or determine, if the purchaser grants time or indulgence or vary the terms of the contract with the Contractor or without our consent or knowledge.

7. The guarantee herein contained shall not be affected by any change in the constitution of the Contractor.

8. We.....further undertake not to revoke this guarantee during its currency except with the previous consent of the Chief Engineer (Procurement) , Rajasthan RajyaVidyutPrasaran Nigam, Jaipur.

9. All disputes arising under the said guarantee between the Bank and the Nigam or between the Contractor and the Nigam pertaining to the guarantee, shall be subject to the jurisdiction of Courts in Jaipur, Rajasthan alone.

10. This guarantee will remain in force up to and including one hundred eighty (180) days after the date of the opening of bids, i.e. up to ....., with a further grace period of Ninety (90 ) days and any demand in respect thereof should reach the Bank not later than the above date.

Yours faithfully,  
Bankers (EXECUTENT)  
Signed by the above named Bank in presence of :-  
(Signature with full Name and Address)

Witness :

1. \_\_\_\_\_
2. \_\_\_\_\_

Attested by Notary Public, First Class Magistrate or directly confirmed by the executing bank.

\* The Bidder should insert the amount of the guarantee in words and figures denominated in the currency of bid.

Note1 :- In case the bid is submitted by a Joint Venture, the Bid Bank guarantee shall be in the name of Lead partner or in the name of joint venture partners submitting the Bid covering all the partners of the joint venture.

**BID-SECURING DECLARATION**

Date: \_\_\_\_\_  
Notice Inviting Bids No.: \_\_\_\_\_

To: SE (PROC-II), RVPN, Jaipur

We, the undersigned, declare that:

We understand that, according to your conditions, bids must be supported by a Bid-Securing Declaration.

We accept that we are required to pay the bid security amount specified in the term and condition of Bid, in the following cases, namely:

- (a) when we withdraw or modify our bid after opening of bids;
- (b) when we do not execute the agreement, if any, after placement of supply/work order within the specified period;
- (c) when we fail to commence the supply of goods or service or execute work as per supply/work order within the time specified;
- (d) when we do not deposit the performance security within the specified period after the supply/work order is placed; and
- (e) If we breach any provision of code of Integrity prescribed for bidding specified in the Act and Chapter VI of these rules.

In addition to above, the State Government shall debar us from participating in any procurement process undertaken for a period not exceeding three years in case where the entire bid security or any part thereof is required to be forfeited by procuring entity.

We understand this Bid securing Declaration shall expire if:-

- (i) we are not successful Bidder;
- (ii) the execution of agreement for procurement and performance security is furnished by us in case we are successful Bidder;
- (iii) thirty days after the expiration of our Bid;
- (iv) the cancellation of procurement process; or
- (v) the withdrawal of bid prior to the deadline for presenting bids, unless the bidding documents stipulate that no such withdrawal is permitted.

Signed: \_\_\_\_\_

Name: \_\_\_\_\_

In the capacity of: \_\_\_\_\_

Duly authorized to sign the bid for and on behalf of: \_\_\_\_\_

Dated on \_\_\_\_\_ day of \_\_\_\_\_ [insert date of signing]

Corporate Seal \_\_\_\_\_

RAJASTHAN RAJYA VIDYUT PRASARAN NIGAM LTD.,  
(On Non-Judicial Stamp of Rajasthan State of Appropriate value)

**AGREEMENT FOR RATE CONTRACT**

This Indenture made at \_\_\_\_\_ on this \_\_\_\_\_ day of the Month of \_\_\_\_\_ of the year \_\_\_\_\_ between the Rajasthan Rajya Vidyut Prasaran Nigam Ltd. (herein after referred to as the Purchaser), which expression unless the context does not permit includes its successors and assignees) of the one part and

(i) To be used in case of Limited Companies

Messers \_\_\_\_\_ a Private/ Public Limited Company incorporated on \_\_\_\_\_ under the \_\_\_\_\_ Companies Act and having its Registered office at \_\_\_\_\_ (hereinafter referred to as Suppliers which expression unless the context does not permit includes their successors and permitted assignees)

(ii) To be used in case of Partnership concerns

Messers \_\_\_\_\_ a Partnership Firm consisting of the following Partners namely:

(Name) (Age) (Residence) (Occupation)

- 1
- 2
- 3
- 4

having its registered office at \_\_\_\_\_ (herein after referred to as Supplier which expression unless the context does not permit includes their respective heirs, executors, administrators, legal representatives, permitted assignees)

(iii) To be used in case of Proprietorship firm

Messers \_\_\_\_\_ a Proprietorship firm having its proprietor Mr/Mrs \_\_\_\_\_ and \_\_\_\_\_ having its Registered office at \_\_\_\_\_ (hereinafter referred to as Supplier which expression unless the context does not permit includes their successors and permitted assignees)

of the second part witnesses as follows:-

- (1) The Supplier, do by these presents agree to supply to the Purchaser and the Purchaser does agree to purchase from the Supplier the material at the agreed rate(s) specified in the Schedule appended herewith. The Purchaser reserves the right to place separate Purchase Order(s) under this Agreement for Rate Contract for any quantity based on the requirement of material. The Purchaser does not guarantee any volume of quantity for Purchase Order(s) under this Agreement for Rate Contract and the decision in this regard would be binding on the Supplier and shall not be called into question by the Supplier. Purchaser reserves sole discretion in this matter. However, it is agreed that total quantity ordered through Purchase Order(s) under this Agreement for Rate Contract shall not exceed the agreed quantity indicated in the Schedule.
- (2) The period of validity of this Agreement for Rate Contract shall be ..... year **(s)** from the date of issue of letter of award, i.e. ... .., which can be extended for **three** more **month** if mutually agreed in writing. The Purchaser shall be at liberty to issue multiple Purchase Orders under this Agreement for Rate Contract or no Purchase Order based on the requirement of material during the term of this Agreement for Rate Contract.
- (3) The Purchase Order(s) issued under this Agreement for Rate Contract shall inter alia indicate the quantity to be supplied and the Delivery Schedule.
- (4) Scheduled Delivery Period for the material to be supplied against the each Purchase Order shall be ..... months from the date of issue of respective Purchase Order.
- (5) The terms of payment of the material supplied against the Purchase Order(s) under this Agreement shall be in accordance with clause 1.42 of the GCC. However, it is agreed that, if applicable, Price



Variation in accordance with terms and conditions in Purchase Order shall be applicable for the material supplied against the Purchase Order(s) under Rate Contract.

- (6) The General Conditions of the Contract, Instructions to the bidders & Technical Specification and other documents appended hereto are considered a part of this Agreement. Each Purchase Order issued under this Agreement for Rate Contract shall also be part of this Agreement.
  - (7) The Supplier have deposited Rs. \_\_\_\_\_ (in words Rs. \_\_\_\_\_ only)
    - (a) In cash, or
    - (b) by furnishing a Demand Draft No. \_\_\_\_\_ dated \_\_\_\_\_ drawn in favour of \_\_\_\_\_ or
    - (c) by furnishing a Bank Guarantee equivalent to \_\_\_\_\_% of the Total Estimated Value of the material to be supplied under this Agreement for Rate Contract towards Performance Security deposit with the Purchaser for the performance of this agreement as per the Schedule. The Performance Security deposit receipt duly endorsed in favour of the Purchaser should be lodged to his safe custody.
  - (8) The specifications of the materials to be supplied under this Agreement shall be as set forth in the bid specification.
  - (9) (a) The Supplier is to deliver the material:-
    - (i) To F.O.R Destination(s) anywhere in Rajasthan by Train.
    - (ii) Free delivery at Consignees Stores/ Site by Road Transport, duly packed in good condition conforming to specification.(b) If so required by the Purchaser, the Supplier will book the consignments by Rail/ Road to any destination stipulated by the Purchaser.
  - (c) The Purchaser shall pay the FORD Price including all the taxes and Charges to the Supplier from time to time on receipt of the bills from the supplier supported by documentary evidence or acknowledgement granted by Purchaser for supplies received.
- (10) In case of dispute as to whether any materials supplied are or are not in accordance with Specifications set forth in the schedule, the decision of the Chief Engineer, RVPN shall be final and binding on both the parties.
  - (11) The delivery shall be effected and completed as per provision of the respective Purchase Order.
  - (12) Payment of the price for the material supplied under this Agreement shall be as per respective Purchase Order.
  - (13) The deposit made by the supplier under clause (7) will be returned to the Supplier after due fulfilment of obligations under this Agreement.
  - (14) If the Supplier fail wholly or in part to fulfil this Agreement, the Purchaser shall be entitled at his discretion to retain the whole or any part of the deposit made by the Supplier under clause (7) and if the loss suffered by the Purchaser exceeds the amount of said deposit, they will be entitled to recover the said loss from the Supplier.
  - (15) If any sum remains due or becomes recoverable from the Supplier on account of the non-fulfilment of this agreement or on account of any other reason, the Supplier shall pay the same immediately on demand. If the Supplier does not make such payment on demand, the Purchaser shall be entitled to recover the same from the Supplier as arrears of Land Revenue.
  - (16) All disputes arising under this Agreement, between the Supplier and the Purchaser shall be subject to the jurisdiction of Courts only at Jaipur in Rajasthan alone.

In witness of the due execution of this agreement the parties have hereunder set their hands, signed and delivered by

In case of Limited/ Partnership Shri _____ Companies & Firms Designation	(1) Signature (2) Signature
For and on behalf of _____	(1) Signature
In presence of witnesses Signed and delivered by	(2) Signature
In case of Individuals Shri _____ In the presence of witness:	(1) Signature
(1) Shri _____ Designation	(1) Signature
(2) Shri _____ Designation	(2) Signature
Signed and delivered by the _____ RVPN By order and on behalf of the RVPN	

Rajasthan Rajya Vidyut Prasaran Nigam Ltd.,  
(seal to be affixed)

**SCHEDULE TO AGREEMENT FOR RATE CONTRACT**

S. No.	Material	Estimated Qty.	Unit FORD Price inclusive of ex-works price and Freight & Insurance charges (Inclusive of GST @...%) (Rs)	Total Estimated FORD Price inclusive of ex-works price and Freight & Insurance charges (Inclusive of GST @...%) (Rs)
1				
2				
3				
4				
...				

Total Estimated Value

**Annexure-CCA**

**(On the Letter Head of Chartered Accountant)**

This is to certify that M/s----- (Name of the bidder with address) have manufactured and supplied the equipment/material as detailed below:-

Sr. No	Name of the equipment	Voltage class of C&R Panels	Type of Panel (TR./Feeder/ Bus coupler)	Quantity supplied (in Nos.)	Period of supply	Name and address of purchaser	Name and address of end user
1.							
2.							
3.							
4.							
..							
..							
..							
..							
..							

The above certificate has been issued based on the basis of documents made available by M/s-----  
----- (Name of the bidder)

Signature of CA

Date:

(Name and address of CA)

Place:

Membership No.-----

**Annexure-CI**

**COMPLIANCE WITH THE CODE OF INTEGRITY AND NO CONFLICT OF INTEREST**

(Must be signed by the bidder and attached with Techno-commercial Bid)

**COMPLIANCE WITH THE CODE OF INTEGRITY**

Any person participating in procurement process shall

- (a) not offer any bribe, reward or gift or any material benefit either directly or indirectly in exchange for an unfair advantage in procurement process or to otherwise influence the procurement process;
- (b) not misrepresent or omit information that misleads or attempts to mislead so as to obtain a financial or other benefit or avoid an obligation;
- (c) not indulge in any collusion, bid rigging or anti-competitive behaviour to impair the transparency, fairness and progress of the procurement process;
- (d) not misuse any information shared between the procuring entity and the bidders with an intent to gain unfair advantage in the procurement process;
- (e) not indulge in any coercion including impairing or harming or threatening to do the same, directly or indirectly, to any party or to its property to influence the procurement process;
- (f) not obstruct any investigation or audit of a procurement process;
- (g) disclose conflict of interest, if any; and
- (h) disclose any previous transgressions with any entity in India or any other country during the last three years or any debarment by any other procuring entity.

**CONFLICT OF INTEREST:**

The bidder participating in the bidding process must not have a Conflict of interest

A conflict of interest is considered to be a situation in which a party has interests that could improperly influence that party's performance of official duties or responsibilities, contractual obligations, or compliance with applicable laws & regulations.

A Bidder may be considered to be in conflict of interest with one or more parties in a bidding process if, including but not limited to:

- (a) have controlling partners/shareholders in common; or
- (b) receive or have received any direct or indirect subsidy from any of them; or
- (c) have the same legal representative for purposes of the bid; or
- (d) have a relationship with each other, directly or through common third parties, that puts them in a position to have access to information about or influence on the bid of another bidder, or influence the decisions of the procuring entity regarding bidding process; or
- (e) The bidder participates in more than one bid in the bidding process. Participation by a bidder in more than one bid will result in the disqualification of all bids in which the bidder is involved. However, this does not limit the inclusion of the same sub-contractor, not otherwise participating as a bidder, in more than one bid; or
- (f) The bidder or any of its affiliates participated as a consultant in the preparation of the design or technical specifications of the goods, works or services that are the subject of the bid; or
- (g) Bidder or any of its affiliates has been hired (or is proposed to be hired) by the procuring entity as engineer in-charge/consultant for the contract.

(Bidder's Signature)

Name & Designation with seal of the bidder

CHECK LIST

List of required Annexure/Schedules/documents to be submitted online on e-proc duly signed digitally by Authorized Signatory along with this Check List:

S. No.	Particulars as per specification	Description of required document to be uploaded on eproc	Weather uploaded (Yes or No)
<b>1)</b>	<b>Documents related to Fee:-</b>		
	Details of Bid Security	Proof of depositing bid security.  In case of Departments & Undertakings of the Rajasthan State Government and Undertakings of the Central Government, Bid securing declaration as per Annexure-BSD.	
	Bid processing fee	Proof of depositing bid processing fee.	
	Cost of Bid Document	Proof of depositing bid document cost.	
<b>2)</b>	<b>Documents related to Pre-Qualifying Requirements:-</b>		
2.1	The bidder must be a company registered under the Companies Act, 1956/2013 or Proprietary firm or a Partnership firm.	Memorandum of Association, Registration Certificate as per the Companies Act, 1956/2013 or as per its latest amendment in case of Companies or Registration Certificate under Rajasthan Shop & Establishment Act, 1958 or similar Act in case of Proprietary firm or Registration Certificate from Registrar of Firms in case of Partnership firm	
2.2	If Bidders belonging to or with beneficial ownership from countries sharing land border with India must be registered with the Industries Department of the Government of Rajasthan or Competent Authority of the Government of India <b>OR</b> Bidders do not belonging to or with beneficial ownership from countries sharing land border with India	Registration Certificate with the Industries Department of the Government of Rajasthan or Competent Authority of the Government of India and shall be valid upto bid validity period.  Furnish undertaking on Rs. 50/- Stamp Paper of Rajasthan as per Annexure-BEC.	
2.3	The bidder should be registered under Goods & Services Tax Act	Copy of GST Registration	
2.4	The bidder shall comply with the policy of Govt. of India issued vide Gazette Notification No. GSR 385 (E) dtd. 29.05.2019 for providing preference to domestically manufactured Iron & Steel Products in India	Undertaking on Rs.500/- stamp paper of Rajasthan as per Form-1 (Annexure-DVA)	
2.5	Past supply Criteria	CA certificate towards meeting Past supply criteria of QR as per Annexure-CCA	

S. No.	Particulars as per specification	Description of required document to be uploaded on eproc	Weather uploaded (Yes or No)
2.6	Manufactured duplex type of panels with minimum degree of enclosure protection equivalent to IP 31 in accordance with IS 13947( Part-1)	An undertaking that the panels to be supplied shall provide minimum degree of enclosure protection equivalent to IP 31 in accordance with IS 13947( Part-1)	
2.7	In case of Authorized distributor or selling agent of the manufacturers.	(i) Manufacturer's authorization certificate in prescribed proforma (Annexure-MAF) in favour of the bidder furnishing the bid (ii) Documents in respect of manufacturer fulfilling the technical experience criteria of Pre-Qualifying Requirement.	
2.8	<b>FINANCIAL POSITION:</b> (i) The bidder shall meet Minimum Average Annual Turnover (MAAT) for best three (3) financial years out of last five (5) financial years	Audited balance sheets and income statement Or CA Certificate	
	(ii) The bidder shall have Liquid Assets (LA=Current Assets-inventories) or/and evidence of access to or availability of credit facilities	(i) Audited balance sheets and income statements Or CA certificate. (ii) For credit facilities: Certificate from bank as per Annexure-CR	
	(iii) The Net worth of the bidder on the last day of the preceding financial year should not be less than 100% of the bidder's paid up share capital.	Audited Balance Sheet and income statement or CA certificate	
2.9	The bidder should be qualified, not be insolvent, not be in receivership, not be bankrupt or being wound up, should not have affairs administered by a court or a judicial officer, should not have business activities suspended, should not be black listed or debarred by any utility/ Government agency, should not have a conflict of interest.	Declaration in Schedule-DRQ	
2.10	Statement showing orders executed during last five years for the same item of any rating/ type in RVPN	Statement showing orders executed in last <b>Five</b> years.	
3)	Details of items quoted by the bidder along with other confirmations.	Bid proposal form	
4)	Bank Guarantee in lieu of BIS Certificate, if applicable	Annexure-BGBIS	
5)	Bank Guarantee against Bid Security	Annexure-BSBG	
6)	Compliance with the Code of Integrity and No Conflict of Interest.	Annexure-CI	
7)	Affidavit for MSME Unit on stamp paper	Annexure-MSME	
8)	Confirmation for payment through RTGS / NEFT.	Annexure-NEFT	
9)	Price preference or purchase preference	Annexure-PPP	
10)	Bank Guarantee in lieu of Type Test, if required	Annexure-TTBG	

<b>S. No.</b>	<b>Particulars as per specification</b>	<b>Description of required document to be uploaded on eproc</b>	<b>Weather uploaded (Yes or No)</b>
11)	Additional Conditions of Contracts	Schedule-ACC	
12)	Schedule of Participating bidder's Details	Schedule-BD	
13)	Schedule of Prices (In excel format on eproc portal)	Schedule-BOQ	
14)	Delivery schedule	Schedule-DEL	
15)	Schedule of Deviations	Schedule-DEV	
16)	Schedule of Guaranteed Technical Particulars	Schedule - GTP	
17)	Previous Experience and Performance	Schedule-PEP	
18)	Schedule of Plant and Machinery, Tools & Tackles available	Schedule-PMIT	
19)	Schedule of Price Variation	Schedule-PV	
20)	Qualification Data	Schedule-QD	
21)	Schedule of Special Tools & Tackles for Maintenance	Schedule-STT	
22)	Details of Technical Personnel of bidder	Schedule-TP	
23)	Certificate from Relay Manufacturer	Schedule-CRM	
24)	Schedule of Unit Prices for 33 kV C&R Panels	Schedule-UP	
25)	Power of Attorney for authorized signatory to sign the bid document digitally.	POA	
26)	Others		



**FORMAT FOR EVIDENCE OF ACCESS  
TO OR AVAILABILITY OF CREDIT/FACILITIES  
BANK CERTIFICATE**

This is to certify that M/s \_\_\_\_\_ (full Name & Address), who have submitted their Bid to Rajasthan RajyaVidyutPrasaran Nigam Limited against their Bid specification Vide ref. No. \_\_\_\_\_ & date \_\_\_\_\_ is our Customer for the past \_\_\_\_\_ years.

Their financial transactions with our Bank have been satisfactory. They enjoy the following fund based and non fund based limits including for guarantees, L/C and other credit facilities with us against which the extent of utilization as on date is also indicated below:

Sl. No.	Type of Facility	Sanctioned Limit as on Date _____	Utilisation as on Date _____
1.			
2.			
3.			

This letter is issued at the request of M/s \_\_\_\_\_

Sd/-

Name of Bank \_\_\_\_\_

Name of \_\_\_\_\_

Authorized Signatory \_\_\_\_\_

Designation \_\_\_\_\_

Phone No. \_\_\_\_\_

Address \_\_\_\_\_

SEAL OF THE BANK

**Annexure-DVA**

**Form-1**

**Format for Affidavit of self-certification regarding Domestic Value Addition in Iron & Steel Product/capital goods to be provided on Rs. 500/- Stamp Paper of Rajasthan**

**Date:**

I \_\_\_\_\_ S/o, D/o, W/o \_\_\_\_\_ Resident of \_\_\_\_\_  
hereby solemnly affirm and declare as under:

That I will abide by the terms & conditions of policy of Government of India issued vide Notification No.: F.No.3(2)/2018-IDD Dated 29<sup>th</sup> May 2019.

That the information furnished hereinafter is correct to the best of my knowledge and belief and I undertake to produce relevant records before the procuring agency (ies) for the purpose of assessing the domestic value addition.

That the domestic value addition for all inputs which constitute the said iron & steel products has been verified by me and I am responsible for the correctness of the claims made therein.

That in the event of the domestic value addition of the product mentioned herein is found to be incorrect and not meeting the prescribed value addition criteria, based on the assessment of procuring agency (ies) for the purpose of assessing the domestic value addition, I will be disqualified from any government tender for a period of 36 months. In addition, I will bear all costs of such an assessment.

That I have complied with all conditions referred to Notification No.: F.No.3(2)/2018-IDD Dated 29<sup>th</sup> May 2019 wherein preference to domestically manufactured iron & steel products in Government procurement is provided and that the procuring agency (ies) is hereby authorized to forfeit and my EMD. I also undertake to pay the assessment cost and pay all penalties as specified in the bid document.

I agree to maintain the following information in the company's record for the period of 8 years and shall make this available for verification of any statutory authority.

- i. Name and details of Bidder :  
(Registered office, Manufacturing location, Nature of legal entity)
- ii. Date on which this certificate issued:
- iii. Iron & Steel products for which the certificate is furnished:
- iv. Procuring agency to whom the certificate is furnished:
- v. Percentage of domestic value addition claimed and whether it meets the threshold domestic value addition prescribed:
- vi. Name and details of the unit of the manufacturer(s):
- vii. Net selling price of the Iron & Steel products:
- viii. Freight, Insurance and handling till plant:
- ix. List and total cost value of input steel (imported) used to manufacture the Iron & Steel products:

- x. List and total cost of input steel which are domestically sourced:
- xi. Please attach domestic value addition certificate from suppliers, if the input not in house:
- xii. For imported input steel, landed cost at Indian port with break-up of CIF value, duties & taxes, port handling charges and inland freight cost.

**For and on behalf of  
(Name of firm/entity)**

**Authorized signatory**  
(to be duly authorized by the Board of Directors)

**<Insert Name, Designation and Contact No>**

**MANUFACTURERS' AUTHORIZATION FORM**

No. \_\_\_\_\_ dated \_\_\_\_\_

To

Dear Sir,

NIB Under (BN No. \_\_\_\_\_) for supply of \_\_\_\_\_(item)

We \_\_\_\_\_ who are established and reputable manufacturers of \_\_\_\_\_ (name & descriptions of goods offered) having factory) at (address of factory) do hereby authorize M/s \_\_\_\_\_ (Name and address of Agent) to submit a bid, and sign the contract with you for the above goods manufactured by us against the above NIB under BN No. \_\_\_\_\_

No company or firm or individual other than M/s \_\_\_\_\_ are authorized to bid, and conclude the contract for the above goods manufactured by us against this specific NIB.

We hereby extend our full guarantee and warranty as per the General Conditions of Contract appended with specification for the goods and services offered for supply by the above firm against this NIB.

Yours faithfully,

(Name of manufacturer)

Note : This letter of authority should be on the letter head of the manufacturer and should be signed by a person competent and having the power of attorney to legally bind the manufacturer. It should be included by the Bidder in its bid.

**FORM-I**  
**MEMORANDUM OF APPEAL UNDER THE RAJASTHAN TRANSPARENCY IN**  
**PUBLIC PROCUREMENT ACT, 2012**

Appeal No. \_\_\_\_\_ of \_\_\_\_\_  
Before the \_\_\_\_\_ (First/ Second Appellate Authority)

1. Particulars of appellant:
  - (i) Name of the appellant:
  - (ii) Official address, if any:
  - (iii) Residential address:
  
2. Name and address of the respondent(s):
  - (i)
  - (ii)
  - (iii)
  
3. Number and date of the order appealed against and name and designation of the officer / authority who passed the order (enclose copy), or a statement of a decision, action or omission of the Procuring Entity in contravention to the provisions of the Act by which the appellant is aggrieved:
  
4. If the Appellant proposes to be represented by a representative, the name of and postal address of the representative:
  
5. Number of affidavits and documents enclosed with the appeal:
  
6. Grounds of appeal:  
(Supported by an affidavit)
  
7. Prayer:

Place: \_\_\_\_\_

Date: \_\_\_\_\_

Appellant's Signature

**FORM-B**

**FORMAT OF AFFIDAVIT FOR MSME UNIT**

(On non-judicial Stamp Paper of appropriate value attested by Notary Public/ First Class Magistrate)

I, \_\_\_\_\_ S/o \_\_\_\_\_ Aged \_\_\_\_\_ Year residing at \_\_\_\_\_  
Proprietor/ Partner/ Director of M/s \_\_\_\_\_ do hereby solemnly affirm and  
declare that:

(a) My/Our above noted enterprise M/s \_\_\_\_\_ has been issued acknowledgement of  
Entrepreneurial Memorandum Part-II by the District Industries Center, \_\_\_\_\_. The  
acknowledgement No. is \_\_\_\_\_ dated \_\_\_\_\_ and has been issued for  
manufacture of following items:

Name of Item	Production Capacity (Yearly)
(i)	
(ii)	
(iii)	
(iv)	

(b) My/our above noted acknowledgement of Entrepreneurial Memorandum Part-II has not been  
cancelled or withdrawn by the Industries Department and that the enterprise is regularly manufacturing  
the above Items.

(c) My/our enterprise is having all the requisite plant and machinery and is fully equipped to  
manufacture the above noted items.

(d) The Present status of the firm is as per acknowledgement of Entrepreneurial Memorandum  
Part-II issued on date by the District Industries Center, \_\_\_\_\_.

Place

Signature of Proprietor/Director  
Authorized Signatory with Stamp and date

**VERIFICATION**

I, \_\_\_\_\_ S/o \_\_\_\_\_ Aged \_\_\_\_\_ Year residing at \_\_\_\_\_  
Proprietor/Partner/Director of M/s \_\_\_\_\_ verify and confirm that the contents at (a),(b),(c)  
&(d) above are true and correct to the best of my knowledge and nothing has been concealed therein.  
So, help me God.

Deponent

Note:- If the cost of items to be procured /hired exceeds Rs.1,00,000/- (Rupees One Lakh), the  
procuring entity would be required to have the production unit inspected to satisfy itself of the  
production capacity and that the quality control measures are installed.

**MANUFACTURER'S WARRANTEE FORM**  
(FOR SUPPLY PART)

(Warrantee to be furnished on Rajasthan Non Judicial Stamp paper appropriate value as required under the Rajasthan Stamp Duty Act)

To,  
The Chief Engineer (Procurement),  
RVPN, Gate #3, Old Power House Premises,  
Banipark, Jaipur-302006

Dear Sir,

THIS DEED OF GUARANTEE is made this day \_\_\_\_\_ of \_\_\_\_\_ of the year \_\_\_\_\_ between the Chief Engineer, Rajasthan Rajya Vidyut Prasaran Nigam Limited (which expression shall unless excluded by or repugnant to the context includes his successors and assigns) of the \_\_\_\_\_ one part and \_\_\_\_\_ hereinafter called "The Contractor" (which expression shall unless excluded by or repugnant to the context includes its successors and assigns) of the other part.

WHEREAS MESSERS \_\_\_\_\_ (hereinafter called the contractor) agreed to supply the material \_\_\_\_\_ (Name of material) to the Chief Engineer, Rajasthan Rajya Vidyut Prasaran Nigam Ltd. against LOA No. \_\_\_\_\_ dated \_\_\_\_\_ (hereinafter referred to as the contract).

AND WHEREAS as per the terms of the contract it was provided that the contractor should furnish a Warrantee for supplying any material free of cost that may be required due to defects arising from faulty materials, design and workmanship, so as to make it meet the guarantees and requirements of the contract.

AND WHEREAS at the request of the Chief Engineer, the contractor M/s \_\_\_\_\_ has agreed to execute these presents.

NOW THIS INDENTURE WITNESS AND IT IS HEREBY AGREED AND DECLARED by the \_\_\_\_\_ and between the parties hereto as follows:

1. The Contractor hereby guarantees to the Chief Engineer, Rajasthan Rajya Vidyut Prasaran Nigam Ltd., the fulfillment by the contractor of the various obligations imposed on him under the aforesaid contract including the obligations of the contractor to supply materials of the good quality, design and workmanship and the Contractor further guarantees to the Rajasthan Rajya Vidyut Prasaran Nigam Ltd. that they (M/s \_\_\_\_\_) shall substitute and supply any material free of cost that may be required due to defects arising from faulty material, design and workmanship and the Contractor undertakes to indemnify and keep the Chief Engineer, Rajasthan Rajya Vidyut Prasaran Nigam Ltd. indemnified to the extent of full value of contract (Rs. \_\_\_\_\_) (in words Rupees \_\_\_\_\_) against any loss or damage that may be caused to or suffered by the Rajasthan Rajya Vidyut Prasaran Nigam Ltd. by reason of any failure by the contractor to supply materials of good quality, design and workmanship as aforesaid .

The decision of the Chief Engineer, Rajasthan Rajya Vidyut Prasaran Nigam Ltd. as to whether the contractor ( M/s \_\_\_\_\_) have failed or neglected to perform or discharge their duties and obligations as aforesaid shall be final and binding on the Contractor.

2. The Warrantee herein contained shall remain in full force and effect during the period that would be taken in the performance of the said contract and it shall continue to be valid till all the obligations to the Rajasthan Rajya Vidyut Prasaran Nigam Ltd. under or by force of the contract have been fully and properly discharged by the said contractor, subject however, to the conditions that the Rajasthan Rajya Vidyut Prasaran Nigam Ltd. will have no right under this Warrantee after \_\_\_\_\_ months from the date of commissioning or \_\_\_\_\_ months from the date of receipt of last consignment at the site/store,

whichever is earlier, provided further that if any, claim arises by virtue of this Warrantee before the aforesaid date, the same shall be enforceable against the Contractor notwithstanding the fact that the same is enforced after the aforesaid date.

3. The Warrantee herein contained shall not be affected by any change in the constitution of the Contractor.
4. The Contractor further undertakes not to revoke this Warrantee during its currency except with the previous consent of the Chief Engineer, Rajasthan Rajya Vidyut Prasaran Nigam Limited in writing.
5. All disputes arising under the said Warrantee, between the Contractor and the Rajasthan Rajya Vidyut Prasaran Nigam Ltd. shall be subject to the jurisdiction of Courts, only at Jaipur in Rajasthan alone.

IN WITNESS WHEREOF THE CONTRACTOR HAS executed these presents the day and year written above.

Yours faithfully,

(EXECUTANT)

Signed by the above named Contractor in presence of: -  
(Signature with full Name and Address)

Witness: -

- 1.
- 2.

(Attested by Notary Public or First Class Magistrate or directly confirmed by the executing Contractor).



**REAL TIME GROSS SETTLEMENT (RTGS)/NATIONAL ELECTRONIC FUND  
TRANSFER (NEFT)**

From:

M/s

The Sr. Accounts Officer (            ),  
RVPN,  
\_\_\_\_\_

Sub: RTGS/ NEFT payments.

We refer to remittance of our payments using RBI's RTGS/ NEFT. Our payments may be made through the above system to our under noted account at our cost:-

Name of city	
Bank code No.	
Branch code No.	
Banks name	
Branch address	
Branch Telephone / Fax No.	
Supplier's Account No.	
Type of Account	
IFSC code for NEFT	
IFSC code for RTGS	
Supplier's name as per Account	
Telephone No. of supplier	
Supplier's E-mail ID	

Confirmed by Banker

Signature of Supplier  
with stamp & Address

**PERFORMANCE SECURITY BANK GUARANTEE FORM**  
**(Performance Security Bank Guarantee on non-judicial stamp paper of Rajasthan Govt. of appropriate value)**

BG Issuing Bank: \_\_\_\_\_  
Address: \_\_\_\_\_  
E-mail & fax: \_\_\_\_\_

To,  
The Chief Engineer (Procurement),  
RVPN, Gate #3, Old Power House Premises,  
Banipark, Jaipur-302006

Dear Sir,

THIS DEED OF GUARANTEE is made this day \_\_\_\_\_ of the month \_\_\_\_\_ of the year \_\_\_\_\_ between the Chief Engineer, Rajasthan Rajya Vidyut Prasaran Nigam Ltd., (which expression shall unless excluded by or repugnant to the context includes his successors, assignees and his authorized representatives, hereinafter called "The Purchaser") of the one part and the (the name of Bank with address) \_\_\_\_\_, having its Head office at \_\_\_\_\_ hereinafter called "The Bank" (which expression shall unless excluded by or repugnant to the context includes its successors and assignees) of the other part.

WHEREAS MESSERS \_\_\_\_\_ (hereinafter called "The Contractor"), having their/its Registered/Head office at \_\_\_\_\_, agreed to supply, the materials to the Chief Engineer, Rajya Vidyut Prasaran Nigam Ltd. against **LOA** No. \_\_\_\_\_ dated \_\_\_\_\_ (hereinafter referred to as the contract).

AND WHEREAS as per the terms of the contract it was provided that the contractor should furnish a Bank Guarantee towards performance security deposit equivalent to \_\_\_\_% of the total contract value by way of security for successful execution of **LOA** No. \_\_\_\_\_ Dated \_\_\_\_\_ and supplying any material free of cost that may be required due to defects arising from faulty materials, design and workmanship, so as to make it meet the guarantee and requirements of the contract.

AND WHEREAS at the request of the contractor the Bank has agreed to execute these presents.

NOW THIS INDENTURE WITNESS AND IT IS HEREBY AGREED AND DECLARED by the and between the parties hereto as follows:

1. The Bank hereby guarantees to the Chief Engineer, Rajasthan Rajya Vidyut Prasaran Nigam Ltd., the fulfillment by the contractor of the various obligations imposed on him under the aforesaid contract including the obligations of the contractor to timely supply materials of the good quality, design and workmanship and the bank further guarantees to the Rajasthan Rajya Vidyut Prasaran Nigam Ltd., that the contractor shall substitute and supply any material free of cost that may be required due to defects arising from faulty material, design and workmanship and the Bank undertakes to indemnify and keep the Chief Engineer, Rajasthan Rajya Vidyut Prasaran Nigam Ltd., indemnified to the extent of Rs. \_\_\_\_\_ (Rupees \_\_\_\_\_) against any loss or damage that may be caused to or suffered by the Rajasthan Rajya Vidyut Prasaran Nigam Ltd., by reason of any failure by the contractor to timely supply materials of good quality, design and workmanship as aforesaid and further undertake to pay to the Chief Engineer, Rajasthan Rajya Vidyut Prasaran Nigam Ltd., on demand a sum not exceeding Rs. \_\_\_\_\_ (Rupees \_\_\_\_\_) in the event of the contractor failing or neglecting to perform and discharge the aforesaid duties and obligations on their part to be observed and performed under the said contract.

2. Payment pursuant in this undertaking will be demanded by the purchaser from the Bank and will be met by the Bank without question in the case in which the contractor, on receipt of the order and/or after the acceptance of his Bid has been communicated to him by the purchaser, make default in entering into an agreement or having entered into such Agreement or otherwise the contractor makes default in carrying out the contract thereof. As to whether the occasion or ground is arisen for such demand the decision of the Chief Engineer including Additional Chief Engineer and any other officer exercising the powers of Chief Engineer, Rajasthan Rajya Vidyut Prasaran Nigam Ltd. shall be final.
3. The decision of the Chief Engineer including Additional Chief Engineer and any other officer exercising the powers of Chief Engineer, Rajasthan Rajya Vidyut Prasaran Nigam Ltd., as to whether the contractor has failed or neglected to perform or discharge his duties and obligations as aforesaid and as to the amount payable to the Chief Engineer, Rajasthan Rajya Vidyut Prasaran Nigam Ltd., by the Bank herein shall be final and binding on the Bank.
4. The guarantee herein contained shall remain in full force and effect during the period that would be taken for the performance of the said contract and it shall continue to be enforceable till all the obligations to the Rajasthan Rajya Vidyut Prasaran Nigam Ltd., under or by force of the contract have been fully and properly discharged by the said contractor, subject however, to the conditions that the Rajasthan Rajya Vidyut Prasaran Nigam Ltd., will have no right under this guarantee after \_\_\_\_ months from the date of commissioning of the equipment or \_\_\_\_ months from the date of receipt of last consignment of **last purchase order** at site/ store, whichever is earlier, provided further that if any claim arises by virtue of this guarantee before the aforesaid date, the same shall be enforceable against this bank notwithstanding the fact that the same is enforced after the aforesaid date.
5. The guarantee herein contained shall not be affected by any change in the constitution of the contractor or Bank.
6. No variation in the terms of bid, acceptance or agreement as between the contractor and the purchaser made without the purchaser's consent shall discharge this undertaking.
7. No indulgence or grant of time by the purchaser to the contractor without the acknowledgement of the Bank will discharge the liabilities of the Bank under this guarantee.
8. The Chief Engineer, Rajasthan Rajya Vidyut Prasaran Nigam Ltd., shall have the fullest liberty without affecting the guarantee to postpone for any time and from time to time any of the powers exercisable by the RVPN against contractor and either to enforce or forebear from enforcing any of terms and conditions of the said contract and the Bank shall not be released from its liability under this guarantee and exercise of the Rajasthan Rajya Vidyut Prasaran Nigam Ltd., of the liberty with reference to the matter aforesaid or by the reasons time being given to the contractor or any other forbearance, act or omission on the part of the Rajasthan Rajya Vidyut Prasaran Nigam Ltd., to the contractor or by any other matter or thing whatsoever which under the law relating to the sureties shall not for this provision have the effect of so releasing the bank from such liability.
9. The Bank further undertake not to revoke this guarantee during its currency except with the previous consent of the Chief Engineer, Rajasthan Rajya Vidyut Prasaran Nigam Ltd., in writing.
10. All disputes arising under the said guarantee, between the Bank and the RVPN or between the contractor and the RVPN pertaining to this guarantee, shall be subject to the jurisdiction of Courts, only at Jaipur in Rajasthan alone.
11. Notwithstanding anything contained herein before, the Bank's liability under this guarantee is restricted to Rs. \_\_\_\_\_ (Rupees \_\_\_\_\_ ) and the guarantee shall remain in force upto \_\_\_\_\_. Unless demand or claim in writing is presented/ lodged on the Bank within six months i.e. upto \_\_\_\_\_, the Bank shall be released and discharged from all liabilities there under.

IN WITNESS WHEREOF THE BANK HAS executed these presents the day and year written above.

Yours faithfully,  
Bankers (EXECUTANT)

Signed by the above named Bank in presence of: -  
(Signature with full Name and Address)

Witness: -

1. 2.  
Attested by Notary Public, First Class Magistrate or directly confirmed by the executing bank.

**PRE-BID QUERIES FORMAT**

Name of the company/Firm

Bidding document fee Receipt No \_\_\_\_\_ dated \_\_\_\_\_ for Rs \_\_\_\_\_.

Name of Person(s) Representing the Company/Firm:

Name of person	Designation	E-mail-ID(s)	Tel Nos& Fax No

Company/Firm Contacts

Contact Person(s)	Address for correspondence	E-mail-ID(s)	Tel Nos& Fax No

Query/Clarification Sought MS(Excel Sheet Format)

S. No.	Bidder Name	ITB/GCC/ Specification clause No	Bid document page No	Clause details	Query/Clarifica tion/ suggestion

(Signature)

Name & Designation with seal of the bidder

**PERFORMANCE CERTIFICATE**

**NOT APPLICABLE / DELETED**

**Form A**

(Apply in Duplicate)

**Application by MSME for Price Preference or Purchase Preference or both in Procurement of Goods**

To,  
The General Manager  
DIC, District .....

