TENDER SPECIFICATION

STN-1586/2026-27

FOR

11KV 24 DC LV VCBs WITH CONTROL & RELAY PANELS AND

CURRENT TRANSFORMERS OF RATIO 600-300/1-1-1A

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NOTE:

1. Payment terms, Delivery period, Performance Bank Guarantee, Applicable taxes" should be in line with the terms and conditions of the specification. If any bidder does not meet any one of the conditions, such tender will not be considered. Please note that the conditional offers are also not considered. Hence the bidder shall submit the tender in line with the terms and conditions of the specification.
2. The bidders shall check the website www.tgsouthernpower.org and www.tender.telangana.gov.in for amendments, if any, upto one day prior to the date of tender opening. The amendments shall be binding on the bidders.
3. The purchaser will not be responsible for any damage that may be caused to the samples at any time.
4. The bidder shall furnish required Bid Security amount and validity as per specification. If the bidder fails to furnish bid security amount and bid validity as stipulated in the specification, such tender bid will not be considered for further evaluation.
5. The prospective bidders shall attend the pre-bid meeting(date and time in NIT) for any queries. The discussed queries shall be submitted in the form of a letter during pre bid meeting or within 24 hrs of pre bid meeting. Any new queries received after pre bid meeting are not liable to be considered.
6. In e-procurement commercial stage, if F&I charges are applicable then mention whether F&I charges entered are exclusive/inclusive of GST in the remarks section. If not mentioned in remarks, F&I charges will be considered as inclusive of GST.
7. The bid evaluation will be carried out based on the documents uploaded through www.tender.telangana.gov.in against this tender.

Phones : 040 - 23431035, 23431319, 23431034

Sd/-
CHIEF ENGINEER (P&MM)
TGSPDCL

Energy Saved is Energy Produced

SOUTHERN POWER DISTRIBUTION COMPANY OF TELANGANA LTD.
4th floor, Corporate Office, Mint Compound, Hyderabad – 04

e-Procurement Tender Notice (Paper Notification)

TGSPDCL intends to float tender for procurement of (a) 11KV VCBs with CTs, CRPs & IED Relays (b)33KV Station type LAs (c) 33KV and 11KV Current Transformers (d) 33KV Station type Lightning arresters (e) 33KV Single Phase PTs (f) Scanners (g) 11KV, 3Cx95 Sq.mm TR-XLPE UG Cable (h) 11KV 400A Conv. Single Break AB Switches on e-procurement platform.

For further details of each item above, please visit www.tgsouthernpower.org, www.tender.telangana.gov.in, www.auction.telangana.gov.in.

Phone: 040-23431360, 1033, 1035, 1026

Sd/-
CHIEF ENGINEER (P&MM)

ONLINE VERSION

Tender Notice No:STN-1586/2026-27

Notice Inviting Tender Details		
Sl.No	**Description**	
1	Department Name	TGSPDCL
2	Office	Purchases & Material Management Wing, Corporate Office, SPDC of Telangana Ltd
3	Tender Number	**STN-1586/2026-27**
4	Tender Subject	**11KV 24V DC LV VCB with CRP and CT Ratio 600-300/1-1-1 A**
5	Delivery Schedule	To **commence within one month** from the date of receipt of purchase order and **complete within two months thereafter or as per TGSPDCL requirement.**
6	Tender Type	Open
7	Tender Category	NA
8	Bid Security (INR)	i) Bidders shall furnish an amount equivalent to 2.36% of the Ex-works quoted value . The bid security validity shall be for 90 days plus 45 days from the date of opening of the BID. (or) (ii) Exemption letter of Bid Security in case of Govt. firms..
9	Bid Security Payable to	In the form of DD in favour of Pay Officer/TGSPDCL / Hyd (or) Bank Guarantee from Nationalized Bank/Scheduled Bank in favour of "The CHief Engineer (P&MM), Corporate Office, TGSPDCL, Hyderabad".
10	Processing Fee (INR)	NIL
11	Transaction Fee	**Transaction fee:** All the participating bidders who submit the bids have to pay an amount @ 0.03% of their final bid value online with a cap of Rs. 10,000/- for quoted value of purchase up to Rs.50 crores and Rs.25,000/- if the purchase value is above Rs.50 crores & applicable GST as levied by Govt. of India on transaction fee through online in favor of **TGTS** The amount payable to TGTS is non refundable. **Corpus Fund:** Successful bidder has to pay an amount of 0.04% on quoted value through demand draft/online payment in favor of Managing Director, TGTS, Hyderabad towards corpus fund at the time of concluding agreement.
12	Transaction Fee Payable to	**TGTS**, Hyderabad
13	Date & time of pre-bid meeting with manufacturers	**30.4.2026 at 11:30 Hrs.**
14	Schedule Sale opening date	24-04-2026 from 17:00 Hrs
15	Schedule Sale closing Date	**12-05-2026** Upto 13:00 Hrs.
16	Bid Submission Closing Date & time	**12-05-2026** Upto **13:00 Hrs**
17	Bid submission	On Line
18	Pre-Qualification & Technical Bid Opening Date (Qualification and Eligibility Stage and Technical Bid Stage)	**12-05-2026 Upto 15:00 Hrs**
19	Price Bid Opening Date (Financial Bid Stage)	**13-05-2026** at 12:00 Hrs

20	Place of Tender Opening	O/o CHief Engineer/P&MM, SPDC of Telangana Ltd., 4th Floor, Corporate Office, Mint Compound, Hyderabad – 500 004.
21	Officer Inviting Bids/ Contact Person	CHief Engineer/P&MM/TGSPDCL/HYDERABAD
22	Address/E-mail id	O/o. CHief Engineer/P&MM TGSPDCL., 4th Floor, Corporate Office, Mint Compound,Hyderabad–500 004 cgmpmm@tgsouthernpower.org
23	Contact Details/Telephone	Ph. No. 040-23431360, 23431033, 23431034
24	Eligibility Criteria	As per Section VI
25	Procedure for Bid Submission	**Bids shall be submitted online on** www.tender.telangana.gov.in **platform** 1. The participating bidders in the tender should register themselves free of cost on e-procurement platform in the website www.tender.telangana.gov.in. 2. Bidders can log-in to e-procurement platform in secure mode only by signing with the Digital certificates. 3. The bidders who are desirous of participating in e-procurement shall submit their technical bids, price bids as per the standard formats available at the e-market place. 4. The bidders should scan and upload the following documents in support of technical bids. The bidders shall sign on all the statements, documents certificates uploaded by him, owning responsibility for their correctness/authenticity: a) Bid Security should be furnished i) In the form of DD in favor of Pay Officer/TGSPDCL/Hyderabad **Alternatively BG from Nationalized/ Scheduled bank as per format-II enclosed** ii) If exempted give details of Bid Security Exemption in case of Govt. firms. b) "GSTR 3B Returns" For the latest Financial year. c) Financial Turnover certified by CA for 5 years d) Details of previous supplies along with purchase order and delivery challan copies for 40% qualification requirement as per tender document. e) Performance certificates from purchaser of Govt. power utilities/Distribution power utilities for 20% qualification requirement as per tender f) Copies of previous supply orders and relevant purchase order copies mentioned in the performance certificates in support of the above. g) Drawings, Guaranteed Technical Particulars of the product, other relevant documents attached to the bid. h) Complete Type test certificates from any recognized **NABL laboratory/ International lab.** i) Duly filled and signed proforma as per Format 5. j) Transaction fee payable to **TGTS** 5. The rates should be quoted in online only

		6. After uploading the documents original Demand Drafts **Demand Drafts/BG** in respect of Bid Security (except the Price bid/offer/break-up of taxes) are to be submitted by the bidder to the CHief Engineer/P&MM/TGSPDCL so as to reach before the date and time of opening of the technical bid. Failure to furnish Original BG/DD before the date and time of opening of technical bid will entail in rejection of the bid. The Department shall not hold any risk on account of postal delay. Similarly, if any of the certificates, documents, etc., furnished by the tenderer are found to be false/fabricated/bogus, the bidder will be disqualified, blacklisted, action will be initiated as deemed fit and the Bid Security will be forfeited. 7. The department will not hold any risk and responsibility regulating non-visibility of the scanned and uploaded documents. 8. The Documents that are uploaded online on e-market place will only be considered for Technical Bid Evaluation. 9. Important Notice to Contractors, Suppliers and Department users (i) In the endeavor to bring total automation of processes in e-Procurement, the Govt. has issued orders vide G.O.Ms.No. 13 dated. 5.7.2006 permitting integration of electronic Payment Gateway of ICICI/HDFC Banks with e-Procurement platform, which provides a facility to participating suppliers/ contractors to electronically pay the transaction fee online using their credit cards.
26	Rights reserved with the Department	TGSPDCL reserves the right to accept or reject any or all of the tenders received without assigning any reasons therefore. The TGSPDCL also reserves the right to split the tender and place orders on more than one tenderer at its discretion.
27	General Terms and Conditions	As per tender documents.

SECTION - II
SALIENT FEATURES OF THE BID

SUPERSCRIPTION ON THE TENDER COVER

Specification No : **STN-1586/2026-27**
Material : **11KV 24V DC LV VCB with CRP and CT Ratio 600-300/1-1-1A**
Officer to whom the bid will be addressed :
Superscription on the bid cover and the outer envelope :

a. Specification No. : **STN-1586/2026-27**
b. Due date and time for online submission : **12-05-2026 up to 13.00 hrs**
c. Date and time of online opening : 12-05-2026 at 15.00 hrs
d. Payment of bid security
i) If paid give details: **DD No./BG.No.**_____Dt.___ for Rs._____
ii) If exempted give details
e. Whether 90 days validity offered ……(yes/no).
f. Whether bid is made accepting payment terms Clause….(yes/no).
g. Whether delivery is as per delivery schedule indicated….(yes/no)
h Whether the samples (if specified) has been enclosed/sent…(yes/no)
i. Whether the quotation is in two parts …. (Yes/no)

Content of Bidding Documents:

The materials/equipment required, bidding procedures, and contract terms are prescribed in the bidding documents as listed below:

a. Notice Inviting Bids.
b. Salient feature of the contract.
c. Standard General terms and conditions of contract.
d. Standard Technical specification and drawings wherever necessary.
e. Qualification Requirements.
f. Schedule of materials (delivery Schedule)

SAMPLE FORMS.

g. Bid Form
h. Bid security form
i. Performance Security Form(Applicable for successful bidder)
j. Contract Form(Applicable for successful bidder)
k. Details to be furnished by the Manufacturer.
l. Performance Statement.
m. Schedule of Deviations (Technical & Commercial)
n. Declaration

The Bidder is expected to examine all instructions, forms, terms and technical specifications in the bidding documents. Failure to furnish all information required by the bidding documents or to submit a bid not substantially responsive to the bidding documents in every respect will be at Bidder's risk and may result in the rejection of its bid.

Deviations from standard bidding document

i) General terms and Condition of Contract
ii) Technical

The above deviations supercede the existing terms of GCC and Technical Specification

Sd/-
CHIEF ENGINEER (P&MM)
TGSPDCL

SECTION - III
GENERAL TERMS AND CONDITIONS OF CONTRACT
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SECTION - III
GENERAL TERMS AND CONDITIONS OF CONTRACT

A. Introduction

1. Definitions

1.1 In this Contract, the following terms will be interpreted as indicated:

(a) "The Contract" means the agreement entered into between the Purchaser and the Supplier, as recorded in the contract Form signed by the Parties, including all attachments and appendices thereto and all documents incorporated by reference therein.

(b) "The Contract Price" means the price payable to the Supplier under the Contract for the full and proper performance of its contractual obligations.

(c) "The Materials / equipment" means all of the equipment, machinery, and/or other materials which the Supplier is required to supply to the Purchaser under the Contract.

(d) "The Services" means those services ancillary to the supply of the Materials/ equipment, such as transportation and insurance, and any other incidental Services, such as installation, commissioning, provision of technical assistance, training, and other such obligations of the Supplier covered under the Contract.

(e) "GCC" means the General Terms and Conditions of Contract contained in the section.

(f) "The Purchaser" means the organization purchasing the Materials / equipment.

(g) Vendor is a supplier who has registered with the purchaser for supply of materials/equipment.

(h) "The Supplier" means the firm supplying the Materials/equipment and Services under this Contract.

(i) "Day" means calendar day.

2. Applicability

These General Conditions of contract will apply to the extent that they are not superseded by provisions of Salient features of the Bid.

3(a) Standards

The Materials/equipment supplied under this Contract will conform to the Standards mentioned in the Technical specifications, and, when no applicable standard is mentioned, the authoritative standards appropriate to the Materials / equipment' i.e., BIS, such standards will be the latest. All material will be of the best class and will be capable of satisfactory operation under tropical conditions without distortion or deterioration.

3(b) Interchangeability:

All similar materials and removable parts of similar equipment will be interchangeable with each other. A specific confirmation of this should be furnished in the bid.

4. Scope of Work:

This specification covers design manufacture, testing and delivery FADS (Free at destination Stores) of the materials described at Section IV and Technical Specification Section V.

5. Eligible Bidders:

The Manufacturers who have registered themselves with department of industries of State/Central Govt. with full manufacturing and testing facilities for supply of the material/equipment listed in Section No. IV, of Bid specification.

B. THE BIDDING DOCUMENTS

6. Contents of Bidding Document:

6.1 The Materials / equipment required, bidding procedures, and contract terms are prescribed in the bidding documents as listed below:

1. Notice Inviting Bid
2. Technical Specifications
3. Schedule of Materials (Delivery Schedule)
4. Bid Form and Price Schedules(online only)
5. Salient Features of the Bid
6. General Terms and Conditions of Contract
7. Qualification Requirements
8. Bid Security
9. Performance Security Form
10. Schedule of Deviations

6.2 The Bidder is expected to examine all instructions, forms, terms and Technical specifications in the bidding documents. Failure to furnish all information required by the bidding documents or to submit a bid not responsive to the bidding documents in every respect will be at Bidder's risk and may result in the rejection of its bid.

7. Clarification of Bidding Documents

A prospective Bidder requiring any clarification of the bidding documents may notify the Purchaser in writing or by cable (hereinafter, the term cable is deemed to include telex and facsimile) at the Purchaser's address. The Purchaser will respond in writing to any request for clarification of the bidding documents, which it receives not later than fifteen (15) days prior to the deadline for the submission of bids**.** Written copies of Purchaser's response (including an explanation of the query but without identifying the source of inquiry) will be put on Website of the purchaser and e-procurement website or intimated by mail.

8. Amendment to Bidding Documents:

8.1 At any time prior to the deadline for submission of bids, the Purchaser, for any reason, whether at its own initiative or in response to a clarification requested by a prospective Bidder, may modify the bidding documents by amendment.

8.2 All such amendments also would be made available on the website of TGSPDCL and e-procurement website and such amendments will be binding on the respective Bidders.

8.3 In order to allow prospective Bidders reasonable time in which to take the amendment into account in preparing their bids, the Purchaser, at its discretion, may extend the deadline for the submission of bids.

C. PREPARATION OF BIDS

9. Language of Bid:

The bid prepared by the Bidder including all correspondence and documents relating to the bid exchanged by the Bidder and the Purchaser, will be in English.

10. Cost Associated with Bidding:

The Bidder will bear all costs associated with the preparation and submission of its bid, and the Purchaser, will in no case be responsible or liable for those costs, regardless of the conduct or outcome of the bidding process.

11. Documents Constituting the Bid:

The bid prepared by the Bidder will comprise the following components:

i. Bid Security in accordance with Clause No.19.
ii. A Bid Form and appropriate Price Schedule (**online**) completed in accordance with Clause No.12 and 13.
iii. Documentary evidence establishing in accordance with Clause No.18 that the Bidder is eligible to bid and is qualified to perform the contract if its bid is accepted.
iv. Documentary evidence establishing that the Materials / equipment and ancillary services to be supplied by the Bidder are as per the Technical specification of the bidding documents; and
v. Tax clearance certificate
vi. Schedule of Deviations
    i. Technical
    ii. Commercial

All the Schedules will be duly filled but not necessary in the sheets attached to the specification unless full details required in the schedules are furnished the Bids will be liable for rejection.

12. Bid Form:

The Bidder will complete the Bid form and the appropriate Price Schedule **(online)** furnished in the bidding documents, indicating the Materials / equipment to be supplied, a brief description of the Materials / equipment, quantity and prices.

13. Bid Prices:

13.1 The prices quoted shall be **FIRM**. Bids will be called for with prices FADS inclusive of packing and forwarding, GST handling charges to cover the transport by road from destination railway station to site/stores and insurance (transit and storage at site for 45 days).

13.2 Even though composite price is given the break-up for all the duties, taxes, freight, insurance, packing and forwarding etc., shall be furnished.

13.3 It is the responsibility of the Bidder to inform himself of the correct rates of duties and taxes leviable on the materials at the time of bidding.

13.4 The proforma credit available to the bidder on the purchases of inputs (raw materials) consequent to the introduction of "MODVAT" Scheme may be taken into account while quoting the prices.

13.5 The Bidder shall indicate on the appropriate Price Schedule (online submission) the unit prices (where applicable) and total bid price of the Materials / equipment it proposes to supply under the contract.

Prices indicated on the price schedule (online) shall be entered separately in the following manner.

The price of the Materials/equipment quoted EXWORKS and all excise and other duties and sales and other taxes payable on the finished Materials / equipment with individual breakup for Applicable taxes, packing and forwarding, freight and insurance etc.

14. Applicable taxes

14.1 A bidder will be entirely responsible for quoting the correct applicable taxes, other local taxes or levies if any, license fees, etc., he has to incur until completion of the contract. For the purpose of evaluation the bidder should clearly indicate the GST and any other levies payable. Failure to furnish such details leads to loading as indicated in the evaluation criteria.

14.2 If the rates of statutory levies assumed by the Bidder are less than the actual rates prevailing at the time of bidding, the Purchaser will not be responsible for such errors. If the rates of statutory levies assumed by the Bidder are later proved to be higher than the actual/correct rates prevailing at the time of bidding, the difference will be passed on to the credit of the Purchaser.

14.3. Deemed Export Benefits: This is not applicable for local purchases with TGSPDCL funds.

14.4. Applicable tax collected at source (TCS) is as per Government of India

15. Statutory Variations

Any variation up or down in statutory levy or new levies introduced after signing of the contract under this specification & within the delivery schedule will be to the account of TGSPDCL. In cases where delivery schedule is not adhered to by the supplier and there are upward variation / revision after the agreed delivered date the supplier will bear the impact of such levies and if there is downward variation / revision the TGSPDCL will be given credit to that extent.

In case of Sub-vendor items Taxes are inclusive in tender price. No statutory variation is applicable. Further price variations in respect of Sub-vendor items will be considered on the tender prices.

This is allowed only once during delivery period i.e at the items of delivery of goods at factory.

16. Bid Currencies:

Prices shall be quoted in Indian Rupees; and will be paid in Indian Rupees Only.

17. Quantity to quote:

Bidder shall quote a minimum quantity of at least 20% of the total quantity per item indicated in the bid Specification. Offers less than the minimum prescribed are liable for rejection.

18. Documents Establishing Bidder's Eligibility and Qualifications

The Bidder shall furnish, as part of its bid, documents establishing the Bidder's eligibility to bid and its qualifications to perform the contract if its bid is accepted.

The documentary evidence of the Bidder's qualifications to perform the contract if its bid is accepted will establish to the Purchaser's satisfaction:

(a) that the Bidder has the financial, technical, and production capability necessary to perform the contract;

(b) that the Bidder meets the qualification criteria listed in Section VI. In addition the Bidder may furnish full particulars regarding supply of the material in question made so far to TGSPDCL during the last 5 years and other reputed utilities.

18.1 Documents Establishing Materials/equipment Conformity to Bidding Documents.
The Bidder shall furnish as part of its bid, documents establishing conformity to the bidding documents of all Materials / equipment and services, which the Bidder proposes to supply under the Contract.

The documentary evidence of conformity of the Materials / equipment and the services to bidding documents may be in the form of literature, drawings, and data, and will consist of:

(a) a detailed description of the essential technical and performance characteristics of the Materials / equipment;

(b) the bidder should specifically mention about furnishing the test certificates and a specimen form of test certificate should be furnished along with the bid.

(c) a list giving full particulars, including available sources and current prices of spare parts, special tools etc., necessary for the proper and continuing functioning of the Materials / equipment following commencement of the use of the Materials / equipment by the Purchaser; and

(d) an item-by-item commentary on the Purchaser's Technical Specifications demonstrating substantial responsive-ness of the Materials / equipment and services to those specifications, or a statement of deviations and exceptions to the provisions of the Technical Specifications.

For purposes of the commentary to be furnished pursuant to above, the Bidder will note that standards for workmanship, material, and equipment, as well as references to brand names or catalogue numbers designated by the Purchaser in its Technical Specifications, are intended to be descriptive 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 Purchaser's satisfaction that the substitutions ensure substantial equivalence to those designated in the Technical Specifications.

19. Bid Security

19.1 The Bidder shall furnish, as part of its bid, a Bid Security equivalent to 2.36% of Ex-works quoted value. This amount should be paid by way of a crossed demand draft drawn on any nationalized/scheduled bank in favor of the Pay Officer, TGSPDCL and payable at headquarters of the Purchaser. The crossed DD should invariably be furnished along with the bids. Alternatively the bidders may furnish a B.G. from any nationalized/scheduled bank in original in lieu of DD as per the proforma attached. Fax / photocopies of the bid security will not be accepted and will be rejected.

19.2 The fact of having enclosed bid security by **DD/BG** along with the bid should be clearly superscribed on the bid envelope.

19.3 Submission of BID SECURITY by way of cheque, cash, money order, call deposit will not be accepted and will be considered as disqualification.

19.4 Payment of BID SECURITY will be waived at the discretion of the TGSPDCL in the case of fully owned Government undertaking of the Central or State Government. Such undertakings should immediately apply and obtain exemption before submitting their Bids. They need only refer to the details of such exemption in their Bids. Exemption accorded by any organization other than TGSPDCL will not be considered.

19.5 Requests for exemption from payment of BID SECURITY will not be entertained in any other case.

19.6 Any bid not secured as above will be rejected by the purchaser.

19.7 Unsuccessful Bidders' Bid Security will be discharged or returned as promptly as possible but not later than thirty (30) days after the expiry of the period of bid validity prescribed by the Purchaser.

19.8 The successful Bidder's Bid Security will be discharged upon the Bidder signing the contract.

19.9 The Bid Security may be forfeited:

(a) if a Bidder:

i. Withdraws its bid or alters its prices during the period of bid validity specified by the Bidder on the Bid Form, or

ii. Does not accept the correction of errors pursuant to Clause No.30.2; or

iii. Offers post Bid rebates, revisions or deviations in quoted prices and / or conditions or any such offers which will give a benefit to the Bidder over others will not only be rejected outright but the original Bid itself will get disqualified on this account and the Bidder's BID SECURITY will be forfeited.

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

i. To sign the contract in accordance with Clause No.37.

ii. To furnish performance security in accordance with Clause No.38.

19.10 In cases where the Bid Cover Contains superscription of having furnished Bid Security by way of **DD/BG** but if the same is not found within, such Bids will be rejected and bidder will run the risk of being banned.

Note : The bidder shall furnish required Bid Security amount and validity (The validity of the bank guarantee shall be upto bid validity +45 days from the date of tender opening) as per specification. If the bidder fails to furnish bid security amount and bid validity as stipulated in the specification, such tender bid will not be considered for further evaluation.

20. Period of Validity of Bids.

20.1 Bids shall remain valid for the period of Ninety (90) days from the date of bid opening prescribed by the Purchaser. A bid valid for a shorter period will be rejected.

The bidders should clearly super scribe on the sealed envelopes of the bids about the validity. Bids not containing superscription of validity will be rejected and returned unopened.

20.2 In exceptional circumstances, the Purchaser may solicit the Bidder's consent to an extension of the period of validity. The request and the responses there to will be made in writing (or by cable). The Bid Security provided under Clause No.19 will also be suitably extended. A Bidder may refuse the request without forfeiting its Bid Security.

21. Tax Clearance Certificates:

Copies of Income Tax, Turnover Tax certificates for the latest period from the appropriate authority will invariably be enclosed to the bid. In the case of proprietary or partnership firm it will be necessary to produce the certificate / certificates for the proprietor or proprietors and for each of the partners as the case may be. If the Bidder has already produced the certificate during the calendar year in which the bid is made, it will be sufficient, if particulars are given.

22. Service Conditions

22.1 The equipment/materials offered will be entirely satisfactory for operation under the climatic conditions indicated below:

(a)	Maximum ambient air temperature (in shade)	45^0 C
(b)	Maximum ambient air temperature (under sun)	50^0 C
(c)	Maximum daily average ambient air temperature	35^0 C
(d)	Maximum yearly average ambient air temperature	30^0 C
(e)	Maximum humidity	100%
(f)	Altitude above M.S.L.	Up to 1000M
(g)	Average No. of thunder storm days per annum	50
(h)	Average No. of dust storm days per annum	Occasional
(i)	Average No. of rainy days / annum	90
(j)	Average Annual Rain fall	925mm
(k)	Normal tropical monsoon period	4 months
(l)	Maximum wind pressure	150 kg/Sq.M.

22.2 Due consideration will be given to any special devices or attachments put forward by the Bidder which are calculated to enhance the general utility and the safe and efficient operation of the equipment / materials.

23. Format and Signing of Bid.

23.1 The bid shall be typed and shall be signed by the Bidder or a person or persons duly authorized to bind the Bidder to the contract. The person or persons signing the bid **will initial all pages of the bid**, except for printed literature.

23.2 Any interlineations, erasures, or overwriting will be valid only if they are initialed by the person or persons signing the bid.

D. Submission of Bids

24. Submission, Sealing and Marking of Bids.

24.1 The tenderers are required to submit their bids in two parts as under:

(i) Part-I : Bid Security, Technical Bid & Qualification Requirements
Technical Bid shall contain full technical particulars and commercial terms and conditions **but without prices**. This should not contain any cost information whatsoever.

Part-II : Price Bid – containing Prices **(shall be on-line only**)
Bids received with any details pertaining to prices in the offline mode will be Rejected

(ii) The Part-I of tender should be furnished in a sealed cover superscribing tender enquiry number, name of material, name of the bidder and date of tender opening

(iii) Part-I of the bid will be opened on the due date of tender opening. In case the bidders have been granted Bid Security exemption (clause-19), documentary evidence for the same must be furnished. The firms whose Bid Security and Transaction Fee is not received as specified in the tender document, the price bids will not be opened and their bids will be rejected summarily.

(iv) The price bids of only those bidders whose technical bids, on examination, are determined to be technically and commercially acceptable and meeting the specified Qualification Criteria will be opened at a later date.

Sealing and Marking of Bids.

24.2 The Bidder shall seal the bid in envelope.

24.3 The inner and outer envelopes will be addressed to the Purchaser.

24.4 The sealed cover as well as the outer envelope should be super scribed as follows:

(a) Bid Enquiry No.
(b) Due date and time for online submission.
(c) Payment of Bid Security
  (i) If paid, give details: D.D. No. Date:
  (ii) If not paid or exempted, give details.
(d) Whether 90 days validity offered……YES / NO
(e) Whether the quotation is made accepting Payment terms clause …. YES/NO
(f) Whether the delivery is as per delivery schedule indicated…. YES/NO
(g) Whether the samples (if specified) has been enclosed/ sent…YES/NO
(h) Whether the bid is quoted in two parts (clause 24.1)…. (YES/NO)

24.5 Bids not super scribed as above are liable to be rejected.

24.6 The Bidder shall invariably complete the Bid in full. Details to be furnished by the bidder and Schedule of Prices (On-line only) attached to the specification and enclose the same to the bid without fail.

24.7 The bids shall be in bound volumes (With the documents in the volume not detachable). All pages of the bid except in-amended printed literature shall be initialed by the person/persons signing the bid. The page number shall be referred in Index. All pages including literature, type test reports of the bid shall be numbered and the page numbers shall be continuous. Soft copy of the technical and designs with drawings shall be given in Floppy disc/ CD also. Summary sheet in the given format on the top of the bid duly signed and sealed by the bidder.

24.8 The time of actual receipt in the office only will count for the acceptance of the bid and either the date of bid, date stamp of post office or date stamp of any other office will not count. The TGSPDCL will not be responsible for any postal or any other transit delays.

24.9 Telegraphic quotations will not be entertained under any circumstances. Clarification, amplifications, and/or any other correspondence from the Bidder subsequent to the opening of bid will not be entertained. The Bidders are advised to ensure that their bids are sent in complete shape at the first instance itself.

24.10 The envelope shall also indicate the name and address of the Bidder to enable the bid to be returned unopened in case it is declared "late".

24.11 If the envelope is not sealed and marked as required above, the Purchaser will assume no responsibility for the bid's misplacement or premature opening.

25. Deadline for Submission of Bids.

25.1 Bids together with modifications if any, or other withdrawals must be received by the Purchaser not later than the deadline for submission of bids specified in the Salient features of the Bid**.**

25.2 The Purchaser may, at its discretion, extend this deadline for the submission of bids by amending the bidding documents in which case all rights and obligations of the Purchaser and Bidders previously subject to the deadline will thereafter be subject to the deadline as extended.

26. Late Bids

26.1 Any bid received by the Purchaser after the deadline for submission of bids prescribed by the Purchaser will be rejected and returned unopened to the Bidder.

26.2 Modification and Withdrawal of Bids.

The Bidder may modify or withdraw its bid after the bid's submission, provided that written notice of the modification, including substitution or withdrawal of the bids, is received by the Purchaser prior to the deadline prescribed for submission of bids.

The Bidder's modification or withdrawal notice will be prepared, sealed, marked, and dispatched. A withdrawal notice may also be sent by cable, but followed by a signed confirmation copy, postmarked not later than the deadline for submission of bids. No bid may be modified after the deadline for submission of bids.
No bid may be withdrawn in the interval between the deadline for submission of bids and the expiration of the period of bid validity specified. Withdrawal of a bid during this interval may result in the forfeiture of its Bid Security.

E. Opening and Evaluation of Bids

27. Opening of Bids by the Purchaser

27.1 The Purchaser will open all bids meeting above criteria at the time, on the date, and at the place specified.

27.2 The Bidders' names, bid modifications or withdrawals, discounts and the presence or absence of requisite Bid Security and such other details as the Purchaser, at its discretion, may consider appropriate, will be announced at the opening.

27.3 Bids that are not opened at bid opening will not be considered further for evaluation, irrespective of the circumstances.

27.4 The bid evaluation will be carried out based on the documents uploaded through www.tender.telangana.gov.in against this tender.

28. Clarification of Bids

During evaluation of the bids, the Purchaser 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 prices or substance of the bid shall be sought, offered, or permitted.

29. Preliminary Examination

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

29.2 Arithmetical errors will be rectified on the following basis. 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 will prevail, and the total price will be corrected. If the Supplier does not accept the correction of the errors, its bid will be rejected, and its Bid Security may be forfeited. If there is a discrepancy between words and figures, the amount in words will prevail. If the supplier does not accept the correction of the errors, its bid will be rejected and its Bid Security may be forfeited.

29.3 The Purchaser may waive any minor informality, nonconformity, or irregularity in bid which does not constitute a material deviation, provided such waiver doesn't prejudice or affect the relative ranking of any Bidder.

29.4 Prior to the detailed evaluation, the Purchaser will determine the substantial responsiveness of each bid to the bidding documents. For purposes of these Clauses, a substantially responsive bid is one, which conforms to all the terms and conditions of the bidding documents without material deviations. Deviations from, or objections or reservations to critical provisions, such as those concerning Bid Security, and Applicable taxes will be deemed to be a material deviation. The Purchaser's determination of a bid's responsiveness is to be based on the contents of the bid itself without recourse to extrinsic evidence.

29.5 If a bid is not substantially responsive, it will be rejected by the Purchaser and may not subsequently be made responsive by the Bidder by correction of the nonconformity.

Note : Payment terms, Delivery period, Performance Bank Guarantee, Applicable taxes" should be in line with the terms and conditions of the specification. If any bidder does not meet any one of the conditions, such tender will not be considered. Please note that the conditional offers are also not considered. Hence the bidder shall submit the tender in line with the terms and conditions of the specification

30. Evaluation and Comparison of Bids.

30.1 The Purchaser will evaluate and compare the bids, which have been determined to be Substantially responsive.

30.2 The Purchaser's evaluation of a bid will take into consideration one or more of the following factors

All the bids, which are opened, and considered for evaluation will be checked for qualification requirements in respect of technical and commercial aspects. Such of the bids, which do not meet the qualification requirements, will not be evaluated further. The bid is to be checked for its conformity to the technical specification. If it does not meet the technical specification, the Bid will not be evaluated further. However, if in the opinion of the purchaser the bidder has offered equipment / material better than the technical specification the same may be considered. The bid may be rejected for the following reasons:

1. Not in the prescribed form
2. Insufficient bid security or bid not accompanied by the required bid security or exemption.
3. Bids not properly signed
4. The bidder is a vendor who is banned from further business transactions and the period of ban is still in force.
5. Bid received after the due date and time
6. The bid is through telegram or fax

- Further, the purchaser may enquire from the bidder in writing for any clarification of the bid. The response of the bidder will also be in writing. However no change in the prices or substance of the bid will be sought, offered or permitted.
- Bids will be examined for completeness and for any computational errors.
- Arithmetical errors will be rectified on the following basis.
    - Where there is a discrepancy between the unit price and total price, the unit price will prevail and the total price will be corrected accordingly.
    - Where there is a discrepancy between words and figures, the amount in words will prevail.
    - Failure on the part of the bidder to agree to the above corrections will result in rejection of his offer and forfeiture of his bid security.
- It will be ensured that the required sureties have been furnished and that the documents have been properly signed.
- The purchaser's evaluation of a bid will take into consideration one or more of the following factors
    - (a) Delivery schedule offered in the bid;
    - (b) Deviations in payment schedule from that specified in the general terms and conditions of the contract and technical deviations.
    - (c) The cost of components, mandatory spare parts, and service;
    - (d) The availability of spare parts and after-sales services for the equipment offered in the Bid;
    - (e) The projected operating and maintenance costs during the life of the equipment;
    - (f) The performance and productivity of the equipment offered;
    - (g) Other specific criteria indicated in the Bidding documents.

In addition the Purchaser's evaluation of a bid will take into account the net landed cost of the material at the final destination. For the purpose of evaluation net landed cost is arrived at by adding all elements of the basic price, allowable discount, GST, & any other levies, packing & forwarding, freight charges, insurance (transit & storage) as quoted by the bidder, interest on advance if any, erection, servicing and other charges as called for.

In addition any variation up or down in applicable taxes / new levies introduced subsequent to bid opening and before award will be considered for comparison purposes.

The following criteria may be adopted for applicable taxes for evaluation

a. It is the responsibility of the bidder to quote all applicable taxes correctly without leaving any column unfilled. Where applicable taxes are not applicable the bidder should enter "NA". If no tax is le-viable the same may be entered as "NIL". If any column is left blank or filled vaguely like "as applicable", the same will be loaded with the maximum of the other eligible Bids.

b. Where there is an exemption of GST, the documentary evidence to that effect will be enclosed by the supplier.

c. The bidders for supply and works shall invariably possess the GST number and PAN Number for the bids above Rs. 5.00 lakhs and this must be verified before entering into contract.