1. Name of Applicant with Post:
2. Permanent Address:
3. Contact Details:
  - a. Telephone No.:
  - b. Mobile No.:
  - c. Fax No.:
  - d. Email Address:
4. Name of micro & small enterprise:
5. Office Address:
6. Address of Work Place:
7. No. & Date of Entrepreneurs Memorandum-II/UdyogAadhaarMemorandum:(enclose photo copy)
8. Products for which Entrepreneurs Memorandum-II/UdyogAadhaarMemorandum availed:
9. Products for which are at present being produced by the enterprise:
10. Products for which price preference or purchase preference or both has been applied for:
11. Production capacity as per Capacity Assessment Certificate  
(enclose photocopy of Capacity Assessment Certificate)

Serial No.	Product	Production Capacity	
		Quantity	Value
1			
2			
3			
4			

12. List of Plant & Machinery installed

Serial No.	Name of Plant & Machinery	Quantity	Value

13. List of Testing Equipments installed

Serial No.	Name of Testing Equipments	Quantity	Value

14. Benefits availed as per price preference certificate in last financial year and current financial year

a. Benefits depositing Bid Security and Performance Security:

Department	Last Financial Year		Current Financial Year	
	Bid Security	Performance Security	Bid Security	Performance Security

b. Details of Supply orders received:

Last Financial Year				Current Financial Year		
Department	No. & Date of purchase order	Amount for which purchase order received	Amount of goods supplied	Bid Security No. & Date of purchase order	Amount for which purchase order received	Amount of goods supplied

I declare that the above all facts given in the application are correct and my enterprise is producing the items mentioned in column No. 10.

Date

Signature

(Name of the applicant along with seal of post)

Office of the District Industries Centre \_\_\_\_\_

CERTIFICATE

File No. \_\_\_\_\_

Date \_\_\_\_\_

It is certified that M/s \_\_\_\_\_ was inspected by \_\_\_\_\_ on dated \_\_\_\_\_ and the facts mentioned by the enterprise are correct as per the record shown by the applicant. The enterprise is eligible for Price Preference or Purchase Preference or both under this notification.

The certificate is valid for one year from the date of its issue.

Office Seal

Signature

(Full Name of the Officer)  
 General Manager  
 Industries Centre  
 Rubber Seal/Stamp

Enclosure-(1) Application  
 (2)



**PRE-QUALIFYING REQUIREMENT**

PRE-QUALIFYING REQUIREMENT FOR PURCHASE OF 220 KV AND 132 KV TRANSFORMER, FEEDER & BUS COUPLER CONTROL AND RELAY PANELS.

Qualification of bidder will be based on meeting the minimum pass/ fail criteria specified in table below regarding the Bidder's technical experience and financial position as demonstrated by the Bidder's responses in the corresponding Bid schedules.

The bidder shall be required to furnish the information as detailed here under:

<b>Proposed Provisions</b>	<b>Supporting document required to be furnished</b>
<p><b><u>BIDDER'S STATUS:</u></b></p> <p>1.1 The bidder must be a company registered under the Companies Act, 1956/2013 or Proprietary firm or a Partnership firm.</p> <p>1.2 If Bidders belonging to or with beneficial ownership from countries sharing land border with India must be registered with the Industries Department of the Government of Rajasthan or Competent Authority of the Government of India</p> <p>Or</p> <p>Bidders do not belonging to or with beneficial ownership from countries sharing land border with India</p> <p>1.3 The bidder should be registered under Goods &amp; Services Tax Act.</p> <p>1.4 The bidder shall comply with the policy of Govt. of India issued vide Gazette Notification No. GSR 385(E) dtd. 29.05.2019 for providing preference to domestically manufactured Iron &amp; Steel Products in India</p>	<p>Memorandum of Association, Registration Certificate as per the Companies Act, 1956/2013 or as per its latest amendment in case of Companies or Registration Certificate under Rajasthan Shop &amp; Establishment Act, 1958 or similar Act in case of Proprietary firm or Registration Certificate from Registrar of Firms in case of Partnership firm</p> <p>Registration Certificate with the Industries Department of the Government of Rajasthan or Competent Authority of the Government of India and shall be valid upto bid validity period.</p> <p>Furnish undertaking on Rs.50/- stamp paper of Rajasthan state (As per Annexure-BEC)</p> <p>Copy of GST Registration.</p> <p>Undertaking on Rs.500/- non-judicial stamp paper of Rajasthan state as per Form-1 (Annexure-DVA)</p>
<p><b><u>2. TECHNICAL EXPERIENCE:</u></b></p> <p>The bidder must be a manufacturer of C&amp;R Panels having:</p> <p>(a) authorisation from relay manufacturer(s) whose relays are proposed for installation in their panel, if they themselves are not relay manufacturer.</p> <p>(b) <u>Past Supply criteria:</u> Supplied directly or through his representative at least <b>40%</b> of the NIB quantity of respective C&amp;R Panels (as detailed in the note given below) in any one year (i.e. continuous period of 12 months) during the last five years as on the date of</p>	<p>Certificate from relay manufacturer(s) in Format prescribed in Schedule-CRM</p> <p>Certificate from Chartered Accountant bearing membership number with the name &amp; address of the Chartered Accountant. The certificate should</p>

<p>technical bid opening.</p> <p>Notes:-</p> <p>i) Against requirement of 220 kV Feeder C&amp;R panel (Type A-II) the previous supply of 220 kV or above voltage class feeder panel having distance protection relay shall be considered acceptable.</p> <p>ii) Against requirement of 220kV side C&amp;R panel for 220/132 kV Transformer (Type B-II), the previous supply of any HV side transformer panel of 220 kV or above voltage class having differential protection relay shall be considered acceptable.</p> <p>iii) Against requirement of 220 kV Bus coupler panel (Type C-II) the previous supply of 220 kV or above voltage class Bus coupler panel having Over current &amp; Earth fault relay or 220 kV or above voltage class transformer/ feeder panel having Over current &amp; Earth fault relay shall be considered acceptable.</p> <p>iv) Against requirement of 132 kV Feeder panel (Type J-II) the previous supply of 110 kV or above voltage class Feeder panel having distance protection relay shall be considered acceptable.</p> <p>v) Against requirement of 132 kV side C&amp;R panel for 220/132 kV transformer (Type K-II) the previous supply of LV side panel for transformer having LV winding voltage 110 kV or above or transformer HV side panel of 110 kV or above voltage class having Over current and Earth fault relay or 110 kV or above voltage class Bus Coupler/ Feeder Panel having Over current and Earth fault relay shall be considered acceptable.</p> <p>vi) Against requirement of 132 kV Transformer C&amp;R panel (Type K-III) the previous supply of 110 kV or above voltage class Transformer panel having differential protection relay shall be considered acceptable</p> <p>vii) Against requirement of 132kV Bus coupler panel (Type L-II) the previous supply of any panel of 110kV or above voltage class having Over current &amp; Earth fault relay or 132 kV or above voltage class transformer/ feeder panel having Over current &amp; Earth fault relay shall be considered acceptable.</p> <p>(c) <u>Type Test Criteria:</u> valid Type test(s) as per latest edition of IS-3231 or IEC of quoted relays or on model having additional features in same series, as under, in respect of auxiliary and other relays (except main, Back up and LBB protection relays)conducted at laboratory accredited by Govt. approved / NABL accredited laboratory / ILAC i.e. International Laboratory Accreditation Cooperation (in case of foreign laboratory), accredited for the tests conducted, in case make of relays are other than those specified in Volume-II of the Bid document are offered:</p> <p>(i) Insulation test.</p> <p>(ii) High frequency disturbance test (not applicable for electromechanical relays).</p> <p>(iii) Electrical fast transient test (not applicable for electromechanical relays ).</p> <p>(iv) Relay characteristics, performance and accuracy test.</p> <p>a) Steady state characteristics and operating time.</p> <p>b) Dynamic characteristics and operating time (for</p>	<p>clearly indicate the quantity supplied of C&amp;R panel of respective type, period of supply, name and address of the purchaser and end user.</p> <p><b>The certificate should be furnished in Annexure-CCA</b></p> <p>(a) Duly self attested copies of Type test certificate(s) not older than 7 years, as on the date of Technical bid opening. For this purpose date of conducting type test will be considered.</p> <p>(b) The type test certificate from in-house laboratory of Bidding firm shall also be accepted provided the lab. is accredited by National Accreditation Body of the country and tests have been witnessed by a representative of NABL accredited laboratory / Power Utility.</p> <p>(c) The Type Test report (TTRs) shall contain information like the ratings, the relevant drawings, model number, test circuit, calculations (if any), photos and</p>
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<p>distance relay).</p> <ul style="list-style-type: none"> <li>(v) Test for thermal requirement.</li> <li>(vi) Test for mechanical requirement.</li> <li>(vii) Test for rated burden</li> <li>(viii) Contact performance test.</li> </ul> <p>However, in the following cases the bid of the bidder may be considered meeting the type test criteria if the bidder furnishes an undertaking stating that valid type test certificate from Govt. approved / International Laboratory Accreditation Cooperation Mutual Recognition Arrangement (ILAC-MRA) signatory agency (in case of foreign laboratory), accredited for the tests conducted shall be furnished before commencement of supplies (without asking any delivery extension) along with bank guarantee with the technical bid from a Nationalized / Scheduled bank in prescribed proforma at Annexure-TTBG or DD / Pay order amounting to 15 lacs:-</p> <ul style="list-style-type: none"> <li>(i) Where one or more type test (s) is/are older than 7 years.</li> <li>(ii) Where new type tests have been added in the specification.</li> <li>(iii) Where some changes in respect of type test procedure of existing type tests have been introduced in the relevant standard.</li> <li>(iv) Where the new item is being purchased by Nigam for the first time.</li> </ul> <p>Note: Undertaking by the bidder shall be furnished stating that the type test reports shall be furnished before commencement of the supplies without asking any delivery extension. In case, the bidder fails to furnish the type test certificates before commencement of supplies as per delivery schedule, their bank guarantee / DD / pay order will be invoked / forfeited and their performance will be adjudged poor.</p> <ul style="list-style-type: none"> <li>(d) Manufactured duplex type of panels with minimum degree of enclosure protection equivalent to IP 31 in accordance with IS 13947( Part-1)</li> <li>(e) Authorised distributor or selling agent (bona-fide dealer) of the manufacturers may also participate provided the manufacturer fulfills the qualifying requirements.</li> </ul>	<p>compliance to the relevant standards (IS/IEC) etc., if required. The relevant clauses of the standards (IS/IEC) according to which type tests have been conducted and acceptance criteria/values shall also be brought out clearly in the report.</p> <p>(d) The equipment shall be supplied by the bidder from the same manufacturing works, where from the sample unit was manufactured and successfully type tested as per relevant standard (IS/IEC).</p> <p>(e) Documentary evidence in support of the laboratory whose type test have been furnished, that the said laboratory is a Govt. approved / NABL / International Laboratory Accreditation Cooperation Mutual Recognition Arrangement (ILAC-MRA) signatory agency (in case of foreign laboratory), accredited for the tests conducted, shall be furnished.</p> <ul style="list-style-type: none"> <li>a) Undertaking stating that valid type test certificate as above shall be furnished before commencement of supplies without asking any delivery extension.</li> <li>(b) Bank guarantee from a Scheduled bank in prescribed proforma or DD / Pay order amounting to Rs. 15.0 lacs in lieu of Type test(s).</li> </ul> <p>An undertaking that the panels to be supplied shall provide minimum degree of enclosure protection equivalent to IP 31 in accordance with IS 13947( Part-1)</p> <p>(i) Manufacturer's authorization certificate in prescribed proforma at Annexure-MAF in favour of the bidder furnishing the bid.</p>
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	(ii) Documents in respect of manufacturer fulfilling the qualifying requirements.
<p><b>3. Financial Position :</b></p> <p>3.1 The bidder shall meet Minimum Average Annual Turnover (MAAT) for best three (3) financial years out of last five (5) financial years equal to 1.5 times of estimated cost divided by completion period in years for respective C&amp;R Panels for Rs. <b>684.85 Lacs</b> OR SUM of Rs. 67.18 Lacs for 220 kV FDR C &amp; R Panels (Type A-II) + Rs. 40.98 Lacs for 220 kV Tr. C &amp; R Panels (Type B-II) + Rs. 8.31 Lacs for 220 kV Bus Coupler C &amp; R Panels (Type C-II) + Rs. 227.20 Lacs for 132 kV Feeder C &amp; R Panels (Type J-II) + Rs. 13.05 Lacs for 132 kV Tr. C &amp; R Panels (Type K-II) + Rs. 287.48 Lacs for 132 kV Tr. C &amp; R Panels (Type K-III) + Rs. 40.65 Lacs for 132 kV Bus Coupler C &amp; R Panels (Type L-II)</p> <p>3.2 The bidder shall have Liquid Assets (LA=Current Assets-inventories) or/and evidence of access to or availability of credit facilities equal to 3 times of estimated cost divided by completion period in months for respective C&amp;R Panels for Rs. <b>114.14</b> Lacs OR SUM of Rs. 11.20 Lacs for 220 kV FDR C &amp; R Panels (Type A-II) + Rs. 6.83 Lacs for 220 kV Tr. C &amp; R Panels (Type B-II) + Rs. 1.38 Lacs for 220 kV Bus Coupler C &amp; R Panels (Type C-II) + Rs. 37.87 Lacs for 132 kV Feeder C &amp; R Panels (Type J-II) + Rs. 2.17 Lacs for 132 kV Tr. C &amp; R Panels (Type K-II) + Rs. 47.91 Lacs for 132 kV Tr. C &amp; R Panels (Type K-III) + Rs. 6.78 Lacs for 132 kV Bus Coupler C &amp; R Panels (Type L-II)</p> <p>3.3 The Net worth of the bidder on the last day of the preceding financial year should not be less than 100% of the bidder's paid up share capital.</p>	<p>Audited balance sheets and income statement or CA Certificate</p> <p>(i) Audited balance sheets and income statements or CA certificate.</p> <p>(ii) For credit facilities: Certificate from bank as per Annexure-CR</p> <p>Audited Balance Sheet and income statement or CA certificate or Certificate by Chartered Accountant.</p>
<p><b>4. DISQUALIFICATIONS:</b></p> <p>4.1 The bidder should be qualified, not be insolvent, not be in receivership, not be bankrupt or being wound up, should not have affairs administered by a court or a judicial officer, should not have business activities suspended, should not be blacklisted or debarred by any utility / government agency, should not have a conflict of interest.</p> <p><b>4.2 Poor record of after sales service &amp; performance:</b> RVPN reserve the right to reject the bid of any bidder on the basis of poor after sales service and/ or performance of the material supplied by the bidder or authorising manufacture against the previous orders. For this purpose the orders executed upto the last five years (as on the date of bid opening) for the same item of any rating/ type in RVPN shall be considered.</p>	<p>Declaration in Schedule-DRQ.</p> <p>Statement showing orders executed in last Five years.</p>

**BANK GUARANTEE IN LIEU OF FURNISHING TYPE TEST CERTIFICATE**

(On Rajasthan Non Judicial Stamp paper appropriate value as required under the Rajasthan Stamp Duty Act)

BG Issuing Bank: \_\_\_\_\_

Address: \_\_\_\_\_

E-mail & fax: \_\_\_\_\_

To,

The Chief Engineer (Procurement),  
RVPN, Gate #3, Old Power House Premises,  
Banipark, Jaipur-302006

Dear Sir,

Whereas Rajasthan RajyaVidyutPrasaran Nigam Ltd, Jaipur (hereinafter called the purchaser) has issued a bid enquiry under BN-\_\_\_\_\_ for procurement of \_\_\_\_\_ (name of materials).

Whereas M/s \_\_\_\_\_(hereinafter called the bidder ) has furnished a bid for supply of \_\_\_\_\_to the Chief Engineer (Procurement), Rajasthan RajyaVidyutPrasaran Nigam Ltd, Jaipur or his nominated officer(s).

Whereas in accordance with the provisions of the specification of the aforesaid BN-\_\_\_\_\_, the bidder can deposit a bank guarantee in lieu of the requirement of furnishing the type test report.

Whereas, M/s \_\_\_\_\_ (the bidder) have requested us (name of the bank) to furnish the bank guarantee, in lieu of the type test report, for an amount equivalent to Rs.\_\_\_\_\_(in words also) only.

Under this bank guarantee, we (name of the bank) hereby undertake unconditionally and irrevocably to guarantee as primary obligatory and not as surety merely, the payment to the purchaser on his first demand without whatsoever right of objection on our part and without his first claim to the bidder, in the amount not exceeding (amount of guarantee in figures and words) \_\_\_\_\_.

Payment pursuant in this undertaking will be demanded by the purchaser from the bank and will be met by the bank without question in the case in which the bidder, on receipt of the order and / or after the acceptance of this bid, makes default in furnishing the required type test reports. As to whether the occasion or ground has arisen for such demand the decision of the Chief Engineer(Procurement), Rajasthan RajyaVidyutPrasaran Nigam Ltd, Jaipur or any other officer exercising the powers of Chief Engineer, Rajasthan RajyaVidyutPrasaran Nigam Ltd, shall be final.

The liability of the bank shall not at any time exceed Rs. \_\_\_\_\_ (Rs. in words).

The under taking will be determined on \_\_\_\_\_ but will not withstanding such determination, continue to be in-force till the expiry of 3 months from that date.

No indulgence or grant of time by the purchaser to the bidder without the acknowledgement of the bank will discharge the liabilities of the bank under guarantee.

The guarantee herein contain shall not be affected by any change in the constitution of the bidder.

All disputes arising under the said guarantee between the bank and the Nigam or between the bidder and the purchaser pertaining to the guarantee shall be subject to the jurisdiction of courts only at Jaipur in Rajasthan.

The bank further undertakes not to revoke this guarantee during its currency except with previous consent of the CE (Procurement), RVPN, Jaipur.

Notwithstanding anything contain herein before, the bank's liability under this guarantee is restricted to Rs. \_\_\_\_\_ (Rupees in words) and the guarantee shall remain in force up to \_\_\_\_\_. Unless demand or claim in writing is presented on the bank within 3 months from that date the bank shall be released and discharge from all liabilities there under.

IN WITNESS WHEREOF the Bank has executed these presents the day \_\_\_\_\_ month \_\_\_\_\_ and year \_\_\_\_\_.

Yours faithfully,

(Bankers)  
Executant

Witness:

- 1.
- 2.

ATTESTED BY NOTARY PUBLIC.

Note: - The Bank Guarantee should be valid for a minimum period of 9 (nine) months from the date of opening of Technical Bid.

ADDITIONAL INFORMATION

DELETED

**Schedule- ACC**

**Additional Conditions of Contract**

(Must be signed by the bidder and attached with Techno-commercial Bid)

**1. Correction of arithmetical errors**

Provided that a Financial Bid is substantially responsive, the Procuring Entity will correct arithmetical errors during evaluation of Financial Bids on the following basis:

- (i) If there is a discrepancy between the unit price and the total price that is obtained by multiplying the unit price and quantity, the unit price shall prevail and the total price shall be corrected, unless in the opinion of the Procuring Entity there is an obvious misplacement of the decimal point in the unit price, in which case the total price as quoted shall govern and the unit price shall be corrected;
- (ii) If there is an error in a total corresponding to the addition or subtraction of subtotals, the subtotals shall prevail and the total shall be corrected; and
- (iii) If there is a discrepancy between words and figures, the amount in words shall prevail, unless the amount expressed in words is related to an arithmetic error, in which case the amount in figures shall prevail subject to (i) and (ii) above.

If the Bidder that submitted the lowest evaluated Bid does not accept the correction of errors, its Bid shall be disqualified and its Bid Security shall be forfeited or its Bid Securing Declaration shall be executed.

**2. Procuring Entity's Right to Vary Quantities**

- i) If the Procuring Entity does not procure any subject matter of procurement or procures less than the quantity specified in the Bidding Document due to change in circumstances, the Bidder shall not be entitled for any claim or compensation except otherwise provided in the Conditions of Contract.
- ii) The purchaser reserve the right to place repeat order for extra items or additional quantities as per Rule No. 73 of RTPP Rule-2013 on the same prices, terms and conditions of the original order. The delivery period for such extra/ additional items shall be increased proportionately as per delivery period indicated in Schedule-DEL of the bid document.

3. The performance guarantee period of 220 kV & 132 kV Control and Relay Panels shall be **30** months from the date of commissioning or **36** months from the date of receipt of last consignment at site/store, whichever is earlier. This shall supersede the guarantee clause of GCC (Part-III of Volume-I).

(Bidder's Signature)

Name & Designation with seal of the bidder



**PARTICULARS OF PARTICIPATING BIDDER**

Participating bidder shall furnish following information in Separate sheet /statement along with Techno-Commercial bid to be opened on scheduled date of Bid opening.

S. No.	Description	Details to be filled by Bidder
1	Name & Address	
2	Details to be furnished:	
i)	Full Legal Name	
ii)	Full Address of	
a.	Registered office	
b.	Office where to corresponded:	
c.	Factory Address	
iii)	Authorized Contact Person(s): <b>(Power of Attorney to be enclosed)</b>	
iv)	Phone No. and Mobile No.	
v)	Telex No.	
vi)	Telefax No./Email	
vii)	Nature of registration of agency. (Whether sole/proprietor/ partnership/ private limited/ public limited).	
viii)	Memorandum of Understanding and Articles of Association of the Agency.	
NOTE: - Please furnish documents in support of the above, wherever necessary.		

Place

Signature  
Name  
Status

Whether authorised attorney  
of the Biding company

Name of the Biding company

**AVAILABLE ONLINE IN EXCEL FORMAT**

**DELIVERY SCHEDULE**

The delivery schedule of the 220 kV & 132 kV Control & Relay panel (Type-AII, BII, CII, JII, KII, KIII & LII) shall be as mentioned here under:

S. No.	Particulars of Material	Commencement Period	Period for completion of delivery of Material
1.	220 kV & 132 kV Control & Relay panel (Type-AII, BII, CII, JII, KII, KIII & LII)	30 days from the date of issue of Letter of Award (LOA).	Two months from the date of issue of respective Purchase Orders.

The ordered mandatory spares shall be supplied with last lot of overall delivery schedule.

- Note:-** (i) The contractual formalities shall be got completed within a period of 30 days from the date of receipt of LOA.  
(ii) The above delivery schedule can be revised by the purchaser at his discretion.

(Signature)  
Name & Designation  
with Seal of the firm

**Schedule-DEV****(A) DEPARTURE/DEVIATION FROM TECHNICAL SPECIFICATION**

(Must be filled in by the bidder and attached with Techno-commercial Bid)

The bidder shall state under this schedule the departure from the bid document in respect of technical conditions:-

S. No.	Name of the item	Purchaser's bid document clause reference	Existing provision	Modification desired	Remarks

Certified that we agree to all technical specification as laid down in the bid document except for the deviations to the extent indicated above.

**(B) DEPARTURE/DEVIATION FROM COMMERCIAL TERMS & CONDITIONS OF THE BID DOCUMENT**

(Must be filled in by the bidder and attached with Techno-commercial Bid)

The bidder shall state under this schedule the departure from the bid document in respect of commercial terms & conditions:-

S. No	Name of the item	Purchaser's bid document clause reference	Existing provision	Modification desired	Remarks

Certified that we agree to all commercial terms & conditions as laid down in General conditions of Contract to the bid document except for the deviations to the extent indicated above.

Note : Deviations indicated elsewhere will be ignored.

(Signature)  
Name & Designation with seal of the bidder

**DECLARATION BY THE BIDDER REGARDING QUALIFICATIONS**

(Must be filled in by the bidder and attached with Techno-commercial Bid)

In relation to my/our Bid submitted to \_\_\_\_\_ for procurement of \_\_\_\_\_ in response to their Notice Inviting Bids No. \_\_\_\_\_ dated \_\_\_\_\_, I/we hereby declare under Section 7 of THE Rajasthan Transparency in Public Procurement Act,2012, that:

1. I/we possess the necessary professional, technical, financial and managerial resources and competence required by Bidding Document issued by the Procuring Entity;
2. I/we have fulfilled his obligation to pay the taxes payable to Government viz. GST etc.;
3. I/we are not be insolvent, in receivership, bankrupt or being wound up, not have its affairs administered by a court or a judicial officer, not have its business activities suspended and must not be the subject of legal proceedings for any of the foregoing reasons;
4. I/we do not have, and our directors and officers not have, been convicted of any criminal offence related to my/our professional conduct or the making of false statements or misrepresentations as to my/our qualifications to enter into a procurement contract within a period of three years preceding the commencement of this procurement process, or not have been otherwise disqualified pursuant to debarment **or blacklisting proceedings by any utility / Govt. agency;**
5. I/we do not have a conflict of interest as has been specified in the RTPP Act/ Rules;

Date:  
Place:

Signature of bidder  
Name:  
Designation:  
Address:

**GUARANTEED LOSSES / FUNCTIONAL GUARANTTEE**

**DELETED/NOT APPLICABLE**

**SCHEDULE OF GUARANTEE TECHNICAL PARTICULARS FOR SUPPLY OF 220 KV AND  
132 KV TRANSFORMER, FEEDER & BUS COUPLER CONTROL & RELAY PANELS  
AGAINST BN-9016002118**

NOTE: Incomplete furnishing of information under this schedule will make the Bid quotations liable to be rejected.

S. No.	PARTICULARS	VALUE
<b>1</b>	<b>GENERAL</b>	
a.	Manufacturers Name	
b.	Postal address for correspondence	
i	Name of In charge	
ii	Telephone No.	
iii	Fax no.	
c.	Works Address	
i	Name of In charge	
ii	Telephone No.	
iii	Fax no.	
<b>2</b>	<b>INDICATING INSTRUMENTS</b>	
<b>2(i)</b>	<b>DIGITAL VOLTMETER</b>	
a	Make	
b	Type	
c	Size	
d	VA Burden	
e	Power Consumption	
f	Standards to which conforms	
g	Class of accuracy.	
h	Range of Dial	
i	Limits of error in effective range	
j	Calibration for:	
i)	PT ratio	
k	Whether Magnetically shielded or not	
l	Colour Finish	
m	Short time overload capacity	
n	Type of communication port & communication protocol.	
o	The height of figures for digital display	
<b>2(ii)</b>	<b>DIGITAL MULTIFUNCTIONAL METER</b>	
a	Make	
b	Type	
c	Size	
d	VA Burden	
i)	Current Coil	
ii)	Potential Coil	
e	Power Consumption	
i)	Current Coil	
ii)	Potential Coil	
f	Standards to which conforms	
g	Class of accuracy.	
h	Range of Dial	
i	Limits of error in effective range	
j	Calibration for:	
i)	CT ratio	
ii)	PT ratio	

S. No.	PARTICULARS	VALUE
k	Whether Magnetically shielded or not	
l	Colour Finish	
m	Short time overload capacity	
n	Type of communication port & communication protocol.	
o	The height of figures for digital display for digital meters	
<b>3(i)</b>	<b>CONTROL SWITCHES FOR CIRCUIT BREAKER</b>	
a	Make	
b	Type	
c	Type of handle provided	
d	No. of Position	
e	No. of contacts	
i)	Normally Closed	
ii)	Normally Open	
f	Making Capacity / breaking capacity	
i)	At 220 / 110 V DC for both inductive and non inductive currents	
ii)	At 230 V 50 c/s AC for both inductive current	
g	Whether spring return to neutral or stay put type	
h	Type of lock provided	
i	Whether have two sets of contacts which shall remain closed in neutral after close position	
<b>3(ii)</b>	<b>CONTROL SWITCHES FOR TRIP TRANSFER</b>	
a	Make	
b	Type	
c	Type of handle provided	
d	No. of Position	
e	No. of contacts	
i)	Normally Closed	
ii)	Normally Open	
f	Making Capacity / breaking capacity	
i)	At 220 / 110 V DC for both inductive and non inductive currents	
ii)	At 230 V 50 c/s AC for both inductive current	
g	Whether spring return to neutral or stay put type	
h	Type of lock provided	
i	Whether have two sets of contacts which shall remain closed in neutral after close position	
<b>3(iii)</b>	<b>DEAD BUS CLOSING SWITCH</b>	
a	Make	
b	Type	
c	Type of handle provided	
d	No. of Position	
e	No. of contacts	
i)	Normally Closed	
ii)	Normally Open	
f	Making Capacity / breaking capacity	
i)	At 220 / 110 V DC for both inductive and non inductive currents	
ii)	At 230 V 50 c/s AC for both inductive current	
g	Whether spring return to neutral or stay put type	
h	Type of lock provided	
i	Whether have two sets of contacts which shall remain closed in neutral after close position	
<b>3(iv)</b>	<b>SYNCHRONIZING SELECTOR SWITCH</b>	
a	Make	
b	Type	



S. No.	PARTICULARS	VALUE
c	Type of handle provided	
d	No. of Position	
e	No. of contacts	
i)	Normally Closed	
ii)	Normally Open	
f	Making Capacity / breaking capacity	
i)	At 220 / 110 V DC for both inductive and non inductive currents	
ii)	At 230 V 50 c/s AC for both inductive current	
g	Whether spring return to neutral or stay put type	
h	Type of lock provided	
i	Whether have two sets of contacts which shall remain closed in neutral after close position	
<b>3(v)</b>	<b>CARRIER SELECTOR SWITCH</b>	
a	Make	
b	Type	
c	Type of handle provided	
d	No. of Position	
e	No. of contacts	
i)	Normally Closed	
ii)	Normally Open	
f	Making Capacity / breaking capacity	
i)	At 220 / 110 V DC for both inductive and non inductive currents	
ii)	At 230 V 50 c/s AC for both inductive current	
g	Whether spring return to neutral or stay put type	
h	Type of lock provided	
i	Whether have two sets of contacts which shall remain closed in neutral after close position	
<b>3(vi)</b>	<b>SELECTOR SWITCH FOR AUTO RECLOSE</b>	
a	Make	
b	Type	
c	Type of handle provided	
d	No. of Position	
e	No. of contacts	
i)	Normally Closed	
ii)	Normally Open	
f	Making Capacity / breaking capacity	
i)	At 220 / 110 V DC for both inductive and non inductive currents	
ii)	At 230 V 50 c/s AC for both inductive current	
g	Whether spring return to neutral or stay put type	
h	Type of lock provided	
<b>4</b>	<b>SELECTOR SWITCHES FOR AMMETER/VOLTMETER</b>	
a	Make	
b	Type	
c	Type of handle provided	
d	No. of Position	
i)	In Ammeter	
ii)	In Voltmeter	
e	No. of contacts in each position	
i)	Open	
ii)	Closed	
f	Making Capacity breaking capacity	
g	Breaking Capacity of contacts	

S. No.	PARTICULARS	VALUE
h	Whether locking arrangements provided or not	
<b>5</b>	<b>CONTROL AND RELAY PANELS</b>	
a	Dimensions of control and relay panels	
I	Control panel	
i)	Height	
ii)	Width	
iii)	Depth	
II	Relay panel	
i)	Height	
ii)	Width	
iii)	Depth	
b	Width of corridor for duplex panels	
c	Dimension of supporting channels	
d	Overall dimensions of C&R Panels Height x Width x Depth	
e	Thickness of CRCA sheet steel proposed for use on panels	
i)	Front, door frame, base frame	
ii)	Side Panels, roof, doors	
f	Degree of protection	
g	Painting Process in as per Cl. 11.03	
h	Whether detachable end doors fitted on a detachable frame with suitable hinges is provided for each set of 220 kV / 132 KV duplex type Feeder C&R Panels (Cl. 11.02.2 of spec)	
i)	Height of detachable frame	
ii)	Width of detachable frame	
iii)	Channel height fitted above the detachable frame	
<b>6</b>	<b>SEMAPHORE INDICATORS</b>	
a	Make	
b	Type	
c	Diameter of the disc (mm)	
i)	For Isolator	
ii)	For Breaker	
d	Operating voltage	
e	Burden (Watts DC)	
f	Whether latch in type or supply failure type	
<b>7</b>	<b>INDICATING LAMPS</b>	
a	Make	
b	Type (LED Type)	
c	Operating Voltage	
d	Size of Lens	
e	Wattage of Lamp	
f	Colour of lamps body	
g	Colour of lamps for CB position	
i)	CB ON	
ii)	CB OFF	
iii)	CB AUTO TRIP	
iv)	CB Air Pressure Normal	
<b>8</b>	<b>SWITCHBOARD WIRING</b>	
a	Insulation of wiring	
b	Size of wiring conductor for :	
i)	CT Circuits	
ii)	PT Circuits	
iii)	DC Supply Circuits	
iv)	Alarm & Annunciator Circuit	

S. No.	PARTICULARS	VALUE
c	Size of earthing bar for safety earthing	
d	Type of Terminal provided on wiring	
e	Wiring Conductor	
f	Colour scheme of the wiring	
i)	AC 3 phase circuit	
ii)	No.1 phase	
iii)	No.2 phase	
iv)	No.3 phase	
g	Whether same ferrules provided at both ends of wires	
<b>9</b>	<b>VOLTAGE SELECTION RELAY</b>	
a	Make	
b	Type	
i)	Specified by manufacturer	
ii)	Whether the relay is draw out or non draw out	
iii)	Whether relay is numerical or static or electromechanical	
c	Whether relay is latch-in type with two stable positions.	
d	No. of contacts in each position	
e	Ref. No. of literature submitted	
<b>10</b>	<b>OVER CURRENT RELAY + EARTH FAULT RELAY</b>	
A	Maker's name	
B	Type of the Relay	
i)	Specified by manufacturer	
ii)	Whether the relay is draw out or non draw out	
iii)	Whether relay is numerical & communicable type	
iv)	Whether relay has provision of testing by injecting the voltage/current/frequency (as applicable) from external testing instruments/source without first disconnecting/de-energising the Electrical circuit protected by the Relay and isolating the tripping circuit of relay during such testing	
v)	Whether test block is required for testing of Relay	
vi)	Whether test block is inbuilt	
vii)	Whether test block is provided in panel	
viii)	Whether test plug is required for testing the relay	
ix)	Details of testing facilities provided in relay	
x)	Whether relay have provision to initiate a trip command externally through push button/ programmable switch or through attracted armature relays	
xi)	In case of directional relays whether relay have provision to check the directional feature and to make the relay non directional through a specified procedure. Details of specified procedure be indicated	
C	Current coil rating	
D	Tap range	
E	VA Burden	
F	Time of operation at max. time dial setting at :	
i)	5 times the tap setting current	
ii)	10 times the tap setting current	
G	Type of characteristics	
H	Trip contact rating	
I	Whether seal in contacts provided	
J	No. of contacts	
i)	Digital Input	
ii)	Digital Output	

S. No.	PARTICULARS	VALUE
K	Make & Type of software for Numerical Relays	
L	Type & number of communication ports	
M	Whether Front communication port is available or not.	
N	Communication protocol type	
O	Ref. No. of literature submitted	
<b>11</b>	<b>MAIN-I DISTANCE RELAY FOR 220 kV FEEDER RELAY PANEL</b>	
A	Make	
B	Type	
i)	Specified by manufacturer	
ii)	Whether the relay is draw out or non draw out	
iii)	Whether relay is numerical & communicable type	
iv)	Whether relay has provision of testing by injecting the voltage/current/frequency(as applicable) from external testing instruments/source without first disconnecting/de-energising the Electrical circuit protected by the Relay and isolating the tripping circuit of relay during such testing	
v)	Whether test block is required for testing of Relay	
vi)	Whether test block is inbuilt	
vii)	Whether test block is provided in panel	
viii)	Whether test plug is required for testing the relay	
ix)	Details of testing facilities provided in relay	
x)	Whether relay have provision to initiate a trip command externally through push button/ programmable switch or through attracted armature relays	
xi)	In case of directional relays whether relay have provision to check the directional feature and to make the relay non directional through a specified procedure. Details of specified procedure be indicated	
xii)	Whether the relay is switched or non switched	
xiii)	Principle of measurement	
C	No. of completely independent non switched zones of protection	
D	No. of non switched measuring elements for each zone of protection	
i)	For phase to phase faults	
ii)	For phase to earth faults	
E	Total No. of non switched distance measuring elements	
F	Whether measuring relays are inherently directional	
G	Whether using negative sequence measurement	
H	Whether relay have universal type carrier mode feature	
I	Main relay operating time:	
(i)	At SIR 4	
a	First Zone timing	
b	Second Zone timing	
c	Third Zone timing	
(ii)	At SIR 15	
a	First Zone timing	
b	Second Zone timing	
c	Third Zone timing	
J	Whether provide backup to adjacent feeders	
K	Whether have an adjustable characteristic angle setting range	
i	Angle setting range(in Deg)	
ii	Step range (in deg.)	
L	Characteristics	

S. No.	PARTICULARS	VALUE
(i)	For phase to phase faults:	
a	zone 1	
b	zone 2	
c	zone 3	
(ii)	For phase to ground faults:	
a	zone 1	
b	zone 2	
c	zone 3	
N	Whether have suitable DC/DC converter.	
O	No. of high speed trip relays for	
i)	Single phase faults	
ii)	Multi phase faults	
P	Whether include power swing blocking relay	
i)	Adjustable setting range of time delay on pickup for blocking (in ms)	
ii)	Adjustable setting range of time delay on pickup for unblocking (in ms)	
iii)	Whether tripping block during power swing condition caused by load changes:	
iv)	Type of tripping of breaker if the disturbance lasts for an interval equal to or longer than the set de-blocking time.	
v)	Adjustable characteristics angle setting range ( in degree)	
Q	Whether include fuse failure protection	
i)	Operating time (in Ms)	
ii)	Whether remain inoperative for system earth faults	
R	Nos. of contacts on trip relay	
S	Whether have built-in supervision and testing facility	
T	Whether include continuous DC supply supervision	
U	Whether have week in feed tripping feature.	
V	Whether relay have capacity to detect and monitor broken conductor	
W	Make type of software for numerical relay	
X	Details of starting units	
Y	First zone elements taps are variable in steps of	
Z	Second zone elements taps are variable in steps of	
A1	Third zone elements taps are variable in steps of	
B1	Whether MHO type units have offset setting possible and if so, range	
C1	Contact ratings	
i)	First zone	
ii)	Second zone	
iii)	Third zone	
D1	VA burden of	
i)	Current coil	
ii)	Potential coil	
E1	Accuracy class, VA accuracy limit factor, and knee point requirement of CTs	
F1	Have seal in contacts been provided in the trip circuits	
G1	Details of out of step blocking relays (if provided)	
H1	No. of outputs	
I1	Details of carrier equipment required for controlling remote end CB	
J1	No of digital (Binary I/P)	

S. No.	PARTICULARS	VALUE
K1	Type & No of communication port	
L1	Communication protocol type	
M1	Ref no. of literature submitted	
<b>12</b>	<b>MAIN-II DISTANCE RELAY FOR 220 kV FEEDER RELAY PANEL</b>	
A	Make	
B	Type	
i)	Specified by manufacturer	
ii)	Whether the relay is draw out or non draw out	
iii)	Whether relay is numerical & communicable type	
iv)	Whether relay has provision of testing by injecting the voltage/current/frequency(as applicable) from external testing instruments/source without first disconnecting/ de-energising the Electrical circuit protected by the Relay and isolating the tripping circuit of relay during such testing.	
v)	Whether test block is required for testing of Relay.	
vi)	Whether test block is inbuilt	
vii)	Whether test block is provided in panel	
viii)	Whether test plug is required for testing the relay.	
ix)	Details of testing facilities provided in relay.	
x)	Whether relay have provision to initiate a trip command externally through push button/ programmable switch or through attracted armature relays	
xi)	In case of directional relays whether relay have provision to check the directional feature and to make the relay non directional through a specified procedure. Details of specified procedure be indicated	
xii)	Whether the relay is switched or non switched	
xiii)	Principle of measurement	
C	No. of completely independent non switched zones of protection	
D	No. of non switched measuring elements for each zone of protection	
i)	For phase to phase faults	
ii)	For phase to earth faults	
E	Total No. of non switched distance measuring elements	
F	Whether measuring relays are inherently directional	
G	Whether using negative sequence measurement	
H	Whether relay have universal type carrier mode feature	
I	Main relay operating time:	
(i)	At SIR 4	
a	First Zone timing	
b	Second Zone timing	
c	Third Zone timing	
(ii)	At SIR 15	
a	First Zone timing	
b	Second Zone timing	
c	Third Zone timing	
J	Whether provide backup to adjacent feeders	
K	Whether have an adjustable characteristic angle setting range	
i	Angle setting range(in Deg)	
ii	Step range (in deg.)	
L	Characteristics	
(i)	For phase to phase faults:	
a	zone 1	