- Prior to detailed evaluation, the responsiveness of each bid will be determined. A substantially responsive bid is one that conforms to all the terms and conditions of the bidding documents without material deviations. For this purpose superscription, qualification requirement, bid security, validity, delivery, payment term, price schedule, applicable taxes will be deemed to be the critical provisions and deviations in any one of these items will be deemed to be a material deviation.

  The purchaser may waive any minor informality, non-conformity or irregularity in the bid which does not constitute a material deviation, provided such waiver does not affect the relative ranking of any bidder. The purchaser will clearly indicate in the bid specification the methodology for evaluation of bids.

  (a) Bid price, which will include all, costs of manufacture and services at manufacturing place as well as, Transportation to destination stores, packing and forwarding, insurance and all Taxes & other legally permissible duties & levies payable.

  (b) Delivery schedule offered in the bid.

  (c) Deviations in payment schedule from that specified in the general terms and conditions of the contract.

  (d) The cost of components, mandatory spare parts, and service

  (e) The availability of spare parts and after-sales services for the equipment offered in the Bid;

  (f) The projected operating and maintenance costs during the life of the equipment;

  (g) The performance and productivity of the equipment offered; and/or

  (h) Other specific criteria indicated in the Bid Specification.

30.3(a) The Purchaser's evaluation of a bid will take into account the Net Landed Cost of the Material at destination stores inclusive of all applicable taxes quoted by the Bidder. It is the responsibility of the bidder to quote all Applicable taxes correctly without leaving any column unfilled. Where not applicable the column may be filled as "NA". If no tax is le-viable the same may be filled as "NIL". If any column is left blank the same is loaded with maximum of other eligible Bids.

30.3(b) Any statutory variations of applicable taxes and new levies imposed after opening of the bid and before award of the contract will be taken into consideration for the purpose of evaluation.

30.4 A substantially responsive bid is one, which conforms to all the terms and conditions of the bidding documents without material deviations. For this purpose superscription, qualification requirement, bid security, validity, delivery, payment term, price schedule, submission of Types test certificates (as per Clause 4 section VI), applicable taxes will be deemed to the critical provisions and deviations in any one of these things will be deemed to be a material deviation.

31. Contacting the Purchaser.

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

31.2 Any effort by a Bidder to influence the Purchaser in its decisions on bid evaluation, bid comparison, or contract award will result in the rejection of the Bidder's bid.

F. Award of Contract.

32. Post Qualification

32.1 In the absence of pre-qualification, the Purchaser will determine to its satisfaction whether the Bidder that is selected as having submitted the lowest evaluated responsive bid is qualified to perform the contract satisfactorily.

32.2 The determination will take into account the Bidder's financial, and production capabilities. It will be based upon an examination of the documentary evidence of the Bidder's qualification submitted by the Bidder, as well as such other information as the Purchaser deems necessary and appropriate.

33. Award Criteria:

33.1 The Purchaser will award the contract to the successful Bidder / Bidders whose bid has/have been determined to be substantially responsive.

However it is not binding on TGSPDCL to accept the lowest or any other Bid. It reserves the right to place orders on different Bidders

34. Purchaser's Right to Vary Quantities at Time of Award

34.1 The Purchaser reserves the right at the time of contract award to increase or decrease up to 50% the quantity of Materials / equipment and services originally specified in the Schedule of Materials without any change in unit price or other terms and conditions.

34.2 The purchaser reserves the right to vary the ordered quantity up to 50% during the execution of the contract.

35. Purchaser's Right to Accept Any Bid and to Reject Any or All Bids

The Purchaser reserves the right to accept or reject any bid, and to annul the bidding process and reject all bids at any time prior to contract award, without thereby incurring any liability to the affected Bidder or Bidders or any obligation to inform the affected bidder or bidders.

36. Notification of Award

36.1 Prior to the expiration of the period of bid validity, the Purchaser will notify the Successful Bidder in writing by registered letter or by cable, to be confirmed in writing by registered letter, that its bid has been accepted.

36.2 The notification of award will constitute the formation of the Contract.

36.3 Upon the successful Bidder's furnishing of the performance security, the Purchaser enters into contract with successful Bidder / Bidders. The Purchaser will notify each unsuccessful Bidder and will discharge its Bid Security.

37. Signing of Contract:

The Purchaser notifies the successful Bidder that its bid has been accepted.
Within 30 (thirty days) of receipt of notification of award of Contract, the successful Bidder will sign and date the contract. Failure to comply with this stipulation will entail cancellation of the contract besides forfeiture of the bid security.

38. Performance Security:

38.1 Within Fifteen (15) days of receipt of the notification of Contract award. The successful Bidder will furnish to the Purchaser the performance security for an amount 10% of the contract value for proper fulfillment of the contract, which will include the warranty period, and completion of performance obligations including Warranty obligations. The Performance Security will cover 60 days beyond the date of completion of performance obligations including Warranty obligations.

In the event of any correction of defects or replacement of defective material during the warranty period, the warranty for the corrected/replaced material will be extended to a further period of 12 months and the Performance Bank Guarantee for proportionate value will be extended 60 days over and above the extended warranty period.

38.2 The proceeds of the performance security will be payable to the Purchaser as compensation for any loss resulting from the Supplier's failure to complete its obligations under the Contract.

38.3 The performance security will be…

(a) A bank guarantee issued by any **nationalized/scheduled bank** acceptable to the Purchaser, in the form provided in the bidding documents.

(b) A banker's cheque or crossed DD or Pay Order payable at the Head quarter of the Purchaser in favour of the Purchaser drawn on any scheduled bank.

38.4 The performance security will be discharged by the Purchaser and returned to the Supplier not later than sixty (60) days after the expiry date.

38.5 **Failure of the successful Bidder to comply with the above requirement will entail cancellation of the award and forfeiture of the Bid Security and the balance to make up the performance security deposit will be deducted from pending payments if any due to the tenderer form TGSPDCL on other orders in addition the company will also become liable for being black listed by TGSPDCL.**

39. Corrupt or Fraudulent Practices

It is essential that the Purchaser as well as Bidder/supplier/contractor for the purposes of this provision, the terms set forth below as follows:

(i) "Corrupt practice" means the offering, giving, receiving or soliciting of anything of value to influence the action of a public official in the procurement process or in contract execution, and

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

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

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

40. Use of Contract Documents and Information:

The Supplier will not, without the Purchaser's prior written consent, disclose the Contract, or any provision thereof, of any specification, plan, drawing, pattern, sample, or information furnished by or on behalf of the Purchaser in connection therewith, to any person other than a person employed by the Supplier in the performance of the Contract. Disclosure to any such employed person will be made in confidence and will extend only so far as may be necessary for purposes of such performance.

40.2 The Supplier will not, without the Purchaser's prior written consent, make use of any document or information except for purposes of performing the Contract.

40.3 Any document, other than the Contract itself, will remain the property of the Purchaser and will be returned (in all copies) to the Purchaser on completion of the supplier's performance under the Contract if so required by the Purchaser.

40.4 The Supplier will permit the Purchaser or his authorized representative to inspect the Supplier's accounts and records relating to the performance of the Supplier and to have them audited by auditors appointed by the Supplier.

41. Patent Rights

The Supplier will indemnify the Purchaser against all third-party claims of infringement of patent, trademark, or industrial design rights arising from use of the Materials/ equipment or any part thereof.

42. Places/Locations:

42.1 Particulars of site location and nearest rail heads to which the equipments / material have to be supplied will be given to successful Bidders.

42.2 Un-loading charges of the materials at the destination stores shall be arranged by the consignees at TGSPDCL cost.

43. Delivery:

Delivery period will be reckoned from the date of signing of the contract. The delivery quoted will be firm, definite, unconditional and on the basis of receipt of materials at destination in good condition without any bearing on the procurement of raw materials or any similar prerequisites. The commencement date and date of delivery will be indicted. The preferred delivery time, which is the essence of this specification, is indicated in the schedule. Final deliveries are however, subject to confirmation at the time of Contract. Delay in delivery of materials FADS – (Free At Destination store) due to non-availability of railway booking, non-allotment of wagons and any such reasons will not be considered. It is the responsibility of the supplier to make alternative arrangements for transporting the materials by road or rail so as to see that the material reaches the destination within the stipulated period. The Purchaser reserves its right to defer the delivery date at any time after orders are placed without any change in the conclusion of contract other conditions supply. The delivery period, which will be reckoned from the date of the Contract, will be guaranteed under penalty as in Clause 61.

44. Inspections and Tests

(i) The supplier will keep the Purchaser informed in advance of the time of the starting and the progress of manufacture of equipment in its various stages so that arrangement could be made for inspection. The accredited representative of the TGSPDCL will have access to the supplier's or his subcontractor's work at any time during working hours for the purpose of inspecting the materials during manufacturing of the materials/equipment and testing and may select test samples from the materials going into plant and equipment. The supplier will provide the facilities for testing such samples at any time including access to drawings and production data at no charge to Purchaser. As soon as the materials are ready the supplier will duly send intimation to TGSPDCL by Regd. Post and carry out the tests in the presence of representative of the TGSPDCL.

(ii) The TGSPDCL may at its option get the materials inspected by the third party if it feels necessary and all inspection charges in this connection will be borne by the TGSPDCL. In case of material, not of acceptable quality or not conforming to the specification, the materials will be rejected. The material has to be re-offered for inspection. In such a case the 2nd inspection charges are to suppliers account. In case the materials are rejected in the 2nd inspection also, the TGSPDCL reserves the right to cancel the order.

(iii) The dispatches will be affected only if the test results comply with the specification. The dispatches will be made only after the inspection by the TGSPDCL Officer is completed to the TGSPDCL satisfaction or such inspection is waived by the competent authority.

(iv) The acceptance of any quantity of materials will in no way relieve the supplier of its responsibility for meeting all the requirements of this specification and will not prevent subsequent rejection if such materials are later found to be defective.

(v) The supplier will give 15 days' advance intimation to enable the Purchaser to depute his representative for witnessing the acceptance and routine tests.

(vi) Should any inspected or tested materials/equipment fail to conform to the specification, the Purchaser may reject the materials and supplier will either replace the rejected materials or make alterations necessary to meet specifications requirements free of costs to the Purchaser.

(vii) In the case of transformers, instrument transformers and meters inspection will be conducted every year, for the first 5 years on a 2% sample of the quantities supplied. Samples will be collected at random to establish that the guaranteed technical parameters are as per the submitted bid by the supplier. In the case of non-adherence, the purchaser may take suitable action on the supplier including cancellation of vendor registration and banning further dealings, depending on the gravity of the deviation. These random inspections may be entrusted to a third party.

(viii) **Inspection not carried out due to non-readiness of the material even after contacting/confirmed over phone from the supplier about availability of material and physical verification at the supplier premises, the charges @ 0.21% of Ex-works price of material offered for inspection (inclusive of applicable GST and all other taxes, travelling expenses, boarding and lodging charges at the place of inspection and all incidental charges) shall be paid by supplier subject to a maximum of Rs.10,000.00 .**

45. Name Plate:

Equipment should be provided with name plate giving full details of manufacture, capacities and other details as specified in the relevant ISS or other specification stipulated. The contract No. and date and year of supply and the words **"TGSPDCL"** must be etched on the name plate.

46. Packing

46.1 The Supplier will provide such packing of the Materials / equipment as is required to prevent their damage or deterioration during transit to their final destination, as indicated in the Contract. The packing will be sufficient to withstand, without limitation, rough handling during transit and exposure to extreme temperatures, salt and precipitation during transit, and open storage. Packing case size and weights will take into consideration, where appropriate, the remoteness of the Materials / equipment' final destination and the absence of heavy handling facilities at all points in transit.

46.2 The packing, marking, and documentation and outside the packages will comply strictly with such special requirements as will be expressly provided for in the Contract and in any subsequent instructions ordered by the Purchaser. The supplier will be required to make separate packages for each consignee, each package will be marked on three sides with proper paint / indelible ink with the following;

1. Contract Number (Purchase Order Number)
2 Supplier's name
3 Packing list reference number

46.3 The supplier, whenever dispatches material to a destination should prepare the following information in the form of packing slip in quadruplicate and send the same to the consignee and obtain his acknowledgement. The consignee will return to the supplier one copy of the packing slip with his remarks. The proforma of packing slip will be as follows:

PACKING SLIP

1. Contract No.& Date.
2. Quantity allotted to the stores and rate applicable.
3. Quantity so far supplied to the stores and the rate applied.
4. Quantity now supplied and the rate applied.
5. Total quantity supplied under the Contract with rates applied.
6. Program for supplying the balance quantity to the Stores.

47. Delivery Documents

47.1 Delivery of the Materials/equipment will be made by the Supplier in accordance with the terms specified in the contract.

The latest test certificates containing the result of the tests as per the relevant ISS or other specification stipulated must be submitted to the CHief Engineer (P&MM) and got approved by him.

47.2 Documents to be submitted by the Supplier are specified as under…

(i) Insurance certificate;
(ii) Supplier's certificate certifying that the defects if any pointed out during inspection have been rectified (3 copies).
(iii) Manuals in Six sets and one set of reproducible drawings.

The Purchaser will receive the above documents soon after the dispatch of materials and if not received, the supplier will be responsible for any consequent expenses.

48. Insurance

48.1.1 The Materials/ equipment supplied under the Contract will be fully insured against loss or damage incidental to manufacture or acquisition, transportation and delivery and also storage for **45 days** at destination stores before taking into stock.

48.1.2 The bidder shall a) Initiate and pursue insurance claim till settlement, and b) Promptly arrange for repair and/or replacement of any damaged items in full irrespective of settlement of insurance claim by the under Writers. c) All costs because of insurance liabilities covered under the contract will be to supplier's account. The supplier shall provide the Purchaser with a copy of all insurance policies and documents taken out by him in pursuance of the 'Contract'. Such copies of documents shall be submitted to the purchaser immediately after such insurance coverage. The supplier shall also inform the Purchaser in writing at least sixty (60) days in advance, regarding the expiry, cancellation and/or change in any of such documents and ensure revalidation/renewal etc., as may be necessary well in time.

The risks that are to be covered under the insurance shall be comprehensive and shall include but not limited to, the loss or damage in transit, storage, due to theft, pilferage, riot, civil commotion, weather conditions, accident of all kinds, fire, flood, war risk(during ocean transportation) bad or rough handling etc. The scope of such insurance shall cover the entire contract value.

The insurance will be in an amount equal to 100% FADS value of Materials / equipment on all risks basis. The policy will have a provision for extension to cover further storage if necessary at destination stores / site at TGSPDCL cost. **The insurance beneficiary shall be of TGSPDCL.**

49. Transportation

The Supplier is required under the Contract to transport the Materials / equipment to a specified place of destination defined as normally the district stores, transport to such place of destination, including insurance and storage, will be arranged by the Supplier, and the related costs will be included in the Contract Price only.

50. Incidental Services

The Supplier may be required to provide any or all of the following services, including additional services, if any.

a) Performance or supervision of on-site assembly and/or start-up of the supplied Materials /equipment;

b) Furnishing of tools required for assembly and/or maintenance of the supplied Materials /equipment;

c) Furnishing of a detailed operations and maintenance manual for each appropriate unit of the supplied Materials / equipment;

d) Performance or supervision or maintenance and/or repair of the supplied Materials/ equipment, during warranty period, provided that this service will not relieve the Supplier of any warranty obligations under this contract; and

e) Training of the Purchaser's personnel, at the Suppliers' plant and/or on-site, in assembly, start-up, operation, maintenance, and/or repair of the supplied Materials/ equipment.

51. Spare Parts

The Supplier may be required to provide any or all of the following materials, notifications, and information pertaining to spare parts manufactured or distributed by the Supplier.

(a) Such spare parts as the Purchaser may choose to purchase from the Supplier, provided that this election will not relieve the supplier of any warranty obligations under the contract; and

(b) In the event of termination of production of the spare parts:

(c) Advance notification to the Purchaser of the impending termination.

(d) Time to permit the Purchase to procure needed requirement; and following such termination, furnishing at no cost to the Purchaser, the blueprints, drawings, and specifications of the spare parts, if requested.

52. Warranty

52.1 The supplier will warrant for the satisfactory functioning of the material / equipment as per specification for **a minimum period of 5 years** from the date of receipt of the material / equipment in good condition.

52.2 The Supplier warrants that the Materials/equipment supplied under the Contract are new, unused, of the most recent or current models, and that they incorporate all recent improvements in design and materials unless provided otherwise in the Contract. The supplier further warrants that all Materials/equipment supplied under this Contract will have no defect, arising from a design and /or materials as required by the Purchaser's specifications or from any act of omission of the Supplier that may develop under normal use of the supplied Materials/equipment.

52.3 All the material will be of the best class and will be capable of satisfactory operation in the tropics under service conditions indicated in clause 23.1 without distortion or deterioration. No welding filling or plugging of defective parts will be permitted, unless otherwise specified, they will conform to the requirements of the appropriate Indian, British or American Standards. (Where a standard specification covering the material in question has not been published, the standards of the American Society for testing of Materials should be followed).

52.4 The entire designs and construction will be capable of withstanding the severest stresses likely to occur in actual service and of resisting rough handling during transport.

52.5 Unless otherwise specified the warranty period will be **5 years** from the date of acceptance of the Materials / equipment. The Supplier will, in addition, comply with the performance guarantees specified under the contract. If, for reasons attributable to the Supplier, these guarantees are not attained in whole or in part, the supplier will at its discretion either, Make such changes, modifications, and/or additions to the Materials / equipment or any part thereof as may be necessary in order to attain the contractual guarantees specified in the contract at its own cost and expense and to carry out further performance tests as per the relevant standards.

52.6 The Purchaser will promptly notify the supplier in writing of any claims arising under this warranty.

52.7 "Upon receipt of such notice, the Supplier will within 30 days repair or replace the defective Materials/equipment or parts thereof, free of cost at the ultimate destination. The supplier will take over the replaced parts/Materials/equipment at the time of their replacement. No claim whatsoever will lie on the Purchaser for the replaced parts/Materials/equipment thereafter". In the event of any correction of defects or replacement of defective material during the warranty period, the warranty for the corrected/replaced material will be extended to a further period of 12 months.