S. No.	PARTICULARS	VALUE
b	zone 2	
c	zone 3	
(ii)	For phase to ground faults:	
a	zone 1	
b	zone 2	
c	zone 3	
N	Whether have suitable DC/DC converter.	
O	No. of high speed trip relays for	
i)	Single phase faults	
ii)	Multi phase faults	
P	Whether include power swing blocking relay	
i)	Adjustable setting range of time delay on pickup for blocking (in ms)	
ii)	Adjustable setting range of time delay on pickup for unblocking (in ms)	
iii)	Whether tripping block during power swing condition caused by load changes:	
iv)	Type of tripping of breaker if the disturbance lasts for an interval equal to or longer than the set de-blocking time.	
v)	Adjustable characteristics angle setting range ( in degree)	
Q	Whether include fuse failure protection	
i)	Operating time (in Ms)	
ii)	Whether re Main-Inoperative for system earth faults	
R	Nos. of contacts on trip relay	
S	Whether have built-in supervision and testing facility	
T	Whether include continuous DC supply supervision	
U	Whether have week in feed tripping feature.	
V	Whether relay have capacity to detect and monitor broken conductor	
W	Make type of software for numerical relay	
X	Details of starting units	
Y	First zone elements taps are variable in steps of	
Z	Second zone elements taps are variable in steps of	
A1	Third zone elements taps are variable in steps of	
B1	Whether MHO type units have offset setting possible and if so, range	
C1	Contact ratings	
i)	First zone	
ii)	Second zone	
iii)	Third zone	
D1	VA burden of	
i)	Current coil	
ii)	Potential coil	
E1	Accuracy class, VA accuracy limit factor, and knee point requirement of CTs	
F1	Have seal in contacts been provided in the trip circuits	
G1	Details of out of step blocking relays (if provided)	
H1	No. of outputs	
I1	Details of carrier equipment required for controlling remote end CB	
J1	No of digital (Binary I/P)	
K1	Type & No of communication port	
L1	Communication protocol type	

S. No.	PARTICULARS	VALUE
M1	Ref no. of literature submitted	
<b>13</b>	<b>DISTANCE RELAY FOR 132kV FEEDER RELAY PANEL</b>	
a	Make	
b	Type	
i)	Specified by manufacturer	
ii)	Whether relay is draw out or non draw out	
iii)	Whether relay is numerical	
iv)	Whether the relay is switched or non switched	
c	No. of zone of protection	
d	Details of starting units	
e	Characteristic of measuring relay	
f	Operating time:	
i)	First zone timing	
ii)	second zone timings	
iii)	Third zone timings	
g	Contact rating:	
h	VA burden of each type of relays	
i)	current circuit	
ii)	Potential circuit	
i	Whether relay has built in fault locators	
j	No and type of communication ports front/ rear	
k	Have Communication protocol as per IEC-61850	
<b>14</b>	<b>COMBINED OVER CURRENT RELAY + EARTH FAULT RELAY FOR 220kV TRANSFORMER PANEL (TYPE B-II) HV SIDE OF 220/132kV TRANSFORMERS</b>	
a	Maker's name	
b	Type of the Relay	
i)	Specified by manufacturer	
ii)	Whether the relay is draw out or non-draw out	
iii)	Whether relay is numerical & communicable type	
iv)	Whether relay has provision of testing by injecting the voltage/current/ frequency (as applicable) from external testing instruments/source without first disconnecting/de-energizing the Electrical circuit protected by the Relay and isolating the tripping	
v)	Whether test block is required for testing of Relay.	
vi)	Whether test block is inbuilt	
vii)	Whether test block is provided in panel	
viii)	Whether test plug is required for testing the relay.	
ix)	Details of testing facilities provided in relay.	
x)	Whether relay have provision to initiate a trip command externally through Push button/ programmable switch or through attracted armature relays	
xi)	In case of directional relays whether relay have provision to check the directional feature and to make the relay non directional through a specified procedure Details of specified procedure be indicated	
c	Current coil rating	
d	Tap range	
e	VA Burden	
f	Time of operation at max. time dial setting at :	
i)	5 times the tap setting current	
ii)	10 times the tap setting current	
g	Type of characteristics	
h	Trip contact rating	



S. No.	PARTICULARS	VALUE
i	Whether seal in contacts provided	
j	No. of contacts	
i)	Digital Input	
ii)	Digital Output	
k	Make & Type of software for Numerical Relays	
l	Type & number of communication ports	
m	Whether numerical relay is assessable with remote PC or lap top through a front interface	
n	Type of front interface provided in relay(in ref. to above S. No. m)	
o	Ref. No. of literature submitted	
<b>15</b>	<b>COMBINED OVER CURRENT RELAY + EARTH FAULT RELAY FOR 132kV TRANSFORMER PANEL (TYPE K-II) LV SIDE OF 220/132kV TRANSFORMERS</b>	
a	Maker's name	
b	Type of the Relay	
i)	Specified by manufacturer	
ii)	Whether the relay is draw out or non draw out	
iii)	Whether relay is numerical & communicable type	
iv)	Whether relay has provision of testing by injecting the voltage/current/frequency(as applicable) from external testing instruments/source without first disconnecting/de-energizing the Electrical circuit protected by the Relay and isolating the tripping	
v)	Whether test block is required for testing of Relay.	
vi)	Whether test block is inbuilt	
vii)	Whether test block is provided in panel	
viii)	Whether test plug is required for testing the relay.	
ix)	Details of testing facilities provided in relay.	
x)	Whether relay have provision to initiate a trip command externally through Push button/ programmable switch or through attracted armature relays	
xi)	In case of directional relays whether relay have provision to check the directional feature and to make the relay non directional through a specified procedure. Details of specified procedure be indicated	
c	Current coil rating	
d	Tap range	
e	VA Burden	
f	Time of operation at max. time dial setting at :	
i)	5 times the tap setting current	
ii)	10 times the tap setting current	
g	Type of characteristics	
h	Trip contact rating	
i	Whether seal in contacts provided	
j	No. of contacts	
i)	Digital Input	
ii)	Digital Output	
k	Make & Type of software for Numerical Relays	
l	Type & number of communication ports	
m	Whether numerical relay is assessable with remote PC or lap top through a front interface	
n	Type of front interface provided in relay(in ref. To above S. No. m)	
o	Ref. No. of literature submitted	

S. No.	PARTICULARS	VALUE
<b>16</b>	<b>COMBINED OVER CURRENT RELAY + EARTH FAULT RELAY FOR 132kV TRANSFORMER PANEL(TYPE K-III) HV SIDE OF 132/33kV OR 132 /11kV TRANSFORMERS</b>	
a	Maker's name	
b	Type of the Relay	
i)	Specified by manufacturer	
ii)	Whether the relay is draw out or non draw out	
iii)	Whether relay is numerical & communicable type	
iv)	Whether relay has provision of testing by injecting the voltage/current/ frequency(as applicable) from external testing instruments/source without first disconnecting/de-energizing the Electrical circuit protected by the Relay and isolating the tripping	
v)	Whether test block is required for testing of Relay.	
vi)	Whether test block is inbuilt	
vii)	Whether test block is provided in panel	
viii)	Whether test plug is required for testing the relay.	
ix)	Details of testing facilities provided in relay.	
x)	Whether relay have provision to initiate a trip command externally through Push button/ programmable switch or through attracted armature relays	
xi)	In case of directional relays whether relay have provision to check the directional feature and to make the relay non directional through a specified procedure. Details of specified procedure be indicated	
c	Current coil rating	
d	Tap range	
e	VA Burden	
f	Time of operation at max. time dial setting at :	
i)	5 times the tap setting current	
ii)	10 times the tap setting current	
g	Type of characteristics	
h	Trip contact rating	
i	Whether seal in contacts provided	
j	No. of contacts	
i)	Digital Input	
ii)	Digital Output	
k	Make & Type of software for Numerical Relays	
l	Type & number of communication ports	
m	Whether numerical relay is assessable with remote PC or lap top through a front interface	
n	Type of front interface provided in relay(in ref. to above S. No. m)	
o	Ref. No. of literature submitted	
<b>17</b>	<b>PERCENTAGE BIASED DIFFERENTIAL RELAYS:</b>	
<b>17A</b>	<b>For 220kV TRANSFORMER PANEL HV SIDE OF 220/132kV TRANSFORMER (TYPE B-II )</b>	
a	Make	
b	Type	
i	Specified by manufacturer	
ii	Whether relay is draw out or non-draw out	
iii	Whether relay is numerical	
c	Whether relay is two winding type .	
d	Whether relay is variable bias type.	
e	Operating time of differential relay at 5 times of setting	

S. No.	PARTICULARS	VALUE
f	Whether relay immune to magnetizing inrush current and have feature to provide stability under over excited conditions	
g	Whether the protection system shall not operate for the transformer Inrush current having an inrush factor not Greater than seven and time constant of 200 mili sec.	
h	Operating setting of the differential relay (in percent of the rated current).	
i	Whether relay shall operate for all internal faults but shall not operate on heavy through faults	
j	Whether relay suitable for unbalance current due to on load tap Changing equipment provided on transformer which can vary tap changer Setting from (-)15% to (+)10%	
k	Whether differential relay have adjustable setting for the operating current as well as bias setting.	
l	Whether instantaneous high set circuit with separate indications provided-	
m	Minimum setting of the instantaneous high set circuit (in times of the rated current.	
n	Whether relay have dual slope characteristics.	
o	Whether relay have disturbance recorder which displays pre-event and post event parameter with external triggering facility	
p	whether relay is assessable with remote PC or Laptop through front interface.	
q	Type of front interface provided in offered relays (in ref to above s. no. p)	
r	Whether offered numerical relay have open protocol for communication such as IEC 60870-5-103/IEC 61850	
s	Type of protocol provided (in reference to above S. no. r)	
t	Whether differential have facility to synchronize its time clock from time synchronization equipment having output port IPIG-B/RS232/ Potential free contacts.(PPM)	
u	Type of port provided in relay (in reference to above S. No. t)	
v	Make and Type of application software for Numerical relays	
w	No. of contacts	
i)	Digital Input	
ii)	Digital Output	
<b>17B</b>	<b>FOR 132kV TRANSFORMER PANEL HV SIDE OF 132/33kV &amp; 132/11kV TRANSFORMER (TYPE K-III)</b>	
a	Make	
b	Type	
i	Specified by manufacturer	
ii	Whether relay is draw out or non-draw out	
iii	Whether relay is numerical or static	
c	Whether relay is two winding type -	
d	Whether relay is variable bias type.	
e	Operating time of differential relay at 5 times of setting	
f	Whether relay immune to magnetizing inrush current and have feature to provide stability under over excited conditions	
g	Whether the protection system shall not operate for the transformer inrush current having an inrush factor not greater than seven and time constant of 200 mili sec-	
h	Operating setting of the differential relay (in percent of the rated current)-	
i	Whether relay shall operate for all internal faults but shall not operate on heavy through faults	

S. No.	PARTICULARS	VALUE
j	Whether relay suitable for unbalance current due to on load tap changing equipment provided on transformer which can vary tap changer setting from (-)15% to (+)5%	
k	Whether differential relay have adjustable setting for the operating current as well as bias setting.	
l	Whether instantaneous high set circuit with separate indication is provided	
m	Minimum setting of the instantaneous high set circuit (in times of the rated current.	
n	Whether relay have dual slope Characteristics.	
o	whether relay is assessable with remote PC or Laptop through front interface.	
p	Type of port provided in relay (in reference to above S. No. o)	
q	Make and Type of application software for Numerical relays	
r	No. of contacts	
i)	Digital Input	
ii)	Digital Output	
<b>18</b>	<b>LOCAL BREAKER BACKUP RELAY:</b>	
a	Maker's name	
b	Type	
i)	Specified by manufacturer.	
ii)	Whether relay is draw out or non draw out	
iii)	Whether relay is numerical & communicable type	
iv)	Whether relay has provision of testing by injecting the voltage/current/frequency (as applicable) from external testing instruments/source without first disconnecting/de-energising the Electrical circuit protected by the Relay and isolating the tripping circuit of relay during such testing	
v)	Whether test block is required for testing of Relay	
vi)	Whether test block is in built	
vii)	Whether test block is provided in panel	
viii)	Whether test plug is required for testing the relay	
ix)	Details of testing facilities provided in relay	
x)	Whether relay have provision to initiate a trip command externally through push button/ programmable switch or through attracted armature relays	
xi)	In case of directional relays whether relay have provision to check the directional feature and to make the relay non directional through a specified procedure. Details of specified procedure be indicated	
c	Operating time	
d	Re-setting time	
e	No. of elements	
i)	For over current	
ii)	For earth fault	
f	Whether operate for all type of faults	
g	Whether operate in load condition	
h	Whether initiate remote end tripping	
i	Setting range of rated current	
i)	for phase over current element	
ii)	for earth fault element	
j	Adjustable time setting range on pick up (in sec)	
k	Whether have provision for connecting to existing bus bar protection scheme	

S. No.	PARTICULARS	VALUE
l	Whether LBB scheme include bus bar protection type of tripping relays with necessary auxiliary relays, timers, etc to isolate the faulted bus.	
m	Burden	
n	Type & no of communication ports	
o	Communication protocol type	
p	case finish	
q	Reference No, of literature submitted	
<b>19</b>	<b>AUTO RECLOSE RELAY</b>	
a	Whether built-in feature of	
i)	Main-I distance protection scheme	
ii)	Main-II distance protection scheme	
b	whether it is separate	
i)	Maker's name	
ii)	Type of relay as specified by the manufacturer	
iii)	whether numerical or static or electromechanical type	
iv)	Whether relay is draw out or non draw out	
c	Whether auto reclose relay is suitable for both single and three phase tripping	
d	Continuously variable single phase dead time setting (in secs,)	
e	Continuously variable three phase dead time setting (in secs,)	
f	Continuously variable reclaim time setting (in secs,)	
g	No. of position of selector switch for selection of auto reclose mode	
h	Details of position of selector switch	
i	Whether have facilities for selecting check synchronising or dead line charging feature	
j	Whether single shot type	
k	Whether auto re-closer of the line shall take place	
l	Whether auto re- closer operates when the faults cleared in second zone or third zone	
m	Whether auto re- closer operated when the tripping take place after a power swing condition	
n	Whether auto reclose operates in the event of a trip on pole discrepancy	
o	Whether built in auto reclose relay in main distance protection scheme Main-I and Main-II have single phase pole tripping Feature. if not then how it will be achieved	
p	Whether separate auto re- closer relay have single pole tripping.	
<b>20</b>	<b>CHECK SYNCHRONISING RELAY:</b>	
a	Maker's name	
b	Type	
i)	Specified by manufacturer.	
ii)	Whether relay is draw out or non draw out or built-in feature of Main-I & Main-II distance relay	
iii)	Whether relay is numerical	
iv)	Whether relay has provision of testing by injecting the voltage/current/ frequency (as applicable) from external testing instruments/source without first disconnecting/de-energising the Electrical circuit protected by the Relay and isolating the tripping circuit of relay during such testing	
v)	Whether test block is required for testing of Relay	
i)	Whether test block is in built	
ii)	Whether test block is provided in panel	

S. No.	PARTICULARS	VALUE
vi)	Whether test plug is required for testing the relay	
vii)	Details of testing facilities provided in relay	
c	Time setting range (in sec)	
d	Response time (in mili sec)	
e	Setting phase angle frequency, voltage	
<b>21</b>	<b>DEAD LINE CHARGING RELAY</b>	
a	Maker's name	
b	Type	
i)	Specified by manufacturer	
ii)	Whether relay is draw out or non draw out or built-in feature of Main-I & Main-II distance relay	
iii)	Whether relay is numerical	
iv)	Whether in built or separate	
v)	Time setting (in sec)	
vi)	Set of relays for monitor the voltage	
vi)	Line CVT's setting in % of rated voltage	
vii)	Bus CVT's setting in % of rated voltage	
viii)	Reference No. of literature submitted	
<b>22</b>	<b>AUXILIARY RELAYS</b>	
a	Maker's name	
b	Type	
i)	Specified by manufacturer.	
ii)	Whether relay is draw out or non draw out	
iii)	Whether relay is numerical or static or electromechanical	
c	Capacity of contacts Continuously for 3 sec.	
d	Operating coil VA burden	
e	Voltage operated or current operated	
f	No. of normally closed contacts	
g	No. of normally open contacts	
h	Contacts hand or self/reset type	
i	Type of mounting	
j	Case finish	
k	Any other special feature	
l	Reference No. of literature submitted	
<b>23 I</b>	<b>HIGH SPEED MASTER TRIPPING RELAY FOR 220kV C&amp;R PANELS</b>	
a	Maker's name	
b	Type	
i)	Specified by manufacturer.	
ii)	Whether relay is draw out or non draw out	
iii)	Whether relay is static or electromechanical	
c	Operating Voltage	
d	No. of normally open contacts	
e	No. of normally closed contacts	
f	Operating coil VA burden	
g	Making capacity of contacts	
h	Indicator self reset or hand reset type	
i	Case finish	
j	Reference No. of literature submitted	
<b>23 II</b>	<b>HIGH SPEED MASTER TRIPPING RELAY FOR 132kV C&amp;R PANELS</b>	
a	Maker's name	
b	Type	

S. No.	PARTICULARS	VALUE
i)	Specified by manufacturer.	
ii)	Whether relay is draw out or non draw out	
iii)	Whether relay is static or electromechanical	
c	Operating Voltage	
d	No. of normally open contacts	
e	No. of normally closed contacts	
f	Operating coil VA burden	
g	Making capacity of contacts	
h	Indicator self reset or hand reset type	
i	Case finish	
j	Reference No. of literature submitted	
<b>24</b>	<b>SINGLE PHASE TRIPPING RELAY FOR 220kV C&amp;R PANELS</b>	
a	Maker's name	
b	Type	
i)	Specified by manufacturer.	
ii)	Whether relay is draw out or non draw out	
iii)	Whether relay is static or electromechanical	
c	Operating Voltage	
d	No. of normally open contacts	
e	No. of normally closed contacts	
f	Operating coil VA burden	
g	Making capacity of contacts	
h	Indicator self reset or hand reset type	
i	Case finish	
j	Reference No. of literature submitted	
<b>25</b>	<b>TRIP CIRCUIT SUPERVISION RELAY</b>	
a	Make	
b	Type	
i)	Specified by manufacturer.	
ii)	Whether relay is draw out or non draw out	
iii)	Whether relay is numerical or static or electromechanical	
c	Whether provides trip circuit supervision during CB on and CB off (pre-closing)	
d	Reference No. of literature submitted	
<b>26</b>	<b>CONTACT MULTIPLICATION RELAY FOR ISOLATOR AUXILIARY SWITCH</b>	
a	Make	
b	Type	
i)	Specified by manufacturer.	
ii)	Whether relay is draw out or non draw out	
iii)	Whether relay is numerical or static or electromechanical	
c	Number of contacts	
i)	Normally open	
ii)	Normally closed	
d	Whether relay is heavy duty latch-in type	
<b>27</b>	<b>CONTACT MULTIPLICATION RELAY FOR AUTO RECLOSE FUNCTION</b>	
a	Make	
b	Type	
i)	Specified by manufacturer.	
ii)	Whether relay is draw out or non draw out	
iii)	Whether relay is numerical or static or electromechanical	

S. No.	PARTICULARS	VALUE
c	Number of contacts	
i)	Normally open	
ii)	Normally closed	
d	Whether relay is heavy duty self reset type	
<b>28</b>	<b>VOLTEGE SELECTION RELAY</b>	
a	Make	
b	Type	
i)	Specified by manufacturer.	
ii)	Whether relay is draw out or non draw out	
iii)	Whether relay is numerical or static or electromechanical	
c	Number of contacts	
i)	Normally open	
ii)	Normally closed	
d	Whether relay is heavy duty latch-in type	
<b>29</b>	<b>DC SUPERVISION RELAY</b>	
a	Make	
b	Type	
i	Specified by manufacturer.	
ii	Whether relay is draw out or non draw out	
iii	Whether relay is numerical or static or electromechanical	
c	No. of elements per relay	
d	Setting range	
e	VA Burden	
f	No. of output contact	
g	Reference No, and literature submitted	
<b>30</b>	<b>EXTERNAL TIMER FOR LBB RELAY</b>	
a	Make	
b	Type	
i	Specified by manufacturer.	
ii	Whether relay is draw out or non draw out	
iii	Whether relay is numerical or static or electromechanical	
c	Operating Voltage	
d	Range	
e	No. of contacts	
f	Reference No. of literature submitted	
<b>31</b>	<b>TEST PLUG FOR TESTING OF RELAYS</b>	
a	Whether test plug is required for testing the offered relays	
b	If not required, give detail why it is not required	
c	Whether only one type of test plug is suitable for testing of distance/ over differential over current & earth fault protection schemes/ relays as offered	
i)	Make	
ii)	Type	
d	If separate test plug is required for each/type of protection scheme/relays as offered	
<b>32</b>	<b>DISTANCE TO FAULT LOCATORS</b>	
a	Whether in built in distance protection scheme or provided separately	
b	Make	
c	Type	
d	Accuracy of measurement of line length	
e	Whether provided digital indication of distance to fault in percentage/ actual length of the supervisor length (in Kms)	



S. No.	PARTICULARS	VALUE
f	whether have facility to provide outputs for tertiary and local print out of the distance of fault	
g	Current input required	
h	Voltage input required	
i	Minimum & maximum range of fault detection	
j	Whether distance display in KM available	
k	Mode of output for tele-metering	
l	Whether interfacing equipment required for connection to printer	
m	Mounting details	
n	Standard to which conform	
o	Reference No., Of literature submitted	
<b>33</b>	<b>DISTURBANCE RECORDER</b>	
i)	Whether additional feature of the Main-I & Main-II distance protection	
a	Make	
b	Type	
c	Whether disturbance recorder is microprocessor based	
d	Sampling rate (in ms)	
e	Whether following record in the graphic form of during disturbances	
i)	Instantaneous value of voltage and current in all the three phase	
ii)	Open delta voltages	
iii)	Open & Closed position of relay contacts & breaker etc.,	
f	Whether have individual acquisition unit	
g	Whether the print out shall contain	
i)	Feeder identity	
ii)	Date, time (in hour, minute & second up to 100th of a second)	
h	Whether graphic form of minimum 8 analogue & 16 event signal of all the channels is separate	
i	Whether print out will be clear & legible without the help of magnifying glass or any such device	
j	Whether it is possible to trigger the disturbance recorder externally through contact set	
k	Numbers of	
i)	Analogue channels per circuit	
ii)	Digital channels per circuit	
iii)	Total Analogue channel	
iv)	Total digital channel	
l	whether the equipment is self monitoring or not.	
m	Minimum Memory capacity of Disturbance Recorder	
n	Minimum recording time of each recording (In msec.)	
o	Whether Disturbance recorder is accessible with remote PC or laptop	
<b>34</b>	<b>ANNUNCIATOR</b>	
a	Maker's name	
b	Type of relays	
<b>35</b>	<b>SYNCHRONIZING SOCKET WITH PLUG</b>	
a	Make	
b	Type	
<b>36</b>	<b>HOOTER</b>	
a	Make	
b	Type	
<b>37</b>	<b>BELL</b>	

S. No.	PARTICULARS	VALUE
a	Make	
b	Type	
<b>38</b>	<b>SPACE HEATER</b>	
a	Make	
b	Type	
<b>39</b>	<b>LINK TYPE TEST TERMINAL BLOCK FOR TVM</b>	
a	Make	
b	Type	
<b>40</b>	<b>TEST KIT/PLUG FOR TESTING OF RELAYS</b>	
i)	Distance Relay	
ii)	Over current and Earth fault Relay	
iii)	LBB Relay	
iv)	Any other relay provided in panel	
<b>41</b>	<b>2 FEET TUBE LIGHT</b>	
a	Make	
b	Type	
c	Capacity in watt	
<b>42</b>	<b>PROTOCOL PROVIDED IN NUMERICAL RELAY</b>	
a	220kV Distance Relay Main-I	
b	220kV Distance Relay Main-II	
c	132kV Distance Relay	
d	Over current and Earth fault Relay	
e	LBB Relay	
<b>43</b>	<b>0.2S Class AC Static HT-TVM TOD Meter</b>	
a	Make	
b	Type	
c	Whether it meets the specification of TOD meter as specified at Volume- II K	
<b>44</b>	<b>MISCELLANEOUS</b>	
	Whether 10% spare connectors in terminal boards mounted in control& relay panel?	

Any other particulars which bidder may like to give

Signature  
Name & Designation with Seal of Bidder

**Schedule-PEP****PREVIOUS EXPERIENCE AND PERFORMANCE**

(Must be filled in by the bidder and attached with Techno-commercial Bid)

The bidder shall state under this schedule whether materials and equipments, similar to those offered in the bid have been previously supplied by him. A list shall be given of such orders executed by him together with the information regarding the name of purchasing organization, quantities supplied and when the supplies were effected. This list should be in the form given below:

S. No.	Detailed particulars of item supplied	Qty (Nos.)	Order No. & Date	Name & details of Purchasing authority	Date of completion	If executed partially, mention Qty (Nos.)	Whether still to be executed	Delivery stipulated in PO	Remarks
1	2	3	4	5	6	7	8	9	10

It is certified that the information furnished above is correct to the best of my knowledge and we are liable for action if any information is found incorrect.

Note :- Separate schedule are to be furnished by the bidder for past supply to the RVPN (Erstwhile RSEB), other state electricity Nigam and other department/ organization.

(Signature)

Name &amp; Designation with seal of the bidder

**PLANT/MACHINERY AVAILABLE**  
(TO BE FILLED IN AND SIGNED BY THE BIDDER)

Bidder's Name & Address:

Schedule of plant/machinery available with the Bidder for use in the manufacture of material/  
Equipment and testing

S. No.	Description of Plant/ Machinery & testing equipment	Make	Age & condition	Location where installed	Remarks
1.	2.	3.	4.	5.	6.

**Place**

Signature  
Name  
Status

Whether authorised attorney  
of the Bidding company

Name of the Bidding company

Schedule-PV**PRICE VARIATION CLAUSE FOR LV SWITCHGEAR AND CONTROLGEAR (up to & including 1100 V)**

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

$$P = \frac{Po \left\{ \frac{IS}{100} + 21 + \frac{C}{19} + \frac{Al}{21} + \frac{In}{12} + \frac{W}{15} + \frac{Wo}{12} \right\}}{100 \left\{ \frac{Iso}{100} + Co + Alo + Ino + Wo \right\}}$$

Wherein,

- P = Price payable as adjusted in accordance with above formula.
- Po = Price quoted/confirmed. (Exclusive of all taxes & duties)
- Iso = Wholesale price index for 'Manufacture of Basic Metals' (Base 2011-12 = 100) (refer notes). This index is as applicable for the month, **THREE** month prior to the date of tendering.
- Co = Average LME settlement price of copper wire bars (refer notes). This price is as applicable for the month, **ONE** month prior to the date of tendering.
- Alo = Price of busbar grade aluminium (refer notes). This price is as applicable on the 1<sup>st</sup> working day of the month, **ONE** month prior to the date of tendering.
- Ino = Price of phenolic moulding powder. This price is as applicable on the 1<sup>st</sup> working day of the month, **ONE** month prior to the date of tendering.
- Wo = All India average consumer price index number for industrial workers, as published by the Labour Bureau, Ministry of Labour, Govt. of India (Base 2016 =100) This index number is as applicable for the month, **FOUR** months prior to the date of tendering.

For example, if the date of tendering falls in April 2019, applicable prices Copper(Co), Aluminium Busbar (Alo) and Insulating material (Ino) should be as on 1<sup>st</sup> March 2019 and Wholesale price Index number for 'Manufacture of Basic Metals' (Iso) and all India average consumer price index no. (Wo) should be for the month of January 2019.

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

- IS = Wholesale price index for "Manufacture of Basic Metals" (Base 2011-12 = 100) (refer notes). This index is as applicable for the month, **FOUR** month prior to the date of delivery.
- C = Average LME settlement price of copper wire bars (refer notes). This price is as applicable for the month, **TWO** months prior to the date of delivery.
- Al = Price of busbar grade aluminium (refer notes) This price is as applicable on the 1<sup>st</sup> working day of the month, **TWO** months prior to the date of delivery.

In = Price of phenolic moulding powder.

This price is as applicable on the 1<sup>st</sup> working day of the month, **TWO** months prior to the date of delivery.

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

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

For example, if the date of delivery in terms of clause given below falls in June 2019, applicable prices of Copper(Co), Aluminium Busbar (Alo) and Insulating material (Ino) should be as on 1<sup>st</sup> April 2019 and Wholesale price Index number for 'Manufacture of Basic Metals' (Iso) and all India average consumer price index number (Wo) should be for the month of February 2019.

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

**Note:-**

(a) All prices of raw materials are exclusive of modvatable GST/CV duty amount and exclusive of any other central, state or local taxes, octroi etc.

(b) The details of prices are as under:

- 1) The wholesale price Index number for "Manufacture of Basic Metals" is as published by the office of Economic advisor, Ministry of commerce & Industry, Govt. of India, New Delhi, with base 2011-12 =100.
- 2) The LME price of copper wire bars (in Rs./MT) is the LME average settlement price of Copper Wire Bars converted into Indian Rupees with applicable average exchange rate of SBI of the month. This price is the landed cost, inclusive of applicable customs duty only but exclusive of countervailing duty.
- 3) The price of busbar grade aluminium (in Rs./MT) is the average of ex-works price as quoted by the two primary producers for the busbar size 152.4x6.35 mm flat approximately, grade equivalent to E91 E as per IS 5082-1998(or the latest).
- 4) The price of insulating material (in Rs./Kg) is the average price of phenolic moulding powder quoted by three manufacturers applicable for switchgear and controlgear of medium/lower voltage upto 1100 volts

The provisions for PV claim are :-

**(i) When the material is offered within stipulated delivery schedule.**

For allowing P.V. the date of delivery shall be considered the date on which material is notified as being ready for inspection (date of receipt of inspection call in the office, if the offered material is lying ready) or the date of actual delivery, whichever is beneficial to the Nigam.

**(ii) When the material is offered after expiry of stipulated delivery schedule.**

For allowing P.V. in the cases the supplies are made after the expiry of scheduled delivery, the price prevailing in the last month of the stipulated scheduled delivery or the date on which material is notified as being ready for inspection (date of receipt of inspection call in the office if the offered material is lying ready) or actual date of delivery whichever is beneficial to Nigam.

(iii) **When the material is offered ahead of delivery schedule on the request of RVPN**

Normally supplies ahead of delivery schedule shall not be accepted. However in case of urgency of material, if supplies are accepted ahead of delivery schedule, PV shall be allowed on the basis the material is notified as being ready for inspection (date of receipt of inspection call in the office if the offered material is lying ready) or the actual date of delivery whichever is beneficial to Nigam.

(iv) **When the material is offered ahead of delivery schedule by firm at their own and accepted by RVPN on the request of firm.**

Normally the request of the firm to accept the material ahead of delivery schedule will not be accepted. In case firm offers supplies ahead of delivery schedule at their own and such request is accepted by RVPN, the price prevailing in the first months of stipulated delivery schedule or the date on which material is notified as being ready for inspection (date of receipt of inspection call in the office if the offered material is lying ready) or actual date of delivery whichever is beneficial to Nigam shall be allowed.

**Note:** In case IEEMA changes the applicable formula/indices for price variation during the pendency of the contract for any item, the same shall be applicable, provided if during pendency of the contract when both old and new price indices are being circulated, in such circumstances the lower of the price variation evaluated as per both old and new formula/indices, whichever is beneficial to Nigam, shall be admissible to the supplier(s), and for the period from which the old indices are discontinued, the price variation shall be admissible as per the new PV formula with new indices.

**Qualification Data**

S. No.	Qualifying Requirement criteria	Documents furnished	Page No.
1	<p><b>BIDDER'S STATUS:</b> (Tick appropriately)</p> <ul style="list-style-type: none"> <li>Company registered under the Companies Act, 1956/2013</li> <li>Proprietary firm</li> <li>Partnership firm</li> </ul> <p>If Bidders belonging to or with beneficial ownership from countries sharing land border with India must be registered with the Industries Department of the Government of Rajasthan or Competent Authority of the Government of India or Bidders do not belonging to or with beneficial ownership from countries sharing land border with India</p> <ul style="list-style-type: none"> <li>The bidder shall comply with the policy of Govt. of India issued vide Gazette Notification No. GSR 385(E) dtd. 29.05.2019 for providing preference to domestically manufactured Iron &amp; Steel Products in India</li> </ul>	<p>Memorandum of Association</p> <p>Registration Certificate Copy of GST Registration</p> <p>Registration Certificate with the Industries Department of the Government of Rajasthan or Competent Authority of the Government of India and shall be valid upto bid validity period.</p> <p>Undertaking on Rs. 50/- Stamp Paper as per (Annexure-BEC)</p> <p>Undertaking on Rs. 500/- Stamp Paper as per Form-1 (Annexure-DVA)</p>	
2	<p><b>TECHNICAL EXPERIENCE:</b></p> <p>Whether bidder is authorized from Relay manufacturer</p> <p>Past Supply criteria:</p> <p>Manufactured duplex type of panels with minimum degree of enclosure protection equivalent to IP 31 in accordance with IS 13947( Part-1):</p> <p>Whether Bidder is Manufacturer or Authorised distributor or selling agent (bona-fide dealer) of the manufacturers time.</p>	<p>Certificate From Relay Manufacturer (Schedule-CRM)</p> <p>Certificate from Chartered Accountant.</p> <p>An undertaking that the panels to be supplied shall provide minimum degree of enclosure protection equivalent to IP 31 in accordance with IS 13947( Part-1)</p> <p>Manufacturer's authorization certificate in prescribed proforma at Annexure-MAF</p>	
3	<p><b>FINANCIAL POSITION:</b></p>	<ul style="list-style-type: none"> <li>Audited balance sheets and income statement</li> <li>Certificate by Chartered Accountant.</li> <li>For credit facilities: Certificate from bank as per Annexure-CR</li> </ul>	
4	Bidder's Declaration	Schedule-DRQ	



**SPECIAL TOOLS & TACKLES FOR MAINTENANCE**

Bidder's Name & Address:

To,  
 The Superintending Engineer (Procurement-II)  
 RVPN,  
 Jaipur.

We hereby furnishing below the list of special tools & tackles for maintenance of equipment for the subject Item.

Sr. No.	For Equipment	Item Description	Unit	Quantity

Date : (Signature) .....

Place : (Printed Name) .....

(Designation) .....

(Common Seal) .....

**TECHNICAL PERSONNEL OF BIDDER**  
(TO BE FILLED IN AND SIGNED BY THE BIDDER)

Bidder Name and Address

S. No.	Description	Name	Length of service in the firm	Qualification	Professional experience and details of work carried out	Remarks
1.	2.	3.	4.	5	6.	7.

**Place**

Signature  
Name  
Status

Whether authorised attorney  
of the Bidding company

Name of the Bidding company

**CERTIFICATE FROM RELAY MANUFACTURER**

(On letterhead of the Relay Manufacturer)

**CERTIFICATE**

- (i) I/We hereby confirm to supply various protection and other relays i.e distance relay, differential relay, over current relay, Earth Fault relay and other relays and relevant application software for numerical relays to M/s. \_\_\_\_\_ as quoted by them to RVPN against their BN \_\_\_\_\_. We also confirm to be fully responsible for providing after sales service in India for the same relays atleast for 10 years after commissioning of relay.
- (ii) I/We hereby certify that service facility is existing in India to repair the quoted relays. I, (Mr./Mrs. \_\_\_\_\_) am fully authorised to issue this certificate on behalf of M/s \_\_\_\_\_.

Signature.  
Name and designation with seal.

Alternatively bidder may furnish following two certificates.

**Certificate-1**

**Certificate from the relay manufacturer**

I/We hereby confirm to supply various protection and other relay i.e. distance relay, differential relay, over current relay, Earth Fault relay and other relays and relevant application software for numerical relays to M/s \_\_\_\_\_ as quoted by them to RVPN against their BN-\_\_\_\_\_.

I (Mr./Mrs. \_\_\_\_\_) am fully authorised to issue this certificate on behalf of M/s \_\_\_\_\_.

Signature  
Name & Designation with seal

**Certificate-2**

**Certificate from the bidder.**

I/We undertake to provide service facility for quoted relay make \_\_\_\_\_ model \_\_\_\_\_ from the relay manufacturer at our cost upto 10 years from the date of completion of supplies. All arrangements for sending the relays for repairs & reinstallation after repair shall be made by me/us. During the period of repair of relays. I/We will replace it with a new relay which will be returned to us after the repaired relay is put into service by me/us.

To safeguard the interest of the Purchaser I/We hereby agree to furnish a bank guarantee equivalent to 2% of the ordered value of respective panel valid for a period of 10 years from the date of completion of supply. Such bank guarantee will be furnished before release of Performance bank Guarantee.

Signature  
Name & Designation with seal

**SCHEDULE OF UNIT PRICES FOR 132 KV C&R PANELS****I. RELAYS:****A) 220 kV FEEDER C&R PANEL**

<b>S. NO.</b>	<b>PARTICULARS</b>	<b>MAKE</b>	<b>Type</b>	<b>Unit Ex-works Price</b>
1	Main-I protection, comprising of Numerical distance protection scheme as per clause 4.01.1 of this specification.			
2	Main-II Numerical distance protection scheme as per clause No.4.01.2 of this specification			
3	Numerical LBB relay (should not be inbuilt feature of both Main-I and Main-II distance relay or backup relay)			
4	Voltage selection relay			
5	High speed master tripping relay having 2 normally closed and 20 normally open hand reset pair of contacts for inter trip facility with duplicated trip contacts			
6	Contact multiplication relay (Latch in type) for isolator auxiliary switch			
7	Static Check synchronising relay & dead line feature relay			
8	Trip circuit supervision relay			
9	Separate external timer (0 to 500 mSec) for Bus Tripping of LBB scheme			
10	DC supervision relay for monitoring supervision of trip relay			
11	Single phase trip relay			
12	Contact multiplication relay (Self reset type) for Auto reclose			

**B) 132 kV FEEDER C&R PANEL**

<b>S. NO.</b>	<b>PARTICULARS</b>	<b>MAKE</b>	<b>Type</b>	<b>Unit Ex-works Price</b>
1	Numerical distance protection scheme as per clause 5.01.1 of this specification			
2	Numerical communicable combined IDMT Directional Over current and Directional earth fault relay with voltage polarisation & wide range of maximum torque angle (having three element of O/C and one element of E/F)			
3	High speed master tripping relay having 2 normally closed and 12 normally open hand reset pair contacts for intertrip facility with duplicated trip contacts			
4	Contact multiplication relay for isolator auxiliary switch.			

**C) 132 kV Bus Coupler C&R PANEL**

<b>S. NO.</b>	<b>PARTICULARS</b>	<b>MAKE</b>	<b>Type</b>	<b>Unit Ex-works Price</b>
1	Numerical communicable Inverse non directional over current relays			
2	Numerical communicable Non directional earth fault relay			
3	High speed master tripping relay having 2 normally closed and 6 normally opened hand reset pair of contacts with duplicated trip contacts			
4	Contact multiplication relay for isolator auxiliary switch.			