52.8 If the Supplier, having been notified, fails to remedy the defect(s) within the above period, the Purchaser may proceed to take such remedial action as may be necessary, at the Supplier's risk and expense duly deducting the expenditure from subsequent bills / bank guarantee and without prejudice to any other rights which the Purchaser may have against the Supplier under the Contract.

53. Payment

53.1 **100% payment** along with F&I, applicable taxes **will be made on or after 30 days** reckoned from the date of receipt of material/ equipment at destination/ stores (i.e., 103 entry in SAP module), duly transferring the said amount to the bank account of the supplier by the purchaser bank. The supplier will have to predefine the Bank Account details before entering into contract for electronic transfer of Payments.

53.2 The 100% payment mentioned above is subject to on submission of performance security as per Clause 38 by the supplier.

53.3 The supplier should invariably submit test certificates and other documents, the purchaser specifies as soon as dispatch is made so that they can be checked and approved well in advance.

53.4 The performance guarantee to be executed in accordance with this specification will be furnished on a stamp paper of value Rs.100/-. The Bank Guarantee will be extended if required suitably. In accordance with the provisions of Clause No.38.

53.5 If the supplier has received any over payments by mistake or if any amounts are due to the TGSPDCL due to any other reason, when it is not possible to recover such amounts under the contract resulting out of this specification, the TGSPDCL reserves the right to collect the same from any other amount and / or Bank Guarantees given by the company due to or with the TGSPDCL.

53.6 When the supplier does not at any time, fulfill his obligations in replacing/rectifying etc. of the damaged/defective materials in part or whole promptly to the satisfaction of the TGSPDCL Officers, the TGSPDCL reserves the right not to accept the bills against subsequent dispatches made by the supplier and only the supplier will be responsible for any demurrages, wharf ages or damage occurring to the consignments so dispatched.

54. Prices

Prices charged by the Supplier for Materials/equipment delivered and Services performed under the Contract will not vary from the prices quoted by the supplier in its bid, with the exception of any price adjustment authorized in the contract.

55. Change Orders

The Purchaser may at any time, by a written order given to the Supplier make changes within the general scope of the Contract in any one or more of the following:

(a) Drawings, designs, or specifications, where Materials / equipment to be furnished under the Contract are to be specifically manufactured for the Purchaser;

(b) The method of shipment or packing;

(c) The place of delivery; and/or

(d) The Services to be provided by the Supplier.

56. Contract Amendments

No variation in or modification of the terms of the Contract will be made except by written amendment by the Purchaser and accepted by the supplier.

57. Assignment

The Supplier will not assign, in whole or in part, its obligations to perform under this Contract, except with the Purchaser's prior written consent.

58. Delays in Supplier's Performance

58.1 Delivery of the Materials / equipment will be made by the Supplier in accordance with the time schedule prescribed by the Purchaser in the Schedule of materials.

58.2 If at any time during performance of the Contract, the Supplier should encounter conditions impeding timely delivery of the Materials / equipment, the Supplier will promptly notify the Purchaser in writing of the fact of the delay, its likely duration and its cause(s). As soon as practicable after receipt of the Supplier's notice, the Purchaser will evaluate the situation and may at its discretion extend the Supplier's time for performance, with or without liquidated damages, in which case the extension will be ratified by the parties by amendment of the Contract.

58.3 Except as provided under force measure clause a delay by the Supplier in the performance of its delivery obligations will render the Supplier liable to the imposition of liquidated damages unless an extension of time is agreed upon without the application of liquidated damages.

59. Penalty for delay in supplies

The time for and the dates for delivery mentioned in the contract will be deemed to be the essence of the contract. Subject to force measure Clause No.64, if the Supplier fails to deliver any or all of the Materials/equipment or to perform the Services within the period(s) specified in the Contract, the Purchaser will, without prejudice to its other remedies under the Contract, deduct from the Contract Price, as liquidated damages, a sum equivalent to 0.5% per week on the undelivered portion subject to a maximum of 5% of the cost of the undelivered portion within the scheduled time. The number of days would be rounded off to the nearest week and penalty calculated accordingly. Once the maximum is reached the Purchaser may consider termination of the contract.

The check measurement date i.e., the date of receipt of materials at destination stores in good condition will be taken as the date of delivery. For calculation of penalty the date of receipt of material at the destination stores is the date of delivery subject to the condition that the goods/materials are received in good condition. Materials/Equipment which are not of acceptable quality or are not confirming to the specification would be deemed to be not delivered. For penalty, the number of days would be rounded off to the nearest week and penalty calculated accordingly.

The penalty specified above will be levied and would be adjusted against subsequent pending bills.

In cases where new vendors fail to meet the requirement of the Contract there would be no penalty to such vendors but they will be excluded from the next bid for the particular item of the material.

Any failure on the part of new vendors for a second time would cause them to be removed from the list of registered vendors.

60. Risk Purchase

In case of supplier who has not adhered to the delivery schedule, the TGSPDCL reserves the right to purchase the balance quantity from the open market/floating another tender and recover the extra expenditure thus incurred from the supplier.

61 Termination for Default

61.1 The Purchaser, without prejudice to any other remedy for breach of Contract, by written notice of default sent to the Supplier, may terminate this Contract in whole or in part:

i. If the Supplier fails to deliver any or all of the Materials / equipment within the period(s) specified in the Contract, or within any extension thereof granted by the Purchaser.

ii. If the Supplier fails to perform any other obligation(s) under the Contract.

iii. If the Supplier, in the judgment of the Purchaser has engaged incorrupt or fraudulent practices in competing for or in executing the Contract.

61.2 In the event the Purchaser terminates the Contract in whole or in part, the Purchaser may procure, upon such terms and in such manner, as it deems appropriate, Materials /equipment or services similar to those undelivered, and the Supplier will be liable to the Purchaser for any excess costs for such similar Materials / equipment or Services. However, the Supplier will continue performance of the Contract to the extent not terminated.

62. Termination for Insolvency

The Purchaser may at any time terminate the Contract by giving written notice to the Supplier if the Supplier becomes bankrupt or otherwise insolvent. In this event, termination will be without compensation to the supplier, provided that such termination will not prejudice or not affect any right of action or remedy, which has accrued or will accrue thereafter to the Purchaser.

63. Termination for Convenience

63.1 The Purchaser, by written notice sent to the Supplier, may terminate the Contract, in whole or in part, at any time for its convenience. The notice of termination will specify the termination is for the Purchaser's convenience, the extent to which performance of the supplier under the Contract is terminated, and date upon which termination becomes effective.

63.2 However the Materials/equipment that are complete and ready for shipment within thirty (30) days after the supplier's receipt of notice of termination will be accepted by the Purchaser at the Contract terms and prices.

64. Force Majeure

64.1 The Supplier will not be liable for forfeiture of its performance security, penalty for late delivery, or termination for default if and to the extent that its delay in performance or other failure to perform its obligations under the Contact is the result of an event of Force Majeure.

64.2 For purposes of this clause, "Force Majeure" means an event beyond the control of the Supplier and not involving the Supplier's fault or negligence and not foreseeable. Such events may include, but are not restricted to, wars or revolutions fires, floods, epidemics, quarantine restrictions, and freight embargoes.

64.3 If a Force Majeure situation arises, the supplier will promptly notify the Purchaser in writing of such condition and the cause thereof. Unless otherwise directed by the Purchaser in writing, the Supplier will continue to perform its obligations under the Contract as far as is reasonably practice, and will seek all reasonable alternative means for performance not prevented by the Force Majeure event.

No price variance will be allowed during the period of force measure.

65. Settlement of Disputes

65.1 If any dispute or difference of any kind whatsoever will arise between the Purchaser and the Supplier in connection with or arising out of the Contract, the parties will make every effort to resolve amicably such dispute or difference by mutual consultation.

65.2 If, after thirty (30) days the parties have failed to resolve their dispute or difference by such mutual consultation, then either the Purchaser or the Supplier may give notice to the other party of its intention to commence arbitration, as hereinafter provided, as to the matter in dispute, and no arbitration in respect of this matter may be commenced unless such notice is given.

65.3 Any dispute of difference in respect of which a notice of intention to commence arbitration has been given in accordance with this Clause will be finally settled by arbitration. Arbitration may be commenced prior to or after delivery of the Materials /equipment under the Contract.

65.4 Arbitration proceedings will be conducted in accordance with the following rules of procedure. The dispute resolution mechanism will be as follows:

1. In the case of a dispute or difference arising between the Purchaser and a Supplier relating to any matter arising out of or connected with this agreement, such dispute or difference will be settled in accordance with the Arbitration and Conciliation Act. 1996. The Arbitral Tribunal will consist of three Arbitrators one each to be appointed by the Purchaser and the supplier the Third Arbitrator will be chosen by the two Arbitrators so appointed by the parties and will acts as Presiding Arbitrator. In case of failure of the two Arbitrators appointed by the parties to reach upon a consensus within period of 30 days from the appointment of the Arbitrator appointed subsequently, the Presiding Arbitrator will be appointed by The Institution of Engineers (India).

2. If one of the Parties fails to appoint its Arbitrator in pursuance of Sub-Clause (a) within 30 days after receipt of the notice of the appointment of its Arbitrator by The Institution of Engineers (India), will appoint the Arbitrator. A certified copy of the order of the Institution of Engineers (India), making such an appointment will be furnished to each to the parties.

3. Arbitration Proceedings will be held at Purchaser's Headquarters, and the language of the Arbitration Proceedings and that of all documents and communication between the parties will be English.

4. The decision of the majority of Arbitrators will be final and binding upon both parties. The cost and expenses of Arbitration Proceedings will be paid as determined by the Arbitral Tribunal. However, the expenses incurred by each party in connection with the preparation, presentation etc., of its proceedings as also the fees and expenses paid to the Arbitrator appointed by such party or on its behalf will be borne by each party itself.

5. Where the value of the Contract is Rs. One Crore and below, the disputes or differences arising will be referred to the Sole Arbitrator. The Sole Arbitrator should be appointed by agreement between the parties; failing such agreement, by the appointing authority namely The Institution of Engineers (India).

65.5 Notwithstanding any reference to arbitration herein,

The parties will continue to perform their respective obligations under the Contract unless they otherwise agree; and

The Purchaser will pay the Supplier any monies due the Supplier.

66. Jurisdiction

All and any disputes or differences arising out of or touching this contract will be decided by the Courts or Tribunals situated in Purchaser's Headquarters only. No suit or other legal proceedings will be instituted elsewhere.

67. Notices

67.1 Any notice given by one party to the other pursuant to this Contract will be sent to the other party in writing or by cable, telex, or facsimile and confirmed in writing to the other party's address.

67.2 A notice will be effective when delivered or on the notice's effective date, whichever is later.

68. Foreign Exchange

No Foreign Exchange is available or expected for this purchase. Offers which do not require release of F.E. or procurement of import license by TGSPDCL only will be considered. Where some of the components are to be imported the manufacturer will have to make their own arrangements for import license etc., and should not look for any assistance from TGSPDCL.

SECTION – IV

SCHEDULE OF MATERIALS

SPECIFICATION NO.STN-1586/2026-27

Sl. No.	Description of material	Qty. Required (Nos.)	Free at destination stores
1.	11KV, 3 Pole, 1250A, 50 HZ, 25KA/3Sec porcelain clad vacuum circuit breakers with outdoor control and relay panels & current transformers with control voltage 24V DC suitable for outdoor installation conforming to IS: 13118/IEC-62271-100/2008 (latest version) and as per the technical particulars described in Sec.V including Control Relay panel With Differential &Protection IED Relays with auxiliary relays and with 3 Nos. **Current Transformers of ratio : 600-300/1-1-1A for LV control VCBs**.	**164**	Free at destination Stores of TGSPDCL JURISDICTION

NOTE:-

(i) The prices quoted shall be **FIRM** in Indian Rupees.

(ii) The prices should be Free at destination stores.

(iii) In e-procurement commercial stage, if F&I charges are applicable then mention whether F&I charges entered are exclusive/inclusive of GST in the remarks section. If not mentioned in remarks, F&I charges will be considered as inclusive of GST.

(iv) **Desired Delivery**: To commence within one month from the date of receipt of purchase order and complete within two months thereafter or as per TGSPDCL Requirement. **Month wise delivery may be quoted**

SD/-
CHIEF ENGINEER (P&MM)
TGSPDCL

TECHNICAL SPECIFICATION FOR 11KV LV VCBS WITH CONTROL & RELAY PANELS AND CURRENT TRANSFORMERS OF RATIO 600-300/1-1-1A

I SCOPE:

This specification covers the manufacture, assembly, supply and delivery of Destination stores of 11 KV (Vacuum) Out Door porcelain clad circuit breakers including current transformers, meters, relays and control panels for outdoor installations. The power system is with neutral solidly earthed.

II. APPLICABLE STANDARDS:

Unless otherwise modified in this specification, the Circuit Breakers, Current Transformers etc. shall comply with the following Standards with latest amendments.

IS 13118/1991 – High Voltage A.C. Circuit Breakers.
IEC 62271-100 or latest version– Circuit Breakers.
IS 16227:2016 (Latest version) &IEC61869:2007 – Current Transformers.
IS 335 -Oil
IS 2633 - Galvanization
IS 10601 Primary terminals
IS 2099/1986 – Bushings for Alternating Voltages.
IS 13010/2003 IS 13779/1999 – Energy Meters
IS 3231/1986 & 87 – Relays.
IS 1248/2003 – Ammeters & Voltmeters.
IS 13947/Pt 1/93 – Degree of protection provided by Enclosures.

III. CLIMATIC CONDITIONS:

The climatic conditions under which the equipment shall operate satisfactorily are as indicated at clause No.22 of General and Financial terms and conditions for supply of materials.

IV. PRINCIPAL PARAMETERS:

1. CIRCUIT BREAKERS :

1.1.	Nominal System Voltage	:	11KV
1.2	Type	:	Vacuum porcelain clad
1.3	Service	:	Outdoor
1.4	No. of Poles/Phases	:	THREE
1.5	High system voltage	:	12KV
1.6	Rated Frequency	:	50 Hz
1.7	System of earthing	:	Neutral solidly grounded
1.8	**Insulation level**	:	
1.8.1.	Impulse withstand Voltage	:	75 KVP
1.8.2	One minute power frequency withstand voltage.	:	28 KV (rms)
1.8.3	Power frequency withstand Voltage on Auxillary circuit	:	2 KV (rms)/1 Minute

Note: Please note that the above insulation levels supply at the reference conditions of temperate, pressure and humidity specified below:

Temperature	:	20 degree C.
Pressure	:	1013 millibars
Humidity	:	11 g/m 3

1.9 Rated Thermal Current : **1250 A**

1.10. Rated short circuit breaking current:

1.10.1. Symmetrical : **25 KA/3 Sec**

1.10.2. Asymmetrical : As per IS – 13118/1991 or IEC-62271-100 or latest version

1.11. Rating making capacity : 2.50 times Rated Short circuit breaking Current (Symmetrical)

1.12 Rated short time withstand Current for 3 Sec. : **25 KA**

1.13 Total break time : **60 m sec (max)**

1.14 Bushing Insulator Creepage distance : Not less than 300 mm

1.15. Mounting : Steel Structure

1.16. Rated Operating Sequence: O-0.3S – CO-3min - CO

1.17. Operating Mechanism : Motor operated/Manual spring Charged. The standard DC Voltage for the operating devices shall be 24V DC Operating Voltage for motor spring charging mechanism shall be **250V with ± 20%, AC single phase**. Normally the breaker shall be operated by Power and there shall be provision for manual operation

1.18. Terminal Connector : Aluminium terminal connector

1.18.1 Suitable for : Panther ACSR

1.19. Limits of temperature : The limits of temperature shall be in accordance with IS-13118/IEC-62271-100 or latest version

1.20. Requirement of Simultaneity of Poles : The maximum difference between instants of contact touching during closing and the maximum difference between the instant of contacts separation during opening between 3 poles shall not exceed one half cycle of the rated frequency. The Breaker shall be open and close simultaneously on all three phases for fault on any phase and or all the phases.

1.21 Protection : **(I)**The Breaker shall be provided with

(i) Differential & Controlling IED Electronic As per Annexure-II)
(ii) Auxiliary Relay for Buchholz Alarm with flag.
(iii) Auxiliary Relay for OLTC Buchholz Alarm with flag
(iv) Auxiliary Relay for Low Oil Alarm with flag.

The following shall be with 2NO + 2NC contacts & hand reset Type with flag.

(v) Auxiliary Relay for Buchholz Relay trip.
(vi) Auxiliary Relay for OLTC Buchholz Relay Trip
(vii) Auxiliary Relay for PRV Trip with flag.

II) Anti pumping relay.
III) WT/OT Trip
IV) Master trip relay

Note: The IED (Intelligent Electronic Device) relays shall be draw out type and mechanical relays are of non-draw out type.

1.22 Auxiliary Power Supply :

1.22.1 A.C. Supply : **250 V + or – 20%** (Phase to neutral), 3 phase, 50 HZ + or – 5%, Effectively earthed system.

1.22.2 D.C. Supply : 24V + or – 10%, 2 wire ungrounded system.

1.22.3 Supply point:

1.22.3.1 Auxillary power supplies listed above will be made available to each circuit breaker as below :

A.C. Supply : Single Feeder

D.C. Supply : Single feeder

1.22.3.2 M.C.B. shall be provided at the circuit breaker for each incoming A.C. Supply. For D.C. supply double pole M.C.B. shall be provided. (with different colours for easy identification).

The Rating of MCB shall be 10 Amp.

2 CURRENT TRANSFORMERS: LV Control

2.1	Rated voltage	: 11 KV
2.2.	Type	: Single phase outdoor live tank oil cooled Vacuum impregnated type
2.3.	Earthing	: Solidly earthed
2.4	Insulation level	
2.4.1.	Nominal system voltage	: 11 KV
2.4.2.	Highest system voltage	: 12 KV
2.4.3.	Impulse withstand voltage	: 75 KV peak
2.4.4.	One minute power frequency withstand voltage	
	a. Primary (HV)	: 28 KV
	b. Secondary (LV)	: 3 KV
2.5.	Frequency	: 50 Hz
2.6.	**Transformation ratio**	**: 600-300/1-1-1 A**
2.7	Rated secondary current (Amp)	:
	i) Core I (Protection)	: 1
	ii) Core II (Metering)	: 1
	iii) Core III (Special Protection)	: 1
2.8	Rated output (VA)	:
	i) Protection	: 15
	ii) Metering	: 5

2.9. Class of accuracy :

2.9.1 i) Protection (Core I) : 5P10

2.9.1 ii) Metering (Core II) : **0.2S**

iii) Special Protection

a)Maximum Knee point Voltage Requirement : -- 40 I (Rct +10) ---I = Rated current of CT.

b) Maximum Excitation current: < (less than or equal to) 30mA at 0.25 Vk

2.10	Short time thermal current and its duration	: **25KA/3Sec** The short time thermal current should Suit the breaker rupturing capacity and duration to suit the maximum tripping Time.
2.11.	Accuracy Limit factor	: **10** for protective core
2.12	Class of Insulation	: Immersed in new insulating oil.

2.12.1 Limit of Temp. Rise (Max.) : 55 °C.
2.13 Rated Continuous Thermal Current : 600 A

NOTE: The CTs shall be live tank out door type and shall be offered with first filling of oil. The oil shall confirm to the latest IS:335.

V. TECHNICAL REQUIREMENTS:

I. CIRCUIT BREAKERS

1.1 DESIGN CRITERIA

The equipment will be used in High Voltage system having characteristics as listed in the specification.

The equipment will be installed outdoor in hot, humid and tropical atmosphere.

All equipment, accessories and wiring shall have tropical protection, involving special treatment of metal and insulation against fungus, insects and corrosion.

The maximum temperature in any part of the equipment at specified rating shall not exceed the permissible limits as stipulated in the relevant standards.

The equipment shall be capable of withstanding the dynamic and thermal stresses of listed short circuit current without any damage or deterioration.

The safety clearances of all live parts of the equipment shall be as per relevant standards.

1.2 TYPE AND DUTY:

The circuit breaker shall be outdoor, 3-pole, vacuum type **M2 class (minimum 10,000 operations)** in case of 11KV having internal isolation without any sequential interlock.

In the event of order, the tenderer have to offer at least one breaker tested in respect of Temperature rise test and Mechanical endurance test of 10,000 Mechanical operations (M2 Class) in presence of purchaser representative as an acceptance test.

The duty of the circuit breaker shall involve satisfactory interruption of short circuit currents as listed in the clause-IV (Principal Parameters).

The breaker shall be capable of interruption of reactive current (lagging/leading) without under/over voltage.

1.3 CONSTRUCTION FEATURES:

1.3.1 GENERAL ARRANGEMENTS:

The circuit breaker shall have fixed type construction consisting three single identical poles, complete with a gang operated mechanism for specified duty. The interrupters shall be enclosed in a sealed porcelain housing conforming to protection to IS 13947 Pt1 equivalent IP-65 protection (IS:2147). All three poles of circuit breaker shall be linked together electrically / mechanically to ensure simultaneous closing/tripping of all poles.

The trip free operating mechanism, 3 phase inter connection links shall be completely accommodated in the base. There shall be sufficient clearance between live parts of the circuit breakers and the ground. The circuit breaker shall be complete with operating mechanism, other accessories/materials to ensure complete assembly and proper functioning. The current transformers shall be externally mounted on the supporting structure integrated with circuit Breaker structure. **Aluminium terminal connectors** suitable for panther ACSR conductor for 11KV should be supplied for Circuit Breakers and CTs. The circuit breaker shall be

provided with proper standard earthing and with terminal earth bar for earthing connection. Suitable inter-connection cable from breaker terminal, CTs terminal to control relay panel is 2.5 Sq.mm. PVC copper control cable (un-armored) are to be provided.

Neither the circuit breaker nor any part of the switchgear or its supporting structures shall be permanently strained due to vibration etc. when making or breaking the rated short circuit currents.

The details of any device incorporated in the current breakers to limit or control the rate of restriking voltage across the circuit breaking contacts shall be stated.

The vacuum interrupter assembly used in the circuit breakers shall be interchangeable with indigenously available vacuum interrupters (make and type shall be mentioned.).

Flexible laminations used in VCB shall be electrolytic copper. The ends of the laminations shall be solidified with hot pressed/electro fusion/Electro solidification method to ensure good electrical contacts and achieve minimum contact resistance.

All metal enclosures shall be fabricated from minimum 2.5mm CRCA steel sheet free from all surface defects. The panel shall have sufficient structural re-enforcement to ensure a plain surface to limit vibration and to provide rigidity during dispatch and installation.

1.3.2 MAIN CONTACTS AND ARC QUENCHING CHAMBER :

The main contacts shall have adequate area and contact pressure for carrying rated continuous and short time current without excessive heating liable to cause pitting and welding.

The tips of the arcing and main contacts shall be **special copper-Chromium alloy.**

The contacts that are adjustable to allow for wear, shall be easily replaceable and shall have minimum movable part and adjustments. The arc-quenching device shall be of robust construction and shall not require any critical adjustment. The devices shall be easily accessible and removable for access to the breaker contacts.

1.3.3 INTERLOCK :

All electrical and mechanical interlocks which are necessary for safe and satisfactory operation of the circuit breaker shall be furnished.

1.3.4 AUXILIARY CONTACTS :

Each breaker shall be provided with 6 normally open and 6 normally closed electrically separate spare Auxiliary contacts in addition to those required for its own operation and indication exclusively for purchaser's use.

The auxiliary contacts shall be rotating type so that normally open contacts can be rotating into normally close contacts and vice verse at site.

Minimum requirement current rating for auxiliary contacts shall be 10A for AC and 10A for DC.

Note : 1. **1 No. Spare Tripping Coil and 1No.Spare Closing Coil shall be clamped in the Breaker**.

2. Spring charging multiplier with **2 NO+2NC** shall be available and shall be wired to the spare terminal blocks.

3. Auxiliary switch contact multiplier shall also be incorporated in the control panel and shall be wired to the spare terminal blocks.
4. Spare tripping coil and closing coil for each breaker & an auxiliary switch, TNC switch for 3 breakers shall be given.

1.3.5 INSULATORS :

Bushing insulators for circuit Breakers shall comply with IS2099-1986 specification for High Voltage porcelain bushings.

Insulators shall be wet process porcelain, brown glazed and free from all blemishes. Ferrous metal parts and hardware shall be hot-dip galvanized.

Insulators shall have adequate mechanical strength and rigidity to withstand the duty involved.

When operated at maximum system voltage, there shall be no electrical discharge. Shielding rings, if necessary, shall be provided. Insulation shall be coordinated with basic impulse level of the system. The creepage distance shall correspond to heavily polluted atmosphere.

1.4. OPERATING MECHANISM:

The operating mechanism shall be motor operated and manual operated spring closing mechanism with trip free features complete with shut trip coils. All three poles of the breaker shall operate simultaneously. It shall operate in principle in such a way that the closing springs after each closing operation, are automatically charged by the motor and locked in the charged position by a latch. Means shall be provided to charge the springs manually also. Provision shall be made for the slow closing of the VCB without spring charging.

The contact loading spring shall be designed in such a way that the closing stroke be completed and the opening stroke is commenced only from fully closed position. All the breakers shall be suitable for manual operation **as well as slow closing irrespective of spring charge position**.

Operation counter and mechanically operated indicator to show whether the circuit breaker is open or closed shall be provided on the circuit breaker operating mechanism.

All manually operating gear shall be so designed that the circuit breaker can be operated by one movement. The mechanism shall be such that the tripping spring can be charged while the circuit breaker is closed and the closing mechanism when charged shall not be operated by vibration caused by the circuit breaker opening under fault conditions. The spring shall be suitable for 4 short reclosing operation.

The mechanism shall be designed for electrical control from remote. Local manual close/trip (lever/button) shall be provided in the mechanism box only.

In the event of failure of electrically spring charging of the motor, facility to be provided to charge the breaker mechanically and close the breaker electrically. No mechanical/electrical inter lock shall be inbuilt the manual spring charging of breaker.

Mechanical components Other than spring-spring Mechanism like linkages, shafts etc shall have minimum plating thickness of 10-15 microns. The surface finishing ensures Zinc plating trivalent Passivation (ROHS Compliance) and should withstand for salt spray test in artificial atmosphere upto 192 hrs without white rust.

1.5 CONTROL CUBICLE (MECHANISM BOX)

A common control cubicle shall be furnished to house electricals, controls, monitoring devices and all other accessories except those which must be located on individual poles.

The cubicle shall have protection as per IS:13947 Pt1 equivalent IP-55 protection (IS:2147) of gasketed whether proof construction, fabricated from sheet steel minimum 2.5mm thick.

The cubicle shall have front access door with lock and keys, and removable gland plate at the bottom for cable entry.

If any terminal block is provided in rear side of VCBs mechanism box then door at rear shall be provided for accessing the terminals.

Additional locking arrangement (pad locking facility) is to be provided.

1.6 WIRING & TERMINAL BLOCKS:

1.6.1 WIRING

Wiring shall be complete in all respects to ensure proper functioning of the control, protection, monitoring and interlocking schemes.

Wiring shall be done with flexible 650 V grade, PVC insulated switch board wires with 2.5 sq.mm. stranded copper conductor.

Each wire shall be identified at both ends with permanent markers bearing wire numbers as per wiring diagram. The wiring schematic may confirm to relevant standards. Wire termination shall be done with crimping type connectors with insulating sleeves.

Each wire shall be identified at both ends with permanent markers bearing wire numbers as per wiring diagram. The wiring schematic may conform to relevant standards.

Wire termination shall be done with crimping type connectors with insulating sleeves.

All spare contacts of relays, push buttons, auxiliary switchers etc. shall be wired upto terminal blocks in the control cubicle.

1.6.2. TERMINAL BLOCKS :

Terminal blocks shall be 650 V grade, Nut & Bolt type (Stud Type).

Not more than two wires shall be connected to any terminal. Spare terminals equal in number to 20% active terminals shall be furnished.

Terminal blocks shall be located to allow easy access. Wiring shall be so arranged that individual wires of an external cable can be connected to constructive terminals.

1.7 NAME/RATING PLATE:

BREAKERS : Each circuit-breaker shall be provided with a name plate or plates legibly and indelibly marked with the following information:

a) Name of manufacturer.
b) Type of designation and serial number.
c) Rated Voltage and current.
d) Rated frequency.
e) Rated symmetrical breaking capacity.
f) Rated making capacity and
g) Rated short-time current and its duration.

h) P.O. No. & Date
i) Period of Guarantee

Note : 1. The word "Rated" need not appear on the name plate, recognized abbreviations may be used to express the above quantities.

2. When the circuit breaker is fitted with closing and/or tripping devices necessitating any auxiliary supply the nature of the auxiliary supply shall be stated either on the circuit breaker name-plate or in any other acceptable position.

3. Sl. No. of the equipment, Date and year of Supply, Purchase order Number, Warranty and works "TGSPDCL" must be etched on the name plate

2. CONTROL & RELAY PANELS :

2.1 CONSTRUCTION :

The Control panels to house meters, relays and other items shall be weather proof and vermin proof and of rust-free pressed steel cubicle type with hinged door and locking device. Ventilation louvers shall be provided with GI mesh. The frame shall be made of angle iron or structural steel of sufficient weight and strength to ensure permanent rigidly and alignment. The control panel shall be provided with inter connections, small wiring leads, terminal bolts, fuses, earth bar, multi core cable glands, earth connections etc, The panel should be provided with locking handle with built-in door lock and lock shall be provided with duplicate keys.

The outdoor panels shall be preferable of the following dimensions :-

Height 1750 mm (Excluding the height of the stand)
Width 600 mm
Depth 600 mm

The exterior of the panels shall be painted with dark admiral grey colour and interior should be painted with half white colour. The panel shall be provided with fuse units/MCBs for AC Circuit (both phase and neutral) for all phases of potential Circuit (Potential coil connections to energy meters etc.) DC Control Circuit etc. The internal wiring of the panels shall be with 2.5 sq.mm 650 V grade standard copper PVC Insulated wiring of reputed make.

The Guage of the sheet steel for the front of the panels (where the meters etc. are fixed) and supporting members of the panels shall be of 3 mm thick and for the other members of the panel sheet steel thickness shall be 2 mm.

The suitable interconnection cable from breaker terminal, CTs terminal to control relay panel is 2.5 Sq.mm. PVC copper control cable (un-armored) shall be provided. "Weather proof vermin proof control and relay panel shall be either structure mounted/floor mounted"

Door with suitable lock shall be provided on both front & rear side of CRPs for accessing the terminals & any other instrument

2.2 PAINTING:

Before painting all non-galvanised parts shall be completely cleaned and made free of rust, scale and grease and all external rough surface cavities on casting shall be filled by metal deposition.

All metal enclosures shall be treated in 7 tank Pre-treatment process & should be painted with UV Resistant Pure Polyester Powder coating. The powder coated sheet steel fabrication shall fulfill 700Hrs of Salt spray test. The thickness of Painting/Powder coating shall be of 70-90 microns to withstand tropical heat and extremes of weather. The paint shall be guaranteed for 5 years from the date of receipt of material.

3. CURRENT TRANSFORMERS:

3.1 CONSTRUCTION

The core shall be high grade(M2/M3) non-ageing electrical silicon-laminated steel of low hysteresis loss and high permeability to ensure high accuracy, at both normal and over current/voltage.

The secondary terminals shall be brought into a compartment on one side of current transformer for easy access. The Secondary terminal shall be provided with short circuiting arrangements of current Transformer. The secondary terminals shall be adequately reinforced to withstand normal handling, without damage.

The current transformers shall be suitable for mounting on steel structures or concrete pedestals. **The necessary flanges, bolts (stainless steel) etc., for the base of the Current Transformers shall be supplied and these shall be galvanized**. The current transformer tank and other metal parts shall be galvanized.

All windings of Current Transformers shall be made of high grade electrolytic copper wire double paper covering insulation and the manufacturing of the units shall be done in completely closed and air-conditioned room. Fibre glass insulation sleeves are to be provided for primary winding. Details of winding and core shall be furnished.

The Current Transformers shall be complete in all respects with filling of oil conforming to IS: 335 and with oil level indicator with minimum/maximum oil levels. The top cover and terminal box cover should be such that rain water does not enter even through the gaskets.

The top cover of the CT should be designed to avoid the stagnation of water. Thickness of Tank shall be min. 3.15 mm & top cover min. 5 mm. Thickness of Neoprene/Nitrile rubber gasket should be 5 mm. Top cover bolts hole to hole distance should be 85 mm (total -10 no.s). Gasket size to Bushings should be 155X100X8 mm, Bush rod length outside should be 70 mm, Top cover distance from top of oil level should be 22 mm, Insulation of Pr & Sec conductors should be 30-35 mm and creepage distance of supporting insulator should be 300 mm (min), Oil quantity should be minimum 18 Ltrs and top clearance for expansion of oil should be available.

The minimum clearance from phase to phase in air should be 300 mm.

Note : Facility for selecting the CT ratio in the control panel by closing the appropriate links in the Control and Relay Panel shall be provided. In no case changing of CT ratio with primary links shall be provided it should be of copper material and size should be mentioned.

3.2. PRIMARY & SECONDARY TERMINALS: Primary terminals of Current Transformers to which the line connections are to be made shall have dimensions as per IS: 10601:1983 and **material shall be of tinned copper.** The Size of primary rods shall be 30 mm min

The secondary terminals shall be brought out into suitable compartment, which shall have a removable cover. The terminal box with the cover closed and tightened and the cable/conduit in position when supplied shall have a degree of protection conforming to IP 54 of IS: 2147. The secondary terminals will be M6 Tinned Brass studs of size 11 mm with 3 nuts, 2 flat washers and 1 spring washer. The Primary & Secondary terminals shall be suitably marked.

3.3. TERMINAL AND EARTH CONNECTORS: Terminal connectors suitable for Panther ACSR Conductor shall be supplied. Suitable earth connectors for earthing connections shall also be supplied. The CT stud diameter should be 30mm Thickness of the clamp must be minimum of 12mm and the stud clamp shall be bimetallic. . The terminal connector drawing is enclosed.

3.4. EARTHING: The assembly comprising of the chassis, frame work and the fixed parts of the metal casing of the CT, shall be provided with two separate earthing terminals. The earthing terminals shall be adequate size protected against corrosion and metallically clean and identified by means of the sign marked in a legible and indelible manner on or adjacent to the terminals.

3.5. SEALING ARRANGEMENT: Provision for sealing secondary terminal compartment, primary ratio change strips (if any) and tank effectively shall be made such that no fraud etc. such as tampering of the ratio or circuit (current) is possible. The holes provided for the above sealing provision shall be of adequate size and pass the sealing wire of about 14 SWG.

3.6. Each instrument Transformer shall be provided with prismatic type oil sight window at suitable location so that the oil level is clearly visible with naked eye to an observer standing at ground level.

3.7. For compensation of variation in volume of the oil due to temperature variation nitrogen cushion or stainless steel bellows shall be sued. Rubber diaphragms shall not be permitted for this purpose.

3.8. The units shall be vacuum filled with oil, after processing and thereafter hermetically sealed to eliminate air and moisture from entering the tank.