**D) 220 kV TRANSFORMER C&R PANEL**

<b>S. NO.</b>	<b>PARTICULARS</b>	<b>MAKE</b>	<b>Type</b>	<b>Unit Ex-works Price</b>
1	Numerical communicable differential relay with application software			
2	Numerical communicable IDMT Non-Directional Over current relay with high set element and Directional earth fault relay with directional high set element with voltage polarization & wide range of maximum torque angle.(having three element of O/C and one element of E/F) with application software.			
3	High speed master tripping relay having 2 normally closed and 20 normally open hand reset pair of contacts for intertrip facility with duplicated trip contact.			
4	Three Element Auxiliary Relay			
5	Restricted Earth Fault relay complete with surge set diverter. (Numerical)			
6	Voltage Selection Relay			
7	Local Breaker Back up Scheme complete with timer, Auxiliary Relays and Bus Bar Master Trip Relays			
8	Voltage Neutral Displacement Relay			
9	D.C. Supervision Relay			
10	Trip Circuit Supervision Relay suitable for both open and closed positions of circuit breakers			
11	Contact multiplication relay for Isolator auxiliary contact			
12	High impedance differential			

**E) 132 kV TRANSFORMER C&R PANEL**

S. NO.	PARTICULARS	MAKE	Type	Unit Ex-works Price
1	Numerical communicable differential relay with application software			
2	Numerical communicable IDMT Non-Directional Over current relay with high set element and Directional earth fault relay with directional high set element with voltage polarization & wide range of maximum torque angle.(having three element of O/C and one element of E/F and Neutral Displacement Relay) with application software.			
3	High speed master tripping relay having 4 normally closed and 12 normally open hand reset pair of contacts for intertrip facility with duplicated trip contact.			
4	Three Element Auxiliary Relay			
5	Restricted Earth Fault relay complete with surge set diverter (Numerical)			
6	Voltage Selection Relay			
7	Trip Circuit Supervision Relay suitable for both open and closed positions of circuit breakers			
8	Contact multiplication relay for Isolator auxiliary contact			

**II. INDICATING/ INTEGRATING INSTRUMENTS:**

S. NO.	PARTICULARS	MAKE	Type	Unit Ex-works Price
1	144x144 mm2 Flushing Mounting Digital Voltmeter class of accuracy 1.0			
2	144x144 mm2 Flushing Mounting analogue Ammeter suitable for 1A/5A class of accuracy 1.0			
3	Digital Multifunction meter			
4	TVM			

**III. SWITCHES / LAMPS :**

S. NO.	PARTICULARS	MAKE	Type	Unit Ex-works Price
1	Automatic semaphore indicator.			
	(a) For Isolator.			
	(b) For Circuit Breaker			
2	Three position locking pattern Control switch spring return to normal and having contacts with one no lost motion device with Pistol grip for control of circuit breaker.			
	(a) 220 KV			
	(b) 132 KV			
3	Three position locking pattern Control switch stay put type with Pistol grip for trip transfer.			
	(a) 220 KV			
	(b) 132 KV			
4	Indicating lamps			

<b>S. NO.</b>	<b>PARTICULARS</b>	<b>MAKE</b>	<b>Type</b>	<b>Unit Ex-works Price</b>
5	Ammeter phase selector switch			
6	Voltmeter phase selector switch			
7	Link type Test terminal block 3 phase 4 wire for testing of TVM			
8	Test block for testing of relays			
9	Synchronising selector switch.			
10	Dead Bus closing switch			
11	Test plug for testing of relay			
12	Test handle for testing of relay			
13	Annunciator scheme per way			
14	Synchronising socket.			
15	Two position locking pattern Control switch stay put type with Pistol grip for carrier IN & OUT			

(Signature)  
Name & Designation with seal of the bidder

**Volume-IIA****TECHNICAL SPECIFICATION FOR DESIGN, MANUFACTURE, TESTING AT MANUFACTURER'S WORKS SUPPLY AND DELIVERY OF 220 KV & 132 KV FEEDER, BUS COUPLER & TRANSFORMER CONTROL & RELAY PANELS****1.0 SCOPE :**

This specification covers the design, manufacture, assembly, testing at manufacturer's works before despatch, supply, delivery & commissioning of 220 kV & 132 kV Feeder, Bus Coupler & Transformer Control & Relay Panels to be installed at various 220kV & 132 kV sub stations covered under Rajasthan Rajya Vidyut Prasaran Nigam Ltd., Rajasthan.

**2.0 STANDARDS:**

The relays, associated components & enclosures shall conform to the latest issues of standards given as below or equivalent/relevant IEC or BSS, except to the extent explicitly modified in the specification.

S. No.	Indian Standard No.	Title
1	IS: 3231	Protective Relays.
2	IS: 8686	Static Protective Relays.
3	IS: 1248	General requirement of indicating and integrating meters.
4	IS: 8623	Specification for Low-voltage switchgear and control gear assemblies.
5	IS: 13947	Specification for Low-voltage switchgear and control gear, (covers degree of protection)
6	IS - 5	Colours for ready mix paints and enamels.

**3.0 GENERAL TECHNICAL REQUIREMENT:****3.01 CLIMATIC CONDITIONS :**

The equipment to be supplied against this specification shall be suitable for satisfactory continuous operation under the following tropical conditions:

S.No.	Particular		
1	Max. ambient Air Temperature	:	50 Deg. C
2	Max. daily average ambient Temperature	:	45 Deg. C
3	Max. yearly weighted ambient Temperature	:	35 Deg. C
4	Min. ambient Air Temperature	:	(-) 5 Deg. C
5	Max. relative humidity	:	90%
6	Min. relative humidity	:	10%
7	Height above main sea level	:	Less than 1000 mtr.
8	Dust storms are liable to occur during the period	:	March to July
9	Average number of thunder storm days/annum	:	40
10	Average annual rain fall	:	10 to 100 cm
11	No. of months of tropical monsoon conditions	:	4 months (June to Sep.)
12	Seismic Level Horizontal acceleration	:	0.3 g
13	Degree of pollution	:	Heavy
14	Intensity of solar radiation	:	1.0 KW/Sq.M
15	Maximum wind load	:	195 Kg./Sq.M

**3.02 SYSTEM PARTICULARS :**

**3.02.01** A statement indicating line constants for 220 kV & 132 kV transmission lines, proposed transformer capacities and DC auxiliary voltages at various grid sub stations is placed at Appendix-A.

**3.02.02** A statement showing CT ratio, their technical particulars and instrument range is placed at Appendix -B.



**3.02.03** Statement showing ratio of capacitive voltage transformers proposed to be provided at various sub stations is placed at Appendix -C.

### **3.03 GENERAL DESIGN REQUIREMENT :**

**3.03.01** The specification covers the design, manufacture, fabrication, shop testing, delivery and commissioning of control and relay board duly mounted with protective relays, metering equipments etc. required for the satisfactory operation of 220 kV & 132 kV Feeder, 220 kV & 132 kV Bus Coupler & 220 kV & 132 kV Transformers at various 220 kV & 132 kV Grid substation at RVPN, Rajasthan included in the specification to the satisfaction of Purchaser.

**3.03.02** The intention of the specification is to provide protective relaying & metering equipments on control boards enumerated in the specification and to be complete in every respect for the functions designated. It is required that the supplier, in accepting the contract, agrees to furnish all apparatus, appliances and material whether specifically mentioned or not but which may be found necessary to complete or test any of the herein specified protective schemes in compliance with the requirements of the specification without any extra charges.

**3.03.03** Considerations may be given to alternatives which the supplier considers advisable by reasons of his own manufacturing requirements and experience, provided descriptive literature is submitted pointing out the recommended device or arrangement as equal to, or superior to that required by the accompanying specification.

### **3.04 GENERAL RELAYING / INSTRUMENTS & METERS REQUIREMENTS:**

**3.04.01 a)** The panel offered by the supplier shall comply with the requirements of latest issue of IS:3231 & IS:8686 or relevant BSS/IEC wherever relevant IS is not available and shall be suitable for operation in the climatic conditions specified under clause 3.01 of Volume-III A of this specification. If complying with a specification other than BSS/ISS/IEC then an English translation of the same shall accompany the bid.

b) The bidder shall clearly indicate the specific model of quoted relays completely meeting the requirement of specification. General indication such as series or families, etc. of quoted relays shall not be acceptable.

c) Every relay must have spare contacts for event logger and disturbance recorder which shall be wired on spare TB.

d) Binary Input & Binary Output contacts of every numerical relay shall be configurable at site.

e) Every numerical relay should be accessible with PC or Laptop through front interface & **Remotely from rear port**. Firm shall provide communication cord having USB port (or USB convertor) with each panel to make communication with relay and remote PC or Laptop through front interface.

f) For Time synchronisation firm shall provide one number BNC T-connector (**Female to two Female**) with each panel

**3.04.02** Each electromechanical relay shall be provided with dust tight, removable covers with glass/clear plastic windows. The relay shall be so arranged that on opening the case, it shall be impossible for any dust which may have collected in or upon the case, to fall on the relay mechanism. The operation of the relays shall be practically free from errors due to normal variation in frequency and waveform and from ambient temperature effects between (-) 5 C to 50C.

**3.04.03** Terminal blocks shall have bases and barriers moulded integrally with brass inserts and shall be suitable for 660 volts service. Individual studs with retainer type washer for terminals shall be provided for each incoming and outgoing feeders. Terminal blocks for CT & PT shall be Disconnecting type.

**3.04.04** Annunciation and alarm circuits shall be operated by contacts on an auxiliary tripping relay or by a separate relay added for that purpose. Auxiliary tripping relays for all protections included in this specification shall be hand reset type except for the transmission line protection, where specified to be of self resetting type, because of auto reclosing of circuit breaker.

**3.04.05** i) All the protection scheme and relays shall be provided with test blocks in panel and test plugs so designed that the protection schemes/relays may be tested IN- SITU (without removing the relay from panel). The protection schemes/relays should have provision of testing either through test block or test plug easily accessible by injecting the voltage/current/ frequency (as applicable) from external testing instruments/source without first disconnecting/ de-energising the electrical circuit protected by the schemes & relays. Facilities for isolating the tripping circuit during such testing shall be also provided.

ii) The requirement of separate test block in the panel shall not be applicable in case of those models of relays which have inbuilt test block and relay can be tested by using test plug (in the scope of supplier) without removing the relay from panel.

iii) The testing facilities provided in the relays shall be specifically stated in the bid. Necessary test plug etc. as may be required for proper testing shall be included in the contractor's scope of supply.

iv) All the protection schemes and main relays shall be supplied in cases flush mounted on steel panels.

v) In case of Directional Relay, it should be possible to check the Directional feature of main & Protective relay through a specified procedure with a provision to make the relay non directional. Bidder shall furnish details of specified procedure along with bid.

vi) Signal inputs in between Main Relays/Back up Relays/ LBB relay, etc. shall be transferred through hard wire as well as through GOOSE. The transfer of signals shall be as under(as applicable):

1. CB status of each pole from Main-I protection to Back up relay.
2. CB ready for auto reclosing status from Main-II protection to LBB relay.
3. DR triggering from other operated relays (as applicable):
  - i) DR of Main-I/ Differential protection from LBB relay.
  - ii) DR of Main-II/ Differential protection from Back up Relay.

**3.04.06** In case of electromechanical relays contacts shall be silver surface, bounce free and capable of repeated operation without deterioration. For static/ numerical relay system provided for output shall give the equivalent performance.

**3.04.07** The normal frequency will be 50 Hz. All the numerical relays (current operated) should be suitable for both 1 A & 5 A CT secondary current either by site configuration or through ICT.

### **3.04.08 GENERAL INSTRUMENTS/METERS REQUIREMENTS**

**3.04.08.1** AC static 0.2S class TOD type HT Trivector Meter as per the specification requirement indicated in Volume-II K shall be mounted on front panel of each Control panel. The acceptable make of TOD meter is indicated at clause No. 3.12.3.

**3.04.08.2** The multifunction meter to be provided shall be of digital type of 0.5 class of accuracy. The height of figures of digital display shall be such that it is readable and legible. The size of meter shall not be more than 144 mm x 144 mm. The multifunction meter supply shall be 110 V or 220 V DC as per panel rating and energy reading and other data shall store in non volatile memory

### **3.05 INSPECTION AND TESTS:**

**3.05.1** The following tests shall be carried out on 25 % panel (Nearest higher whole number) for established suppliers and 100 % for un-established suppliers at the manufacturer's works after completely assembling the Control and Relay Boards, in the presence of an Engineer of the Purchaser, if desired by the Purchaser and four copies of the test reports shall be supplied and got approved from the Purchaser before despatching the equipment:

- i) One minute 2kV insulation withstand test at 50Hz on all equipments (may be except electronic devices)on the panels and wiring.
- ii) Insulation resistance of complete wiring, circuit by circuit with all equipments mounted on the panels.
- iii) Checking the operation & function of protection schemes, instruments and meters. The display parameters of the relays and meters shall also be checked.
- iv) Checking of colour scheme used in wiring as per following requirement:

- i) A.C. three phase circuits

No.1 phase	Red
No.2 phase	Yellow

- |      |                      |       |
|------|----------------------|-------|
|      | No.3 phase           | Blue  |
| ii)  | Neutral              | Black |
| iii) | Connections to earth | Green |
| iv)  | D.C. circuits        | Grey  |
- v) Checking of same ferrules at both ends of wires.
- vi) Routine tests in accordance with relevant IS or other international standards shall be carried out on all the instruments, relays and other devices and/or manufacturer's routine test reports shall be enclosed with inspection report.
- vii) Checking of all wires connected on T.B. as per approved drawing and Final drawing should be submitted prior to inspection offer letter.
- viii) Checking of communication through GOOSE between IEC-61850 relays.

### 3.06 UNIT PRICE LIST OF ITEMS PROVIDED ON PANEL AND MANDATORY SPARES:

#### 3.06.1 UNIT PRICE LIST:

The Supplier shall necessarily include in his bid an item wise unit price list of various protection schemes, relays, meters, accessories and other optional items used such as PC, monitor, key board, printer, test plug, test handle, etc. in the manufacture of C&R panels offered by him to facilitate purchasing of spares as well as to make suitable adjustment in prices on account of subsequent additions/ deletions of any of these items to make the protection scheme as per the site requirement. These unit prices shall not be considered for the purpose of bid evaluation. The bid without such price list is likely to be ignored.

#### 3.06.2 MANDATORY SPARES:

The Supplier shall necessary include in his bid following mandatory spares, for which bidder shall quote separate charges in Schedule -BOQ. These charges shall be considered for bid evaluation. The bid without price of Mandatory Spares is likely to be ignored. One set of Mandatory spares shall be supplied with each 05 (FIVE) panels or part thereof. The mandatory spares as ordered shall be supplied with overall delivery schedule. **All numerical relays shall be suitable for both 1A & 5A.**

I)	220kV FEEDER PANEL (TYPE A-II):	
a)	Numerical communicable Distance Protection Relay with application software for Main-I	1 No.
b)	Numerical communicable Distance Protection Relay with application software for Main-II	1 No.
II)	132kV FEEDER PANEL (TYPE J-II):	
a)	Numerical communicable Distance Protection Relay with application software	1 No.
b)	Numerical communicable combined IDMT Directional Over Current and Directional Earth Fault Relay with voltage polarization & wide range of maximum torque angle (having three element of O/C and one element of E/F)with application software	1 No.
III)	220kV TRANSFORMER PANEL (TYPE B-II):	
a)	Numerical Communicable differential relay with application software.	1 No.
b)	Numerical Over flux relay ( <b>can be part of other relay</b> )	1 No.
c)	Numerical Communicable combined IDMT Non-Directional Over current relay with high set element and Directional earth fault relay with directional high set element with voltage polarization & wide range of maximum torque angle (having three elements of Over current and one element of earth fault) with application software	1 No.
d)	Restricted Earth Fault Relay complete with resistor and surge diverter	1 No.
IV)	132 kV TRANSFORMER PANEL (TYPE K-III):	
a)	Numerical Communicable differential relay with application software	1 No.
b)	Numerical Over flux relay ( <b>can be part of other relay</b> )	1 No.
c)	Numerical Communicable combined IDMT Non-Directional Over current relay with high set element and Directional earth fault relay with directional high set element with voltage polarisation& wide range of maximum torque angle (having three elements of Over current and one element of earth fault) with application software	1 No.
d)	Restricted Earth Fault Relay complete with resistor and surge diverter	<b>2 Nos.</b>

Note:- The detailed specification of each item of set of mandatory spares will be the same as for those which will be supplied duly mounted on ordered **220 kV & 132 kV** C&R panels

### **3.07 GUARANTEED TECHNICAL PARTICULARS:**

Guaranteed technical and other particulars as asked for in Schedule-GTP shall be supplied with the bid. Any bid lacking in this respect is liable to be rejected. Particulars of guarantee shall be clearly marked. The words "As per Spec." & "as per catalogue" will not be indicated in GTP.

### **3.08 DRAWINGS:**

**3.08.1** In addition to any other drawings, which the bidder may like to enclose to explain the merits of his proposal, the following drawings shall be enclosed with the bid in single copy:

- i) Principal dimensional details of each control and relay panel.
- ii) Front and rear views with all relays, instruments/ meters and devices positions marked.
- iii) Foundation details.
- iv) Elementary diagrams of all metering, Protection, annunciation and other circuits.
- v) Feeder protection scheme.
- vi) Local breaker backup protection scheme with bus bar tripping relay.
- vii) Auto reclose scheme.
- viii) Transformer biased differential protection scheme. External triggering through other auxiliary relays.
- ix) Transformer high impedance differential (circulating current) protection.
- x) Transformer REF protection scheme.
- xi) Transformer over fluxing protection scheme.
- xii) Transformer voltage Neutral displacement protection scheme.
- xiii) Backup Protection.

**3.08.2** All drawings shall be in English language and dimensions in SI/ Metric System. Further the following drawings in triplicate of respective panels along with schematic drawings indicating internal electrical circuit/ contacts of protection schemes/ relays shall be furnished by the Successful Bidders within 30 days of the receipt of LOI. The drawings for all type of ordered panels shall be furnished in single lot & not in piecemeal. Drawing should be of Standard size of 24"x12" or 12"x8.5" or A4 and should have blank space of size 3"x1.5" on lower right hand side to have a stamp of approval.

- 1) Principal dimensional details of each C&R panel.
- 2) Front & rear views and foundation plan.
- 3) General arrangement of control panel with instruments, relays & devices positions marked.
- 4) Equipment legend details of control panels.
- 5) General arrangement of relay panel with relays & devices positions marked.
- 6) Equipment legend details of relay panels.
- 7) SCHEMATIC DRAWINGS (as applicable)
  - i) Single line diagram/ Key diagram/ Line diagram
  - ii) A.C. supply Distribution circuit
  - iii) D.C. supply Distribution circuit. The DC circuit for annunciation shall be separate and independent from the DC supply used for other functions and terminals shall be marked as J15 & J16 (for 220 KV side annunciation), J21 & J22 (for 132 KV side annunciation).
  - iv) Bus voltage selection
  - v) Metering circuit
  - vi) Back up over current and earth fault protection circuit.
  - vii) Master trip relay circuit separate for group-A (Master trip relay 1) and group-B (Master trip relay 2)
  - viii) Circuit breaker control circuit-closing coil
  - ix) Circuit breaker control circuit-Trip Coil-1
  - x) Circuit breaker control circuit-Trip Coil-2
  - xi) Annunciation Scheme alongwith wiring of monitoring of DC supply of annunciation and failure of AC supply as per clause 11.12.6(a) & (b).
  - xii) Annunciation windows inscription details alongwith details of trip and non trip alarms.
  - xiii) Indication circuits shall be indicate separately on same sheet
    - a) Semaphore indication For circuit breaker and isolator
    - b) For Indicating lamps for circuit breaker by stating that "From transformer panel change over supply as per clause 11.10.03 of specification".
  - xiv) Pole discrepancy protection .
  - xv) Internal position of CB Control switch.
  - xvi) Feeder protection scheme.

- a) Line VT circuit
- b) Synchronising circuit
- c) Distance scheme Main-I A.C. circuit
- d) Distance scheme Main-I D.C. circuit
- e) Distance scheme Main-I Auxiliary circuit
- f) Trip relay circuit distance scheme Main -I
- g) S.No. xvi(c) to xvi(f) is also for distance scheme Main-II
- h) Distance scheme Main-I and Main-II internal details
- i) Local breaker backup protection scheme with bus bar tripping relay.
- j) Auto reclose scheme.
- k) Trip transfer protection scheme as per clause 3.19 of spec.
- xvii) Transformer protection scheme
  - a) Transformer percentage biased differential protection scheme
  - b) Transformer REF protection scheme.
  - c) Transformer over fluxing protection scheme.
  - d) Transformer tertiary protection scheme.
  - e) Back up Protection.
  - f) High impedance differential (Circulating current) Protection.
  - g) Transformer auxiliary protection.
  - h) Trip Transfer protection scheme as per clause 3.19 of specification. Trip transfer scheme should be through NI & IT position of Trip Transfer Switch.
- xviii) The T.B. Schedule drawing sheet.
- xix) Rear view of all relays with indicating wiring with ferrules and sheet No. on each terminal of relay. Alternatively, these may be given in tabular form.
- xx) The device schedule drawing sheet. Alternatively, these may be given in tabular form.
- xxi) The wire routing schedule drawing sheet. The drawing shall be in tabular form indicating the sequence in which any wire will be connected to various devices.
- xxi) Local breaker backup protection scheme with bus bar tripping should have trip repeat facility through separate trip relay. External timer of 100 mSec., which should be initiated by LBB relay and bus bar trip relay should operate with 50Z & 2/50Z contact in series.

**3.08.3** Some of the wiring is standardized for Tripping/ Closing of the Circuit Breaker, CT and PT connections, Supervision Relay, CB and Isolator status etc. on one separate TB. Bidder should adhere to the standardized wiring as per Appendix –D1-D3.

**3.08.4** Apart from above drawings, the supplier shall include other drawings that it considers necessary.

**3.08.5** The Purchaser reserves the right to issue standard drawings according to which the panels shall be fabricated/ manufactured/ wired.

**3.08.6** The bidder shall be responsible for any discrepancies/ errors or omissions in the drawings and other particulars though approved by the Purchaser or not.

**3.08.7** Five sets of approved drawings after incorporating corrections shall be supplied alongwith each panel to the consignee for field officers & three sets to the Purchaser.

**3.09 ILLUSTRATED AND PRINTED LITERATURE ALONGWITH BID:**

One copy of each of the descriptive and printed literature in respect of all the ammeters, voltmeters, selector switches, watt meters, VAR meter, energy meters, power factor meter, control switches. Relays etc., proposed to be used shall be enclosed with the bid. A descriptive note indicating the salient points of the protection scheme offered shall also enclosed with the bid. In the event of an order, 2 (Two) sets of complete technical literature, commissioning/ operating/ maintenance instruction manuals of aforesaid items shall be supplied alongwith each panel to the consignees. Apart from this, manuals/literatures in soft copy shall also be furnished to consignee and purchaser

**3.10 CO-ORDINATION:**

The control and relay board shall be suitably fabricated to match and arranged to form one continuous board with the existing panels at various sub stations wherever mentioned.

### 3.11 COMMISSIONING OF CONTROL & RELAY PANEL:

The supplier will commission 220kV Feeder C&R panel (Type A-II), 220 kV Bus coupler C&R panel (Type C-II), 132 kV Bus coupler C&R panel (Type L-II), 132 kV Feeder C&R panel (Type J-II), 220 kV Transformer C&R panel (Type B-II) and 132 kV Transformer C&R panel (Type K-II & Type-KIII) for which no separate commissioning charges shall be payable over the quoted/ agreed charges. Charges towards commissioning of panels shall be built in the quoted/ agreed charges for respective panels. No separate charges for travelling or other expenses shall be payable. The supplier will depute his service engineer for commissioning of panels within 10 days of first call from field officer. Against the supply of material the supplier shall be eligible for quoted/ agreed charges less Rs. 2500.00 which shall be released on commissioning of panels certified by the designated officer/ personnel of RVPN. **The Supplier shall bring own test kit for testing.**

### 3.12 ACCEPTABLE MAKE AND MODEL OF RELAYS (only for performance purpose):

3.12.1 a) The following approved makes & models of numerical relays are only acceptable for Distance, Differential, Over current & Earth fault and LBB protection:

MAKE	MODEL
Distance Relay For 220kV & 132kV Feeder C&R Panel	
<b>HITACHI</b>	REL670, REL-650 (For 132 kV Panel only)
GE T&D	MICOM P442, MICOM P444
SCHNEIDER	MICOM P442, MICOM P444
SEL	SEL 311C (For 132 kV Panel only)
SIEMENS	7SA522, 7SA611 (For 132 kV Panel only)
Differential Relay For 220 kV & 132 kV Transformer C&R Panel	
<b>HITACHI</b>	RET670, RET-650
GE T&D	MICOM P642, MICOM P643,
SCHNEIDER	MICOM P642, MICOM P643,
SEL	SEL 787 (For 132 kV Transformer Panel only)
SIEMENS	7UT613 (With 8 Nos. Binary Input & 8 Nos. Binary Output contacts), 7SR23
Combined Over Current & Earth Fault relay and separate LBB relay (For 220kV & 132kV C&R Panel)	
ABB	REF 615
GET&D	MICOM P141, P14D, P14N
SCHNEIDER	MICOM P141
SEL	SEL 751(For O/C E/F Protection), SEL 751A
SIEMENS	7SJ80, 7SR10, 7SR11, 7SR12 , 7SJ66 (For LBB Protection)

Subject to confirmation that the relay supplied shall be suitable for both 1A & 5A. Conversion from 1A to 5A and vice versa with ICT is also acceptable. ICT be supplied as mandatory spare.

In Siemens make 7SA611 (For 132kV Panel only) subject to providing following features in the relay.

- I. Synchronizing and voltage check feature.
- II. Auto reclose feature

In case bidder wants to quote other than the approved models of relays, then prior to quoting that relay, they have to get the same acceptable from the Chief Engineer (MPT&S), RVPN, Jaipur by **submitting its type test reports to SE(Proc-II) and then** arranging demonstration for ascertaining that the relay to be offered meets the requirement of specification. Further the same model of relay (1 No.) be installed in RVPN system for a period of 6 months as per direction of Chief Engineer (MPT&S), RVPN, Jaipur at firm's own cost for ascertaining the performance of same. After completion of said period of 6 months from the date of commissioning, the Chief Engineer (MPT&S), RVPN, Jaipur will ascertain its performance and finalize to consider the said model of relay as approved model. RVPN will not make any payment whatsoever to the firm, if any of the parts or complete relay is damaged during trial period.

Alternatively, bidder may get the relay **acceptable** from the Chief Engineer (MPT&S), RVPN, Jaipur by conducting demonstration in RVPN laboratory/site, get the certificate of accept from the Chief Engineer (MPT&S), RVPN, Jaipur and submit with the bid. For the panels supplied with such relays the performance guarantee period shall be double the period specified in the specification(i.e. in such cases performance

guarantee period shall be 60 months from the date of commissioning or 72 months from the date of supply of last consignment at site, whichever is earlier).

b) For auxiliary and other relays (except main, Back up and LBB protection relays) in case make of relays are other than following then type test report of such relays shall also be furnished.

- i) GE T&D / Schneider
- ii) HITACHI / ABB
- iii) EasunReyrolle
- iv) JVS
- v) AVANA

In case make of auxiliary and other relays (except main, Back up and LBB protection relays) are other than the approved then the bidder shall furnish the following valid and authenticated Type test certificate from manufacturer/ a laboratory accredited by the **Govt. approved / NABL accredited laboratory / ILAC** signatory for the type tests as per latest edition of IS-3231 or IEC of quoted relays or on model having additional features in same series. Such type test certificate should not be older than 7 years as on the date of technical bid opening. For this purpose date of conducting type test will be considered.

- (i) Insulation test.
- (ii) High frequency disturbance test (not applicable for electromechanical relays).
- (iii) Electrical fast transient test (not applicable for electromechanical relays).
- (iv) Relay characteristics, performance and accuracy test.
  - a) Steady state characteristics and operating time.
  - b) Dynamic characteristics and operating time for distance relay.
- (v) Test for thermal requirement.
- (vi) Test for mechanical requirement.
- (vii) Test for rated burden
- (viii) Contact performance test.

c) In case of 220kV & 132kV Feeder C&R Panel, 220kV & 132kV Bus coupler and 220kV & 132kV Transformer C&R Panels, which are duplex type of panels, the bidder shall furnish an undertaking that the panels shall provide minimum degree of enclosure protection equivalent to IP 31 in accordance with IS 13947(Part-1).

**3.12.2** All the HT TVMs, integrating instruments, Control switches, selector switches, indicating lamps, Semaphore indicators, Annunciation scheme, Bell, Hooter etc. shall be of "ISI MARK" for which bidders shall furnish attested Photostat copies of ISI certificate for the respective make offered along with bid. Alternatively bidder shall furnish original/attested Photostat copies of the latest type test report of aforesaid items along with bid. The type test certificate/report should not be older than 7 years.

**3.12.3** The following make of bought out items are acceptable to RVPN for the purpose of functionalities:

S.No	Name of item	Make
1.	0.2S Class AC Static HT-TVM TOD type Energy Meter	L&T(ER300P)/SECURE(Premier300)/GENUS(03D/HC (for 1A) / 03C (for 5A) / WALLBY(Now EDM) / HPL(CTPT1.24)
2.	Digital voltmeter	Any make having ISI mark
3.	Digital multifunction meter (Digital type)	SATEC(PM130EH-PLUS) / SECURE(ELITE445) / RISHAB (RISH PQM & RISH MASTER 3440) / AE(AE9000) / ACCORD(MFM-02) / HPL(EBRIT) / POWERTRAC(PGMFR3)
4.	Control Switch for Circuit Breaker/Trip Transfer	ALSTOM(Areva)/ SWITRON/ KAYCEE/ ABB/ RECOM/ EasunReyrolle/ HEMAADRI
5.	Selector Switch for Voltmeter/ Ammeter	SWITRON/ KAYCEE/ RECOM/ HEMAADRI
6.	Semaphore Indicator	ALSTOM(Areva)/ DAV/DEEPL// ER
7.	Indicating Lamp(LED Type)	ALSTOM(Areva)/ TEKNIC/ VAISHNO/ DAV / DEEPL) / VENSON/ L&T/ SIEMENS/JVS/SECO/CRAFTECH

S.No	Name of item	Make
8.	Annunciator	MINILEC/ YASHMUN/ INSTALRAM/ PROTON/ JVS/ PRADEEP/ ALAN / EXPO FYN/ACCORD /SECO
9.	Push Button	TEKNIC/ VAISHNO/ ESSEN/ L&T/ SIEMENS/ ALSTOM (Areva)
10.	A.C. Hooter/Bell	TARGET/ INDUSTRIAL HOOTER/ ALAN/ JVS / PROTON / ACCORD / SECO / CRAFTECH
11.	D.C. Hooter / Bell	TARGET/ INDUSTRIAL HOOTER/ ALAN/ JVS / PROTON / ACCORD / SECO/CRAFTECH
12.	Heater	SOFIA/ ELTER/ AIREX/ KAYCEE / PRAVEEN
13.	Link type Test Terminal Block for testing of TVM	IMP/ CAPITAL/ DAV/DEEPL
14.	2 Feet Tube Light	PHILIPS/ CROMPTON/ BAJAJ
15.	2 Pin/3 Pin socket with switch (5/15A)	ISI MARK

NOTE: In case the successful bidders establish to the Satisfaction of purchaser that specified makes of particular item (except digital multifunctional meter) are not available than other make shall also be acceptable if it is of "ISI" MARK or type tested for which bidders shall furnish attested Photostat copies of valid ISI certificate/type test report. The type test report which should not be older than 7 years as on date of bid opening. As regard digital multifunction meter the other make is also acceptable provided it meets the requirement of specification (clause No. 9.03)

### 3.13 MAKE AND TYPE OF BOUGHT OUT ITEMS:

Make/type of each relay, integrating instruments, Control switches, selector switches, indicating lamps, Semaphore indicators, Annunciation scheme, Bell, Hooter etc. shall be clearly and invariably indicated in the GTP (Guaranteed Technical Particulars), Bill of material and unit price list. Only specific make accessories shall be indicated. The words like "EQUIVALENT/ REPUTED MAKE" will not be given consideration.

### 3.14 GUARANTEE PERIOD OF CONTROL AND RELAY PANELS:

The guarantee period of control & relay panel shall be for a period of 30 months from the date of commissioning or 36 months from the date of supply of last consignment at site, whichever is earlier.

### 3.15 DOCUMENTATION:

Two sets of following documents shall be supplied to the consignee for field officer alongwith each panel and three sets to the purchaser.

- i) Approved drawings after making corrections as advised at the time of approval of drawing.
- ii) The complete technical literature, commissioning/operating /maintenance instruction manuals of protection scheme(s)/relay /relay testing instruments/integrating instruments/etc.

### 3.16 DEPARTURE FROM SPECIFICATION:

If the bidder wishes to depart from the specification in any respect, he should draw attention to such departures stating the reasons thereof under Schedule DEV A and Schedule DEV B. Unless this is done the departmental specification will hold good. Mentioning of deviations in the form of clarification /academic knowledge, etc. elsewhere in the offer will not be considered. In the event of contractor's drawings, table etc. being found to disagree during the execution of the contract the requirement of this specification shall be held as binding.

### 3.17 PACKING OF C&R PANELS:

Packing shall be governed by Cl.1.30 of GCC. Each panels shall be first packed inside water proof polythene cover of minimum 0.1 mm thickness and then appropriately wooden casing shall be provided to hold the panel securely suitable for transportation/ handling.

The supplier shall be required to make separate packages for each consignee. Each package will be marked on three sides with proper point/ indelible ink with the following:

- i) Name of consignee.
- ii) Destination.
- iii) PO No. RVPN/SE(Proc-II)/XEN-IV/A-3/BN-9016002228/D. Dated



- iv) Particulars of C&R Panel.
  - a) Description of control/relay panel.
  - b) CT Secondary.
  - c) DC Aux. voltage.
  - d) S.No. of control/Relay panel.
- v) Manufacturer's Name.

### **3.18 DEMONSTRATION AND TESTING OF OFFERED RELAYS/ INSTRUMENTS/ ACCESSORIES:**

Purchaser reserves the right to get demonstration and sample testing of offered protection scheme(s)/ relay(s)/ instruments/ accessories to ascertain their technical suitability, in the office of Chief Engineer (MPT&S)/ Superintending Engineer (MPT&S), RVPN, Hawa Sarak, Chambal Power House, Jaipur or at other place of RVPN, at the risk & Cost of supplier.

### **3.19 TRIP TRANSFER SCHEMES:**

In order to energise master trip relay of bus coupler through master trip relay of line/Transformer a trip transfer scheme will be provided for transferring the tripping signal to the bus coupler breaker whenever any line/transformer is connected to the auxiliary bus. The three position locking pattern switch Stay put type with pistol grip handle shall be provided on each 220 kV and 132 kV Feeder/ Transformer Control panel.

The positions of Trip Transfer switch are as under:

- i) Normal.
- ii) Inter
- iii) Trip transfer.

### **3.20 CONTACT MULTIPLICATION RELAY:**

#### **3.20.1 FOR ISOLATOR AUXILIARY SWITCH:**

Heavy duty latch in type contact multiplication relays will be required for bus isolator. This relay will be voltage operated electrically reset having identical stable positions and minimum 4 pairs of NO contact and 4 pair of NC contact duly wired on TBs for requirement of various protection control schemes.

#### **3.20.2 FOR AUTO RECLOSE FUNCTION (AS APPLICABLE):**

Heavy duty self reset type contact multiplication relays will be required for multiplication of breaker contacts/ signals for auto reclosing. This relay will be voltage operated self reset having identical stable positions and minimum 6 pairs of NO contact and 3 pair of NC contact duly wired on TB's for requirement of various protection control schemes.

### **3.21 AUXILIARY RELAY:**

The auxiliary relay should have relay connecting fingers/strips and Pins/plug capable of carrying 30A for 3 sec. & 5A continuously at 660 V.

Auxilliary relay should have 15% additional contacts.

### **3.22 PT VOLTAGE SELECTION RELAY:**

Heavy duty latch in type auxiliary relays are required for PT voltage selection. The relay shall be voltage operated, electrically reset type having identical stable contacts. Sufficient number of contacts in each position shall be provided as per scheme requirement.

### **3.23 TRIPPING RELAY:**

High speed master tripping relay are required for Tripping. The relay should have 2 Normally Closed and 12 Normally Open for 132 kV and 20 Normally Open for 220 kV Electrical reset pair of contacts with push button.

**Volume-IIB**  
**PROTECTION SCHEME FOR 220kV FEEDER C&R PANEL**

**4.01 220kV FEEDER PROTECTION:**

The protection scheme for 220 kV line shall consist of Main-I & Main-II protection with numerical distance scheme relay, Back-up protection with numerical directional over current and earth fault relays, Auto reclosing scheme and numerical local breaker back-up protection as per following details:

**4.01.1 Main-I Distance Relay:**

**The protection shall:**

- a) i) Be based on principle of distance measurement, which shall be independent of noise frequency and unaffected by D.C. transients contained in fault current and voltage.
  - ii) Main-I distance relay shall be connected on line CVT.
  - iii) Should have display facility for current, voltage and power of each phase.
- b) (i) Be based on micro processor numerical technology
  - (ii) Should have minimum 12 digital input and 20 digital output contacts.
- c) Have at least three forward zones and one reverse zone of protection.
- d) Shall be capable of simultaneously detecting phase to phase and phase to earth fault on all three phases for each zone of protection.
- e) Fault detection and measurement relays shall be inherently directional. Single measuring element that measure all the phase faults using negative sequence measurement will not be accepted.
- f) Shall have universal type carrier mode feature that is built in user selectable facility to choose any required carrier mode at site. A software scheme logic shall be preferred to a hardware logic arrangement.
- g) Have the main relay operating time at SIR4 & SIR15 as per CBIP guidelines.
  - (i) Shall have two independent continuously variable time setting range of 0-3 seconds for Zone-2 and 0-5 seconds for Zone 3 with accuracy of better than or equal to 5% of set value in time measurement of Zone 2 and 3.
  - (ii) Relay measurement accuracy of better than or equal to 5% of set value for reach measurement in Zone-1 and better than or equal to 10% of set value for zone 2 & 3.
  - (iii) Shall have resetting time of 55 msec or less (including the resetting time of inbuilt trip relays).
- h) Protect 100% of the line section and provide backup to adjacent feeders.
  - i) Have an adjustable characteristics angle setting range 45 to 80 degrees. (In steps of one Degree)
- j) Zone 1, zone 2, zone 3 **and zone 4** characteristics for phase to phase faults shall be mho or quadrilateral and shall be quadrilateral for phase to ground faults.
- k) Have suitable AC/DC converter
- l) Operate instantaneously for a close up three phase fault and switch on to fault.
- m) Incorporate three separate high speed **single phase** trip relays for single phase faults and fourth high speed trip relay for multi phase faults.
- n) **Include Power Swing Blocking relay which shall:**
  - i) Have suitable setting range to encircle/envelope the characteristics of distance protection described above.
  - ii) Have a fixed time delay on pickup for blocking and adjustable time delay up to two seconds for deblocking. Alternatively Power swing blocking shall be achieved by measuring rate of change of impedance/locus.
  - iii) Block tripping during power swing conditions caused by load changes. But there shall be provisions for allowing the breaker to trip if the disturbance lasts for an interval equal to or longer than the set

- deblocking time. Tripping of breaker under such condition shall be three phase mode with auto reclose lockout.
- iv) Have an adjustable characteristics angle setting range 45 to 80 degrees (in steps of one degree).
- o) Include Fuse Failure Protection which shall:**
- i) Monitor all three phase fuses of CVT and associated cables against open circuit, which shall be capable to detect single phase, two phase & three phase fuse failure.
  - ii) Inhibit trip circuits on operation and initiate annunciation
  - iii) DELETED
  - iv) Remain inoperative for system earth faults.
- p) Shall have residual compensation feature.
- q) DELETED
- r) Include continuous DC supply supervision.
- s) DELETED
- t) DELETED
- u) Insensitive due to lightning strokes, switching, radio interference, corona discharge, circuit breaker and isolator operation inrush current when energized the line, complete load rejection at receiving end of line.
- v) Be suitable for both single and three phase auto reclosure.
- w) Have built in supervision facility.
- x) Shall have a continuous current rating of 2 times of rated current. The voltage circuit shall be capable of operation at 1.2 times rated voltage. The relay shall be capable of carrying a high short time current of 70 times of rated current without damage for a period of one second.
- y) Serial / **LAN** interface for local & remote communication should have port for connection of Laptop.
- z) Should have capacity to detect & monitor broken conductor conditions.
- a1) TIME SYNCHRONIZATION:** The relay shall have facility to synchronize its time clock from time synchronisation equipment having out put port IRIG B/ RS232/Potential free contacts (PPM)
- b1) i)** The numerical distance relay should be accessible with PC or Laptop through front interface **and remotely from rear port**. It should have facility for inter bus communication and remote communication
- ii) The numerical distance relay should have protocol for communication as IEC-61850. The protocol mapping along with associated software should be made available to the Purchaser along with required attachments

#### **4.01.2 Main –II Distance relay:**

The protection includes: Distance protection having protection features identical to Main-I distance relay specified above. However, Main-II distance relay shall either be another model of the same manufacturer or a relay of another manufacturer. Main–II distance relay shall be connected on **selected** Bus CVT.

#### **4.01.3 Backup protection:**

The numerical O/C & E/F relay shall be in built feature in both Main-I and Main II distance relay.

- a) Back up protection for phase fault: Back up protection for phase faults shall be provided with IDMTL directional over current relays with a wide range of maximum torque angle.
- b) Back up protection for E/F: This shall be provided with IDMTL directional E/F relays with current and voltage polarization with a wide range of maximum torque angle.

#### 4.01.4 Auto Reclose Function:

- a) The Auto reclose relay shall be in built feature in both Main-I and Main-II distance relay.
- b) have single phase and three phase auto reclose facility.
- c) have a continuously variable single phase dead time of 0.5-3.0 secs.
- d) have a continuously variable three phase dead time of 0.5-3.0 secs.
- e) have continuously variable reclaim time of 5-30 secs.
- f) have auto reclose In/Out switch.
- g) have facilities for selecting check synchronizing or dead line charging features. It shall be possible at any time to change the required feature.
- h) be of single shot type.
- i) include check synchronizing relay which shall
  - i) have a time setting continuously variable between 2.0 and 10.0 secs.
  - ii) have a response time within 200 milli seconds with a timer disconnected.
  - iii) have a phase angle setting not exceeding 35 degree.
  - iv) have a voltage setting not exceeding 10%
  - v) Only one relay either Main-I or Main-II shall be used for auto reclose function at one time.
- j) include dead line charging relay which shall:
  - i) have a time setting continuously variable between 2.0 and 10.0 secs.
  - ii) have two sets of relays and each set shall be able to monitor the voltage.
  - iii) have one set connected to the line CVTs with a fixed setting of 20% of rated voltage.
  - iv) have one set connected to the bus CVTs with a fixed setting of 80% of rated voltage.
  - v) incorporate necessary aux. relay and timers to give comprehensive scheme.
- k) The auto reclosing of the line shall take place only when fault is cleared in the 1st Zone or cleared by Zone 2 carrier aided trip signal **and should not reclose when:**
  - i) The faults cleared in 2nd Zone or 3rd Zone time **or Zone 4 time.**
  - ii) When the tripping take place after a power swing condition.
  - iii) In the event of a trip on pole discrepancy.
- l) Only one relay either Main-I or Main-II shall be used for auto reclose function at one time **(Selection through switch).**
- m) Multiplication of breaker contacts/ signals for auto reclosing shall be done by contact multiplier. The number of contact multiplication relays/ contacts shall depend on the scheme requirement on the basis of the main relays employed for the protection schemes. Accordingly, contact multiplication relays with self reset contacts shall be provided as required.

#### 4.01.5 CHECK SYNCHRONISING AND DEAD LINE CHARGING FACILITY:

- a)** The Check synchronizing relay and dead line charging facility shall be in built feature in both Main-I and Main-II distance relay. Inbuilt Check synchronizing relays shall compare the phase angle and frequency of the incoming and running supply and the auto reclosing will only take place when both figures are within the permissible limits.

Dead line charging facility will be selected on one end of the line sections. On the other end of which check synchronizing facility has been selected, such facility will enable check for no volt on the line prior to energizing reclose relay.

#### **b) Manual closing:**

A common check synchronizing relay for manual closing of lines shall be provided in the B/C relay panel which shall be suitable for all the 220 kV lines at the sub-stations. Common bus wiring for this will be provided in all the control panels of 220 kV line and B/C. Facility for dead bus/ dead line charging shall also be provided in the above scheme alongwith selection of check synchronizing/ bye pass. A synchronizing–dead bus selector switch (3 position– dead bus/ off/ check synchronizing) shall be provided on control panels of all 220 kV lines and B/C. A check synchronizing by pass selector switch (3 position– By pass/ off/ check synchronizing) shall also be provided on control panel of all 220 kV feeders. A socket and plug arrangement is to be provided in each line and B/C panel for selecting the circuit which is to be closed. It shall not be possible to select two circuits for synchronizing at a time through this arrangement. Guard relay shall also be provided in the scheme to inhibit unwanted closing of CB.

#### 4.01.6 LOCAL BREAKER BACK UP PROTECTION (BREAKER FAILURE PROTECTION):

- i) The LBB relay should be provided separately i.e should not be built-in feature of Main-I or Main-II distance and back-up protection and shall be of numerical communicable type with protocol as per IEC-61850.

- ii) DELETED
- iii) DELETED
- iv) Have three over current element.
- v) Operate only for all type of faults and not in load conditions.
- vi) Initiate remote end tripping required.
- vii) Have a setting range of 20-200% of rated current for phase over current elements
- ix) Have a adjustable time setting range of 0.05 to 0.5 sec. on pick up.
- x) Include all necessary auxiliary relays required for completeness of scheme.
- xi) The numerical relay have sufficient tripping contacts for LBB, Bus Bar protection scheme (Bus Bar protection scheme is not in Supplier's scope)
- xii) Provision for connecting to existing bus bar protection scheme
- xiii) Have continuous thermal withstand two times rated current irrespective of setting.
- xiv) Separate external timer (0 to 500 m sec) for Bus Tripping of LBB scheme shall be provided.
- xv) Have provision for initially giving trip repeat signal to CB through separate contacts and there after to trip Bus bar/ other CBs as per setting.
- xvi) Should be accessible with PC or Laptop through front interface **and remotely from rear port.**
- xvii) Should have minimum 8 digital input and 8 digital output contacts. In case 8 digital output contacts are not available in the relay, the same can be permitted to be achieved by using high speed tripping relays.

#### 4.01.7 SOFTWARE FOR NUMERICAL RELAYS:

The bidder shall supply one set of licensed copy of application software for numerical relays with each C&R panel free of cost. The application software shall consist of relay setting software and relay data analysis software.

#### 4.01.8 SPECIFICATION FOR DISTANCE TO FAULT LOCATOR:

The distance to fault locator shall be built-in feature of Main-I & Main-II distance protection scheme.

- (a) Fault locator shall accurately calculate the distance to fault within +/- 3 % of line length.
- (b) Current and voltage input shall be from the CTs and CVTs provided.
- (c) Deleted
- (d) **Fault locator shall provide following display:**
  - i) Distance to fault in percentage/ actual length of the supervised line length in km.
  - ii) Fault current of each phase & neutral
  - iii) Fault voltage of each phase & neutral
  - iv) Fault Resistance
  - v) Date & Time
  - vi) Fault clearance time.

#### 4.01.9 SPECIFICATION FOR DISTURBANCE RECORDER.

- (a) The disturbance recorder function shall be built-in feature of Main-I & Main II distance protection scheme.
- (b) The acquisition unit of disturbance recorder shall have following features:
  - i) Minimum pre fault recording time of 100 m sec.
  - ii) Minimum post fault recording time of 1000 msec.
  - iii) Memory capacity– Minimum 5 recordings each of 1500 msec. recording time.
  - iv) The disturbance recorder shall be microprocessor based with scan rate of 1000 Hz per channel or better .
  - v) To record the graphic form of instantaneous values of voltage, current in all three phases, open delta voltage, open and closed position of relay contacts and breaker etc. during the disturbances
- (c) It should be possible to trigger the disturbance recorder externally through contact set.
- (d) The disturbance recorder shall have **minimum** 8 analogue and 16 digital channels.

**4.01.10** The complete trip logic in the control and relay panel will be supplied by the Supplier for tripping of remote end breaker through operation of backup, LBB relay etc. through PLCC channel. Similarly tripping of local breaker on receipt of signal from remote end on operation of back up, LBB relays etc.

## Volume-IIC

### PROTECTION SCHEME FOR 132kV FEEDER C&R PANEL

#### **5.01 132kV FEEDER PROTECTION:**

All 132 kV circuit breakers are 3 pole ganged type, equipped with 2 tripping coils only. The protection trip contacts therefore, are required to be suitably multiplied such that each coil receives independent trip signal from each protection.

##### **5.01.1 PRIMARY PROTECTION:**

As a primary protection, distance scheme is proposed for 132 kV lines. The distance protection scheme for 132 kV feeders shall be of directional distance type suitable for phase to phase and phase to ground faults. The scheme shall have **minimum 4** Zones of protection with stepped characteristics. The distance scheme shall be numerical type and shall be suitable for three phase tripping and will operate with permissive inter trip for accelerating tripping at remote end in case of Zone-2 fault. The measuring relays in the above protection shall be based on MHO cross polarised and quadrilateral/shaped characteristics. The maximum operating time of the relay for the first Zone faults shall be within 4 cycles. The timing of the second and third zone shall be graded to suit the timings of the adjacent section. The relay shall have facility to synchronize its time clock from time synchronisation equipment having output port IRIG-B/ RS232/Potential free contacts (PPM).

The numerical distance relay should be accessible with PC or Laptop through front interface. It should have facility for inter bus communication and remote communication **and remotely from rear port.**

The numerical distance relay should have protocol for communication as IEC 61850. The protocol mapping along with associated software should be made available to the Purchaser along with required attachments.

The offered scheme should also have following:

- i) Fault locator facility.
- ii) Detection of Broken conductor condition.
- iii) Fuse failure supervision.
- iv) Indication of power flow (Import / Export), current and voltage.
- v) Should have minimum 6 digital input and 12 digital output contacts.

##### **5.01.2 BACK-UP PROTECTION :**

- i) The back-up protection for phase faults shall be provided with inverse directional over current relays with voltage polarisation for all lines.
- ii) The back-up protection for earth faults shall be provided with inverse directional earth fault relays with voltage as well as current polarisation for all lines.
- iii) The over current and earth fault relay shall be of numerical type.
- iv) The numerical over current and earth fault relays shall be independent of the primary protection i.e. these shall be separately provided even if such a feature is inbuilt in the primary protection.
- v) The numerical O/C & E/F relay should be accessible with PC or Laptop through front interface. It should have facility for inter bus communication and remote communication.
- vi) The numerical O/C & E/F relay should have protocol for communication as per IEC-61850. The protocol mapping along with associated software should be made available to the purchaser along with required attachments
- vii) Should have minimum 4 digital input and 6 digital output contacts.

##### **5.01.3 DELETED**

**5.01.4 TIME SYNCHRONIZATION:**

- (a) The relay shall have facility to synchronize its time clock from time synchronisation equipment having output port IRIG-B/ RS232/Potential free contacts (PPM)
- (b) The numerical distance, numerical O/C & E/F relay should be accessible with PC or Laptop through front interface. It should have facility for inter bus communication and remote communication.
- (c) The numerical distance, O/C & E/F relay should have protocol for communication as IEC-61850. The protocol mapping alongwith associated software should be made available to the Purchaser alongwith required attachments

**5.01.5 SOFTWARE FOR NUMERICAL RELAYS:**

The bidder shall supply one set of licensed copy of application software for numerical relays with each C&R panel free of cost. The application software shall consist of relay setting software and relay data analysis software

**Note:** Trip circuit Supervision will be done by Numerical Distance protection scheme and Numerical O/C & E/F Relay. Binary I/P shall be capable for this feature.

**Volume-II**  
**PROTECTION SCHEME FOR 132 kV BUS COUPLER C&R PANEL**

**6.01 132 KV BUS COUPLER:**

- (a) The protection provided on bus coupler shall be non directional IDMTL relays for over current and earth fault. The IDMTL relay shall be of Numerical type.
- (b) The over current and earth fault relay shall be of Numerical type.
- (c) The bidder shall supply one set of licensed copy of application software for numerical relays with each bus coupler panel free of cost. The application software consists of relay setting of software and relay data analysis software.
- (d) The numerical over current & earth fault relay should be accessible with PC or Laptop through front interface. It should have facility for inter bus communication and remote communication.
- (e) The numerical over current & earth fault relay should have protocol for communication as IEC-61850. The protocol mapping alongwith associated software should be made available to the purchaser alongwith required attachments.
- (f) Trip circuit supervision will be done by numerical O/C & E/F relay. Binary I/P shall be capable for this feature.



**Volume –IIE**

**PROTECTION SCHEME FOR 220 kV BUS COUPLER C&R PANEL**

**7.01 220KV BUS COUPLER PROTECTION:**

a) The protection provided on Bus coupler shall be non directional IDMTL numerical relays for over current and earth fault. The over current and earth fault relay shall be of numerical and communicable type. Separate local breaker backup relays will be provided to guard against circuit breaker mechanical stuck-up condition. Check synchronising relay will also be added to synchronise two buses. The LBB relay shall be of numerical communicable type. The check synchronizing relay may however be of static type if provided separately.

(i) The numerical over current & earth fault relay should be access able with PC or Laptop through front interface **and remotely from rear port**. It should have facility for inter bus communication & remote communication.

(ii) The numerical over current & earth fault relay should have protocol for communication as per IEC-61850. The protocol mapping with associated software should be made available to the Purchaser alongwith required attachments.

(iii) Should have minimum 4 digital input and 6 digital output contacts.

(iv) Supervision of tripping relay will be done by numerical O/C & E/F relay.

**7.01.1 CHECK SYNCHRONIZING RELAY:**

Check synchronizing relay shall

i) have a time setting continuously variable between 2.0 and 10.0 secs.

ii) have a response time within 200 mili seconds with a timer disconnected.

iii) have a phase angle setting not exceeding 35 degree.

iv) have a voltage setting not exceeding 10%

**7.01.2 CHECK SYNCHRONISING AND DEAD LINE CHARGING FACILITY:**

(a) Check synchronizing relays where selected shall ensure that unless the incoming and running supplies are in synchronism the controlling circuit breaker for incoming supply can not be reclosed. Check synchronizing relays shall compare the phase angle and frequency of the incoming and running supply and the closing will only take place when both parameters are within the permissible limits.

Dead line charging facility will be selected on one end of the line sections. On the other end of which check synchronizing facility has been selected, such facility will enable check for no volt on the line prior to closing of line CB.

(b) A common check synchronizing relay for manual closing of lines shall be provided in the B/C relay panel which shall be suitable for all the 220 kV lines at the sub-stations. Common bus wiring for this will be provided in all the control panels of 220 kV line and B/C. Facility for dead bus/ dead line charging shall also be provided in the above scheme alongwith selection of check synchronizing/ bye pass. A synchronizing –dead bus selector switch (3 position – dead bus/ off/ check synchronizing) shall be provided on control panels of all 220 kV lines and B/C. A check synchronizing by pass selector switch (3 position– By pass/ off/ check synchronizing) shall also be provided on control panel of all 220 kV lines. A socket and plug arrangement is to be provided in each line and B/C panel for selecting the circuit which is to be closed . It shall not be possible to select two circuits for synchronizing at a time through this arrangement . Guard relay shall also be provided in the scheme to inhibit unwanted closing of CB.

**7.01.3 LOCAL BREAKER BACK UP PROTECTION (BREAKER FAILURE PROTECTION):**

i) The Numerical LBB relay should be provided separately i.e should not be built-in feature of back-up protection and shall be of numerical communicable type with protocol as per IEC-61850.

ii) **DELETED**

iii) **DELETED**

iv) Have three over current element.

v) Operate only for all type of faults and not in load conditions.

- vi) Initiate remote end tripping required.
- vii) Have a setting range of 20-250% of rated current for phase over current elements
- ix) Have a continuously adjustable time setting range of 0.05 to 0.5 sec. on pick up.
- x) Include all necessary auxiliary relays required for completeness of scheme.
- xi) The numerical relay have sufficient tripping contacts for LBB, Bus Bar protection scheme (Bus Bar protection scheme is not in Supplier's scope)
- xii) Provision for connecting to existing bus bar protection scheme
- xiii) Have continuous thermal withstand two times rated current irrespective of setting.
- xiv) Separate external timer (0 to 500 m Sec) for Bus Tripping of LBB scheme shall be provided.
- xv) Have provision for initially giving trip repeat signal to CB through separate contacts and thereafter to trip Bus bar/ other CBs as per setting.
- xvi) Should be accessible with remote PC or Laptop through front interface **and remotely from rear port.**
- xvii) Should have minimum 8 digital input and 8 digital output contacts. In case 8 digital output contacts are not available in the relay, the same can be permitted to be achieved by using high speed tripping relays.

#### **7.01.4 SOFTWARE FOR NUMERICAL RELAYS:**

The bidder shall supply one set of licensed copy of application software for numerical relays with each C&R panel free of cost. The application software shall consist of relay setting software and relay data analysis software.

**Volume –IIF**  
**PROTECTION SCHEME FOR 220 kV/132 kV AUTO TRANSFORMER**

**8.01 220 kV SIDE OF 220 kV/132 kV AUTO TRANSFORMER:**

**The protection scheme proposed to be adopted for 220/132/11 kV Auto transformers will be as under:**

- a) Percentage biased differential protection for internal faults. Relay will be immune to magnetising inrush current and 5th harmonic (under over excitation condition) incorporate feature to provide stability under severe through-fault condition and under CTs saturation.
- b) High Impedance Differential (Circulating current) protection.
- c) Restricted Earth Fault protection
- d) Inverse Over Current back-up protection for phase faults with instantaneous attachment.
- e) Inverse backup Earth Fault protection for ground faults with instantaneous attachment.
- f) High Temperature winding protection.
- g) High Temperature oil protection.
- h) **Buchholz protection for transformer.**
- i) Voltage Neutral Displacement relay for tertiary protection.
- j) Over fluxing protection.
- k) Pressure Release Device (PRD)
- l) **OSR protection for OLTC of transformer.**

**8.01.1 DIFFERENTIAL PROTECTION**

- (a) 220/132 kV 50/100/160 MVA Auto transformers shall be provided with high speed numerical two winding differential relay suitable for Auto transformer and shall be of variable bias type (Tertiary winding is delta connected unloaded and is only for stabilizing purposes). The differential relay shall operate for all internal faults and shall not operate on heavy through faults. The relay shall be immune to magnetizing inrush current and have feature to provide stability under over excited conditions and should also be stable for unbalance current due to on load tap changing equipment provided on the transformer which can vary the tap changer setting from 15% to +10%. The protection system shall not operate for the transformer inrush current having an inrush factor not greater than 7 and time constant of 200 m sec. Necessary inbuilt provision shall be made for ratio and vector group corrections to suit 50 MVA, 100 MVA & 160 MVA Transformers.

The differential protection relay shall have an operating time of not greater than **40m** sec at 5 times of setting current. The main differential relay shall have an adjustable operating setting of the order of 20% to 50% of the rated current so that it covers practically the entire transformer winding susceptible to faults.

The differential relays shall have adjustable settings for the operating current as well as bias setting. An instantaneous high set circuit with separate indication shall be provided. The setting of this circuit shall be variable with minimum setting of 8 times of the rated current so as to trip the transformer when the differential current exceeds setting.

The differential relay shall have dual slope characteristic. The relay will be provided with disturbance recorder which displays pre event and post event parameter with external triggering facility

Necessary terminals and links shall be provided on the panel to measure the current in the restraining circuit/elements of HV & LV and in the operating circuit/elements of all phases under load without making wiring changes. The relay will also have fault recorder, having facility to display fault currents, date, time, frequency, etc. The relay will be provide with event recorder. The relay should have minimum 8 digital input and 8 digital output contacts

- (b) **TIME SYNCRONISATION:** The relay shall have facility to synchronize its time clock from time synchronisation equipment having output port IRIG B/RS232/Potential free contacts (PPM)
- (c) The numerical differential relay should be accessible with PC or Laptop through front interface. It should have facility for inter bus communication and remote communication.

- (d) The numerical differential relay should have protocol for communication as IEC-61850. The protocol mapping along with associated software should be made available to the purchaser along with required attachments.

**8.01.2 Deleted.**

**8.01.3 TRANSFORMER AUXILIARY RELAY:**

Separate auxiliary relays for the following function for each transformer shall be provided:

- i) 4 Nos. for tripping on Buchholz alarms and trips.
- ii) 3 Nos. OLTC diverter switch oil surge trip and 1 common OLTC oil surge trip.
- iii) 3 Nos. winding temperature trip on three windings.
- iv) 1 No. oil temperature trip.
- v) 2 Nos. pressure release device trip.
- vi) 2 Nos. spares.

Two Gas detector relays have been provided with each of the above mentioned transformers and each relay will have one pair of alarm contacts and one pair of tripping contacts all of which shall be used for tripping the transformer.

OLTCs are equipped with oil surge type relays with tripping contacts. Similarly winding temperature indicators have been provided on HV & LV windings of the transformers which have two pairs of actuating contacts for winding temperature alarm and trip. The auxiliary tripping relays shall be provided to trip simultaneously the incoming & the outgoing circuits of the transformers in conjunction with the main tripping contacts.

The auxiliary relay should have relay connecting fingers/ strips/Pins /plug capable of carrying 30A for 3 sec & 5A continuously at 660 V. The Auxiliary relays:

- (a) Shall be hand reset type.
- (b) Should have flag indication for operation.
- (c) Should have independent contact for energizing the trip relay, alarm annunciator, for connection to main differential relay for initiate disturbance recorder.
- (d) Each auxiliary relay has three elements and each element have six actuating contacts.

**8.01.4 OVER FLUXING RELAY:**

Numerical Over fluxing relays shall be connected to the star connected secondary terminals of PT/RVT provided on the tertiary of the transformer as mentioned at clause 8.01.7 hereunder. It will provide protection against excessive flux density. The relay shall have settings for alarm and trip, w.r.t. voltage/ frequency ratio as per over fluxing characteristics of transformer. An instantaneous element with separate relay flag shall be provided. If the relay is part of some other relay then it shall have separate alarm and tripping contacts.

**8.01.5 HIGH IMPEDANCE DIFFERENTIAL PROTECTION AND RESTRICTED EARTH FAULT PROTECTION:**

**8.01.5(A) HIGH IMPEDANCE DIFFERENTIAL (CIRCULATING CURRENT) PROTECTION:**

The numerical relay shall be:

- i) Shall provide separate indication for each phase.
- ii) High speed circulating current type.
- iii) Have current setting of 10-50% in minimum step of 10%.
- iv) Tuned to supply frequency and reject harmonics.
- v) Provided with continuously adjustable stabilising resistance.
- vi) Suitably protected against high voltages by suitable non-linear resistance.
- vii) Have alarm and trip output contacts and contacts for trigger Disturbance recorder of main Differential relay.
- viii) Relay shall be Numerical.
- ix) High impedance differential relay shall not be part of any other relay

**8.01.5(B) RESTRICTED EARTH FAULT PROTECTION:**

**The numerical relay shall be:**

- i) Deleted.
- ii) Deleted.
- iii) High speed, circulating current type.

- iv) Have current setting of 20-80%.
- v) Tuned to supply frequency and reject harmonics.
- vi) Provided with continuously adjustable stabilising resistance.
- vii) Suitably protected against high voltage by suitable non-linear resistance.
- viii) Have alarm and trip output contacts and contacts for trigger Disturbance Recorder of main Differential relay.
- ix) Relay shall be Numerical with fault recorder, having facility to display fault Currents, date, time, etc.
- x) REF relay shall not be part of any other relay.

**Note:** Each 220/132/11kV (YNa0d11) Auto transformer of the purchaser is provided with double core identical current transformers for high impedance and REF protection in the following manner:

1. Three Nos. on HV winding Bushing (One No. per phase)
2. Three Nos. on LV winding Bushing (One No. per phase)
3. Three Nos. on neutral end Bushing (One No. per phase before neutral formation)
4. One no. on common neutral.

Current transformers on each HV, LV & neutral side (before star formation) shall be provided in the appropriate manner in the bushings of the transformer. Technical particular of the bushing for CTs high impedance differential protection and restricted earth fault protection are given below:

		<u>100 MVA</u>	<u>160 MVA</u>
i)	Rated frequency	50 c/s	50 c/s
ii)	No.of cores.	Two	Two
iii)	Rated primary current	1000 A	1000 A
iv)	Rated secondary current	1 Amp.	1 Amp
v)	Rated continuous thermal current.	120% rated.	120% rated.
vi)	Rated transformation ratio.	1000/1	1000/1
vii)	Accuracy class	PS	PS
viii)	Min. Knee point voltage	1000 V	1000 V
ix)	Max. Magnetisation current at guaranteed knee point voltage	60 mA	60 mA
x)	Max. Secondary winding resistance at 75 degree C	5 Ohm	5 Ohm
xi)	Rated short time thermal current for 1 second.	40 KA (RMS)	40 KA (RMS)
xii)	Rated dynamic current.(Peak)	100 KA Peak	100 KA Peak

#### 8.01.6 BACK UP PROTECTION (Protection scheme for 220kV side of 220/132 kV Auto Transformer (Type B-II)):

- (a) The transformers shall be protected on 220 kV side as well as 132 kV side by inverse over current relays with high set instantaneous elements on all the three phases, for phase faults(non-directional type) with high set, and inverse type earth fault relays shall be directional type with directional high set instantaneous element. The combined over current and earth fault relay shall be of numerical type. The over current and earth fault relay shall not be part of any other relay.
- (b) The numerical backup protection relay should be accessible with PC or Laptop through front interface. It should have facility for inter bus communication and remote communication.
- (c) The numerical backup protection relay should have protocol for communication as IEC-61850. The protocol mapping alongwith associated software should be made available to the purchaser along with required attachments.
- (d) The numerical O/C & E/F relay should have minimum 4 digital input and 6 digital output contacts.

#### 8.01.7 TERTIARY PROTECTION:

Although tertiary is unloaded and for stabilizing purpose as detailed at para 8.01.1 above but all the 3 terminals of the tertiary shall be brought out for connection to PT/RVT. The primary of PT is star connected having earthed/floating neutral depending upon transformer design consideration. The PT will have two secondary winding, one star connected and another connected in open delta mode while over fluxing relay will be connected on the star secondary winding as required under clause 8.01.4 above, Neutral displacement relay will be connected to the two open delta terminals of the 2nd secondary winding of PT.

The neutral displacement relay (NDR) will have with setting range of 5% to 20% of rated voltage of  $110/\sqrt{3}$  V. The NDR shall be Numerical. The NDR **may** be part of REF relay. The windings of PT shall have following specification

		Secondary windings of PT	
		Winding-1	Winding-2
1	Rated burden, VA	50	50
2	Accuracy class	0.5	3.0
3	Connection	Star(star point earthed)	Open Delta
4	Purpose	For over flux relay	For Neutral Displacement Relay
5	Voltage Ratio	11000V/110 V	11000V/190 V

#### 8.01.8 LOCAL BREAKER BACKUP PROTECTION: (BREAKER FAILURE PROTECTION FOR 220kV PANELS)

- i) The LBB relay should be provided separately i.e should not be built-in feature of Main-I or Main-II distance and back-up protection and shall be of numerical communicable type with protocol as per IEC-61850.
- ii) DELETED
- iii) DELETED
- iv) Have three over current element.
- v) Operate only for all type of faults and not in load conditions.
- vi) Initiate remote end tripping required.
- vii) Have a setting range of 20-200% of rated current for phase over current elements
- viii) Have a continuously adjustable time setting range of 0.05 to 0.5 sec. on pick up.
- ix) Include all necessary auxiliary relays required for completeness of scheme.
- x) The numerical relay have sufficient tripping contacts for LBB, Bus Bar protection scheme (Bus Bar protection scheme is not in Supplier's scope)
- xi) Provision for connecting to existing bus bar protection scheme
- xii) Have continuous thermal withstand two times rated current irrespective of setting.
- xiii) Separate external timer (0 to 500 m sec accurately adjustable within range) for Bus Tripping of LBB scheme shall be provided.
- xiv) Have provision for initially giving trip repeat signal to CB through separate contacts and there after to trip Bus bar/ other CBs as per setting.
- xv) should be accessible with PC or Laptop through front interface **and remotely from rear port.**
- xvi) Should have minimum 8 digital input and 8 digital output contacts. In case 8 digital output contacts are not available in the relay, the same can be permitted to be achieved by using high speed tripping relays.

#### 8.02 132kV SIDE OF 220/132 kV AUTO TRANSFORMER:

- (a) The transformers shall be protected on 220kV side as well as on 132kV side by inverse over current relays with high set instantaneous elements on all the three phases, for phase faults (non-directional type) with high set, and inverse type earth fault relays shall be directional type with directional high set instantaneous element. The combined over current and earth fault relay shall be of numerical type. The over current and earth fault relay shall not be part of any other relay.
- (b) The numerical over current and earth fault relay should be accessible with PC or Laptop through front interface. It should have facility for inter bus communication and remote communication.
- (c) The numerical over current and earth fault relay should have protocol for communication as per IEC-61850. The protocol mapping along with associated software should be made available to the purchaser along with required attachments
- (d) The Relay should have fault recorder facility to display fault currents, **phase wise**, date, time, etc.
- (e) The numerical O/C & E/F relay should have facility to make directional unit in non- directional unit.
- (f) The numerical O/C & E/F relay should have minimum 4 digital input and 6 digital output contacts

#### 8.03 SOFTWARE FOR NUMERICAL RELAYS:

The bidder shall supply one set of licensed copy of application software for numerical relays with each C&R panel free of cost. The application software shall consist of relay setting software and relay data analysis software.

#### **8.04 SPECIFICATION FOR DISTURBANCE RECORDER:**

- (a) The disturbance recorder function shall be built-in feature of Differential protection scheme.
- (b) The acquisition unit of disturbance recorder shall have following features:
  - i) Minimum pre fault recording time of 100 m sec.
  - ii) Minimum post fault recording time of 700 msec.
  - iii) Memory capacity – Minimum 3 recordings each of 800 msec. recording time.
  - iv) The disturbance recorder shall be microprocessor based with scan rate of 1000 Hz per channel or better.
  - v) To record the graphic form of instantaneous values of voltage, current in all three phases, open delta voltage, open and closed position of relay contacts and breaker etc. during the disturbances.
  - vi) The print out of disturbance recorder shall contain identity, date, time (in hour, minute and second upto 100th of a sec.) graphic form of minimum 8 analogue and 16 event signal of all the channels separately etc.
- (c) It should be possible to trigger the disturbance recorder externally through contact set.
- (d) The disturbance recorder shall have minimum 8 analogue and 16 digital channels.
- (e) The disturbance recorder shall have provision for minimum 16 nos. digital inputs which can be recorded in the disturbance recorder output. These can also be utilized for event logging by initiating external triggering of the disturbance recorder appropriately as per requirement.

#### **8.05 NUMERICAL RELAY:**

##### **The relay shall have**

##### **(a) TIME SYNCHRONIZATION:**

All Numerical relays shall have facility to synchronize its time clock from time synchronisation equipment having output port IRIG-B/ RS232/Potential free contacts (PPM).

(b) All Numerical relays should be access able with PC or Laptop through front interface. It should have facility for inter bus communication and remote communication.

(c) The numerical Differential relay, LBB relay and O/C&E/F relay should have protocol for communication as IEC-61850. The protocol mapping along with associated software should be made available to the purchaser along with required attachments

(d) All Numerical Relays shall have inbuilt fault recorder and facility to display fault currents, date, time, etc.

**Volume –IIG**

**PROTECTION SCHEME FOR 132 kV SIDE OF 132/33 kV OR 132/11 kV TRANSFORMER**

**9.01 132 kV SIDE OF 132/33kV OR 132/11kV TRANSFORMER:**

**The protection scheme proposed to be adopted for transformers will be as under:**

- a) Percentage biased differential protection for phase and ground faults with harmonic restraint and magnetic inrush blocking.
- b) Inverse over current back-up protection for phase faults with instantaneous attachment.
- c) Inverse backup protection for ground faults with instantaneous attachment. Elements shall have directional features.
- d) High temperature winding/oil protection.
- e) Buchholz protection for transformer (two relays).
- f) Over fluxing protection.
- g) Pressure release device.
- h) Voltage neutral displacement protection.
- i) Numerical Restricted Earth Fault Protection.
- j) **OSR protection for OLTC of transformer.**

**9.01.1 DIFFERENTIAL PROTECTION:**

132/33 kV or 132/11kV, 10/12.5 or 20/25MVA or 40/50MVA Power transformers shall be provided with high speed numerical two winding differential relay suitable for 2 (Two) winding transformers controlled individually and shall be of variable bias type. The differential relay shall operate for all internal faults and shall not operate on heavy through faults. The relay shall be immune to magnetising inrush current and have feature to provide stability under over excited condition and should also be stable for unbalance current due to on load tap changing equipment provided on the transformer which can vary the tap changer setting from -15% to +5%. The protection system shall not operate for the transformer inrush current having an inrush factor not greater than 7 and time constant of 200 mili seconds.

The differential protection relay shall have an operating time of not greater than **40** m sec at 5 times of setting current. The main differential relay shall have an adjustable operating setting of the order of 20% to 50% of the rated current so that it covers practically the entire transformer winding susceptible to faults.

The differential relays shall have adjustable settings for the operating current as well as bias setting. An instantaneous high set circuit with separate indication shall be provided. The setting of this circuit shall be variable with minimum setting of 8 times of the rated current so as to trip the transformer when the differential current exceeds setting.

The differential relay shall have dual slope characteristic. The relay will also have fault recorder, having facility to display fault currents, date, time, frequency, etc. The relay will be provide with event recorder. The relay should have minimum 8 digital input and 8 digital output contacts

**9.01.2 TRANSFORMER AUXILIARY RELAY:**

Separate auxiliary relays for the following function for each transformer shall be provided:

- a. 4 Nos. for Buchholz alarm and trip
- b. 1 No. for OLTC oil surge trip
- c. 2 Nos. for winding temp. trip
- d. 1 No. for Oil temp. trip.
- e. 1 No. for pressure release device trip.
- f. 1 No. spare.

Gas detector relays have been provided with each of the above mentioned transformers and each relay will have one pair of alarm contacts and one pair of tripping contacts all of which shall be used for tripping the transformer.

OLTCs are equipped with oil surge type relays with tripping contacts. Similarly winding temperature indicators have been provided on HV & LV windings of the transformers which have two pairs of actuating contacts for winding temperature alarm and trip. The auxiliary tripping relays shall be provided to trip simultaneously the incoming & the outgoing circuits of the transformers in conjunction with the main tripping contacts.



The auxiliary relay should have relay connecting fingers/ strips/Pins/plug capable of carrying 30A for 3 sec. & 5A continuously at 660V.

**The Auxiliary relays:**

- (a) Shall be hand reset type.
- (b) Should have flag indication for operation.
- (c) Should have independent contact for energizing the trip relay, alarm annunciator, for connection to main differential relay to initiate disturbance recorder.
- (d) Each auxiliary relay has three elements and each element have six actuating contacts.

**9.01.3 OVER FLUXING RELAY:**

Numerical Over fluxing relays shall be provided on high voltage side of the transformers (but connected to LV bus PT) to provide protection against excessive flux density. The relay shall have inverse time delay settings for Alarm & trip, w.r.t. voltage/ frequency ratio. An instantaneous element with separate relay flag shall be provided. If the relay is part of some other relay it should have separate alarm and tripping contacts.

**9.01.4 BACK UP PROTECTION FOR 132kV TRANSFORMER ON 132 kV SIDE OF 132/33 kV OR 132/11kV TRANSFORMER:**

- (a) The power transformers shall be provided with inverse over current back up protection(non-directional) for phase faults and separate inverse earth fault protection for ground faults(directional type).The back up over current relays shall be non-directional type with instantaneous attachment.

The back-up earth fault relay shall be directional type with directional highset instantaneous element with a provision to make the relay non directional externally. The relays shall be numerical type.

Both combined (having separate tripping contacts for over current and earth fault) and separate over current and earth fault relays are acceptable. The over current and earth fault relay shall not be part of any other relay.

- (b) The numerical O/C & E/F relay should be accessible with PC or Laptop through front interface. It should have facility for inter bus communication and remote communication.
- (c) The numerical O/C & E/F relay should have protocol for communication as per IEC-61850. The protocol mapping along with associated software should be made available to the purchaser along with required attachments.
- (d) The numerical O/C & E/F relay should have minimum 4 digital input and 6 digital output contacts.
- (e) The numerical O/C & E/F relay should have facility to make directional unit in non- directional unit.

**9.01.5 RESTRICTED EARTH FAULT PROTECTION:**

The numerical relay shall be:

- i) Deleted.
- ii) Deleted.
- iii) Deleted
- iv) Have current setting of 20-80%.
- v) Tuned to supply frequency and reject harmonics.
- vi) Provided with continuously adjustable stabilising resistance.
- vii) Suitably protected against high voltage by suitable non-linear resistance.
- viii) Have alarm and trip output contacts and contacts for trigger Disturbance recorder of main Differential relay.
- ix) Relay shall be Numerical having fault recorder facility to display various currents, date, time, etc. .
- x) REF relay shall not be part of any other relay.
- xi) Trip circuit supervision I & II shall be done through REF HV / LV relay. Binary I/P shall be capable for this feature.

**Note :** Each 132/33kV (Y-Y) Transformer of the purchaser is provided with double core identical current transformers (CT)for REF protection in the following manner:

1. Three Nos. on HV winding Bushing (One No. per phase)
2. Three Nos. on LV winding Bushing (One No. per phase)
3. Two No. on neutral (One for HV neutral &One for LV neutral).

Current transformers on each HV, LV & neutral side shall be provided in the appropriate manner in the bushings of the transformer. Technical particular of the bushing CTs for restricted earth fault protection are given below:

i)	Rated frequency	50 Hz
ii)	No. of cores	Two
iii)	Rated primary current a) For HV & HV Neutral 500 A b) For LV & LV Neutral 1000 A	500 A 1000 A
iv)	Rated secondary current	1 Amp.
v)	Rated continuous thermal current.	120% rated.
vi)	Rated transformation ratio a) For HV and HV Neutral b) For LV and LV Neutral 1000/1	500/1 1000/1
vii)	Accuracy class	PS
viii)	Min. knee point voltage	1000 V
ix)	Max. magnetisation current at guaranteed knee point voltage.	60 mA
x)	Max. Secondary winding resistance at 75 degree C.	5 Ohm
xi)	Rated short time thermal current for 1 sec. a) For HV b) For LV	31.5 kA(RMS) 25.0 kA(RMS)
xii)	Rated dynamic current.(Peak)	100 kA Peak(for HV & HVN) 63.0 kA Peak(for LV & LVN)

#### 9.01.6 VOLTAGE NEUTRAL DISPLACEMENT PROTECTION:

The voltage neutral displacement relay will be connected to the open delta terminals of the bus voltage transformer. The neutral displacement relay will have IDMT characteristics with setting range of 5% to 20% of rated voltage of 63.5 V. The relay shall be Numerical type. The NDR relay may be part of numerical O/C & E/F relay.

#### 9.01.7 NUMERICAL RELAY:

The relay shall have:

- TIME SYNCHRONIZATION: All Numerical relays shall have facility to synchronize its time clock from time synchronisation equipment having output port IRIG B/ RS232/Potential free contacts (PPM).
- All Numerical relays should be access able with PC or Laptop through front interface. It should have facility for inter bus communication and remote communication.
- The numerical Differential relay and O/C & E/F relay should have protocol for communication as IEC-61850. The protocol mapping along with associated software should be made available to the purchaser along with required attachments.
- All Numerical Relays shall have inbuilt fault recorder and facility to display fault currents, date, time, etc.

#### 9.01.8 SOFTWARE FOR NUMERICAL RELAYS:

The bidder shall supply one set of licensed copy of application software for numerical relays with each C&R panel free of cost. The application software shall consist of relay setting software and relay data analysis software.

**Volume –III**  
**SPECIFICATION OF INSTRUMENTS/METERS**

**10.01 INDICATING AND INTEGRATING INSTRUMENTS AND METERS:**

All instruments shall be of switch board type back connected suitable for flush mounting and provided with dust and vermin proof case for tropical use and finished in black colour. All fixing screws, nuts and threaded parts shall be designed according to relevant Indian Standards. Digital Multifunctional meters shall be digital type as per clause 3.04.08.2 and shall conform to the provisions of the latest edition of relevant IS/ IEC. Energy meters shall conform to the provisions of relevant IS amended upto date and RVPN's technical specification. The specification of AC static 0.2S Class TOD type HT TVM is at Volume II K.

The Digital multifunctional meters shall be of class 0.5 accuracy. The energy meters shall also conform to class 0.2S accuracy. The calibration of the instruments shall function satisfactorily when mounted on steel panels.