3.9 NAME/RATING PLATE :

Each Current Transformer shall have the following particulars indelibly marked on it or on a label permanently secure to it or its casing.

a) Manufacturer's Name :

b) Manufacturer's Sl.No. and /or type of designation:

c) Rated transformation ratio :

d) Rated Frequency

e) Highest system voltage

f) Insulation level and

g) Rated short time thermal current with the associated rate time and rated dynamic current.

h) Purchase order Number, Sl. No. of the equipment, Date and year of Supply, Warranty and works "TGSPDCL" must be etched on the name plate.

VI. SCHEDULE OF EQUIPMENT

1. CIRCUIT BREAKERS:

Vacuum Circuit Breaker complete with suitable painted steel support structure (with anchor bolts & nuts **(stainless steel)**) for mounting 1 No. circuit breaker – 3 poles. Mechanism box, control and relay panel and Current Transformers.

Note : 1. Earth strips as per IS shall be provided for proper earthing of equipments.

2. EARTH BAR OF COPPER (SUITABLE FOR TERMINATION OF 2 NOS. 40 X 6 MM FLATS) SHALL BE PROVIDED ON CIRCUIT BREAKER SUPPORT STRUCTURE.

3. Connecting Cable from Breaker to Control panel and Breaker to CTs are to be provided.

3 (i) Connecting Cable from Breaker to CTs 6 Core cable of 5 mtrs length from each CT i.e., total 3 x 5 = 15 mtrs / Breaker and from Breaker to Control panel 10 core cable of **15 mtrs length**.

3 (ii) Size of interconnection cable from breaker terminal, CTs terminal to control relay panel is 2.5 Sq.mm. PVC copper control cable (un-armored).

2. MECHANISM BOX CONTAINING: TNC

(a) Operating mechanism

(b) Mechanical indicator for "SPRING CHARGED" and "SPRING DISCHARGED" coupled to the Circuit breaker operating mechanism

(c) TNC Switch heavy duty piston grip type

(d) 1No. Spare Trip Coil & 1No. Spare Closing Coil

(e) Mechanical indicator for "ON" and "OFF" coupled to the Circuit breaker operating mechanism.

(f) Mechanical close and trip (with protective flap) lever/push button.

(g) Terminal blocks for control wiring and a spare terminal block (with 20% of the active terminals).

(h) Operation Counter.

(i) Operating handle for manual charging of springs and for slow closing.

(j) 2 Nos. cable glands over and above those provided for control cables with suitable dummies**. (Size of cable glands: 19mm & 25mm).**

(k) Not less than 6 numbers normally open and 6 normally closed spare auxiliary contacts over and above those required for normal operation.

(l) 250 V single phase AC Motor/Manual operated spring charging mechanism complete with electrical spring release coil, 2 Nos. shunt trip coil and 1 No. closing coil.

(m) Protection Fuses (HRC) for Motor Circuit is required.

(n) Local – Remote selector switch.

(o) One Heavy duty Pistol grip type Control Switch for VCB trip/Neutral/Close positions with spring return to neutral position.

(p) Earth bar (suitable for termination of 2 Nos. 50 x 6 mm class)

(q) 6 Nos. **aluminum terminal connectors** for incoming and outgoing connectors.

(r) Set of 2 pole MCBs for AC and DC supply with different colours.

(s) 1 No. of anti-pumping relay.

3. CONTROL AND RELAY PANEL :

Weather proof vermin proof control and relay panel **shall be either structure mounted/ floor mounted** having equipped as follows:

a) 3 Line Display, 3 Phase CT operated digital A.C. Ammeter with Class of Accuracy **0.5 with Auxiliary Supply Preferably 24V DC or 110 V AC** to suit the indicated in Section-IV, Schedule of materials of size (96x96) mm

b) One ammeter selector switch with "R", "Y", "B", "Neutral" and "OFF" position. **Selector switch size 96x96 sq.mm**

c) One Heavy duty Pistol grip type Control Switch for VCB trip/Neutral/Close positions with spring return to neutral position.

d) One Red and one Green indicating lamps for indicating close and open positions respectively.

e) Two Yellow lamp for healthy trip indication with push button control for both trip coils.

f) One white lamp for spring charged indication.

g) One amber Lamp for auto-trip indication.

Note: All indication lamps shall be of LED type of voltage 24V DC.

h) One CMRI Compatible 3 phase 4 wire static energy meter class 0.2S accuracy suitable scaled to work on 110 V AC 50 Hz 1 Amp to suit the CT ranges indicated in Section-IV "Schedule of materials" for 11KV LV Control VCBs (**DLMS COMPATIBLE)**

i) Numeric Relays shall be of reputed make with the following features.

a)Differential IED relays(As per annexure-II)

b)Master trip relay Self Reset with Flag (4NO+2NC) of 24V DC of reputed make shall be provided

j) Two Nos. cable glands over and above those provided for control CT, PT, Control Circuit cables and auxiliary supplies (AC&DC) with suitable dummies. **(Size of cable glands: 19mm & 25mm).**

k) 3 Line Display 3 Phase digital A.C. Voltmeter displaying All Phase & Line Voltages with Auxiliary Supply Preferably 24V DC or 110 V AC with size 96x96 Sq.mm

l) DC fail Supervision relay and Trip circuit Supervision (Pre and Post close) relays shall be provided for each trip coil.

m) One set alarm bell and push button for acceptance of alarm. Audio alarms shall be static hooters of reputed make.

n) Necessary LT Fuses/MCBs for Control Circuit. Set of fine wiring with ferrules with standard code number of respective terminals and with **suitable terminal connectors.**

o) **Protection HRC Fuses shall be required for closing, Tripping and indications circuit.**

p) 250 V three pin socket with plug & switch.

q) 3 Phase 4 Wire Test terminal blocks with CT and PT terminals with links for testing ammeter and energy meter.

r) Stud terminal blocks (Bolt and nut type) for CT and PT control cables suitably wired with 6 Nos. spare terminals.

s) One suitable copper earth strip of 25x3 mm size with adequate number of holes with suitable nuts and bolts(**Stainless steel)**

t) 2 No. push button for Trip Circuit healthy check-up

u) 1 No. plug point with knob (10A, 250 VAC)

v) 1 No. CFL with switch (40W, 250 VAC)

w) 1 No. panel space heater with heater switch thermostat.

x) 1 No. 24V DC LED for DC Healthy

a) Auxiliary Relay for BUCHOLTZ ALARM with Hand Reset Flag
b) Auxiliary Relay for OLTC BUCHHOLZ ALARAM with Hand Reset Flag
c) Auxiliary Relay for Low Oil Alarm with Hand Reset Flag
d) Auxiliary Relay for BUCHOLTZ RELAY TRIP with atleast 2NO contacts & Hand Reset type with flag
e) Auxiliary Relay for OLTC BUCHOLTZ RELAY TRIP with atleast 2NO contacts & Hand Reset type with flag
f) Auxiliary Relay for PRV TRIP with atleast 2NO contacts & Hand Reset type with flag
g) Auxiliary Relay for OTI,WTI TRIP with 2NO contacts & Hand Reset type

NOTE: 1. All the instruments and relays to be provided on control panel shall be flush mounted unless otherwise specified. The relays are to be worked on 1 amp secondary current of CTs and with DC Voltage of 24 V.

2. All the indicating meters (Ammeter, Voltmeter) shall be of 96 x 96 size or standard size.

3. Auxiliary supply for voltmeter and Ammeter should be 24V DC Preferably or 110V AC.

All instruments shall have at least 100 mm margins across all sides, and Numerical relay shall have margin of at least 150 mm across all sides both on front & rear side.

4. CURRENT TRANSFORMERS.

Three numbers outdoor CTs as specified (Ratios).

a) **Aluminium Terminal connectors** suitable for panther ACSR conductor for 11KV shall be supplied for Circuit Breaker (6 Nos.) and CT terminals (6 Nos.)

b) Suitable inter connection between circuit breaker terminals and CT terminals are to be provided.

C) Cables from circuit breaker and CTs to control panel shall be provided. As specified in Schedule of equipment.

5. All fasteners Exposed to Air should be of hot dip galvanized of MS 8.8 Grade for M10 and above, and shall be of Stainless steel for M8 & below.

Note : Other standard accessories which are not specifically mentioned but supplied with breakers of similar type and rating for efficient and trouble free operation shall be provided.

VII. TESTS:

The Circuit breakers and current transformers shall be subjected to the following routine and type tests in accordance with the details specified in the relevant Indian Standards as amended from time to time or any other equivalent international standards.

1. CIRCUIT BREAKER: IS 13118/IEC-62271-100 or Latest version.

Copy of type test reports shall be enclosed to the tender. **The date of type tests shall not be later than FIVE years.**

1.1

ROUTINE TESTS

a) Measurement of resistance of the main circuits.

a) Operation tests.

b) One minute power frequency voltage dry withstand test on the circuit breakers.

c) One minute power frequency voltage dry withstand test on auxilliary circuits.

ACCEPTANCE TEST.

a) (i) Visual Check, (ii) Verification of Bill of materials, (iii) Verification of dimensions as per approved drawings, interrupter details such as make and ratings.

b) Measurement of resistance of the main circuits.

c) Operation tests (Both Mechanical & Electrical with variable auxiliary voltage 70-110%)

d) VCB Operating timings i.e. Opening and closing timings etc.

e) One minute power frequency voltage (70KV for 1 Minute) dry withstand test on the circuit breakers between phase to earth and across between phase terminals.

f) Temperature rise test and Mechanical endurance test of 10,000 Mechanical operations (M2 Class) in presence of purchaser representative.

g) Auxiliary circuit checking

(i) Voltage test on control and auxiliary circuit 2KV for 1minute between all LT terminals to earth.

(ii) Insulation resistance test (>1 M Ohm (min)) before and after HV test. Between phase to phase, between open contacts, control wiring.

(iii) Checking of Breaker control switch, Local/Remote Switch, Ammeter & Voltmeter selector switch, Auxiliary switch, Anti pumping contactor, ON-OFF Spring charge, Indication lamps, push buttons, Space heater, Thermostat working & Buzzer,

(iv) Operation of meters by applying current and voltage.

(v) Operation of relays by applying current and voltage.

1.2 TYPE TESTS:

a) Temperature rise test for the main circuits.
b) Measurement of resistance of the main circuit.
c) Operation tests.
d) Mechanical endurance tests.
e) Impulse voltage tests.
f) One minute power frequency voltage dry withstand tests.
g) One minute power frequency voltage wet withstand tests.
h) Tests for short circuit conditions.
i) Tests for short time current.
j) Seismic test of 0.6g.
k) Capacitor switching duty test.

2. CURRENT TRANSFORMERS:

2.1. The following Type tests as per **IS-16227:2016 (Latest version)** &IEC61869:2007 shall be conducted at any Recognized NABL Laboratory/ International and Type Test Certificates for the Tests carried out shall be enclosed with the tender. **The date of type tests shall not be later than FIVE years**.

i. Temperature rise test.
ii. Impulse voltage Test on primary terminals.
iii. Wet test for outdoor type transformers.
iv. Test for accuracy
v. Verification of the degree of protection by enclosures
vi. Short-time current tests.

Note: Testing equipment should be calibrated from NABL or from any other standard equipment calibrated from NABL.

2.2 ACCEPTANCE & ROUTINE TESTS: The following tests shall be conducted as per IS:16227:2016&IEC61869:2007

i. Power frequency voltage withstand Tests on primary terminals.
ii. Partial discharge measurement
iii. Power frequency voltage withstand Tests on secondary terminals.
iv. Test for accuracy
v. Verification of markings
vi. Pressure test for the enclosure @ 0.5Kg/CM2 for 30 Min is to be conducted for at least one unit for every lot.
vii. Determination of the secondary winding resistance
viii. Inter-turn overvoltage test

Note: Satisfactory Valid type test certificates from recognized laboratory NABL/International labs is to be furnished for the tests mentioned above as per Clauses 1.2 and 2.1. In line with relevant specifications along with tender bid. For Type tests applicable as per IS:13118 or IEC-62271-100.Without required type test certificates, the offer shall be treated as non-responsive. Provisional/in-house NABL type testing reports are not acceptable

The bidder will furnish Type Test Results of 11KV Current Transformers as per **the upgraded IS 16227 (Part-I to V with Latest version) & IEC 61869:2007** in any recognized laboratory NABL laboratory /International Labs as per the latest revision.
The **date of Type tests will not be later than 5 years**.

VIII. SPECIAL GUARANTEE FOR CIRCUIT BREAKERS:

i) The Circuit Breakers **(total equipment including control and relay panel and CTs)** shall be guaranteed for satisfactory operation for a period of 5 years (five years) from the date of receipt at stores.

ii) All similar materials or removable parts of similar equipment shall be interchangeable with each other.

IX. DRAWING:

Drawings and technical literature of Breakers, Current Transformers and panels shall be enclosed to the Officer, Tenders not accompanied by the above are liable to be rejected. These drawings and literature are to be supplied in duplicate copies along with each unit in the event of order and are to be housed in a proper weather proof enclosure on the rear of the control panel door. One set of reproducible drawings shall be supplied. Schematic wiring diagrams of the control circuits of the circuit breaker and control & relay panel shall be displayed (embossed on a plate/Laminated) on the doors of the circuit breaker, control cubicle and control & relay panel respectively.

X. OVERALL DIMENSIONS AND FOUNDATION DETAILS:

The manufacturer shall give the necessary information as regards the overall dimensions of the circuit breaker and foundation details.

XI. PACKING :

All the equipments shall be packed in suitable crates with suitable steel bands so as to withstand rough handling and storage at destination.

XII. Support structure shall be galvanized as per relevant standards.

XIII. DC Fail shall be sensed by a relay or equivalent and indication of DC Fail shall be given with an indication lamp.

XIV. **Training:** Hands on training to TGSPDCL employees should be provided by the successful bidder on supplied IED Relays and up to integration of relays to TGSPDCL SCADA control centre.

ANNEXURE – I

TECHNICAL SPECIFICATION FOR STATIC TRIVECTOR METERS FOR USING ON 11KV Feeder and 11KV LV VCBS COMPATIBLE TO DLMS.

1.0 SCOPE:

Design, manufacturing, testing, supply and delivery of AC, 3 Phase, 4 Wire, fully static and AMR compatible Tri-Vector Energy Meters for measurement of different electrical parameters listed elsewhere in the document including Active Energy (KWH), Reactive Energy (KVARH), Apparent Energy (KVAH) etc., The detail scope is given below.

2.0 APPLICATION

In Substations on incoming/Outgoing HT feeders **(Cat-A),**

3.0 STANDARDS TO WHICH METERS SHALL COMPLY

Guidelines as per revised ICS-DLMS document "Data Exchange for Electricity Meter Reading, Tariff and Load Control-Companion specification.

IS:14697/1999 (reaffirmed 2004) Specification for AC Static Transformer operated Watt Hour and VAR-Hour meters **(Class 0.2S);**

IS-15707 Specification for Testing, evaluation, installation & maintenance of AC Electricity Meters – Code of Practice

The equipment meeting with the requirement of other authoritative standards, which ensure equal or better quality than the standard mentioned above, also shall be considered; in case of conflict related with communication protocol, the Guidelines on "Data Exchange for Electricity Meter Reading, Tariff and Load Control – Companion Specification" enclosed with this document as annexure shall prevail upon. For conflict related with other parts of the specification, the order of priority shall be – i) This technical specification ii) IS:14697/1999 (reaffirmed 2004).

4.0 GENERAL TECHNICAL REQUIREMENTS

1	Type	AMR Compatible Static, 3 Ph, 4 Wire HT Tri-Vector Energy Meter (Export/Import type for interface meters)
2	Frequency	50 Hz +/- 5%
3	Accuracy class	0**.2S**
4	Secondary voltage	Suitable for operation from 110V Ph-Ph or 63.5Ph-N for HT TVR.
5	Basic current (ib)	-/1 A as per existing HT for – feeders
6	Maximum continuous current	2.0 Ib, Starting and Short time current shall be as per IS-14697/1999.
7	Power consumption	i) The active and apparent power consumption, in each voltage circuit, at reference frequency shall not exceed 1.5W and 8 VA. ii) The apparent power taken by each current circuit, at basis current, reference frequency and reference temperature shall not exceed 1.0 VA
8	Power factor	0.0 Lag – Unity – 0.0 Lead
9	Design	Meter shall be designed with application specific integrated circuit (ASIC) or micro controller, shall have no moving part; electronic components shall be assembled on printed circuit board using surface mounting technology; factory calibration using high accuracy (0.05 class) software bass test bench.

5.0 CONSTRUCTIONAL REQUIREMENT/METER COVER & SEALING ARRANGEMENT :

Wherever poly carbonate cover is specified, it shall conform to IS 11731 (FH-1 Category besides meeting the test requirement of heat deflection test as per ISO 75, glow wire test as per the IS:11000 (part 2/SEC-1) 1984 OR IEC PUB, 60695-2-12, Ball pressure test as per IEC-60695-10-2 and Flammability Test as per UL 94 or As per IS 11731 (Part-2) 1986.

6.0 WORKING ENVIRONMENT

As per IS-14697-1999 (reaffirmed 2004). Meter to perform satisfactory under Non-Air Conditioned environment (within stipulations of IS).

Meter body will conform to IP51 degree of protection. For outdoor use meter shall be installed in sealed enclosure conforming to IP 55.

The meter shall be suitable designed for satisfactory operation under the hot and hazardous tropical climate conditions and shall be dust and vermin proof. All the parts and surface, which are subject to corrosion, shall either be made of such material or shall be provided with such protective finish, which provided suitable protection to them from any injurious effect of excessive humidity.