**10.02 DIGITAL VOLT METERS:**

Digital voltmeters shall be provided wherever asked for in the detailed equipment requirement. The digital voltmeter should be capable to display voltage between phases and between phases and earth one at a time through user selection.

**10.03 DIGITAL MULTIFUNCTION METER:**

- i) The Digital multifunction meter shall be of programmable type of 0.5 class accuracy
- ii) It shall be suitable for measurement by 3 Phase 4 wire unbalance load
- iii) It shall be able to indicate following parameters:-
  - a) Max/ Min Voltage & current
  - b) Phase and line Voltage
  - c) Three phase currents.
  - d) Frequency.
  - e) Power Factor
  - f) Reactive & Active Power
  - g) Apparent Power
  - h) Maximum demand
  - i) Per phase KW, KVAR, KVA and P.F.
  - j) Total harmonic distortion (voltage and current both).
  - k) Active Energy,
  - l) Reactive Energy,
  - m) Apparent Energy.
- iv) DMFM shall operate on auxiliary supply either 110V or 220 V DC as per panel rating and have non-volatile memory to store energy data and setting data.
- v) The other specification shall be:
  - a) Current Range 1A or 5A, Continuous 1A, 5A (as per IS: 1248)
  - b) Surge withstand (1A CT & 5 A CT) (As per IS: 1248)
  - c) The digital multifunction meter shall be able to accommodate ratios of installed CT/PT and have adequate rating range.
  - d) The meter shall have the communication port RS-232/RS-485 having MODBUS protocol or any other open protocol.
  - e) EMI/EMC compliant as per requirement IS/IEC.
  - f) DMFM shall be site configurable for both 1A or 5A operation either through configuration setting or through ICT.

**10.04 ENERGY METERS :**

The specification of AC static 0.2S clause ToD type HT TVM is enclosed at Volume II K

**10.05 TESTING TERMINAL BLOCK (TTB) FOR TESTING OF TRIVECTOR METER:**

Link type testing terminal block suitable for 3 phase 4 wire system shall be provided for carrying out calibration tests on Energy meters, without disconnecting the connecting leads or removing the meters. The wiring of the TTB shall be so arranged that when the testing receptacle are fitted, the current and voltage are automatically disconnected from the source and injection from the separate source is possible. In case of draw out type meters the provisions shall be made to automatically short circuit the secondary of CTs when the meter is taken out of circuit for testing.

**Volume-II(I)**  
**GENERAL SPECIFICATION OF CONTROL AND RELAY BOARD**

**11.01 STANDARDS:**

**11.01.1** The equipment offered should conform to relevant Indian Standards or equivalent IEC standards. The references of the relevant standard specifications wherever mentioned in the text of this specification have been given accordingly. Other authoritative standards which ensure an equal or better quality than the standards specified will also be accepted.

**11.02 GENERAL:**

**11.02.1** The Boards shall comprise of cubicles placed side by side to form continuous boards. The duplex type shall be mounted back to back and so arranged as to have a covered corridor in between to provide access to the internal wiring. Hinged lockable access doors shall be fitted at both ends of the corridor and switch boards interior shall be automatically lit by the opening of these doors. The control boards for the same line voltages at each substation shall be placed side by side and shall form one board.

**11.02.2** For the existing sub stations the bidder shall ensure the matching of control & relay boards with the existing ones. The complete details of the existing control & relay panels shall be supplied to the successful bidder. The following points shall be particularly co-ordinated:

- i) The height and depth of the panel shall be perfectly matched.
- ii) Colour of panels both on exterior and interior shall be matched.
- iii) Size and appearance of instruments, control switches and indicating lamps mounted on the front of the panels shall be matched with the existing ones to the extent possible.
- iv) The size, colour and disposition of the mimic diagram shall be perfectly matched with the existing scheme.

**11.02.3** For other new sub stations, access doors with concealed hinges having a swing of not less than 1050 mm on full opening of their position shall be provided at suitable locations. The equipment specified shall be manufactured in the manner set out and where not set out, to the reasonable satisfaction of the Purchaser.

**11.02.4** The control and relay cubicles shall be of folded type construction. The front panels, base frame and door frame shall be manufactured from CRCA sheet steel 10 SWG(3mm) thick, while the side panels, roof and doors shall be manufactured out of 14 SWG(2mm) thick CRCA sheet steel. The bottom of the cubicle frame shall be suitable for erection on cable trenches in the flush concrete floor. Evenly spaced ground bolts projecting through the base channels forming members of the frame shall be used for securing cubicles to the floor. The dimensions of control and relay panels where no specific matching is required shall be as follows:

Height : 2312 mm (inclusive of base channel height of 102 mm).

Width : 610 mm or suitable to accommodate equipments.

Depth

Duplex panel: 610+762+610 mm (Corridor width is 762 mm).

**11.02.5** The front panels of all the cubicles shall be detachable and all inter connections from the control to the relay cubicles and vice versa shall be through terminal connectors. The inter connections shall preferably run underneath the top cover. In order to avoid sectionalising the leads at two points, the top cover may be provided with hinges on the part of blinking plate or similar arrangement shall be provided on both sides of all control and relay panels for bus wiring of common supplies (DC, PT, AC etc.) between them. The wiring for such as wiring between panels of one board shall be provided by the supplier. This shall be done using terminal block on both sides. They shall be at specified distance from the top.

**11.02.6** The complete switch board shall be dust and vermin proof and shall be suitable for tropical use. All holes and extension windows in the panels shall be blanked and access doors shall be lined with compressible line at the edges. The complete boards shall incorporate all necessary meters, instruments, relays control switches, indicating lamps, mimic buses, audible and visual alarms, horizontal and vertical wiring supports, earth bars, interior lighting system, terminal blocks, cable glands, fuses, labels, cleats, ferrules, space heaters, automatic semaphore indicators and other necessary equipment. In the relay panels, it will be the responsibility of the supplier to make provisions for the leads to be connected to the annunciator scheme for different trip and non trip alarms. The enclosure shall provide a minimum degree of protection equivalent to IP31 in accordance to IS 13947(Pt.1) for this purpose manufacturer will furnish undertaking.

**11.02.7** All power and control cables will be conduit in separate distributing trenches running immediately, underneath the control & relay panels. The cables will branch off into each cubicle through entry holes in the concrete floor opening in the bottoms of the cubicles. The bidder shall mark the details of the cable entry holes, glands and position of grouting bolts to enable the Purchaser to prepare foundations with pockets for grouting bolts while casting floor.

**10.02.8** Knock out holes with glands shall be provided by the bidder in one of the base plate, as under:

	<u>220 kV Panel</u>	<u>132 kV Panel</u>
32mm	6 Nos.	3 Nos.
25mm	12 Nos.	8 Nos.
19mm	8 Nos.	6 Nos.

**11.03 PAINTING:**

All unfinished surfaces of steel panels and frame work shall be sand blasted to remove rust, scale, foreign adhering matter and grease, a suitable rust resisting primer shall be applied on the interior and exterior surface of steel, which shall be followed by application of an under coat suitable to serve as base and binder for the finishing coat.

- i) All sheet steel work shall be phosphated in accordance with IS: 6005 code of practice for phosphating iron and steel.
- ii) Oil, grease, dirt and swarf shall be thoroughly removed by emulsion cleaning.
- iii) Rust and scale shall be removed by pickling with dilute acid followed by washing with running water rinsing with slightly alkaline hot water and drying.
- iv) After phosphating thorough rinsing shall be carried out with clean water followed by final rinsing with dilute dichromate solution and oven drying.
- v) The phosphate coating shall be sealed with application of two coats of ready mixed, stoved type zinc chromate primer. The first coat may be "flash dried" while second coat shall be stoved.
- vi) After application of primer two coats of finishing synthetic enamel paint shall be applied, each coat shall be applied followed by stoving the second coat shall be applied after inspection of first coat of painting. Generally the exterior colour of paint shall be as per shade 631 of IS:5(2007) except where specific matching is required.
- vii) Each of coat of primer and finished paint shall be of slightly different shade to enable inspection of painting.
- viii) Powder coating method of painting is also acceptable.
- ix) In case the bidder proposed to follow any other established painting procedure like electrostatic painting, the procedure, shall be submitted along with the bid for purchaser's review and approval.

**11.04 PANEL WIRING**

**11.04.1** All wiring other than annunciation circuits, alarmed and control circuit shall be of switch board type 2.5 sq.mm PVC insulated copper conductor suitable for 660V service and in accordance with relevant Indian Standards, for annunciation, control circuit and alarm, the wiring will be done with 1.5 sq.mm PVC insulated copper conductor. Polyvinyl chloride used shall have excellent resistance against burning, moisture, oil and vermin and shall be furnished with clear colour. Rubber insulated wiring shall not be acceptable.

**11.04.2** The wiring shall be supported by plastic cleats/PVC channels, Wires shall be terminated on to the terminal blocks with annealed and tinned (not soldered) crimp tag termination, separate termination being used for each wire, and the size of termination suited to the size of wire terminated. Wiring shall in general be accommodated on the sides of the cubicles and the wires for each circuit shall be separately grouped.

**11.04.3** Wires shall not be jointed or tied between terminated points. At the terminal connections, washers shall be interposed between terminals and holding nuts. All holding nuts shall be secured by locking nuts. The connecting studs shall be secured by locking nuts; the connecting studs shall be project at least 6 mm from the lock nuts surface.

**11.04.4** Bus wiring terminal blocks shall be provided in the control panel and the relay panel along with wiring of common circuits and common AC/DC /PT supplies, etc for inter connection with adjacent control and relay panels. Bus wires shall be fully insulated and run separately. Fuses and links shall be provided to enable all circuits in a panel except lighting circuit to be isolated from the bus wire. When ever practicable all circuits in which the voltage exceeds 125 volts shall be kept physically separated from the remaining wiring. The function of each circuit shall be marked on the associated terminal boards. All spare terminals of relays shall be wired upto terminal block.

**11.04.5** All wiring diagrams for the control and relay Boards shall be drawn as viewed from the back of the cubicles and shall be in accordance with the relevant IS.

**11.04.6** Wiring connected to the space heaters in the cubicle shall have porcelain beaded insulation over a safe length from the heater terminals.

**11.04.7** All wiring inter connecting the front panels with the rear panels of the switch boards over the access shall be wired in gutters held against the ceiling of corridors by means of screws. As the front and the back panels will be detachable, the interconnection shall be made through suitable terminal connectors securely fixed on the panel.

**11.04.8** All potential bus wiring, audible and non audible alarm bus wiring, AC & DC control supply, bus wiring for panel lighting and such other wiring which runs from panel to panel within the switch board shall be laid out in gutters and shall be suitably screened.

**11.04.9** All wire shall be suitable for bending to meet the terminal studs at right angle with the studs and they shall not be skewed. Metal cases of all apparatus mounted on panels shall be separately earthed by means of flexible copper wire or strip.

**11.04.10** The following colour scheme of the wiring shall be used:

- |      |                                  |        |
|------|----------------------------------|--------|
| i)   | A.C. three phase circuits Colour |        |
|      | No.1 phase                       | Red    |
|      | No.2 phase                       | Yellow |
|      | No.3 phase                       | Blue   |
| ii)  | Neutral                          | Black  |
| iii) | Connections to earth             | Green  |
| iv)  | D. C. Circuits                   | Grey   |

Use of coloured sleeves at both end of the wire shall not be acceptable.

**11.04.11** All wire termination shall be made with insulated sleeve crimping type lugs. only eye/ ring type of flat/ round pin type lugs, as appropriate for the terminals/terminal boards, shall be used. Fork type or open- ended type of lugs shall not be used. Only one wire shall be crimped in one lug. Wire shall not be tapped or spliced between terminals. The insulated sleeve shall be integral part of the lug and shall not be used for colour coding.

**11.04.12** The earthing of the equipment mounted in the panels shall be done by starting the earthing conductor from the earthing strip of all the equipment in series and then terminating the earthing conductor at the earthing strip so that one end of any equipment remains connected to earth even if the wire is opened at any point.

## **11.05 FERRULES:**

**11.05.1** Same ferrules should be provided at both ends of wires. Ferrules with the same numbers, letters and symbols as indicated in the connection and wiring diagrams shall be provided on the terminal ends of all wires for easy identification of circuits for inspection and maintenance.

**11.05.2** Ferrules shall be strong and flexible insulating material with glossy finish to present adhesion. They shall be engraved and clearly and durably marked and shall not be affected by dampness.

**11.05.3** Ferrules numbering shall be in accordance with IS: 375/1963. The same ferrule number shall not be used on wires in different circuits on a panel.

**11.05.4** All points of interconnection between the wiring carried out for equipments for different suppliers, where a change of number cannot be avoided, double ferrules shall be provided on each wire with appropriate numbers on the changing end. The change of numbering shall be shown on the appropriate connection wiring diagram of the equipment.

**11.06 TERMINAL BOARDS:**

**11.06.1** Terminal block connectors built from cells of moulded dielectric and brass stud inserts shall be provided for terminating the outgoing ends of the panel wiring and the corresponding incoming tail ends of control cables. The terminals for CT & PT wiring shall be sliding link type. Insulating barrier shall be provided between adjacent connections. The height of the barriers and the spacing between terminals shall be such as to give adequate protection while allowing easy access to terminals. Provision shall be made on each pillar for holding 10% extra connections. All blocks shall be shrouded by easily removable shrouds of non inflammable moulded and transparent dielectric materials.

**11.06.2** The terminal blocks shall be suitable for 660 volts service and for connection with copper wires.

**11.06.3** Terminal boards shall be mounted in such a manner as to afford easy access to terminations and to enable ferrule number to be read without difficulty. Wire ends shall be so connected to the terminals that no wire terminal number gets marked due to succeeding connections. In other words ferrule numbering at the terminals should be unambiguous and fool proof. Terminal board rows shall be adequately spaced and shall not be less than 100 mm apart so as to permit convenient access to wires and terminals. Labels in the form of engraved plastic plates shall be provided on the fixed portion of terminal boards.

**11.06.4** No live metal parts shall be exposed at the back of the terminal boards.

**11.06.5** All studs, nuts, bolts screws etc. shall be threaded according to the latest relevant Indian or equivalent Inter- national Standards.

**11.06.6** The terminal blocks shall be stud type only. The connecting studs shall be locked by locking nuts or by use of a spring washer. The connecting studs shall project at least 2 threads from the lock nuts surface. Terminal blocks for CT & PT shall be Disconnecting type.

**11.07 SPACE HEATERS:**

Tubular space heaters suitable for connection to the single phase 230 volts A.C. supply complete with switches located at convenient positions shall be provided at the bottom of each cubicle to prevent condensation of moisture. The Watt loss per unit surface of heater shall be low enough to keep surface temperature well below visible heat. Each cubicle shall also be provided with a switch of appropriate rating for control for space heater.

**11.08 MIMIC DIAGRAM :**

Painted colour bands or painted dove tailed aluminium strips shall be used for the mimic bus. The Width of mimic diagram and its colour shall be matched with the existing panel. The mimic shall represent a single line arrangement of the station switch Yard equipment having two buses (one main bus for 132 kV Panel) and transfer bus arrangement. The following colours for showing the various voltages on the mimic shall be used:

- 220 kV Crimson Red (shade No.540 of IS 5)
- 132 kV Black
- 33 kV Brilliant green (shade No.221 of IS 5)

The mimic diagram shall be of the eye level type Automatic, rotating disc type semaphore indicators for indication of 'Close' and 'Open' position of circuit breakers, isolators and earth switches shall be incorporated in the mimic diagram. Other equipments such as transformers, voltage Transformers etc. shall be represented by suitable symbols.

**11.09 SEMAPHORE INDICATORS:**

The operating coils of the semaphore indicators shall be continuously rated and shall be operated from 220/110 volts DC. The units will operate satisfactorily between the limits of 80 to 120 percent of rated DC voltage. The Semaphore disc shall have a 90 degree angular movement clock wise/counter clock wise to show on/off position of the equipment.

**11.10 INDICATING LAMPS:**

**11.10.01** Indicating lamps shall be provided on the control Board to indicate the following:

- i) Visual indication of 'ON' and 'OFF' position of each circuit breaker.
- ii) Auto trip indication for each circuit breaker.
- iii) Spring charged indication/normal pressure indication for circuit breaker.

**11.10.02** Each lamp body shall be of moulded insulation and shall be able to withstand a high voltage of appropriate value. The lamp shall be suitable for 220/110 volts DC supply and single phase AC supply and shall have low wattage of consumption and shall provide a wide angle of illumination of sufficient intensity for comfortable viewing.

**11.10.03** The circuit breaker position indication lamps shall be LED type and shall operate on DC supply.

**11.10.04** A glass of appropriate colour shall be screwed into the front of the lamps body. The design of the indication lamps shall be such as to facilitate replacement of burnt lamps. An engraved label indicating the purpose of the lamp shall be provided with each lamp. The bidder shall quote unit prices for lamps and lenses to enable the Purchaser to order certain spare quantity along with the main panels.

**11.10.5** The circuit breaker position indication lamps shall be LED type and shall operate on D.C. supply.

**11.11 SWITCH BOARD LIGHTING:**

**11.11.01** The switch Board interiors shall be illuminated by 2 feet tube light. The illumination of interior shall be free from hand shadows and shall be planned to avoid any strain or fatigue to the wireman who may be called upon to do work.

**11.11.02** A door operated button switch shall be provided for control of lighting on both entrances of corridor of duplex C&R panels. In case of simplex panels each cubicle shall have its own interior illumination lamp operated by respective door switch.

**11.12 ANNUNCIATION:**

**11.12.1** Each C&R panel shall be equipped with Annunciation scheme for indicating all the annunciations required for the trip and non-trip alarms as per details given hereunder. Each annunciation shall be clearly labelled to indicate the nature of particular annunciation.

**11.12.2** The following switches shall be provided with the annunciator :

- i) A common push button switch near the annunciator unit which when pressed shall cancel the audible alarm by means of the alarm cancellation relay. The indication lamps incorporated in the control switch shall remain illuminated, but shall change from flashing to steady glow.
- ii) A common reset push button shall be provided. By pushing this button, annunciation shall be restored to the normal condition. The lamp incorporated in the control switch should not glow after resetting all the protection devices.
- iii) A test push button switch shall be provided to activate all the alarm/ lamps of the associated group as long as the test switch is held in pressed position.
- iv) All above push buttons are to be provided at height convenient for their operation. The push buttons built-in on annunciator unit itself are not acceptable.

**11.12.3** Necessary auxiliary relays shall be provided in the annunciation scheme to indicate each alarm individually. Each alarm whether trip or nontrip shall have visual as well as audible annunciation.



**11.12.4** The visual annunciator alarm shall be in the form of flashing display type glow pattern. The illuminated facias with inscription on the glass transducent plastic to indicate the operation of particular protection device shall be provided. The window shall remain illuminated till the particular initiating contact is reset and the common reset push button is pressed.

**11.12.5** As regards the audible indication, the automatic trip of the circuit breaker due to the operation of protection relays shall be indicated by sounding of a hooter. All non trip alarms shall be indicated by an alarm bell. Hooter and bell shall be provided on each panel.

**11.12.6 (a)** The DC supply used for annunciation shall be separate and independent from the DC supply used for other functions. Suitable scheme using AC supply (230V) shall be provided for monitoring the DC supply used for the annunciation scheme. Annunciation scheme which have inbuilt DC supervision facility operating totally on AC supply can also be accepted in place of separate scheme for monitoring the DC supply used for the annunciation scheme. This scheme shall have accept & test push buttons and DC bell along with lamp indication of DC supply failure.

**(b)** The AC supply used for monitoring the annunciation DC supply failure shall also be provided with audio visual alarm against failure of this AC supply.

### **11.13 DETAILS OF TRIP AND NON TRIP ALARMS:**

#### **11.13.1 220kV Feeder C&R Panel:**

Following trip / non trip alarms shall be provided for each 220kV Feeder C& R Panel.

##### **10.13.1.1 Trip alarms Facia Indications (220 kV Feeder C&R Panel)**

- i) Main-I prot. operated.
- ii) Main-II prot. operated.
- iii) Auto reclose lockout
- iv) Over current Prot. operated.
- v) Earth fault prot. operated.
- vi) LBB prot. operated.
- vii) Bus bar Prot. trip relay operated
- viii) Direct trip signal receipt.
- ix) LBB trip repeat
- x) Trip relay (86) operated
- xi) Spare
- xii) Spare

##### **11.13.1.2 Non Trip Alarms Facia Indications (220kV Feeder C&R Panel)**

- i) CB closed on auto reclose.
- ii) Main-I carrier signal received.
- iii) Main-II carrier signal received.
- iv) Main-I prot. power swing detected
- v) Main-II prot. power swing detected
- vi) Main-I prot. DC fail
- vii) Main-I Prot. Unhealthy
- viii) Main-I prot. carrier fail
- ix) Main-I prot. VT fuse fail.
- x) Main-II Prot. DC fail.
- xi) Main-II prot. Unhealthy
- xii) Main-II prot. carrier fail.
- xiii) Main-II prot. VT fuse fail.
- xiv) CB trip circuit-1 faulty.
- xv) CB trip circuit-2 faulty.
- xvi) CB low air pressure.
- xvii) CB low SF6 gas pressure.
- xviii) CB low air/ SF6 gas pressure lockout.
- xix) CB pole discrepancy trip.
- xx) Control Board AC supply fail.
- xxi) Trip relay I unhealthy.
- xxii) Trip relay II unhealthy.
- xxiii) Circuit breaker OFF.

- xxiv) VT not selected.
- xxv) Broken conductor Alarm.
- xxvi) Spare
- xxvii) Spare
- xxviii) Spare

**11.13.2 220kV Bus Coupler C&R Panel:**

Following trip/non trip alarms shall be provided each 220kV Bus Coupler C& R Panel:

**11.13.2.1 Trip alarms Facia Indications (220 kV Bus Coupler C&R Panel)**

- i) Over current Prot. Operated.
- ii) Earth fault Prot. Operated
- iii) LBB Prot. Operated
- iv) Bus bar Prot. trip Relay Operated
- v) Bus bar Prot. Zone A/B Operated
- vi) LBB trip repeat
- vii) Trip relay (86) operated
- viii) Spare

**11.13.2.2 Non Trip Alarms Facia Indications (220kV Bus Coupler C&R Panel)**

- i) Protection DC Fail.
- ii) CB Trip Circuit-1 Faulty
- iii) CB Trip Circuit-2 Faulty
- iv) CB Low Air Pressure
- v) CB Low SF6 Gas Pressure
- vi) CB Low Air/SF6 Gas Pressure Lockout
- vii) CB Pole Discrepancy Trip
- viii) Control Board AC Supply Fail
- ix) Bus Bar Prot. DC Fail
- x) Bus Bar Prot. CT Circuit Faulty
- xi) Bus Bar Prot. PSU Faulty
- xii) Trip relay I unhealthy
- xiii) Spare
- xiv) Spare
- xv) Spare
- xvi) Spare

**11.13.3 132 kV Feeder C&R Panel:**

Following trip/non trip alarms shall be provided for each 132 kV feeder C&R Panel.

**11.13.3.1 Trip Alarms Facia Indications (132kV Feeder C&R Panel):**

- i) Trip relay (86) operated.
- ii) Distance Prot. Operated.
- iii) Over current Prot. Operated.
- vi) Earth fault Prot. Operated.
- v) Spare.
- vi) Spare.
- vii) Spare.

**11.13.3.2 Non Trip Alarms Facia Indications (132kV Feeder C&R Panel):**

- i) Circuit breaker OFF.
- ii) Broken conductor Alarm.
- iii) Protection DC Fail.
- iv) Distance Protect. Unhealthy.
- v) VT Fuse Fail.
- vi) VT not Selected.
- vii) CB Trip Circuit-1 Faulty.
- viii) CB Trip Circuit-2 Faulty.
- ix) CB Low Air Pressure.
- x) CB Low SF 6 Gas Pressure.
- xi) CB Low Air/SF 6 Gas Pressure Lockout.

- xii) Control Board AC Supply Fail.
- xiii) Backup protection unhealthy.
- xiv) Trip relay I unhealthy.
- xv) Spare.

**11.13.4 132 kV Bus Coupler C&R Panel:**

Following trip/non trip alarms shall be provided for each 132 KV Bus coupler panel:

**11.13.4.1 Trip alarms Facia indications (132 kV Bus Coupler):**

- i) Over current protection operated.
- ii) Earth fault protection operated.
- iii) Trip relay (86) operated

**11.13.4.2 Non Trip alarm Facia indications (132 kV Bus Coupler):**

- i) Protection DC fail
- ii) VT not selected.
- iii) CB trip circuit-1 faulty.
- iv) CB trip circuit-2 faulty.
- v) CB low air pressure.
- vi) CB low SF6 gas pressure.
- vii) CB low air/SF6 gas pressure lockout.
- viii) Control Board AC supply.
- ix) Circuit breaker off

**11.13.5 220kV Side of 220/132kV Transformers:**

**11.13.5.1 Trip Alarms Facia Indications (220kV Transformer):**

- i) Main Differential Prot. Operated
- ii) Circulating Current Differential Prot. Operated
- iii) Overcurrent prot. operated.
- iv) Earth Fault prot. operated.
- v) Restricted Earth Fault prot. operated.
- vi) Neutral displacement prot. operated.
- vii) Over flux prot. trip.
- viii) LBB prot. operated.
- ix) Buchholz Alarm-I.
- x) Buchholz Alarm-II.
- xi) Buchholz Trip-I.
- xii) Buchholz Trip-II.
- xiii) Pressure Relief Device-I/II operated.
- xiv) HV/LV Winding Temperature Trip.
- xv) Oil Temperature Trip.
- xvi) OLTC Surge Relay Trip U-phase.
- xvii) OLTC Surge Relay Trip V-phase.
- xviii) OLTC Surge Relay Trip W-phase.
- xix) OLTC Surge Relay Trip Common.
- xx) Bus Bar Protection Trip Relay Operated.
- xxi) LBB trip repeat
- xxii) Trip relay (86) operated

**11.13.5.2 Non Trip Alarms Facia Indications (220kV Transformer.)**

- i) HV/LV Winding Temperature High.
- ii) Oil Temperature Trip.
- iii) Over flux prot.Alarm.
- iv) Transformer Oil Level Low.
- v) OLTC Oil Level Low.
- vi) Group A/B protection DC Fail.
- vii) VT not selected.
- viii) Differential Prot. Unhealthy.
- ix) CB Trip Circuit-1 Faulty.
- x) CB Trip Circuit-2 Faulty.
- xi) CB Low Air Pressure.

- xii) CB Low SF 6 Gas Pressure.
- xiii) CB Low Air/SF 6 Gas Pressure Lockout.
- xiv) CB Pole Discrepancy Trip.
- xv) Control Board AC Supply Fail.
- xvi) Voltage failure alarm for Over Flux relay
- xvii) Voltage failure alarm for O/C & E/F relay.
- xviii) Air cell alarm.
- xix) Trip circuit 1 supervision Alarm.
- xx) Trip circuit 2 supervision Alarm.
- xxi) Watch dog alarm for all numerical relays.
- xxii) Voltage not selected alarm.
- xxiii) Circuit breaker OFF

**11.13.6 132kV SIDE OF 220/132 kV TRANSFORMERS:**

**11.13.6.1 Trip Alarms Facia indications (132kV side of 220/132 kV Tr.):**

- i) Over current Prot. Operated.
- ii) Earth Fault Prot. Operated.
- iii) Trip relay (86) operated
- iv) Spare.

**11.13.6.2 Non Trip Alarms Facia indications (132 kV side of 220/132 kV Tr.):**

- i) Protection DC Fail.
- ii) VT not Selected.
- iii) CB Trip Circuit-1 Faulty.
- iv) CB Trip Circuit-2 Faulty.
- v) CB Low Air Pressure.
- vi) CB Low SF 6 Gas Pressure.
- vii) CB Low Air/SF 6 Gas Pressure Lockout.
- viii) CB Pole Discrepancy Trip.
- ix) Control Board AC Supply Fail.
- x) Voltage failure alarm for Over Flux relay
- xi) Voltage failure alarm for O/C & E/F relay.
- xii) Air cell alarm.
- xiii) Trip circuit 1 supervision Alarm.
- xiv) Trip circuit 2 supervision Alarm.
- xv) Watch dog alarm for all numerical relays.
- xvi) Voltage not selected alarm.
- xvii) Circuit breaker OFF

**11.13.7 132kV side of 132/33kV & 132/11kV transformers.**

Following trip/non trip alarms shall be provided for each transformer panel:

**11.13.7.1 Trip Alarms Facia indications (132kV side of 132/33kV & 132/11kV):**

- i) Differential Prot. operated.
- ii) Over current prot.operated.
- iii) Earth fault prot.operated.
- iv) Over Flux prot.trip.
- v) Buchholz alarm-I.
- vi) Buchholz alarm-II.
- vii) Buchholz trip-I.
- viii) Buchholz trip-II.
- ix) Pressure relief device operated.
- x) HV/LV winding temp. trip.
- xi) Oil temp.trip.
- xii) OLTC surge relay trip.
- xiii) Restricted Earth Fault ( For HV)
- xiv) Restricted Earth Fault (For LV)
- xv) Trip relay (86) operated

- xvi) Spare
- xvii) Spare

**11.13.7.2 NonTrip alarm Facia indications (132 kV side of 132/33kV & 132/11kV Tr.):**

- i) Over flux prot. Alarm
- ii) HV/LV winding temp.high.
- iii) Oil temp. high
- iv) Oil level low.
- v) OLTC oil level low.
- vi) Protection DC fail.
- vii) Differential protection unhealthy.
- viii) CB trip circuit-1/2 faulty.
- ix) CB low air pressure.
- x) CB low SF6 gas pressure.
- xi) CB low air/SF6 gas pressure lockout.
- xii) Control Board AC supply fail.
- xiii) Voltage failure alarm for Over Flux relay
- xiv) Voltage failure alarm for O/C & E/F relay.
- xv) Air cell alarm.
- xvi) Trip circuit 1 supervision Alarm.
- xvii) Trip circuit 2 supervision Alarm.
- xviii) Watch dog alarm for all numerical relays.
- xix) Voltage not selected alarm.
- xx) Circuit breaker OFF

**11.13.8** It will be responsibility of the supplier to provide all the alarms and annunciation equipments required for the safe and efficient operation of the sub stations. General description of the alarms required are given but the supplier shall include other alarms that he considers necessary.

**11.14 TRIP CIRCUIT SUPERVISION:**

For continuous supervision of the trip circuits, continuous trip circuit supervision relay shall be installed. The relay shall operate self reset alarm contact for failure of trip supply and open circuit of trip coil or trip circuit wiring. The relay shall monitor the trip circuit in both close and open position of the circuit breakers upto the auxiliary NO contact of CB trip circuits. Since 220 kV SF6 Circuit breakers being procured are equipped with 6 trip coils, 6 Nos. supervision relays would be required on each 220 kV control panel. The 132 kV SF6 circuit breakers are gang operated with 2 trip coils. Two Nos. supervision relays shall be required for these circuit breakers. There would be 2 sets of alarm annunciations for 132 kV circuit breakers. Trip circuit supervision in 132 kV Feeder C&R Panels may be done by distance protection scheme and numerical O/C & E/F relay..

**11.15 TITLE PLATES AND NAME PLATE:**

**11.15.1** A title plate bearing the name and purpose of each panel shall be fixed on the top of each control as well as relay panel.

**11.15.2** Control and relay panels shall be provided with a name plate. The name plate shall be weather and corrosion proof. It shall be mounted back side of the panels. It shall carry the information duly engraved/punched as detailed hereunder:

- i) Manufacturer's name.
- ii) PONo. RVPN/SE/Proc-II/XEN-4/A-3/BN-9016002228/D. \_\_\_\_\_ dated\_\_\_\_\_.
- iii) S.No. of panel
- iv) Month of despatch.
- v) Particulars of panel.
  - (a) Description of panel
  - (b) CT secondary
  - (c) DC auxiliary voltage.
- vi) Guarantee period;- 30 months from the date of commissioning or 36 months from the date of supply of last consignment at site whichever is earlier.

**11.16 TEST BLOCKS FOR TESTING OF PROTECTION SCHEME/RELAYS:**

Switch board type back connected test blocks alongwith Test plug 10 Nos. of upper and 10 Nos. lower terminals (Similar to universal type AREVA make MPG test block and MPB test plug) shall be provided for shorting terminals of CT loads and isolating the tripping circuit before interrupting the normal circuit for injection from an external source or for inserting testing instruments in the circuit without causing open circuit of the CT. The potential testing studs shall preferably be housed in the narrow recesses of the block moulding insulation to prevent accidental short circuit across the studs. All test blocks for the relays etc., whenever required, shall properly be of flush mounting pattern and the number of test blocks being provided on each control and relay panel shall be stated in the bid.

Irrespective of number of test blocks provided on each panel, one number test plug with a lot of 5 panels or part thereof shall be supplied necessarily, free of cost.

In case if test block is the part of the relay itself then one number test handle/ test plug with a lot of each 10 panels or part thereof shall be supplied necessarily, free of cost.

**11.17 SAFETY EARTHING:**

Earthing of current free metallic parts or metallic bodies of the equipments mounted on the switch boards shall be done with 2.5 sq.mm green coloured PVC insulated copper wire. The two ends of this line shall be provided with crimp tag terminations and connected to a tinned copper earth bar of 25mm x 3mm section running longitudinally at the bottom of the Control Board.

The neutral point of star connected secondary winding of instrument transformers and one corner of the open delta connected LV side of potential transformers, if used, shall not be earthed in the panels. Multiple earthing of any instrument transformer circuit shall be avoided.

**Volume-II(I)****BILL OF MATERIAL**

**12.01** The C&R panels, required at various sub stations can be broadly classified into following categories of panels:

S.No.	Particulars	Type of panels	
		Simplex	Duplex
1	220kV Feeder panel	A-I	A-II
2	220kV Transformer panel	B-I	B-II
3	220kV Bus Coupler panel	C-I	C-II
4	132kV Feeder panel		J-II
5	132kV Trf. panel for HV side of 132/33 or 132/11kV Trf.		K-III
6	132kV Trf. panel for LV side of 220/132kV Trf.	K-I	K-II
7	132kV Bus coupler panel		L-II

**12.02** a) The requirement of various sub stations will comprise of one or more of these panels. The simplex panel shall be complete in itself and provided with doors at the back, while the continuous board of Duplex panels shall have end doors at each end of the corridor between relay and control position of the set of duplex panels.

b) The supplier shall supply end doors and frames alongwith each set of each type of 220kV & 132kV duplex type feeder Control & Relay panel. The end doors shall be detachable type fitted on a detachable frame with suitable hinges. The frame size shall be 2200 mm height & 760 mm width. The frame shall be fitted so that its base shall be at the floor level. A channel of height 100 mm shall be fitted above the frame.

**12.03 DETAILS OF EQUIPMENTS TO BE MOUNTED ON EACH PANELS:**

The control and relay panel shall generally be equipped as under, however if auxiliary relays are required to complete the protection scheme as per site requirement, same shall be supplied free of cost.

**12.04 220kV FEEDER CONTROL AND RELAY PANELS TYPE A-II (DUPLEX):****12.04.1 220 kV Feeder Control Panel:**

S.No.	Qty.	Particulars
1	One	Section of mimic diagram with symbols.
2	Six	Semaphore indicator for four Isolator and two earth switch position indication.
3	One	Semaphore indicator for circuit breaker position indication.
4	One	Three position locking pattern control switch, spring return to normal and having contacts with onelost motion device pistol grip for control of 220kV & 132kV circuit breakers with following positions: i)Close ii) Normal iii) Trip.
5	Two	Breaker position indicating lamps: red and green.
6	One	Indicating lamp fitted with a white lens and labelled 'Auto trip'.
7	One	Indicating lamp fitted with an amber lens and labelled 'Circuit Breaker air pressure normal'
8	One	Digital Multifunction Meter
9	One	3 phase 4 wire AC static trivector meter of 0.2S class accuracy
10	One	42 way facia Annunciation scheme complete as per specification along with auxiliary relays and control switches with Hooter & Bell
11	One	Three position locking pattern selector switch stay put type with pistol grip handle with following positions: i) Dead bus ii) Off iii) Check synchronizing.

S.No.	Qty.	Particulars
12	One	Three position locking pattern synchronizing selector switch stay put type with pistol grip handle with following positions: i) By pass ii) Off iii) Check synchronizing.
13	One	Link type 3 phase 4 wire test terminal block (TTB) for testing of trivector meter.
14	One	Three position locking pattern control switch stay put type with pistol grip handle for trip transfer with following positions: i) Trip transfer ii) Inter iii) Normal.
15	One	Heavy duty metal clad 12 pin Synchronizing socket with plug(12 Amps, 415 V)
16	One	BNC Connector for Time synchronisation
17	One	Selector switch for Main DC-I and Main DC-II

#### 12.04.2 220kV Feeder Relay Panel:

S. No.	Qty.	Particulars
1	One	Three step Main-I protection, comprising of distance scheme as per clause 4.01.1 of this specification.
2	One	Main-II Protection scheme as per clause No. 4.01.2 of this specification.
3	-	Auto reclose relay shall be inbuilt feature of both Main-I and Main-II distance relay
4	One	Separate Numerical LBB relay (should not be inbuilt feature of both Main-I & Main-II distance relay or backup relays)
5	One set	Voltage selection relay needed for double main+1 auxiliary bus arrangement (Latch in type, electrically reset as per clause 3.22 of specification)
6	Two	High speed master tripping relay having 2 Normally Closed and 20 Normally Open hand reset pair of contacts for inter trip facility with duplicated trip contacts. Both tripping relays should have supervision facility.
7	Two	Test block for testing of Main-I and Main-II distance protection scheme (clause 11.16)
8	Inbuilt feature	Check synchronizing relay & dead line feature shall be in built feature of both Main-I & Main-II distance relay
9	Six	Trip circuit supervision relay suitable for both open and close position of circuit breaker.
10	One	High speed master tripping relay having 2 Normally Closed and 20 Normally Open hand reset pair of contacts for inter trip facility for bus bar protection and for LBB scheme + <b>One Aux. relay for retrip</b>
11	One	Test block for testing LBB relay
12	One	Separate external Timer (0 to 500 ms) for Bus Tripping of LBB scheme.
13	Two	Two position locking pattern selector switch stay put type with pistol grip handle for carrier selection with the following positions: i) Carrier In ii) Carrier Out
14	One	Three position switch for auto recloser M1 – OFF – M2
15	Four	Contact multiplication relay (Self reset type) for Auto Reclose Function (As per clause No. 3.20.2)
16	<b>Six</b>	Single phase Trip Relay
17	One	BNC Connector for Time synchronization ( <b>Female to two female BNC 'T' connector</b> )

#### 12.05 220 kV BUS COUPLER CONTROL AND RELAY PANELS TYPE C-II (DUPLEX):

##### 12.05.1 220kV Bus Coupler Control Panel:

S. No.	Qty.	Particulars
1	One	Section of mimic diagram and symbols.
2	Four	Semaphore indicators for isolator position indication.
3	One	Semaphore indicator for automatic indication of circuit breaker position



S. No.	Qty.	Particulars
4	One	Three position locking pattern control switch, spring return to normal and having contacts with onelost motion device pistol grip for control of 220kV circuit breakers with the following positions: i) Close ii) Normal iii) Trip.
5	Two	Breaker position indicating lamps.
6	One	One indicating lamp fitted with a white lens & labelled 'Auto trip'.
7	One	One indicating lamp fitted with an amber lens & labelled 'CB air pressure normal'
8	Two	Flush switch board mounting digital AC voltmeter of class 1.0 accuracy.
9	One	3 phase 4 wire AC static trivector meter of 0.2S class accuracy
10	Six	Voltmeter lamps with lenses coloured Red, Amber and Blue for VT supply indication.
11	Two	Voltmeter selector switch to indicate voltage between phases and between phase & Earth.
12	One	Three position locking pattern selector switch stay put type with pistol grip handle with the following positions: i) Dead bus ii) Off iii) Check synchronizing.
13	One	Three position locking pattern synchronizing selector switch stay put type with pistol grip handle with the following positions: i) By pass ii) Off iii) Check synchronizing.
14	One	24 way Annunciation scheme complete with auxiliary relays and control switch with hooter & bell.
15	One	One Digital Multifunction Meter
16	One	3 phase 4 wire link type test terminal block of 15 amps. rating for testing of static trivector meter (clause 10.05)
17	One	Heavy duty metal clad 12 pin Synchronizing socket with plug (12 Amps, 415 V)
18		<b>DELETED</b>
19	One	Selector switch for Main DC-I and Main DC-II

#### 12.05.2 220kV Bus Coupler Relay Panel:

S.No.	Qty.	Particulars
1	One-	Numerical communicable combined IDMT Non Directional Over current and Non Directional earth fault relay with voltage polarisation & wide range of maximum torque angle (having three element of O/C and one element of E/F)
2	One	Separate Numerical LBB Relay (LBB relay should not be inbuilt feature of O/C or E/F relay)
3	One	Check synchronising relay.
4	One set	Voltage selection relay for double Main+1 auxiliary bus arrangement
5	One	High speed master tripping relay having four normally closed and 12 normally opened hand reset pair of contacts with duplicated trip contacts
6	As Req.	Test block for testing of O/C, E/F and other relays (clause 11.16)
7	Four	Contact multiplication relay for isolator auxiliary switch.
8	Six	Trip circuit supervision relay suitable both for open & close position of circuit breaker.
9	Two	High speed master tripping relay having 4 normally closed and 12 normally open hand reset pair of contacts for inter trip facility for bus bar protection & for LBB scheme
10	One	BNC Connector for Time synchronization ( <b>Female to two female BNC 'T' connector</b> )

#### 12.06 132 kV FEEDER CONTROL & RELAY PANEL TYPE J-II (DUPLEX):

##### 12.06.1 132kV Feeder Control Panel:

S.No.	Qty.	Particulars
1	One	Section of painted mimic diagram with symbols.
2	Four	Semaphore indicator for four Isolator and one earth switch position indication.
3	One	Semaphore indicator for circuit breaker position indication.
4	One	Three position locking pattern control switch, spring return to normal and having contacts with lost motion device with pistol grip handle for control of 132 kV circuit breakers with the following positions : i) Close ii) Normal iii) Trip.
5	Two	Breaker position indicating lamps red and green.

S.No.	Qty.	Particulars
6	One	Indicating lamp fitted with a white lens and labelled 'Auto trip'.
7	One	Indicating lamp fitted with an Amber lens and labelled 'Air pressure normal'.
8	One	Digital Multifunction meter.
9	One	3 phase 4 wire AC static trivector meter of 0.2S class accuracy
10	One	One 24 way annunciation scheme complete with auxiliary relays and control switches with hooter & bell.
11	One	3 phase 4 wire link type Test terminal block for testing of Trivector meter.
12	One	Three position locking pattern control switch stay put type with pistol grip handle for trip transfer with the following position. i) Trip transfer ii) Inter iii) Normal.
13	One	Three position locking pattern synchronizing selector switch stay put type with pistol grip handle with the following position. i) By pass ii) Off iii) Check synchronizing.
14	One	Three position locking pattern selector switch stay put type with pistol grip handle with the following position. i) Dead bus ii) Off iii) Check synchronizing.
15	One	Selector switch for Main DC-I and Main DC-II

**12.06.2 132kV Feeder Relay Panel:**

No.S.	Qty.	Particulars
1	One	Directional distance scheme as per clause 5.01.1 of this specification
2	One	Numerical communicable combined IDMT Directional Over current and Directional earth fault relay with voltage polarization & wide range of maximum torque angle (having three element of O/C and one element of E/F)
3		Deleted.
4	Two	High speed master tripping relay having 2 normally closed and 12 normally open hand reset pair contacts for intertrip facility with duplicated trip contacts and for closing interlock, separate for distance and backup protection.
5	One	Test block for testing of distance scheme set (clause 11.16).
6	As reqd.	Test block for testing of O/C, E/F & other relays (clause 11.16)
7	One	Two position locking pattern selector switch stay put type with pistol grip handle for carrier selection with the following positions: i) Carrier In ii) Carrier Out
8	One	Contact multiplication relay for isolator auxiliary switch.
9		Deleted.
10	One	BNC Connector for Time synchronization <b>(Female to two female BNC 'T' connector)</b>

**12.07 132 kV BUS COUPLER CONTROL AND RELAY PANELS TYPE L-II (DUPLEX):****12.07.1 132 kV Bus Coupler Control Panel:**

S. No.	Qty.	Particulars
1	One	Section of mimic diagram and symbols.
2	Two	Semaphore indicators for isolator position indication.
3	One	Semaphore indicator for automatic indication of circuit breaker position
4	One	Three position locking pattern control switch, spring return to normal and having contacts with one lost motion device pistol grip for control of 132 kV circuit breaker with the following positions: i) Close ii) Normal iii) Trip.
5	Two	Breaker position indicating lamps Red and Green.
6	One	One indicating lamp fitted with a white lens & labelled 'Auto trip'.

S. No.	Qty.	Particulars
7	One	One indicating lamp fitted with an amber lens & labelled 'CB air pressure normal'
8	Two	Flush switch board mounting digital AC voltmeter of class 1.0 accuracy.
9	One	3 phase 4 wire AC static trivector meter of 0.2S class accuracy
10	Six	Voltmeter lamps with lenses coloured Red, Amber and Blue for VT supply indication.
11	Two	Voltmeter selector switch to indicate voltage between phases and between phase & Earth.
12	One	Three position locking pattern selector switch stay put type with pistol grip handle with the following positions: i) Dead bus ii) Off iii) Check synchronizing.
13	One	Three position locking pattern synchronizing selector switch stay put type with pistol grip handle with the following positions: i) By pass ii) Off iii) Check synchronizing.
14	One	18 way Annunciation scheme complete with auxiliary relays and control switch with hooter & bell.
15	One	One Digital Multifunction Meter
16	One	3 phase 4 wire link type test terminal block of 15 amps. rating for testing of static trivector meter (clause 10.05)
17	One	Set of 3 control push buttons for 'ACCEPT', RESET and LAMP TEST' common for 18 way annunciation scheme provided in panel
18	One	Selector switch for Main DC-I and Main DC-II

**12.07.2 132 kV Bus Coupler Relay Panel:**

S.No.	Qty.	Particulars
1	Two	Numerical communicable Inverse non directional over current relays
2	One	Numerical communicable Non directional earth fault relay
3	One	High speed master tripping relay having 2 normally closed and 6 normally opened hand reset pair of contacts with duplicated trip contacts
4	As Req.	Test block for testing of O/C, E/F and other relays (clause 10.16)
5	Two	Contact multiplication relay for isolator auxiliary switch.
6		Deleted
7	One	BNC Connector for Time synchronization <b>(Female to two female BNC 'T' connector)</b>

DC shall be supervised by numerical O/C & E/F relay.

**12.08 220kV TRANSFORMER CONTROLS & RELAY PANELS Type B-II (DUPLEX):****12.08.1 220kV Transformer Control Panel:**

S. No.	Qty.	Particulars
1	One	Section of mimic diagram with symbols.
2	Four	Semaphore indicators for isolator position indicator
3	One	Semaphore indicator for circuit breaker position indication.
4	One	Three position locking pattern control switch with spring return to normal and having of contacts with lost motion device and two sets of contacts which shall remain close in neutral after close position with pistol grip handle for control of 220kV circuit breaker with the following position : i) Close ii) Normal iii) Trip.
5	Two	Breaker position indicating lamps
6	One	Indicating lamp fitted with a white lens and labelled auto trip.
7	One	Indicating lamp fitted with an Amber lens and labelled circuit breaker air pressure normal.
8	One	Digital Multifunction meter
9	One	3 phase 4 wire AC static trivector meter of 0.2S class accuracy

S. No.	Qty.	Particulars
10	One	42 way facia Annunciation scheme complete with auxiliary relays and control switches as per specification with hooter & bell.
11	One	Three phase 4 wire link type test terminal block of current rating 15 amps for testing of tri-vector meters.
12	One	Detachable end doors and detachable frames with suitable set hinges for corridor between control and relay panel as per clause 11.02.01.
13	One	Three position locking pattern switch stay put type with pistol grip handle for trip transfer. i) Trip Transfer ii) Inter iii) Normal
14	One	Selector switch for Main DC-I and Main DC-II

**12.08.2 220kV Transformer Relay Panel:**

S. No.	Qty.	Particulars
1	One	Numerical communicable differential relay with application software
2	One	High impedance differential protection relay.
3	One	Over fluxing protection relay. (Numerical) <b>(can be part of other relay)</b>
4	One	Numerical Communicable IDMT Non-Directional Over current relay with high set element and Directional earth fault relay with directional highset element with voltage polarization & wide range of maximum torque angle.( having three element of O/C and one element of E/F)
5	Six	Trip circuit supervision relays suitable for both open and closed position of circuit breakers.
6	Two	High speed master tripping relay having 2 Normally Closed and 20 Normally Open hand reset pair of contacts for inter trip facility with duplicated trip contacts. Both tripping relays should have supervision facility
7	Five	Three element auxiliary relay for operation in conjunction with the 2 Nos for tripping on buchholz alarm, 2 Nos. for tripping on buchholz trips, 3 Nos. OLTC diverter switch oil surge trip , 1 No. for common OLTC oil surge trip , 2 Nos. for winding temperature trip on two windings, 1 No. for oil temperature trip, 2 Nos. for pressure release device trip and 2 Nos. spare.
8	One Set	Heavy duty latch-in type Voltage selection relay for set double main+ 1 auxiliary bus arrangement.
9	One	Local breaker back up scheme complete with timer, auxiliary relays and Bus bar master trip relays.
10	One set	Restricted Earth Fault relay complete with surge diverter. (Numerical) Note: NDR shall be part of REF relay.
11	One	Test block for testing of differential relay (clause 11.16).
12	As reqd	Test block for testing of O/C, E/F & other relays(clause(11.16).
13	Three	Contact multiplication relay for Isolator auxiliary contact.
	One	Test block for testing of Voltage neutral displacement relay and over fluxing relay
14	One	Separate external timer for Bus Tripping.
15	One	Separate High speed master tripping relay having 2 Normally Closed 20 Normally Open hand reset pair of contacts for LBB scheme.
16	One	BNC Connector for Time synchronization <b>(Female to two female BNC 'T' connector)</b>

**12.09 132kV TRANSFORMER CONTROL AND RELAY PANELS (FOR CONTROLLING LV SIDE BREAKER OF 220/132kV TRANSFORMER) (TYPE K-II):****12.09.1 132kV TRANSFORMER CONTROL PANEL FOR 220/132kV TRANSFORMER:**

No.S.	Qty.	Particulars
1	One	Section of mimic diagram with symbols
2	Three	Semaphore indicators for Isolator position indication
3	One	Semaphore indicator for circuit breaker position indication
4	One	Three position locking pattern control switch with spring return to normal and having of contacts with lost motion device and two sets of contacts which shall remain close in neutral after close position with pistol grip handle for control of 132 kV circuit breaker with the following position : i) Close ii) Normal iii) Trip.
5	Two	Breaker position indicating lamps.
6	One	Indicating lamp fitted with a white lens and labelled 'Auto Trip'.
7	One	Indicating lamp fitted with an Amber lamps and labelled CB air pressure normal
8	One	3 phase 4 wire AC static trivector meter of 0.2S class accuracy
9	One	Digital Multifunction meter.
10	One	24 way annunciation scheme complete with auxiliary relays and control switches with bell and hooter
11	One	Three phase 4 wire Link type Test terminal block of 15 amp. rating for testing of tri-vector meter
12	One set	Detachable end doors and detachable frames with set suitable hinges for corridor between control and relay panel (cl.11.02.01)
13	One	Three position locking pattern switch stay put type with pistol grip handle for trip transfer. i) Trip transfer ii) Inter ii) Normal
14	One	Selector switch for Main DC-I and Main DC-II

**12.09.2 132kV TRANSFORMER RELAY PANEL FOR 220/132kV TRANSFORMER:**

S.No.	Qty.	Particulars
1	One	Numerical Communicable IDMT Non-Directional Over current relay with high set element and Directional earth fault relay with directional highset element with voltage polarization & wide range of maximum torque angle.(having three element of O/C and one element of E/F)
2	One	High speed master tripping relay having 4 normally closed and 12 normally open pair of contacts for inter-trip facility with duplicated trip contacts and for closing interlock
3		Deleted
4	Two	Trip circuit supervision relay both for circuit breaker close position and open position.
5	As Reqd.	Test block for testing of O/C, E/F & other relays (Cl.11.16).
6	Two	Contact multiplication relay for isolator auxiliary switch.
7	One	BNC Connector for Time synchronization ( <b>Female to two female BNC 'T' connector</b> )

Note: Supervision of trip Relay will be done by Numerical O/C + E/F relay.

**12.10 132kV TRANSFORMER CONTROL & RELAY PANEL FOR 132/33kV AND 132/11kV TRANSFORMER TYPE K-III (DUPLEX)****12.10.1 132kV TRANSFORMER CONTROL PANEL FOR 132/33kV OR 132/11kV TRANSFORMER (FRONT)**

S.No.	Qty.	Particulars
1	One	Section of mimic diagram with symbols.
2	Four	Semaphore indicators for Isolator position indication
3	One	Semaphore indicator for circuit breaker position indication
4	One	Three positions locking pattern control switch, spring return to normal and having contacts with lost motion device with pistol grip handle for control of 132kV circuit breaker with the following positions : i) Close ii) Normal iii) Trip.
5	Two	Breaker position indicating lamps.
6	One	Indicating lamp fitted with a white lens and labelled 'Auto Trip'
7	One	Indicating lamp fitted with an Amber lens and labelled air pressure normal.
8	One	3 phase 4 wire AC static trivector meter of 0.2S class accuracy
9	One	Digital Multifunction meter
10	Three	Indicating lamps with lenses coloured Red, Amber and Blue for VT supply indication.
11	One	42 way annunciation scheme complete with auxiliary relays and control switches with bell & hooter.
12	One	3 phase 4 wire Test terminal block for testing of tri-vector meter
13	One Set	Detachable end doors and detachable frames with suitable hinges for corridor between control and relay panel (Cl.11.02.01)
14	One	Three position locking pattern control switch stay put type with pistol grip handle for trip transfer with the following position. i) Trip transfer. ii) Inter iii) Normal.
15	One	Selector switch for Main DC-I and Main DC-II

**12.10.2 132kV TRANSFORMER RELAY PANEL FOR 132/33 OR 132/11kV TRANSFORMER:**

S.No.	Qty.	Particulars
1	One	Numerical communicable differential relay with application software
2	One	Numerical Communicable IDMT Non-Directional Over current relay with high set element and Directional earth fault relay with directional highset element with voltage polarization & wide range of maximum torque angle.(having three element of O/C and one element of E/F ) (Note: NDR shall be part of O/C + E/F relay.)
3	Six	Three element auxiliary relay for operation in conjunction with 2 Nos. for buchholz alarm, 2 Nos. for buchholz trip, 1 No. for OLTC oil surge trip, 2 Nos. for winding temperature trip, 1 No. for oil temperature trip, 1 No. for pressure release device trip, 1 No. for spare.
4	One	Over fluxing relay for connection to LV winding. Numerical (can be part of other relay)
5	One	High speed master tripping relay having 2 normally closed and 12 normally open hand reset pair of contacts for inter trip facility with duplicated trip contacts and for closing interlock.
6	One	Test block for testing of differential relay (Cl.11.16).
7	As Required	Test block for testing of O/C, E/F & other relays (Cl.11.16)
8	Two	Contact multiplication relay for isolator auxiliary switch
9		Deleted.
10	Two	Restricted Earth Fault Relay (Numerical)
11	One	Test block for testing of Voltage neutral displacement relay and Over fluxing relay

S.No.	Qty.	Particulars
12	One	BNC Connector for Time synchronisation. <b>(Female to two female BNC 'T' connector)</b>

Note: Trip circuit Supervision will be done by numerical REF relay for which Binary inputs shall be capable for this feature.

Note: Irrespective of number of relay test blocks provided on each panel, one number test plug with a lot of 5 panels or part thereof shall be supplied necessarily, free of cost.

In case if test block is the part of the relay itself then one number test handle/ test plug with a lot of each 5 panels or part thereof shall be supplied necessarily free of cost.

One number each test block for testing LBB relay shall be provided with 220 kV Feeder C&R panel & 220 kV Bus Coupler C&R Panel free of cost.

**Volume-II K****TECHNICAL SPECIFICATION FOR 3-PHASE, 4-WIRE, 0.2S CLASS, AC STATIC TOD TARIFF TRIVECTOR METER FOR EHV/HV SYSTEM OF RVPN****1.0 SCOPE**

- 1.1 This specification covers the design, engineering, manufacture, assembly inspection, testing at manufacturer's works before dispatch, supply and delivery at site / FOR destination anywhere in Rajasthan of class 0.2S accuracy static HT TOD Tariff trivector meters as per requirement given in this specification. The meters shall be mounted on the C&R Panel and used for Energy accountal & auditing as well for T&D loss calculation.
- 1.2 The meter shall be installed on each panel to be utilized at various EHV/HV lines/ transformer/ Bus-coupler Panel as a self-contained device for measurement of parameters in a programmable time clock initially set at 15 minute blocks. The meter shall also measure and display true cumulative energy import and export on daily and monthly basis.
- 1.3 The meter Manufacturer should possess fully computerized meter test bench system for carrying out the relevant routine / acceptance tests as well facility to generate test reports for each and every meter tested.
- 1.4 The meter manufacturer should have duly calibrated electronic reference standard (ERS) meter of class 0.02 accuracy or better.
- 1.5 The meter should be 3 phase 4 wire type suitable for connection to 3 phase 4 wire as well as 3 phase 3 wire system. The meter shall be capable of measuring in all the 4 quadrants. The meter should be capable of recording and displaying active, reactive and apparent energy and maximum demand for 3 phase 4 wire as well as 3 phase 3 wire AC balanced / unbalanced loads without affecting the accuracy for a power factor range of zero (lagging), unity and zero (leading) for export and import as per requirement given in this specification.
- 1.6 Each Meter shall be supplied alongwith related basic computer software (BCS) as per details given in this specification. The meter shall have following features:
- Modem interface connectable and compatible to MPLS system for transfer of data to remote stations.
  - For transfer of data, meter should have multiple communication ports for local reading and remote communication facility.
- 1.7 It is not the intent to specify completely herein all the details of the design and construction of material. The material shall, however, confirm in all respects to high standards of engineering, design and workmanship and shall be capable of performing for continuous commercial operation in a manner acceptable to the purchaser, who will interpret the meaning of drawings and specification and shall have the power to reject any work or material which in his judgment is not in accordance therewith. The offered materials shall be complete with all accessories, hardware, software and components necessary for their effective and trouble free operation. Such components shall be deemed to be within the scope of bidders supply irrespective of whether those are specifically brought out in this specification and / or the commercial order or not.

**2.0 STANDARDS APPLICABLE**

- 2.1 Unless otherwise specified elsewhere in this specification the performance and testing of the meters shall confirm to the following Indian/international standards and all related Indian/international standards to be read with upto date and latest amendments/revisions thereof :

S. No	Standard No.	Title
1	IS 14697- 1999with latest amendment	AC static transformer operated Watthour and VAR-Hour meters, class 0.2S & 0.5S.
2	CBIP Publication No. 304	Manual on Standardization of AC Static Electricity Energy Meters. To be referred for tests for immunity against AC & DC magnetic induction of external origin as per revised values given at Clause 4.6.4, Table – 17, Influence Quantities.
3	IEC – 60687 – 2000 with latest amendment	AC static Watthour meters for active energy, class 0.2S & 0.5S.



S. No	Standard No.	Title
4	IS – 9000 with latest amendment	Basic environmental testing procedures for electronic and electrical items.
5	IS 15959 – 2011	Indian Standard – Data Exchange for Electricity Meter Reading, Tariff and Load Control – Companion Specification.
6	IEC – 61000 – 4 – 5 (2001 – 04) with latest amendment	For Electro-magnetic compatibility – Testing and measurement techniques, surge immunity test.
7	IS – 15707:2006	Specification for testing evaluation, installation and maintenance of AC Electricity Meters – Code of practice.

- 2.2 The meters shall bear BIS Certification mark.
- 2.3 Meters matching with requirements of other national or international standards which ensure equal or better performance than the standards mentioned above shall also be considered. When the equipment offered by the tenderer conforms to standards other than those specified above, salient points of difference between standards adopted and the standards specified in this specification shall be clearly brought out in the relevant schedule and copy of such standards alongwith their English translation shall invariably be furnished alongwith the offer.

### 3.0 PRINCIPAL PARAMETERS

#### 3.1 Supply system:

Rated voltage (Vref)  $3 \times 110/\sqrt{3}$  V- phase to neutral .  
(Through PT) (3 phase 4 wire system)  
 $3 \times 110$  V- phase to phase  
Meter shall be programmed for  
-/ $3 \times 110$  V (Ph.-Ph.)  
-/ $110/\sqrt{3}$  V (Ph.-N).

Rated current (basic current Ib)  $3 \times -/1$  Amps or  
(Connected through CT)  $3 \times -/5$  Amp as per requirement.

Multiplying factor to arrive at actual primary values wherever applicable, shall be calculated from the CT and VT ratio of the installed CTs and VTs.

### 4.0 GENERAL TECHNICAL REQUIREMENTS:

- 4.1 The microprocessor based 3 phase 4 wire metering system shall conform to class 0.2 S as per IS:14697-1999.
- 4.2 The active energy measurement (Wh) shall be carried out on 3 phase 4 wire principal with an accuracy as per class 0.2S of IS:14697-1999. In the meters, the energy shall be computed directly in CT/VT secondary quantities and indicated in Watthours. The meters shall compute the active energy (Wh) import and export from the substation during each successive 15 minute block and stored in its memory.
- 4.3 Further the meter shall continuously integrate and display on demand the accumulative active energy import and export from the substation upto date time. The cumulative Watthour reading at each midnight shall be stored in the meter memory. Separate register shall be maintained for active energy import and export.
- 4.4 The meter shall continuously compute the average of the RMS value (fundamental only) of the 3 lines to neutral VT secondary voltage and then display the same on demand.
- 4.5 Four cumulative energy registers for reactive energy should be available on meter display.
- Reactive energy lag while active energy import.
  - Reactive energy lag while active energy export.
  - Reactive energy lead while active energy import.
  - Reactive energy lead while active energy export.
- 4.6 Each meter shall have a built in calendar in clock. The maximum drift permissible in the real time clock shall be +/- 2 minutes / year for 0.2S class meters. The calendar and clock shall be correctly set at the manufacturer's works. The date (day – month – year) and time (hour – minute – seconds) shall be displayed on the meter front on demand. Clock adjustment shall be possible at site using the Common

- Meter Reading Instrument (CMRI) and LAPTOP and also remotely using time synchronization signal through modem and MPLS system.
- 4.7 Each meter shall have a unique identification code, which shall be marked permanently on the front as well as in its memory.
- 4.8 Each meter shall have a non-volatile memory in which the following shall be automatically stored. The non-volatile memory should retain data for a period not less than 10 years under un-powered condition. Battery back up memory will not be treated as NVM and shall not be accepted.
- 4.8.1 Wh transmittal during each successive 15 minute block upto second decimal for import and export separately.
- 4.8.2 Cumulative Wh transmittal at each mid night.
- 4.9 The meters shall store all data in their memories for a period of 22 days. The data older than 22 days shall get erased automatically.
- 4.10 All meters shall be totally identical in all respects except for their unique identification codes. They shall also be totally sealed with no possibility of any adjustment at site except for clock correction.
- 4.11 The meters shall safely withstand the usual fluctuation arising during faults, in particular, 115% of rated VT secondary voltage applied continuously and 190% of rated secondary voltage for 3 seconds, and 120 % of rated CT secondary current applied continuously and 20 times of maximum current applied for 0.5 seconds, shall not cause any damage to or the mal-operation of the meters.
- 4.12 An automatic back up for the continued operation of the offered meters clock and calendar shall be provided through a long life battery which shall be capable of supplying the required power for atleast two years under meter un-powered conditions. The offered meters shall be supplied duly fitted with the battery that shall not be required to be changed for at least 10 years, as long as total VT interruption does not exceed two years.
- 4.13 Power Factor Range:  
The meter shall be suitable for full power factor range from zero (lagging) through unity to zero (leading). The meter should work as an active energy import and export and reactive (lag and lead) energy meter.
- 4.14 Power Supply Variation:  
The meter should be suitable for working with following supply variations:  
Specified operating range - 0.8 to 1.1 V<sub>ref</sub>.  
Limit range of operation - 0.7 to 1.2 V<sub>ref</sub>  
Frequency - 50 Hz  $\pm$  5 %.
- 4.15 Accuracy:  
Class of accuracy of the meter shall be 0.2S for active energy & 0.5S for reactive energy or better. The accuracy should not drift with time.
- 4.16 Power Consumption:  
i) Voltage Circuit: The active and apparent power consumption in each voltage circuit including the power supply of meter at reference voltage, reference temperature and reference frequency shall not exceed 1.5 Watt. Per phase and 10 VA per phase respectively.  
ii) Current Circuit: The apparent power taken by each current circuit at basic current, reference frequency and reference temperature shall not exceed 1 VA per phase.
- 4.17 Starting Current  
The meter should start registering the energy at 0.1% I<sub>b</sub> at unity power factor.
- 4.18 Maximum Current:  
The rated maximum current of the meter shall be 120% I<sub>b</sub>.

## 5.0 GENERAL AND CONSTRUCTIONAL REQUIREMENTS

- 5.1 Meters shall be designed and constructed in such a way so as to avoid causing any danger during use and under normal conditions. However, the following should be ensured:
- Personnel safety against electric shock
  - Personnel safety against effects of excessive temperature.
  - Protection against heat & spread of fire.
  - Protection against penetration of solid objects, dust and water.
  - Protection against radio interference.
  - Protection against electro-magnetic & electro-static fields.
  - Protection against shock & vibration.
  - Protection against fraud.
  - Prevention against pilferage.

- 5.2 All the material and electronic power components used in the manufacture of the meter shall be of highest quality and reputed make to ensure higher reliability, longer life and sustained accuracy.
- 5.3 The meter shall be designed with application specific non – editable integrated circuits/ microprocessors. The electronic components shall be mounted on the printed circuit board using latest technology.
- 5.4 All insulating materials used in the construction of meters shall be non-hygroscopic non ageing and of tested quality. All parts that are likely to develop corrosion shall be effectively protected against corrosion by providing suitable protective coating.
- 5.5 Meter shall be supplied with transparent extended block cover (ETBC).
- 5.6 Each meter shall have a test output device (visual) for checking the accuracy of active energy (Wh) and reactive energy (VArh) measurement using a suitable test equipment. The test output shall not be software configurable. It should be possible to select the output for active energy import / export and reactive energy lag/lead by operation of the push button(s)/ keypad provided on the meter for scrolling through the menu / display.
- 5.7 The meter shall have an operation indication device such as a blinking LED. The operation indicator shall be visible from the front window. Separate indicators shall be provided for KWh & KVARh pulse indication. In case only one indicator is provided, it should be possible to select kWh or kVARh pulse with the use of push buttons/ keypad / menu selection provided on the meter (access through software should not be required).
- 5.8 The meter shall be suitable for being connected through test terminal blocks to the voltage transformer having a rated secondary line to neutral voltage of  $110/\sqrt{3}$  V and to current transformers having a rated secondary current of 1A or 5A as per requirement. Any further transformers/ transducers required for their functioning shall be in-built in the meters. Necessary isolation and/ or suppression shall also be built in for protecting the meters from surges and voltage spikes that may occur in the VT/CT circuits of the EHV switchyards.
- 5.9 A keypad / Push button (s) shall be provided on the front of the main control module for switching on the display of the metering module/parameters selected and for changing from one indication to the next. Menu driven or other forms of display can also be accepted provided they meet RVPN requirements. Such arrangements shall be demonstrated and got approved from RVPN during technical bid evaluation.
- 5.10 The meter shall have communication facilities as per Indian Standard – Data Exchange for Electricity Meter Reading, Tariff and Load Control – Companion Specification.
- a) The meter shall be provided with the following ports:
- i) RS – 485 port for periodic data transfer to Sub Station data logger / Computer. RS – 485 communication port shall be suitable for interfacing multiple Energy Meters. It shall be possible to download stored meter data on polling basis with the aid of a software schedule by addressing one meter at a time and downloading the stored data into the Sub Station data logger / Computer / Data Acquisition Server.
- ii) Galvanically isolated optical communication port in front of the meter for data transfer to or from a hand held data Collection Device (Common Meter Reading Instrument– ‘CMRI’)/LAPTOP – conforming to IEC 62056 or CBIP Technical Report No. 111.
- 5.11 The meter shall have a light emitting diode as a test output device for checking accuracy of the meter. The operation indicator shall be visible from an operation indication device for/on the front window.
- 5.12 The meter shall conform to the degree of protection IP 51 of IEC60687 for protection against ingress of dust, moisture and vermin.
- 5.13 The meter-base, meter-cover, terminal block and ETBC shall be made of unbreakable, high grade, fire-resistant, reinforced, non-inflammable, high grade and good quality engineering plastic/ suitable material to ensure safety. The manufacturer shall clearly indicate the material used.
- 5.14 The meter cover shall have one window. The window shall be of transparent, UV stabilized polycarbonate or equivalent high grade engineering plastic for easily reading all the displayed values/parameters, name plate details and observation of operation indicator. The window shall be ultrasonically welded with the meter cover such that it cannot be removed undamaged without breaking the meter cover seals.
- 5.15 The terminal block shall be of high grade non hygroscopic, fire retardant, low tracking, fire-resistant, high grade engineering plastic (not bakelite) which should form an extension of the meter case, meeting the requirement of clause No.6.4 of IS 14697/ Clause No. 4.2.4 of IEC 1036-1996.

- The current circuit conductors of a meter shall be connected to its current terminals inside the meter terminal block adopting any of the recommended methods given in clause 6.4 – Annexure B of IS-13779 – 1999.
- 5.16 The meter shall have tin/nickel plated brass terminals. The terminals shall have suitable construction with barriers and cover to provide firm and safe connection of current and voltage leads of stranded copper conductors with copper reducer type terminals ends (thimbles).
- 5.17 The manner of fixing the conductors to the terminal block shall ensure adequate and durable contact such that there is no risk of loosening or undue heating. Screw connections transmitting contact force and screw fixings which may be loosened and tightened several times during the life of the meter shall screw into a metal nut. All parts of each terminal shall be such that the risk of corrosion resulting from contact with any other metal part is minimized. Two screws shall be provided in each current terminal for effectively clamping the external leads of thimbles. Each screw shall engage at least 3 threads in the terminal. The ends of screws shall be such as not to pierce the conductor. Electrical connections shall be so designed that contact pressure is not transmitted through insulating material. The internal diameter of the terminal holes shall be 5.5 mm. The clearances and creepage distances shall conform to clause 6.6 of IS 14697 -1999. Minimum center to center clearance between adjacent connections shall be 13.5 mm. Alternate equivalent manner of fixing / connecting conductors / wires to the meter may be proposed but shall have to be demonstrated during pre-bid evaluation for acceptance by RVPN.
- 5.18 In case of the terminal block and the meter case reasonable safety shall be ensured against the spread of fire and should not be ignited by thermic overload of live parts in contact with them.
- 5.19 The meter shall be compact in design. The entire design and construction shall be capable of withstanding stresses likely to occur in actual service and rough handling during transportation. The meter shall be convenient to transport and immune to shock and vibrations during transportation and handling.
- 5.20 SEALING OF THE METER :
- 5.20.1 Reliable sealing arrangement should be provided to make the meter tamper - proof and to avoid tempering by unauthorized persons.
- 5.20.2 The body/cover of the meters shall be sealed by the manufacturer at his works. In addition, one more body/cover sealing point shall be provided for sealing the meters after installation.
- 5.20.3 Two Nos. sealing points shall be provided for sealing the meter terminal cover.
- 5.20.4 One sealing point shall also be provided for each communication port.
- 5.20.5 One sealing point shall also be provided for each communication port the MD reset button (if such button is provided).
- 5.20.6 A tracking and recording software for all new seals shall be provided by the manufacturer of the meters so as to track total movement of seals starting from manufacturing, procurement, storage, record keeping, installation, series of inspections, removal and disposal.
- 5.20.7 Only the patented seals (seal from the manufacturer who has official right to manufacture the seal) shall be used.
- 5.20.8 Polycarbonate or acrylic seals or plastic seals or holographic seals or any other superior seal shall be used. Lead seals shall not be used in the meters.
- 5.20.9 Rear side sealing arrangement will not be preferred, unless specifically agreed to.
- 5.20.10 The sealing arrangement should be explained by the suppliers in their offer.
- 5.21 MARKING OF METER :
- The meter terminal marking and mounting arrangement should be as per Indian installation practices. The marking on every meter shall be in accordance with IS 14697-1999 /IEC 60687-2000. Every meter shall have name plate beneath the meter cover such that the name plate cannot be accessed without opening the meter cover and without breaking the seals of the meter cover and the name plate shall be marked indelibly. The name plate marking should not fade or otherwise be adversely affected by UV exposure with lapse of time. The basic markings on the meter name plate shall be as follows:-
- i. Manufacturer's name and trade mark.
  - ii. Type designation.
  - iii. Number of phases and wires.
  - iv. Serial Number.
  - v. Month and year of manufacture.
  - vi. Reference voltage and VT ratio.

- vii. Rated secondary current of CT (-/1 A) or (-/5 A) as per requirement.
  - viii. Principal unit(s) of measurement.
  - ix. Meter constant (Imp/kWh, Imp/kVArh).
  - x. Class index of meter.
  - xi. "Property of RVPNL".
  - xii. RVPNL's purchase order number and date.
  - xiii. Guarantee period.
  - xiv. BIS Certification Mark.
- 5.22 Connection Diagram And Terminal Markings :  
The connection diagram of the meter shall be clearly shown for 3 phase 4 wire system, on inside portion of the terminal cover and shall be of permanent nature. The meter terminals shall also be marked and this marking should appear in the above diagram.
- 5.23 SOFTWARE:  
One licensed copy of the following software shall be supplied by the supplier without extra cost with each meter.
- 5.23.1 Software for reading, down loading data, time setting and TOD programming in the meter normally resident in the Common Meter Reading Instrument CMRI & Laptop both. The software shall be suitable for Windows. Software should be suitable and configurable to other kind of tariff within the recorded parameters/ data provided by the meter.  
Time setting and TOD programming should be enabled at BASIC COMPUTER SOFTWARE under multi-level password protected security system for specified meter(s). The Base Computer Software should be able to schedule the Laptop/CMRI for meter reading.
- 5.23.2 Windows based Basic Computer Software (BCS) for receiving data from CMRI/Laptop and from meter directly through specified communication system. The facility to convert meter reading data into user definable ASCII format so that it may be possible for the user to integrate the same with the user's billing data and process the selected data on line in desired manner.
- 5.23.3 Any other special application software of the manufacture for the meter.

Any future up-gradation made by the bidder in any of the above software shall also be provided free of cost.

## 6.0 SALIENT FEATURES :

- The meter shall have the following additional salient features:
- 6.1 The 3 line to neutral voltages shall be continuously monitored by individual phase wise LEDs or by any other indications. The time blocks in which such a voltage failure occurs/ persists shall also be recorded in the meter's memory. The lamp shall automatically resume normal function when corresponding VT secondary voltage is healthy again.
  - 6.2 It should be possible to check the healthiness of phase voltages by displaying all the voltages on the meter display.
  - 6.3 The meter should work accurately irrespective of phase sequence of the mains supply.
  - 6.4 It should be possible to check the correctness of connections of CT and VT to the meter with proper polarity. This feature may be made available on the meter display. For this purpose, suitable software for field diagnosis of meter connections with the help of meter and Laptop/CMRI should be supplied as per Annexure – G – 15 of IS 14697-1999.
  - 6.5 The meter should continue to record accurately as per prevailing electrical conditions even if the neutral of potential supply gets disconnected.
  - 6.6 The meter shall be provided with adequate magnetic shielding so that any external magnetic field (AC electro magnet or DC magnet) as per the values specified in CBIP Publication No. 304 (with latest amendments) applied on the meter shall not affect the proper functioning and recording of energy as per error limits prescribed by CBIP.
  - 6.7 It shall not be possible to change the basic meter software by any means in the field. Moreover, critical events like time set, MD reset operation and tariff change shall be logged by the meter. Such events shall be logged in roll over mode for minimum ten events.

**6.8 Display Of Measured Values:**

- 6.8.1 The measured value(s) shall be displayed through Liquid Crystal Display (LCD backlit) or Light Emission Diode (LED) display and should have page wise display of multiple parameters, with option of configuring favorite parameters under the favorite page.
- 6.8.2 The data should be stored in Non Volatile Memory. The non volatile memory should retain data for a period of not less than 10 years under un-powered condition. Battery backup memory will not be considered as NVM.
- 6.8.3 It should be possible to easily identify the single or multiple displayed parameters through symbols/legend on the meter display itself or through display annunciator. A separate legend plate indicating the symbols shall be supplied by manufacturer alongwith each meter.
- 6.8.4 The register shall be able to record and display, starting from zero, for a minimum of 1500 hours, the energy corresponding to rated maximum current at reference voltage and unity power factor for CT ratio upto 1000/1A for 1 Amp meters and for VT ratio upto 400 KV/110 V. The register should not roll over in between this duration.
- 6.8.5 Any interrogation/read operation shall not delete or alter any stored meter data. The meter should continue to read & store data even during simultaneous interrogation/read operation through BCS/Laptop/CMRI/ and should not stop working on this account.
- 6.8.6 The meter shall store all data in its memory for a period of 22 days. The data older than 22 days shall gets erased automatically.
- 6.9 Meter Serial Number :  
In addition to providing serial number of the meter on the display plate, the meter serial number shall also be programmed into meter memory for identification through Laptop/ CMRI/ meter reading print out, and optionally on meter display.
- 6.10 Display Sequence :  
The meter shall display the required parameters on suitable selection through key pad or push button(s) or menu selection:
  - i) LED/LCD segment check.
  - ii) Real time.
  - iii) Date – dd, mm, yy.
  - iv) Meter serial number.
  - v) Deleted
  - vi) Power On hours of current month.
  - vii) Cumulative MD reset count.
  - viii) Cumulative Active energy import (kWh/MWh).
  - ix) Cumulative Active energy export (kWh/MWh).
  - x) Cumulative Reactive energy lag (kVArh lag) while kWh import.
  - xi) Cumulative Reactive energy lag (kVArh lag) while kWh export.
  - xii) Cumulative Reactive energy lead (kVArh lead) while kWh import.
  - xiii) Cumulative Reactive energy lead (kVArh lead) while kWh export.
  - xiv) Cumulative Apparent energy (kVAh) while kWh import.
  - xv) Cumulative Apparent energy (kVAh) while kWh export..
  - xvi) High resolution energy registers (Minimum 4 digits after decimal).
    - i) kWh - \*\*.\*\*\*\*
    - ii) kVArh lag - \*\*.\*\*\*\*
    - iii) kVArh lead - \*\*.\*\*\*\*
    - iv) kVAh - \*\*.\*\*\*\*

Note: If energy readings upto 4 decimal or more digits are provided on the main registers, then high resolution energy registers as given at sequence (xvi) will not be required separately.

- xvii) Instantaneous power factor with sign for lag/lead.
- xviii) Cumulative maximum demand (kVA) import mode.
- xix) Cumulative maximum demand (kVA) export mode.
- xx) Instantaneous phase voltage.
  - i) R phase voltage
  - ii) Y phase voltage
  - iii) B phase voltage
- xxi) Instantaneous line currents (Amps.)