7.0 MANUFACTURING PROCESS, ASSEMBLY AND TESTING

Meters shall be manufactured using latest and 'state of the art' technology and methods prevalent in electronics industry. The meter shall be made from high accuracy and reliable surface mount technology (SMT) components. All inward flow of major components and sub assembly parts (CT, PT, RTCs/Crystal, LCDs, LEDs, power circuit electronic components etc.,) shall have batch and source identification. Multilayer 'PCB' assembly with 'PTH' (Plated through Hole) using surface mounted component shall have adequate track clearance for power circuits. SMT component shall be assembled using automatic 'pick-and-place' machines, Reflow Soldering oven, for stabilized setting of the components on 'PCB' for soldered PCBs, cleaning and washing of cards, after wave soldering process is to be carried out as standard practice. Assembly line of the manufacturing system shall have provision for testing of sub-assembled cards. Manual placing of components and soldering, to be minimized to items, which cannot be handled by automatic machine. Handling of 'PCB' with ICs/C-MOS components, to be restricted to bare minimum and precautions to prevent 'ESD' failure to be provided. Complete assembled and soldered PCB should undergo functional testing using computerized Automatic Test Equipment.

Fully assembled and finished meter shall undergo 'burn-in' test process for 12 hrs at 55 degree Celsius (Max. temperature not to exceed 60 degree Celsius) under base current (Ib) load condition.

Test points should be provided to check the performance of each block/stage of the meter circuitry. RTC shall be synchronized with NPL time at the time of manufacture. Meters testing at intermediate and final stage shall be carried out with testing instruments, duly calibrated with reference standard, with traceability of source and date.

8.0 DISPLAYS

The meter shall have 7 digits (with +/- indication), parameter, identifier, backlit liquid crystal display (LCD) of minimum 10 mm height, wide viewing angle. Auto display cycling push button required with persistence time of 10 seconds. LCD shall be suitable for temperature withstand of 70 deg. C; sequence of display of various instantaneous electrical parameters shall be as desired by Purchaser at the time of order.

The data stored in the meters shall not be lost in the event of power failure. The meter shall have Non Volatile Memory (NVM), which does not need any battery backup. The NVM shall have a minimum retention period of 10 years.

9.0 PERFORMANCE UNDER INFLUENCE QUANTITIES

The meters performance under influence quantities shall be governed by IS 14697-1999 (reaffirmed 2004). The accuracy of meter shall not exceed the permissible limits of accuracy as per standard IS:14697(latest version).

10.0 OUTPUT DEVICE

Energy meter shall have test output, accessible from the front, and be capable of being monitored with suitable testing equipment while in operation at site. The operation indicator must be visible from the front and test output device shall be provided in the form of LED. Resolution of the test output device shall be sufficient to enable the starting current test in less than 10 minutes.

11.0 REAL TIME INTERNAL CLOCK (RTC)

RTC shall be pre-programmed for 30 years Day/Date without any necessity for correction. The maximum drift shall not exceed +/- 300 seconds per year.

The clock day/date setting and synchronization shall only be possible through password/Key command from one of the following:

a) Hand Held Unit (HHU) or Meter testing work bench and this shall need password enabling for meter;

(b) From remote server through suitable communication network or Sub-Station data logger 'PC'.

12.0 QUANTITIES TO BE MEASURED & DISPLAYED

The meter shall be capable of measuring and displaying the following electrical quantities within specified accuracy limits for polyphase balanced or unbalanced loads.

a) Instantaneous Parameters such as phase and line voltages, currents, power factors, overall kVA, kW, kVAr, power factor, frequency etc., as per details given in the table below and enclosed annexure.

b) Block Load profile parameters such as kVAh/kWh/kVArh (lad/lead)/Maximum Demand (MD) in kW/kVA/power factor/phase and line voltages/currents etc., (minimum 5 parameters) as per details given in the table below and enclosed annexure.

c) Daily load profile parameters such as cumulative energy kWh (import/export)/cumulative kVAh (while kW-import/export)/cumulative energy kVArh (quadrant-1/2/3/4)/reactive energy high (V>103%)/low(V<97%), etc as per details give in the table below and enclosed annexure.

In addition to above the meter shall also record the Name plate details, programmable parameters (readable as profile), occurrence and restoration of tamper events along with the parameters (Table A5.1, A5.2 and A6.1 to A6.8 respectively of enclosed guideline document).

Detail of category wise parameters requirement suitable for specific location such as feeder/DT metering, interface points/boundary points is given in following tables of guidelines document enclosed as annexure.

Category	Parameter group	Annexure Table No.
Substation Feeder/Distribution Transformer meter	Instantaneous parameters	A2.1
	Block load profile parameters	A2.2
Boundary/Ring fencing/interface meters	Instantaneous parameters	A3.1
	Block load profile parameters	A3.2
	Daily load profile parameters	A3.3
HT Consumer Meters	Instantaneous parameters	A4.1
	Block load profile parameters	A4.2
	Billing load profile parameters	A4.3
Substation feeder/Distribution Transformer/Boundary/Ring fencing/Interface/HT Consumer meters	Name Plate details	A5.1
	Programmable Parameters	A5.2
	Event Conditions	A6.1 to A6.7
Logging parameters for each of the event condition – shall be selected	Capture parameters for event as applicable (Event log profile)	A6.8

Also as per the requirement of HT TVR and LT TVR meters

13.0 DEMAND INTEGRATION PERIOD

The maximum demand integration period may be set at 15 min at the time of order.

14.0 MD RESET

It should be possible to reset MD by the following options.

a) Communication driven reset
b) Local push button
c) Auto reset at 24.00 hrs at the end of each billing cycle

15.0 MARKING OF METERS

The marking of meters shall be in accordance with IS:14697/1999 (reaffirmed 2004).

The meter shall also store name plate details as given in the table A5.1 of annexure. These shall be readable as a profile as and when required.

16.0 COMMUNICATION CAPABILITY

The meter shall be provided with two ports for communication of the measured/collected data as per guideline document enclosed in the annexure, i.e. a hardware port compatible with RS 232 or RS 485 specifications which shall be used for remote access through suitable Modem (GPRS/GSM/EDGE/CDMA/PSTN/LPR) and an Optical Port complying with hardware specifications detailed in IEC-62056-21. This shall be used for local data downloading through a DLMS compliant HHU.

The RS 485 port shall be used at Substations suitable for multi-drop connections of the meter for exporting data to sub-stations data logger/DCU/Computer and the remote end server. The RS 232 port shall be used at boundary points meters and Distribution Transformer meters capable to transfer and export data to the remote end server through suitable communication mediums (GPRS/GSM/EDGE/CDMA/PSTN/LPR). Both ports shall support the default and minimum baud rate of 9600 bps.

18.0 TAMPER & FRAUD MONITORING FEATURES

The meter shall work satisfactorily under presence of various influencing conditions like External Magnetic Field, Electromagnetic Field, Radio Frequency Interference, harmonic Distortion, Voltage/Frequency Fluctuations and electromagnetic high frequency fields etc., The meter shall be immune to abnormal voltage/frequency generating devices and shall record the occurrence and restoration of such tamper events along with parameters such as current, voltages, kWh, power factor, event cod, date & time etc., (listed on Table A6.1 to A6.7 in enclosed document).

Tamper details shall be stores in internal memory for retrieval by authorized personnel through either of the following.

(i) HHU
(ii) Remote access through suitable communication network.

Minimum 200 numbers of events (occurrences & restoration with date & time) should be available in the meter memory.

19.0 TYPE TESTS

The meter offered should have successfully passed all type tests described in the IS 14697 and the meter Data Transfer and Communication capability as per enclosed guidelines document. **Type test certificate shall be submitted at the time of inspection** and the same shall not be more than 36 months old at the time of bid submission. Make & type of major components used in the type-tested meter shall be indicated in the QAP. The conditions are to be relaxed by the purchasers (utilities) for the bids to be issued in next six months (i.e. upto Feb 2010) to accommodate design, development and testing of the new standard meters, confirming to the guidelines document enclosed as annexure, by manufacturers. The bidder shall have to submit the required type test certificate (as per bid requirement) to the purchaser (utility) at the time of meters delivery.

Further purchaser shall reserve the right to pick up energy meters at random from the lots offered and get the meter tested at third party lab i.e. CPRI/agencies listed at Appendix-C of latest – standardization of AC static electrical energy meters – CBIP publication No. 304/NPL/CQAL.ERTL/ERDA at the sole discretion of the purchaser. The supplier has no right to contest the test results of the third party lab or for additional test and has to replace/take corrective action at the cost of the supplier.

It shall be the responsibility of the supplier to arrange such tests and purchaser shall be informed of the date and time of conduction of tests well in advance to enable him to witness such tests. Test charges of the testing authority, for such successful repeat type tests, shall be reimbursed at actual by the Purchaser. Other tests which are not covered in this will be as per the requirement of HT TVR and LT TVR meters specification.

20.0 ACCEPTANCE & ROUTINE TESTS

Criteria for selection for such tests and performance requirements shall be as per IS 14697-1999 (reaffirmed 2004).

Additional acceptance shall include Surge withstand (SWC) for 6 kVp as per IEC 62052-11, Lightning impulse test and HF disturbance test as per IS 14697. One sample meter per order from one of the offered lot shall be subjected to these specific tests. Meters subjected to these tests shall not be used after tests.

Accuracy tests shall be performed at the beginning at the end of the acceptance tests specified.

23.0 FIXING & CONNECTION ARRANGEMENT

Manufacturer shall ensure following technical points.

(i) Meter shall be suitable for mounting on Simplex type vertical panel with front door; CAT-M4 disconnecting type TBs to be used for current circuit; Panel wiring to be properly dressed and harnessed; External cables to enter panel from bottom gland plate using double compression glands.

(ii) Meter installation and inter-connection from existing CT/PT connections to energy meters in the panel shall be in the scope of contractor/bidder. The external cabling from existing CT/PT to Energy meter panel shall be in the scope of purchaser.

(iii) Energy Meter terminals block shall be adequately sized with regard to maximum conductor dimension, commensurate with current rating of Energy meter.

Application Guide for users of this specification:

(i) The specification does not contain constructional details and methods of sealing of the meter COVER and the terminal sizes required for the Purchasers incomer cables. These may be added suitably as per the requirement of individual users. Quantities of meters require with/without meter COVER needs to be specified in the Bill of Quantities in the NIT specifications.

(ii) The NIT specification shall suitably incorporate the appropriate qualifying requirements considering the quantity of meters intended to be procured.

25. GENERAL:

a. Principle of operation of the meter, outlining the methods and stages of computation of various parameters starting from input voltage and current signals including the sampling rate if applicable shall be furnished by the bidder.

b. The bidder shall indicate the method adopted to transform the voltage and current to the desired low values with explanation on devices used such as CT, VT or Potential divider as to how they can be considered superior in maintaining ratio and phase angle for variation of influence quantities during its service period.

c. The bidder shall furnish details of memory used in the meter.

d. Details of testing facilities:

The manufacturer laboratory must be well equipped for testing of the meters. They must have computerized standard power source and standard equipment calibrated not later than a year (or as per standard practice). The details of testing facilities available for conducting (a) The routine tests and (b) Acceptance tests shall be furnished in a statement. Bids without these details will be treated as Non responsive.

26. TECHNICAL DEVIATIONS:

Technical deviations to Section-III "Technical Specification" shall be specifically and clearly indicated in the "Schedule – A".

ACRONYMS

Reference Abbreviations	Name and Address
IEC	International Electro Technical Commission Bureau Central de la Commission Electro Technique International, Rue de verembe Geneva, Switzerland.
ISO	International Organization for Standardization, Danish Board of Standardization Aurehoegyej – 12, DK – 2900, Heel prup, DENMARK.
ISS	Indian Standard Bureau of Indian Standards Nanak Bhavan, 9, Bhadur Shah Zafar Marg, NEW DELHI – 110 002, INDIA.
CBIP	Central Board of Irrigation and Power Malcha Marg, Chankyapuri, NEW DELHI–110 021. INDIA.
CT	Current Transformer
PT	Potential Transformer
Deg.C	Degrees centigrade
Max	Maximum
Accn.	Acceleration
db	Decibels
MD	Maximum Demand
TOD	Time off day
Min.	Minimum
CMRI	Common Meter Reading Instrument

ANNEXURE – II

TECHNICAL SPECIFICATION FOR INTELLIGENT ELECTRONIC DEVICE (IED) (WITH IEC 61850 Protocol edition 2.0) FOR PROTECTION AND CONTROL

1.0 SCOPE :

The specification covers specification of Intelligent Electronic Devices (IED's) to be fixed on control and relay panel.

2.0 STANDARDS :

The applicable standards of IED's are specified here below :

i.	Impulse withstand : 5 KV	:	IEC 60255-5
ii.	Fast Transients, Class IV	:	IEC 60255-22-4
iii.	Electromagnetic Radiation, Class III	:	IEC 61000-4-3
iv.	Degree of Protection, IP 54 on front panel , IP 20 for Rear panel	:	IEC 60529
v.	Vibration, Shocks, Earthquakes, class-II	:	IEC 60255-21-1, 2, 3
vi.	The unit should have conformal coating for operation in hazardous atmosphere	:	EIA-364-65A

3.0 SYSTEM DETAILS :

The IED's shall be suitable for outdoor and indoor installations with 3 Phase, 50 Hz, 33KV & 11KV system in which the neutral is effectively earthed and the same shall be suitable for service under fluctuations in supply voltage upto 12% permissible under Indian Electricity Rules and the frequency variation of -5% and +2% (47, 5Hz to 51.0 Hz).

4.0 CLIMATIC CONDITIONS :

The material used in the construction of the IED's shall be suitable for use under the following climatic conditions.

a.	Ambient Air Temperature	:	5 Deg. C to 70 Deg. C
b.	Relative Humidity	:	0 to 93%
c.	Altitude	:	0 to 100 Meters

5.0 RATINGS :

The protection and control unit range shall be designed to accommodate all types of control power supply voltages from **24V DC to 250V DC** ± 15%, The relay shall withstand upto 250V DC auxiliary voltage continuously.

6.0 COMPLIANCE :

The relay manufacturers shall furnish the following statements to the TGSPDCL.

PICS : Protocol Implementation Conformance statement.

PIXIT : Protocol Implementation Extra Information Statement.

MICS : Modeling Implementation Conformance statement.

The manufacturer shall furnish a NABL accreditation certificate of Level A duly noting the relay version that are to be supplied and analyzed the UCA (Utility Communication Architecture) with KEEMA Tool.

7.0 TECHNICAL PARAMETERS :

S.No	Technical Parameter
A	***Hardware***
1	Make, model/type
2	IED supports with IEC-61850 with Ed 2.0 loop in loop out Fiber optic interfaces with RSTP Protocol.
3	Metering and protection functionality shall be derived from CT Protection core with **8**CT (1A and 5A) and **4**VT inputs.
4	**Auxiliary Supply** : **24V to 250 V DC ± 15 %** Ripple **Digital Inputs** : Atleast **22 No**. Configurable Inputs with thresold voltage atleat 80% of Rated Voltage. **Analog Inputs** : Atleast **4 No.** Temparature Sensing Inputs taken from PT100 Transducer. **Digital Output** : Atleat **11 No**. Configurable Outputs with Burden rating **atleast 400 W** for Closing & Tripping VCB directly **and DC Contactor's with suitable breaking capacity required** for utilized DOs. 1No. Watch dog contact for continuous checking of internal health of the relay and should have dedicated output for alarm and tripping for the same. **LEDs** : Atleast **18 No.** Configurable Tri Color LEDs, Protection tripping should be indicated on the front of the device by a dedicated LED and text indicating the cause of the fault **Display** : Big Graphical Display with Atleat 8 Line, With exclusive button for resetting relay & exclusive 2 No. push buttons for closing/tripping via HMI. It shall also have keypad to view measurement / settings / SLD The display shall be in English Language. The Display Shall indicate type of the fault. The relay shall have **IP54** Ingress Protection on the front & **IP20** in rear. **Software : ** Bidder should have supply IED configuration and Programming licensed software along with product key for GOOSE Configuration, extracting ICD, CID files and settings, required cables etc. for **free with the supplies & also provide free software upgrades.** The relay's software must provide the setting file of relay to be exported to XRIO or Equivalent format for **automatic testing** of all protection function.
5	All PCBs shall be **conformally coated**
6	**Terminals :** Auxiliary Supply, CTs, PTs – **Ring Terminals** required DIs, DOs, Analog Inputs (If any) – **PIN/Fork/Ring** Terminal with Screw required.
7	**Ports :** 1No. Serial port **or** USB port in front for relay for programming with baud rate atlest 10 Mbits/Sec & 1No. Serial port at rear of relay should be available. **Also it should** supports with IEC-61850 with IED 2 (loop in loop out) Fiber optic interfaces.
8	**a) Hard Wiring for following Digital Inputs including Spare DIs till TBs required :-**

Circuit Breaker Close Status	SC ADA In (LR in Remote) Status
Circuit Breaker Open Status	SCADA Out (LR in Local Position) Status
Spring charge Status	PTR Buchholz Alarm Operated
Master Trip Relay Operated	PTR Buchholz Trip Operated
Trip Circuit Healthy-1 (Pre)	PTR Low Oil Alarm Operated
Trip Circuit Healthy-1 (Post)	PTR OLTC Buchholz Alarm Operated
Trip Circuit Healthy-2 (Pre)	PTR OLTC Buchholz Trip Operated
Trip Circuit Healthy-2 (Post)	PTR PRV Operated
Close Circuit Healthy	DC Healthy
TNC Close	TNC Trip
Spare - 1	Spare - 2

b) Hard Wiring for following Analog Inputs for measuring PTR Oil & Winding Temperature

Oil Temperature	Winding Temperature

c) Hard Wiring for following Digital Outputs including Spare DOs till TBs required :-

86 Trip	86 Trip Spare - 1
Remote Close VIA SCADA & Closing with HMI Push Button	Remote Trip VIA SCADA & Tripping with HMI Push Button
For Hooter when Any Protection Function Operates	50BF/LBB to upstream VCB
Trip Upstream/Down Stream VCB	Watch Dog Contact for giving alarm
Trip Upstream/Down Stream VCB (Spare)	HTC to Indication Bulb
For Hooter when PTR Alarm, Trip Operates	