- i) R phase line current
- ii) Y phase line current.
- iii) B phase line current.
- xxii) Phase sequence of voltages.
- xxiii) Instantaneous load in
  - i) kW (import & export)
  - ii) kVA
- xxiv) Maximum demand in kVA since last reset (imports & export separately).
- xxv) Anomaly data:
  - i) Present status of anomaly
    - a) Missing potential with phase identification
    - b) CT polarity reversal with phase identification
    - c) Current unbalance.
    - d) Current short (bypass)/open with phase identification (applicable when meter is connected in 3 phase 4 wire mode only).
  - ii) Date and time of last anomaly occurrence with type of anomaly.
  - iii) Date and time of last anomaly restoration with type of anomaly.
  - iv) Cumulative anomaly count of all types of anomalies and all phases.  
Detailed phase wise anomaly information should, however, be logged in the meter memory and be available for downloading to the BCS directly.
- xxvi) TOD Maximum Demand (kVA during kW Import) registers.
  - 06:00 – 09:00 HRS
  - 09:00 – 18:00 HRS
  - 18:00 – 22:00 HRS
  - 22:00 – 06:00 HRS
 TOD Maximum Demand (kVA during kW Export) registers.
  - 06:00 – 09:00 HRS
  - 09:00 – 18:00 HRS
  - 18:00 – 22:00 HRS
  - 22:00 – 06:00 HRS
- xxvii) TOD Active Energy (Cumulative kWh Import) registers.
  - 06:00 – 09:00 HRS
  - 09:00 – 18:00 HRS
  - 18:00 – 22:00 HRS
  - 22:00 – 06:00 HRS
 TOD Active Energy (Cumulative kWh Export) registers.
  - 06:00 – 09:00 HRS
  - 09:00 – 18:00 HRS
  - 18:00 – 22:00 HRS
  - 22:00 – 06:00 HRS

Note: Apparent energy should be based on reactive lag/lead,  
 i.e., App. energy =  $\sqrt{\{(\text{active imp. energy})^2 + [\text{react. energy}(\text{lag} + \text{lead})]^2\}}$

Note: The following TOD wise billing parameters like active energy (Imp./Exp.), apparent energy (Imp./Exp.) and maximum demand (Imp./Exp.), should be logged in the meter memory and be capable of being downloaded to the BASIC COMPUTER SOFTWARE directly and through the CMRI.

- a) Cumulative active energy import reading (kWh/MWh) of predefined date and time for monthly billing purpose (BP kWh/MWh).
- b) Cumulative active energy export reading (kWh/MWh) of predefined date and time for monthly billing purpose (BP kWh/MWh).
- c) Cumulative apparent energy reading (kVAh) during kWh import of predefined date and time for monthly billing purpose (BP kVAh).
- d) Cumulative apparent energy reading (kVAh) during kWh export of predefined date and time for monthly billing purpose (BP kVAh).

- e) Maximum demand (kVA) upto predefined date and time of the month for monthly billing purpose (BP kVA) Import mode.
- f) Maximum demand (kVA) upto predefined date and time of the month for monthly billing purpose (BP kVA) Export mode.
- g) Average power factor of the consumption month upto predefined date and time for monthly billing purpose (BP PF) Import mode.
- h) Average power factor of the consumption month upto predefined date and time for monthly billing purpose (BP PF) Export mode.

(Note: The average power factor displayed for billing purposes should exactly match the average power factor worked out through kWh/kVAh).

6.11 Output Device :

The meter shall have a test output accessible from the front and be capable of being monitored with suitable testing equipment. The operation indicator must be visible from the front. Test output device shall be provided in the form of one common LED/LCD for Wh & VARh with the provision of selecting the parameter being tested by the use of the keypad / push button (s)/ menu selection. Alternatively, test output device in the form of separate LEDs/LCDs for Wh & VARh is also acceptable.

The relation between test output and the indication on display shall comply with the marking on the name plate (imp. per Wh/VARh).

The manufacturer shall state the necessary number of pulse count(s) to ensure measurement accuracy of atleast 1/10th of class of the meter at the different test points.

The resolution of the test output pulse(s) should be sufficient to enable conduction of the starting current in less than 10 minutes and accuracy test at the lowest load with desired accuracy within 5 minutes.

6.12 Auxiliary power:

The auxiliary power shall be drawn from all three phases equally and the meter should be able to remain powered up with availability of any two phases or any one phase and neutral.

6.13 Time Synchronization:

The meter shall support one minute advance and retard command from CMRI/ Laptop through password protected security system which shall be adjusted in six 15 minutes blocks with an adjustment of 10 seconds each block. If one time advance/retard command is accepted than meter shall not accept time adjustment command for next seven days. The clock adjustment correction shall be registered in the meters memory and suitably shown on print out of load survey data. The time synchronization should also be possible from remote through communication ports of the meter and data concentrator using time synchronization signal received through MPLS system and modem.

6.14 TOD (Time of day registers):

The metering system shall have TOD registers for active energy import and export, apparent energy import and export and apparent MD import and export. Maximum eight registers for each energy and MD can be defined. It shall be possible to program number of TOD registers and TOD timing through BASIC COMPUTER SOFTWARE with multilevel password security system.

6.15 Maximum demand (MD) registration:

The meter shall continuously monitor and calculate the average demand in VA/ W during the integration period set and the maximum, out of these shall be stored alongwith date and time when it occurred in the meter memory. The maximum registered value shall also be made available on meter display.

The integration period shall be set as 15 minutes, on real time basis which shall be capable to change to other integration period also, if required.

The principal of maximum demand calculation used by the bidder should be explained in the offer.

6.16 Maximum demand reset:

Facility for auto reset of MD at predefined date and time shall be provided. The meter shall display the maximum demand reset count.

6.17 Load survey capability and billing point requirements:

The meter shall be capable of recording following data for 15 minutes integration period for at least last 22 days.

- a) KWh Import.
- b) KWh Export.
- c) KVARh Lag when KWh is Import.
- d) KVARh Lag when KWh is Export.



- e) KVA<sub>rh</sub> Lead when KWh is Import.
- f) KVA<sub>rh</sub> Lead when KWh is Export.
- g) KVA<sub>h</sub> when KWh is Import.
- h) KVA<sub>h</sub> when KWh is Export.

It shall be possible to select either demand or energy view in the Basic computer Software.  
Voltage low marking should be locked when average voltage goes below 60% of V<sub>ref</sub>.

The load survey data should be available in the form of bar charts as well as in spread sheets. The BASIC COMPUTER SOFTWARE shall have the facility to give the complete load survey data both in numeric and graphic form.

The figures of 24 hourly Wh import, Wh export, VA<sub>h</sub> import and VA<sub>h</sub> export should also be made available under each date in the load survey or otherwise, it should be possible to calculate such figures through BASIC COMPUTER SOFTWARE.

The predefined date and time for registering the billing parameters of Wh import, Wh export, VA<sub>h</sub> import, VA<sub>h</sub> export, PF import, PF export, VA MD import and VA MD export shall be 00.00 hours of the first day of each calendar (billing) month. All billing parameters shall be transferred to billing registers and shall be displayed on display mode referred to as 'BILLING PARAMETERS'.

The above billing data, TOD registers data, load survey data, anomaly information and instantaneous parameters data shall all be retrievable as stored in the preset cyclic order through Laptop and a common meter reading instrument (CMRI). It shall be possible to transfer (down load) this data to a PC with windows based software to get complete details in numerical and graphic form. The necessary basic computer software (BCS) for this purpose shall be provided by the bidder with complete details. The software/tool required for obtaining the information through the communication ports of the meter as above shall be supplied by the manufacturer.

- a) Meter programming count.
- b) MD reset count
- c) Billing parameters for last three months

6.18 Harmonics measurements:

The meter should be capable of measuring fundamental energy as well total energy i.e. fundamental plus harmonics energy. Fundamental energy should be made available on meter display and the same only shall be used for billing purpose.

The supplier shall indicate the sampling rate so that it shall be sufficient for the user to determine the accuracy of total energy.

The values of total energy shall be made available either on meter display or on CMRI/ Laptop with proper resolution.

The supplier shall state as to how he will meet the above requirement and finally the above requirement shall be mutually agreed between user and supplier.

The total energy (fundamental plus harmonic energy) shall be logged in the meter memory and be capable of down loading to the BCS directly or through the CMRI/Laptop.

6.19 Self Diagnostic feature:

The meter shall be capable of performing complete self diagnostic check to monitor the circuits for any malfunctioning to ensure integrity of data memory location all the time. The meter shall have indications for unsatisfactory / nonfunctioning / malfunctioning of the following as per requirement under G 19 of IS 14697:

- a) Time and date
- b) All display segments

The meter shall have indications for unsatisfactory/ nonfunctioning/ malfunctioning of the following as per clause 6.10 of the CBIP Publication No. 304:

- a) Time and Calendar
- b) Real Time Clock.
- c) RTC Battery
- d) Non-Volatile Battery

The details of malfunctioning of time and date should be recorded in the meter memory. The details of self diagnostic capability feature should be furnished by the bidder.

## 6.20 Tamper and Anomaly detection features:

The meter should have features to detect the occurrence and restoration of, atleast, the following common ways of tamper/anomaly:

- a) Missing potential: The meter shall be capable of detecting and recording occurrences and restoration of missing potential (1 phase or 2 phases) which can happen due to intentional / accidental disconnection of potential leads, alongwith the total number of such occurrences for all phases. Absence of one or more phase voltage from mains side should not be recorded as missing potential.
- b) CT polarity reversal: The meter shall be capable of detecting and recording occurrences and restoration of CT polarity reversal of one or more phases.
- c) CT Short (Bypass) / Open : The meter shall be capable of detecting and recording occurrences and restoration of shorting (bypassing) / opening of any one or two phases of CT when the meter is connected to a 3 phase 4 wire system. This feature shall not be available if and when the meter connected to a 3 phase 3 wire system.
- d) Current and voltage unbalance: The meter shall be capable of detecting and recording occurrences and restoration of current and voltage unbalance separately as an anomaly event. Snap shorts (numerical values) of voltage, current, power factor and energy (Wh/kWh) readings as well as the date and time of logging of the occurrence and restoration of all anomaly events, subject to meter-memory space as described herein under, should be logged in the meter memory and available for retrieving through the meter's optical port via CMRI/Laptop and the BASIC COMPUTER SOFTWARE.
- e) Power On/Off: If all the voltages are not available, power off event should be logged and power On event should be logged when supply is available. The power on and off event should be logged with date and time. Minimum hundred (100) events (occurrence and restoration) of all types of anomaly with date and time shall be available in the meter memory on first-in, first-out basis. It shall be possible to retrieve the anomaly data alongwith all related snap shots data through the meter's optical port with the help of communication system available and down load the same to the BASIC COMPUTER SOFTWARE where it shall be available for viewing. All this information shall be available in simple and easily understandable format.

## 6.21 Anomaly detection logic:

A properly designed meter anomaly logic should be provided. The anomaly logic should be capable of discriminating the system abnormalities from source side and load side and it should not log / record anomaly due to source side abnormalities.

The threshold values and logic for voltage, current and PF, etc. for the purpose of logging occurrence and restoration of various types of anomalies are given below at clause 6.22. The bidder may, however, propose other logics/ values in their offer based on their experience.

## 6.22

S.No.	Tamper event with date and time	Occurrence	Restoration
1	Missing Potential :		
a)	Voltage	<20% Vref	>40% Vref
b)	Line current	>10 % Ib	Ignored
c)	Persistence Time	5 Min.	120 Seconds
Notes :	Missing potential should be phase wise.		
1)	Absence of one or more phase voltages from supply side should not be recorded as missing potential.		
2.	CT Polarity Reversal : (Phase wise)		
a)	Line current in tampered phase	>5% Ib(Current direction negative)	Current direction becomes positive
b)	Power Factor	>0.2	Not applicable
c)	Persistence Time	5 Min.	120 Seconds
Notes :	Current reversal detection will be phase wise.		
1)			
3	Current Short / Bypass:		

S.No.	Tamper event with date and time	Occurrence	Restoration
a)	Vector sum of line currents	$(I_R + I_Y + I_B) > 20\% I_b$	$(I_R + I_Y + I_B) < 5\% I_b$
b)	Persistence Time	5 Min.	120 Seconds
4	Current Unbalance:		
a)	(Max. Current –Min. Current)	$> 5\% I_b$	$< 1\% I_b$
b)	Persistence Time	5 Min.	120 Sec.
5	Voltage Unbalance		
a)	$\{(Max. Voltage - Min. Voltage) \times 100\} / Avg. Voltage$	$> 5\% V_{ref.}$	$< 1\% V_{ref.}$
b)	Persistence Time	5 Min.	120 Sec.
Note: Any temper event will be logged only when the meter senses all respective threshold conditions.			

6.23 There shall be four separate compartments for logging of different type of anomalies as follows :  
Compartment No. 1:

25% of total anomaly memory space shall be allocated for the following current related anomalies:

- CT polarity reversal
- CT open circuit
- CT short (by pass)

Compartment No. 2:

25% of total anomaly memory space shall be allocated for missing potential and voltage unbalance anomalies.

Compartment No. 3:

50% of total anomaly memory space shall be allocated for current unbalance anomalies.

Compartment No. 4:

Twenty(20) events of power ON/OFF.

The logging of various anomalies in each compartment should be as under:

Once one or more compartments have become full, the last anomaly event pertaining to the same compartment will be entered and the earliest (first one) anomaly event should disappear. Thus, in this manner each succeeding anomaly event will replace the earliest recorded event, compartment wise. Events of one compartment/category should overwrite the events of their own compartment/ category only.

Bidders may indicate alternate proposals for the above anomaly detection and logging scheme.

Anomaly count should increase as per occurrence (not restoration) of anomaly events. The total No. of anomaly counts should also be provided on the meter display as well as at the BASIC COMPUTER SOFTWARE end.

6.24 Anomaly persistence time:

The persistence time for logging/registration of an occurrence of an anomaly should be 5 minutes  $\pm 10$  seconds. The persistence time for logging of restoration of anomaly should not be more than 120 seconds.

6.25 Transmission of Data:

The following parameters/Data shall be available for transmission through the communication ports indicated at clause 5.10 above.

S.No.	Parameters
1	Real time clock, date and time
2	Current IR
3	Current IY
4	Current IB
5	Voltage VRN
6	Voltage VYN
7	Voltage VBN

8	Three phase power factor PF
9	Frequency
10	Signed active power kW [(+)Forward, (-) reverse]
11	Cumulative energy, kWh
12	Number of power failures.
13	Cumulative of power failure duration
14	Cumulative tamper count
15	Deleted

## 6.26 Accuracy Requirement:

The accuracy of parameters measured by meters shall be tested in accordance with the relevant standards described in clause 2.0 of this specification. For apparent energy, accuracy testing shall be done in accordance with the provisions of annexure G 7 of IS 14697-1999. Time accuracy of the meter should be as per annexure G 18 of IS-14697-1999.

## 6.27 Electrical Requirement:

The electrical requirement of meter shall be as specified in the relevant standards described in clause 2.0 of this specification.

## 6.28 Electro magnetic compatibility and interference requirement:

The meter shall meet EMI / EMC requirements as specified in the relevant standards described in clause 2.0 of this specification.

## 6.29 Mechanical Requirement:

The meter shall meet the mechanical requirements as specified in the relevant standards described in clause 2.0 of this specification.

## 6.30 Climatic influence requirement:

The meter shall meet dry heat / cold / damp heat cyclic test requirements as per the relevant standards described in clause 2.0 of this specification.

**7.0 LIFE EXPECTANCY:**

The metering system shall be designed to meet the life expectancy of 20 years.

**8.0 TESTS FOR THE METER (for HT-TVM of make other than acceptable):**

## 8.01 TYPE TESTS:

The energy meters shall be fully type tested at NABL accredited Test Laboratories as per relevant standards described in clause No. 2.0 of the specification. The bidder must furnish type test reports in respect of AC static HT trivector meter (TOD Meters) of 0.2S accuracy class of both current ratings. These type tests must not have been conducted earlier than seven years from the date of opening of bid.

8.02 Names of Competent Laboratories as given in the CBIP Publication no. 304 (National Physical Laboratory or Laboratory accredited by NABL, India for the particular testing) where type tests can be conducted are listed below:

No.	Short Name	Full Name of Testing Laboratories
1	NPL	National Physical Laboratory, New Delhi
2	CPRI (Bangalore)	Central Power Research Institute, Bangalore
3	CPRI (Bhopal)	Central Power Research Institute, Bhopal
4	ERTL (N)	Electronics Regional Test Laboratory (North), New Delhi
5	ERTL (E)	Electronics Regional Test Laboratory (East), Kolkata
6	ERDA	Electronics Research & Development Association, Vadodara
7	ETDC (Chennai)	Electronics Test & Development Centre, Chennai
8	YMPL	Yadav Measurements Private Ltd., Udaipur
9	SML	Secure Meters Ltd., Udaipur
10	Torrent Power	Torrent Power Ltd., Ahmedabad
11	MPSE	MPS Electrical Test Laboratory, L&T Ltd., Mysore

8.03 TYPE TESTS TO BE CONDUCTED ON TWO UNITS OF EACH TYPE AND EACH RATING AS PER RELEVANT STANDARD NO. 14697 – 1999/ IEC 687- 1992/ CBIP PUBLICATION NO. 304 / IS – 9000.

- a) Test of insulation properties
  - i) Impulse voltage test
  - ii) AC High voltage test
  - iii) Insulation test
- b) Test of accuracy requirement
  - i) Tests on limits of error
  - ii) Test on starting condition
  - iii) Test on no load condition
  - iv) Test of Ambient Temperature influence
  - v) Test of repeatability of error
  - vi) Test of influence quantities
- c) Test of electrical requirement
  - i) Test for power consumption
  - ii) Test for influence of supply voltage
  - iii) Test of influence short time over current
  - iv) Test of influence of self heating
  - v) Test of influence of heating
- d) Test of electromagnetic compatibility
  - i) Radio interference measurement
  - ii) Fast transient burst test
  - iii) Test of immunity to electrostatic discharges
  - iv) Test of immunity to electromagnetic HF field
- e) Test for climatic influences
  - i) Dry heat test
  - ii) Cold test
  - iii) Damp heat cyclic test
- f) Test for mechanical requirements
  - i) Vibration test
  - ii) Shock test
  - iii) Spring hammer test
  - iv) Protection against penetration of dust and water
  - v) Test of resistance to heat and fire

8.04 Tests At Site:

The Purchaser reserves the right to conduct all tests on the meters after arrival at site and the Contractor shall guarantee test certificate figures under actual service conditions.

The supplier should furnish detailed write up for the procedure to be adopted for error testing of the meters in the laboratory and at site/field.

**9.0 INSPECTION:**

The purchaser reserves the right to insist for witnessing the acceptance/routine testing of the bought out items.

**10.0 Mounting of Meters:**

The meter shall be wired / mounted on the front side of the C&R Panel

**11.0 FURNISHING OF SAMPLES** (for HT-TVM of make other than acceptable):

- a) One No. sample meter of each rating, alongwith all associated software, shall be supplied by the bidder to the Purchaser along with type test certificates as per clause No. 5.0 of the specification for checking and testing in our Meter Testing Laboratory at Jaipur for routine / acceptance tests to ensure that offered meter meets the requirement specified under clause 4.0 of the specifications. It shall be the responsibility of the bidder to get the sample meter tested in his presence at our testing laboratories.

- b) The details of logic and threshold values for various kinds of tampers as proposed and incorporated by the bidder in their meter samples shall be furnished along with the meter sample(s). The sample(s) should be duly labeled and with full address of the firm with tender enquiry number and date thereupon. Sample(s) should be handed over personally or sent by post. Sample shall not be received against RR or through G/R. After finalization of the tender, the unsuccessful bidder(s) will collect their sample(s) so submitted otherwise department does not hold itself responsible for safe custody of sample(s) so received.
- c) The bidder can commence the supply only after approval of sample.
- d) Tests to be conducted:
  - i) Starting condition test.
  - ii) Power consumption test.
  - iii) Repeatability of error test.
  - iv) Accuracy requirements.
  - v) Voltage variation test (- 30% to + 20%).
  - vi) Tamper and fraud protection test: Tests to prove compliance to this specification.
  - vii) AC and DC magnetic immunity test.
  - viii) Temper logic and threshold values.
  - ix) Capability of meter to transmit / communicate data as per specifications.

**12.0 GUARANTEE:**

The equipment found defective within the guarantee period shall be repaired / replaced by the bidder free of cost within one month of receipt of intimation.

The bidder shall also furnish an undertaking that there shall be no drift in the accuracy class of the meter for a minimum period of 10 years from the date of supply.

**13.0 AFTER SALES SUPPORT:**

The supplier shall provide competent and timely after sales service support.

**TECHNICAL PARAMETERS****(A) LINE CONSTANTS OF 220 kV LINE**

(P.U. POSITIVE SEQUENCE VALUES PER Km)

**(I) BASE 100 MVA**

CONDUCTOR : SINGLE ZEBRA  
 SECTIONAL AREA TOTAL : 484.5 SQ.MM  
 SECTIONAL AREA ALUM : 428.9 SQ.MM

	R1	X1	B1
SINGLE CIRCUIT	.00016	.00025	.00132
DOUBLE CIRCUIT	.00008	.000425	.00264

**(B) LINE CONSTANTS OF 132 kV LINE**

(P.U. POSITIVE SEQUENCE VALUES PER Km)

**(I) BASE 100 MVA**

CONDUCTOR : SINGLE PANTHER

	R1	X1	B1
SINGLE CIRCUIT	.00091	.00236	.0005
DOUBLE CIRCUIT	.000455	.00118	.0010
S/C 220 kV, CHARGED ON 132 kV SINGLE ZEBRA CONDUCTOR	.000444	.002363	.0005

**(II)** LINE LENGTH OF EACH FEEDER 0.5 Km TO 150 Km.**(C) PROPOSED TRANSFORMER CAPACITIES AT EACH STATION.**

220 kV CLASS 100 MVA 220/132 kV OR 160 MVA 220/132 kV  
 OR  
 50 MVA 220/132 kV

132 kV CLASS 2X10/12.5 MVA 132/33kV & 132/11kV  
 OR  
 2X20/25 MVA 132/33kV  
 (Transformer may also control individually)  
 OR  
 40/50 MVA 132/33kV Transformer

**(D) DC AUXILIARY VOLTAGE**

220 kV GSS 220V/110V

132 kV GSS 220V/110V

**TECHNICAL PARTICULARS OF CTs UTILISED AT VARIOUS GSS****1. 220 kV FEEDER, BUS COUPLER AND TRANSFORMER  
CT Ratio : 400-800/1A OR 5A 5C**

S.No.	Description	Core				
		I	II	III	IV	V
1	Rated burden.					
	1A Secondary	-	--	10VA	--	--
	5A Secondary	--	--	10VA	--	--
2	Accuracy class	PS	PS	0.2S	PS	PS
3	Min. knee point voltage at lowest ratio					
	1A Secondary	850V	850V	--	850V	850V
	5A Secondary	280V	280V	--	280V	280V
4	Max. secondary resistance(Ohms)					
	1A Secondary	2.5	2.5	-	2.5	2.5
	5A Secondary	0.44	0.44	-	0.44	0.44

**2. 132 kV FEEDER, BUS COUPLER & 132 kV TRANSFORMER LV SIDE OF 220/132 KV TRANSFORMER  
CT RATIO : 250-500/1 A OR 5A 4C (At 220 KV GSS & for 132 kV Tr.)  
250-500/1 A OR 5A 3C (AT 132 kV GSS)**

S.No.	Description	Core		
		I	II	III
1	Rated burden.			
	1A Secondary	--	--	10VA
	5A Secondary	--	--	15VA
2	Accuracy class	PS	PS	0.2S
3	Min. knee point voltage at lowest ratio			
	1A Secondary	650V	650V	-
	5A Secondary	280V	280	-
4	Max. secondary resistance(Ohms)			
	1A Secondary	2.5	2.5	-
	5A Secondary	0.44	0.44	-

**3. 132 kV TRANSFORMER CT'S RATIO 132 KV SIDE OF 132/33kV OR 132/11kV TRANSFORMER  
Ratio : 125-250-500/1A OR 5A 3C**

.N.No	Description	Core		
		I	II	III
1	Rated burden.			
	1A Secondary	--	--	10VA
	5A Secondary	--	--	15VA
2	Accuracy class	PS	PS	0.2S
3	Min. knee point voltage at lowest ratio			
	1A Secondary	650V	650V	-
	5A Secondary	280V	280	-
4	Max. secondary resistance(Ohms)			
	1A Secondary	2.5	2.5	-
	5A Secondary	0.44	0.44	-



**4. INSTRUMENT RANGES**

S. No	INSTRUMENT	220 kV Bus coupler Panels (Type C-II)	132 kV Feeder Panels (Type J-II)	132 kV Trans. Panels (Type K-II)	132 kV Bus coupler Panels (Type L-II)
1	2	3	4	5	6
1	AMMETER	0-800A	0-500A	0-500A	0-500A
2	VOLTMETER	0-260V	0-150V	0-150V	0-150V
3	MW METER	0-200 MW	0-80MW	N.A	0-80 MW
4	MVAR METER	N.A	0-50 MVAR	N.A	N.A
5	POWER FACTOR	N.A	0.5LAG- UNITY- 0.5LEAD	N.A	N.A

NOTE- BIDDERS SHALL PROVIDE TWO SCALES IN AMMETER SUITABLE FOR HIGHER CT RATIO & NEXT LOWER RATIO ALONGWITH MULTIPLICATION FACTOR FOR REMAINING CT RATIO IF ANY.

**TECHNICAL PARTICULARS OF CVT's UTILISED AT VARIOUS G.S.S.****DETAILS OF CVT**

S.NO.	PARTICULARS	220 kV	132 kV
1	Type	CVT	CVT
2	Rated primary voltage	$220 \text{ kV}/\sqrt{3}$	$132 \text{ kV}/\sqrt{3}$
3	No. of secondary winding	Three	Three
4		$110\text{V}/\sqrt{3} \text{ V}$ $110\text{V}/\sqrt{3} \text{ V}$ $110\text{V}/\sqrt{3} \text{ V}$	$110\text{V}/\sqrt{3} \text{ V}$ $110\text{V}/\sqrt{3} \text{ V}$ $110\text{V}/\sqrt{3} \text{ V}$
5	Rated burden Winding.I Winding.II Winding.III	25 VA 25 VA 25 VA	25 VA 25 VA 25 VA
6	Accuracy class Winding.I Winding.II Winding.III	3P 3P 0.2	3P 3P 0.2
7	Maximum ratio error with rated burden & 5% normal primary voltage	Within limits specified by IS:3156 for accuracy class indicated	
8	Maximum phase angle error with rated burden & 5% normal primary voltage	Within limits specified by IS:3156 for accuracy class indicated	
9	Oil	Transformer oil conforming to IS:335	
10	Temperature rise of 1.2 times rated Voltage with rated Burden	Within limits specified by IS:3156	
11	Rated voltage Factor and time	1.2 continuous, 1.5 for 30 seconds	
12	Temperature for 11 above	Within limits specified by IS:3156	

**STANDARD WIRING ON TB OF 132 & 220 KV FEEDER C&R PANEL**

Description	Ferrule Marking	TB No. & Position	Description	Ferrule Marking	TB No. & Position
Main DC- I	J1	CX2-31	TC2 Supervision Pre-close	K61	RX4 - 47
	J2	CX2-32		K63	RX4 - 48
Main DC-II	J3	CX2-33		K65	RX4 - 50
	J4	CX2-34		K67	RX4 - 51
Annunc. DC	J21	CX2-35		K69	RX4 - 53
	J22	CX2-36		K71	RX4 - 54
Control DC	K1	RX4-33	Bus 1 VT Protection Core	E11A	RX3 - 25
	K2	RX4-34		E31A	RX3 - 26
Trip Ckt. 1 Protection Trip	K3A	RX4 - 35		E51A	RX3 - 27
	K3B	RX4 - 38		E71A	RX3 - 28
	K3C	RX4 - 41	Bus 1 VT Metering Core	E21A	RX3 - 29
Trip Ckt. 2 Manual trip(For 132 KV TC1 & TC2)	K53	RX1 - 22		E41A	RX3 - 30
	K55	RX1 - 23		E61A	RX3 - 31
	K57	RX1 - 24		E81A	RX3 - 32
	K59	RX1 - 25	Bus 2 VT Protection Core	E11B	RX3 - 33
Control DC	K51	RX4-44		E31B	RX3 - 34
	K52	RX4-45		E51B	RX3 - 35
Trip Ckt. 2 Protection trip	K53A	RX4 - 46		Bus 2 VT Metering Core	E71B
	K53B	RX4 - 49	E21B		RX3 - 37
	K53C	RX4 - 52	E41B		RX3 - 38
CT wiring (Main - I)	A11	RX3 - 1	LBB		E61B
	A31	RX3 - 2		E81B	RX3 - 40
	A51	RX3 - 3		B211	RX3 - 17
	A71	RX3 - 4		B231	RX3 - 18
CT wiring (Main - II) Only for 220 KV	A21	RX3 - 5	CB Status	B251	RX3 - 19
	A41	RX3 - 6		B271	RX3 - 20
	A61	RX3 - 7		L1	CX2 - 1
	A81	RX3 - 8		L3	CX2 - 4
CT wiring Back Up (Only for 132 KV)	C11	RX3 - 5	ON	L5	CX2 - 5
	C31	RX3 - 6	SEM OFF	L7	CX2-6
	C51	RX3 - 7	SEM ON	L11	CX2-2
	C71	RX3 - 8	Auto Trip	L13	CX2-3
CT Metering Core	D - 11	CX3 - 1	CB status for Relay R Ph	K 39	RX 6-13
	D - 31	CX3 - 2	CB status for Relay YPh	K41	RX 6-14
	D - 51	CX3 - 3	CB status for Relay BPh	K43	RX 6-15
	D - 71	CX3 - 4	Positive for CB status	K101	RX 6-16
Line PT Wdg. 1	E111	CX1 - 5	Isolator Status	K1	RX6 - 1
	E131	CX1 - 6	Bus-I OFF	K13A	RX6 - 3
	E151	CX1 - 7	Bus-I ON	K15A	RX6 - 2
	E171	CX1 - 8			
Line PT Wdg. 2	E211	RX3 - 21		K1	RX6 - 4
	E231	RX3 - 22	Bus-II OFF	K17A	RX6 - 6
	E251	RX3 - 23	Bus-II ON	K19A	RX6 - 5
	E271	RX3 - 24			
TC1 Supervision Pre-close	K9	RX4 - 36		K1	RX6 - 7
	K11	RX4 - 37	Aux Bus -OFF	K21A	RX6 - 9
	K13	RX4 - 39	Aux. Bus- ON	K23A	RX6 - 8
	K15	RX4 - 40		K1	RX6 - 10
	K17	RX4 - 42	Line- OFF	K25A	RX6 - 12

Description	Ferrule Marking	TB No. & Position	Description	Ferrule Marking	TB No. & Position
	K19	RX4 - 43	Line -ON	K27A	RX6 - 11
			Closing	K21	RX1 - 19
				K31	RX1 - 20
			Auto Reclose	K36	RX1 - 21
			AC Supply	H1	CX1-1
				H2	CX1-2

Note: Terminal / ferrules not applicable shall be left unutilized.

**STANDARD WIRING ON TB OF 132 & 220 KV BUS-COUPLER C&R PANEL**

Description	Ferrule Marking	TB No. & Position	Description	Ferrule Marking	TB No. & Position
Main DC-I	J1	CX2-31	Bus 1 VT Metering Core	E21A	RX3 - 29
	J2	CX2-32		E41A	RX3 - 30
Main DC-II	J3	CX2-33		E61A	RX3 - 31
	J4	CX2-34		E81A	RX3 - 32
Annunc. DC	J21	CX2-35	Bus 2 VT Protection Core	E11B	RX3 - 33
	J22	CX2-36		E31B	RX3 - 34
Control DC	K1	RX4-33		E51B	RX3 - 35
	K2	RX4-34		E71B	RX3 - 36
Trip Ckt. 1 (Protection Trip)	K3A	RX4 - 35	Bus 2 VT Metering Core	E21B	RX3 - 37
	K3B	RX4 - 38		E41B	RX3 - 38
	K3C	RX4 - 41		E61B	RX3 - 39
Trip Ckt. 2 Manual trip (For 132 KV TC1 & TC2)	K53	RX1 - 22		E81B	RX3 - 40
	K55	RX1 - 23	LBB (Only for 220 KV)	B211	RX3 - 17
	K57	RX1 - 24		B231	RX3 - 18
	K59	RX1 - 25		B251	RX3 - 19
Control DC	K51	RX4-44		B271	RX3 - 20
	K52	RX4-45	CB Status	L1	CX2 - 1
Trip Ckt. 2 Protection trip	K53A	RX4 - 46	OFF	L3	CX2 - 4
	K53B	RX4 - 49	ON	L5	CX2 - 5
	K53C	RX4 - 52	SEM.OFF	L7	CX2-6
CT wiring Back Up	C11	RX3 - 1	SEM.ON	L11	CX2-2
	C31	RX3 - 2	Auto Trip	L13	CX2-3
	C51	RX3 - 3	CB status for Relay R Ph	K 39	RX 6-13
	C71	RX3 - 4	CB status for Relay YPh	K41	RX 6-14
CT Metering Core	D - 11	CX3 - 1	CB status for Relay BPh	K43	RX 6-15
	D - 31	CX3 - 2	Positive for CB status	K101	RX 6-16
	D - 51	CX3 - 3	Isolator Status	K1	RX6 - 1
	D - 71	CX3 - 4	Bus-I OFF	K13A	RX6 - 3
			Bus-I ON	K15A	RX6 - 2
TC1 Supervision Pre-close	K9	RX4 - 36		K1	RX6 - 4
	K11	RX4 - 37	Bus-II OFF	K17A	RX6 - 6
	K13	RX4 - 39	Bus-II ON	K19A	RX6 - 5
	K15	RX4 - 40		K1	RX6 - 7
	K17	RX4 - 42	Transfer ISO. -OFF	K21A	RX6 - 9
	K19	RX4 - 43	Transfer ISO. -ON	K23A	RX6 - 8
TC2 Supervision Pre-close	K61	RX4 - 47		K1	RX6-10
	K63	RX4 - 48	Coupler ISO. OFF	K25A	RX6-12

Description	Ferrule Marking	TB No. & Position	Description	Ferrule Marking	TB No. & Position
	K65	RX4 - 50	Coupler ISO. ON	K27A	RX6-11
	K67	RX4 - 51	Closing	K21	RX1 - 19
	K69	RX4 - 53		K31	RX1 - 20
	K71	RX4 - 54	Auto Reclose	K36	RX1 - 21
			AC Supply	H1	CX1-1
				H2	CX1-2

Note: Terminal / ferrules not applicable shall be left unutilized

**Appendix-D3****STANDARD WIRING ON TB OF 132 & 220 KV TRANSFORMER C&R PANEL**

Description	Ferrule Marking	TB No. & Position	Description	Ferrule Marking	TB No. & Position
Main DC-I	J1	CX2-31	Bus 1 VT Metering Core	E21A	RX3 - 29
	J2	CX2-32		E41A	RX3 - 30
Main DC-II	J3	CX2-33		E61A	RX3 - 31
	J4	CX2-34		E81A	RX3 - 32
Annunc. DC	J21	CX2-35	Bus 2 VT Protection Core	E11B	RX3 - 33
	J22	CX2-36		E31B	RX3 - 34
Control DC	K1	RX4-33		E51B	RX3 - 35
	K2	RX4-34		E71B	RX3 - 36
Trip Ckt. 1 Protection Trip	K3A	RX4-35	Bus 2 VT Metering Core	E21B	RX3 - 37
	K3B	RX4-38		E41B	RX3 - 38
	K3C	RX4-41		E61B	RX3 - 39
Trip Ckt. 2 Manual trip (For 132 KV TC1 & TC2)	K53	RX1-22		E81B	RX3 - 40
	K55	RX1-23	OVER FLUX RELAY (From RVT/LV Side of TRF PT)	ER OF	RX3 - 41
	K57	RX1-24		EY OF	RX3 - 42
	K59	RX1-25		EB OF	RX3 - 43
Control DC	K51	RX4-44		EN OF	RX3 - 44
	K52	RX4-45	Neutral Displacement Relay (From RVT/HV Side of TRF PT)	E NDR	RX3 - 45
				E NDR	RX3 - 46
Trip Ckt. 2 Protection trip	K53A K53B K53C	RX4 - 46 RX4 - 49 RX4 - 52	LBB (Only for 220 KV)	B211	RX3 - 17
				B231	RX3 - 18
				B251	RX3 - 19
				B271	RX3 - 20
CT wiring (Differential - HV)	A111	RX3 - 1	CB Status	L1	CX2 - 1
	A131	RX3 - 2	OFF	L3	CX2 - 4
	A151	RX3 - 3	ON	L5	CX2 - 5
	A171	RX3 - 4	SEM.OFF	L7	CX2 - 6
CT wiring (Differential- LV)	A211	RX3 - 5	SEM.ON	L11	CX2 - 2
	A231	RX3 - 6	Auto Trip	L13	CX2 - 3
	A251	RX3 - 7	CB status for Relay RPh	K 39	RX 6-13
	A271	RX3 - 8	CB status for Relay YPh	K41	RX 6-14
CT Wiring Back UP	C11	RX3-21	CB status for Relay BPh	K43	RX 6-15
	C31	RX3-22	Positive for CB status	K101	RX 6-16
	C51	RX3-23	For Isolator Status	K1	RX6 - 1
	C71	RX3-24	Isolator Bus-I OFF	K13A	RX6 - 3
CT Metering Core			Isolator Bus-I ON	K15A	RX6 - 2
	D - 11	CX3 - 1	For Isolator Status	K1	RX6 - 4
	D - 31	CX3 - 2	Isolator Bus-II OFF	K17A	RX6 - 6
	D - 51	CX3 - 3	Isolator Bus-II ON	K19A	RX6 - 5
TC1 Supervision Pre-close			For Isolator Status	K1	RX6 - 7
	K9	RX4 - 36	Isolator Aux Bus -OFF	K21A	RX6 - 9
	K11	RX4 - 37	Isolator Aux. Bus- ON	K23A	RX6 - 8
	K13	RX4 - 39	For Isolator Status	K1	RX6 - 10
	K15	RX4 - 40	Isolator Transformer- OFF	K25A	RX6 - 12
	K17	RX4 - 42	Isolator Transformer- ON	K27A	RX6 - 11
TC2 Supervision Pre-close	K19	RX4 - 43	Closing Command	K21	RX1 - 19
	K61	RX4 - 47		K31	RX1 - 20
	K63	RX4 - 48	REF (132 kV Panel)	A181	RX3-9

Description	Ferrule Marking	TB No. & Position	Description	Ferrule Marking	TB No. & Position
Bus 1 VT Protection Core	K65	RX4 - 50	HV	A182	RX3-10
	K67	RX4 - 51	REF (132 kV Panel) LV	A281	RX3-11
	K69	RX4 - 53		A282	RX3-12
	K71	RX4 - 54	REF (220 kV Panel)	A181	RX3-9
	E11A	RX3 - 25		A182	RX3-10
	E31A	RX3 - 26	High Impedance Differential	A21	RX3-13
	E51A	RX3 - 27		A41	RX3-14
	E71A	RX3 - 28		A61	RX3-15
				A81	RX3-16
				AC Supply	H1
			H2		CX1-2

Standard Ferruling of Transformer Aux. Protection At C& R Panel		
Purpose	Ferrule	T B No.
Positive for Aux. Prot. Alarm	L101	RX7-01
Oil Temp. High Alarm	OTA	RX7-02
HV Winding Temp. High Alarm	HWTA	RX7-03
LV Winding Temp. High Alarm	LWTA	RX7-04
MOLG Main Conservator Tank Alarm	LOAM	RX7-05
MOLG OLTC Conservator Tank Alarm	LOAOL	RX7-06
Air Cell Fail Alarm	ACF	RX7-07
Positive for Aux. Prot. DC 1 Trip	K 101	RX7-08
Oil Temp. High Trip	OTT	RX7-09
HV Winding Temp. High Trip	HWTT	RX7-10
Buchholz Relay 1 Alarm	BA1	RX7-11
Buchholz Relay 1 Trip	BT1	RX7-12
Pressure Relief Device 1 Trip	PRD1	RX7-13
Pressure Relief Device OLTC	PRDOL	RX7-14
OLTC OSR Common Trip	OSRC	RX7-15

Purpose	Ferrule	T B No.
Positive for Aux. Prot. DC 2 Trip	K 201	RX7-16
LV Winding Temp. High Trip	LWTT	RX7-17
Buchholz Relay 2 Alarm	BA2	RX7-18
Buchholz Relay 2 Trip	BT2	RX7-19
Pressure Relief Device 2 Trip	PRD2	RX7-20
OLTC OSR U-Phase Trip	OSRU	RX7-21
OLTC OSR V-Phase Trip	OSRV	RX7-22
OLTC OSR W-Phase Trip	OSRW	RX7-23

Note: Terminal / ferrules not applicable shall be left unutilized.

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