9	**Following Protection Functions & Supervisions Required in Relay**
9.1	51 – IDMT Over Current Protection
9.2	50 - Instantaneous Over Current Protection
9.3	51N – IDMT Earth Fault Protection
9.4	50N – Instantaneous Earth Fault Protection
9.5	49 – Thermal Overload Protection
9.6	46 – Broken Conductor Protection
9.7	51 V - Voltage Dependent Inverse Time Over Current Protection
9.8	50BF - Breaker Failure Protection
9.9	27 - Under Voltage Protection
9.10	59 - Over Voltage Protection
9.11	59N - Neutral Displacement Voltage Protection
9.12	24 – Over Excitation Protection
9.13	32 – Power Protection
9.14	37 - Undercurrent Protection
9.15	47 – Sequence Over Voltage Protection
9.16	55 – Power Factor Protection
9.17	67 – Directional Over Current Protection
9.18	67N – Directional Earth Fault Protection
9.19	87GH – Restrcted Earth Fault Protection High Impeadance
9.20	87NL – Restricted Earth Fault Protection Low Impeadance

<table>
<tr><td>9.21</td><td>87T – Transformer Bias Differential Protection</td></tr>
<tr><td>9.22</td><td>For 51, 51N Protection Function All standard IEEE/IEC curves including IEC 1.3 Sec Curve shall be available in relay by default. Also user configurable curve must be available for user to configure if required. For Reset Curve Characteristrics user shall have all standard IEC/IEEE curves.
For 51, 51N Protection 2nd harmonic current blocking must be available. For 87T Protection 2nd & 5th Harmonic current blocking must be available.</td></tr>
<tr><td>9.23</td><td>Trip Circuit Supervision for both trip coils</td></tr>
<tr><td>9.24</td><td>Close Circuit Supervision</td></tr>
<tr><td>9.25</td><td>Circuit Breaker Condition Monitoring</td></tr>
<tr><td>9.26</td><td>CT Supervision & VT Supervision</td></tr>
<tr><td>9.27</td><td>Cold load Pickup & Inrush Restrain</td></tr>
<tr><td>9.28</td><td>Temparature Supervision shall have provision to Set Temparature for generating Alarm & Trip</td></tr>
<tr><td>9.29</td><td>The Relay should have at least four setting Groups & atleast four stages in each group which are selectable by logical conditions as well as remote setting facilities for thresholds and time delay adjustments</td></tr>
<tr><td>10</td><td>Disturbance record of atleast 50 No. X 1 Sec with atleat 16 fault records point per cycle.
DR should have a facility to record the following parameters in each DR, selectable from DI/DO/Pick Up/Start/Trip with all Analog Channels & atleast 20 Digital Channels.
<table>
<tr><td>All Measured Currents, Voltages Values & Derived Values in Analog Channels</td><td>All Binary Inputs in Digital Channels</td></tr>
<tr><td>All Binary Outputs in Digital Channels</td><td>All Alarm/Pick Up in Digital Channels</td></tr>
<tr><td>All Trip in Digital Channels</td><td></td></tr>
</table>
Fault Log of atleast 16 No to be visible in HMI displaying all Phase, Neutral, Bias, Difference Currents & All Voltages with date & time stampings.
Events Log atleast 2000 with resolution of 1msec
Security Logs atleast 1000</td></tr>
<tr><td>11</td><td>Access to setting mode should be protected by Two different customized passwords of at least 4 characters.
(1) Viewing Protection Settings
(2) Editing Protection Settings & Parameter Settings</td></tr>
<tr><td>12</td><td>Metering Functionality</td></tr>
<tr><td>12.1</td><td>The relay should have all the Measurement Values</td></tr>
</table>

		Three Phase Current RMS, Max, Avg, Instantaneous Magnitude & Phase Angle of HV Side	Neutral Current RMS, Max, Avg, Instantaneous Magnitude & Phase Angle of HV Side
		Three Phase Current RMS, Max, Avg, Instantaneous Magnitude & Phase Angle of LV Side	Neutral Current RMS, Max, Avg, Instantaneous Magnitude & Phase Angle of LV Side
		All Bias, Difference Currents RMS, Max, Avg, Instantaneous Magnitude & Phase Angle	Maximum Demand, Minimum Demand recorded **Hourly, Daily, Weekly, Monthly**
		Phase to Earth RMS Voltage RMS, Max, Avg, Instantaneous Magnitude & Phase Angle	Phase to Phase RMS, Max, Avg, Instantaneous Voltage Magnitude & Phase Angle
		Active Power Per Phase & 3 Phase	Power factor Phase wise & 3 Phase
		Apparent Power Per Phase & 3 Phase	Reactive Power Per Phase & 3 Phase
		Frequency	All Energy Measurement KWH, KVARH, KVAH
		Oil Temparature	Winding Temparature
		All Sequence Voltages with Magnitude & Phase Angle	All Sequence Currents with Magnitude & Phase Angle
13	Bidder should have to supply IED configuration and Programming software for extracting ICD, CID files and settings, required cables etc. for **free with the supplies**		
14	Capability of Switching ON & OFF the breaker with DO via RTU with IEC 61850 shall be facilitated		
15	***Communication*** **IEC 61850 protocol Edition 2.0** with optical loop in and loop out ring topology with RSTP Protocol. Relay should communicte with Other make IED relays Via GOOSE and it has to be demonstrated in POC.		
16	The relay should have one serial port **or** USB port in front for relay programming, **Also it should have one serial port at rear for service purpose.**		
17	**Parameters to be Reported by Feeder IED to Remote Control Centre**		
	Digital Inputs	**Digital outputs**	
	Breaker ON	Breaker close	
	Breaker off	Breaker trip	
	Breaker spring charge	TCS on Close alarm	
	Breaker trip circuit supervision	Two output for goose	
	SCADA IN		
	SCADA OUT	**Analog Inputs**	
	Buchholz Alarm Operated	Oil Temparature	
	Buchholz Trip Operated	Winding Temparature	
	Low Oil Alarm Operated		
	OLTC Buchholz Trip Operated		
	OLTC Buchholz Alarm Operated		
	Soft Signals to be Reported	**Soft Signals to be Reported**	
	Breaker tripped on 51R> with set values and acted values	Breaker tripped on 51Y>with set values and acted values	
	Breaker tripped on 51B>with set values and acted values	Breaker tripped on 50N>with set values and acted values	
	Breaker tripped on 51R>>with set values and acted values	Breaker tripped on 51Y>>with set values and acted values	

	Breaker tripped on 51B>>with set values and acted values	Breaker tripped on 50N>>with set values and acted values
	Breaker failure protection	Breaker tripped on REF with set values and acted values
	Oil Tempararature Alarm Operated	Oil Temparature Trip Operated
	Winding Tempararature Alarm Operated	Winding Temparature Trip Operated
	Breaker tripped on Differential with set values and acted values	Current of R
	Current of Y	Current of B
	Voltage of RY	Voltage of YB
	Voltage of BR	KWH import and export
	KVAH import and export	KVARH import and export
	PF Phase wise and Average	MD Maximum and average
	CT Supervision	VT Supervision
	Facility to communicate the disturbance recording in COMTRADE 2000 Format through IEC 61850 and it shall be saved in substation LDMS	Facility to communicate the Fault Record with time stamping through IEC 61850 and it shall be saved in substation LDMS
	The relays All BOs and All LEDs shall be RESET from Control Center and LDMS when command is given remotely.	
18	**The relay shall have Cyber security feature such as Security logs, signed firmware etc. The relay shall have Role Based Access Control(RBAC) feature. Every relay should comply with SNTP Protocol.**	
19	Goose signal should be freely configurable for any kind of signals using graphic tools/user friendly open software without use of any external converter	

8.0 Guarantee

- The relays shall be guaranteed for five years from the date of commissioning.
- The manufacturer shall demonstrate the availability of spares for all the above relays.

9.0 Cyber Security

- Security logs, signed firmware features to be available.
- The Relay should be provided with an RBAC (Roll Based access Control) with 3 Rolls 1. Operator for closing/ tripping, 2. Supervisor for accessing data, 3. Administrator for configuring.
- The Relay should comply SNTP protocol.

10.0 Type Test

The following Type tests are to be conducted as per IEC 60255-27:2005. The date of Type tests will not be later than 5 years

I. Insulation as per IEC60255-27:2005
II. Creepage Distances and Clearances as per IEC60255-27:2005
III. High Voltage (Dielectric) withstand IEC60255-27:2005
IV. Impulse Voltage with stand Test as per IEC60255-27:2005
V. Environment Tests
VI. Electromagnetic Compatibility Test (EMC)
VII. Mechanical Robustness

Note :- Bids received without type test reports / partial type test reports will be treated as Non- Responsive.

Formulae for the Curves

IAC Curves

Equation	Curve type Inverse	Coefficient Values					
		A	B	C	D	E	β
$t_d(I)=\left(A+\frac{B}{\left(\frac{I}{I_s}-C\right)}+\frac{D}{\left(\frac{I}{I_s}-C\right)^2}+\frac{E}{\left(\frac{I}{I_s}-C\right)^3}\right)\times\frac{T}{\beta}$	Inverse	0.208	0.863	0.800	-0.418	0.195	0.297
	Very Inverse	0.090	0.795	0.100	-1.288	7.958	0.165
	Extremely Inverse	0.004	0.638	0.620	1.787	0.246	0.092

IAC curves

Equation	Curve type	Coefficient values					
		A	B	C	D	E	β
$t_d(I)=\left(A+\frac{B}{\left(\frac{I}{I_s}-C\right)}+\frac{D}{\left(\frac{I}{I_s}-C\right)^2}+\frac{E}{\left(\frac{I}{I_s}-C\right)^3}\right)\times\frac{T}{\beta}$	Inverse	0.208	0.863	0.800	-0.418	0.195	0.297
	Very inverse	0.090	0.795	0.100	-1.288	7.958	0.165
	Extremely inverse	0.004	0.638	0.620	1.787	0.246	0.092

$$t_d(I)=A+(B/(1/I_s-C))+(D/(1/I_s-C)^2)+(E+(1/I_s-C)^3))*T/\beta$$

GUARANTEED TECHNICAL PARTICULARS

(A) CIRCUIT BREAKERS

1.		RATED VALUES AND CHARACTERISTICS	As per TGSPDCL	As per Tenderer
	a)	No. of Poles	Three	
	b)	Manufacturer's type & designation	Outdoor Porcelain Clad Vacuum circuit Breaker	
	c)	Rated Voltage	11 KV/12 KV	
	d)	Rated Insulation-Level	12KV/28KV/75KV	
		i) Impulse withstand voltage	75KV Peak	
		ii) One minute Power frequency withstand voltage.	28 KV Rms	
		iii) One minute Power frequency withstand voltage on Auxiliary wiring.	2 KV Rms	
	e)	Rated Frequency	50 HZ	
	f)	Rated Normal Current	**1250 A**	
	g)	Rated Cable charging current	25A	
	h)	Rated (Single) Capacitor breaking current	400 A	
	i)	Rated Small Inductive breaking current	_	
	j)	Rated Symmetrical Short Circuit breaking Current and breaking capacity in MVA.	**(25 KA** & 350 MVA)	
	k)	Rated Transient Recovery Voltage.	20.6 KV Rms As per IS : 13118/1991 /IEC-62271-100	
	l)	Rated short Circuit making current	**62.5KA Peak**	
	m)	Rated Operating Sequence	O-0.3Sec-Co -3Min-CO	
	n)	Rated duration of short circuit	3Sec	
	o)	Opening time and Break time (milli Sec.)	**<=60msec**	
	p)	Closing Time (Milli Sec.)	<100ms max	
2.		Whether type test certificate enclosed with tender	_	
3.		Weight of complete Circuit Breaker	_	
4.		i) Pressure maintained in vacuum chamber.	10^{-6} torr	
		ii) Gap between the contacts in Vacuum.	6-8 mm	
		iii) Area of contacts.	Adequate	
		iv) The voltage to which the circuit breaker shall be capable of withstanding indefinitely across open contacts.	12KV	
5.		Minimum Clearance in air		
		i) Between Poles	**300 mm**	
		ii) **From phase to Earth**	**250 mm (min)**	
6	**Details of vacuum interrupter make and ratings**			

(B) OPERATING MECHANISM OF CIRCUIT BREAKER AND ASSOCIATED EQUIPMENT

	1.	Type of closing mechanism.	Spring-charged, motor operated	
	2.	Whether Circuit breaker is Fixed trip or Trip free.	Trip free	
	3.	No. and type of auxiliary contacts (No. of spare normally open contacts and No. of spare normally closed contacts are to be indicated).	**6NO+6NC (4NO+4NC spare)**	
	4.	Power requirement :		
		i) Closing coil	200W maximum	
		ii) Opening coil	200W maximum	
	5.	Electrical service life :		
		i)Rated Current (times)	10000 Operations	
		ii) Rated interruption current (times)	100 Operations at STC	
	6.	Periodicity of maintenance for the following : For maintaining Vacuum in interrupting	_	
		1) For maintaining Vacuum in Interrupting chamber.		
		2) For changing contacts.		
		3) Other maintenance schedules if any.	_	

(D) 11 KV CTs of Ratio 600-300/1-1-1A for LV Control VCB

Sl. No.	Details	As per TGSPDCL	As per Tenderer
1	Type	Single phase oil cooled Live tank type	
2	Manufacturer's Type & designation	Vidyuth// S.G.Electricals/ Vishal Transformer/Reputed with complete type test reports as per IS	
3	Rated Voltage/Highest voltage	11 KV/12KV	
4	Rated Primary current	600-300	
5	Rated Secondary current	Core-I : 1A Core-II: 1A	
6	No. of cores (Secondary core details)	Two	
7	Turns ratio	600-300	
8	Rated Output in VA	Core I : 15VA Core II : 5 VA	
9	Class of Accuracy	Core I : 5P10 Core II : 0.2S	
10	Accuracy Limiting factor	10 for protective core	
11	Method of ratio change and secondary connection details & connection diagram.	–	
12	Short time current	**25 KA/3Sec**	
13	Rated current dynamic (Peak Value)	**62.5KA Peak**	
14	Rated continuous thermal current temperature rise over ambient.	Within limits as per IS: 16227 i.e. 1.2 times continuous	
15	One minute power frequency Dry/Wet withstand voltage in KV (r.m.s)	28KV	
16	1/50 micro second Impulse withstand test voltage in KV (Peak)	75KV	
17	One minute power frequency withstand test voltage on secondaries in KV (r.m.s)	3KV	
18	Total Quantity/weight of oil in KL/KG	–	
19	Total weight of in KG	–	
20	Magnetization curve of CT core	–	
21	Mounting details	–	
22	Overall dimensions	–	
23	Total creepage distance of the bushing	300 mm (min)	
24	Phase to phase clearance in air	280 mm (min)	
25	Live part to the ground clearance	**360 mm (min)**	
26	Whether the CT is hermetically sealed	-	
27	Whether over voltage protection for open circuit of secondary moulded if provided details to be furnished	–	

(E) HT TRIVECTOR METERS (DLMS COMPATIBLE):

Sl. No	Characteristics	As per TGSPDCL	As per the Tenderer
1	Makers name and country	Secure/L&T/Elster	
2	Type of Meter/model	Static/As per supplier make (DLMS)	
3	Accuracy class	0.2s as per IS 14697/99/Meter PTR : 11KV/110V CTR : 400/1A for feeder 600/1A for LV	
4	Power consumption for phase		
	i) Voltage Circuit	1 Watts & 8 VA per phase	
	ii) Current circuit	Less than 1VA/Phase	
5	Minimum starting current (%Ib)	0.1% Ib per IS 14697/99	
6	Parameters measured	1. Lamp test	
		2. Date & Time	
		3. Active energy-kwh/Mwh import & Export	
		4. Reactive Energy lag-KV Arh/MV Arh import & Export	
		5. Reactive Energy lead-KV Arh/MV Arh import & Export	
		6. Apparent energy –Kvah/Mvah import & Export	
		7. Max. demand (00.00-24.00hrs) (KVA)	
		8. Max. demand (00:00 24 hrs) occurrence time,date	
		9. Inst. Avg. power factor	
		10.Aggregate Power factor	
		11. Rising demand with Elapsed time (KVA/MVA) import & Export	
		12. Cumulative MD resets	
		13. Cumulative MD (KVA/MVA) import/export	
		14. Inst. Phase Voltage – R,Y, B phase	
		15. Inst. Phase Current– R,Y, B phase	
		16. MD with 15 minutes integration	
		17. Real time	
		18. LED test	
		19. Power off, Power fully On and Power partially On Periods	
7	No of digits of display and height of character	8 digits and 9mm height	
8	P.F. range	0 Lag – UPF – 0 Lead	
9	Variation of voltage at which meter functions normally	-30% to + 20%	
10	Particulars of read out		
	a) Continuous display	As per Sl.No.6 of above.	
	b) manually on display	1. Supply frequency	
		2. Present PT & CT status	
		3. Last occurrence tamper ID	
		4. Time and date of last occurrence	
		5. Time & date of last tamper restoration	
		6. Cumulative tamper occurrence counts	
	c) auto display parameters		
	i) Scrolling period	10 Sec	
	ii) Display off period between two cycles	2 Sec	
	d) With CMRI/RMR	As per technical specification	
11	Details of Meter base and cover		
	a) Type of material	1. base : Poly Carbonate, 2. Top : Polycarbonate Transparent	
	b) Dimensions and weight	As per the make of the meter	
12	Non volatile memory retention time in absence of power	**10 Years**	
13	Memory capacity (kB)	**32 KB**	
14	**DLMS and RS 232 port in addition to optical port.**		

IV. GUARANTEED TECHNICAL PARTICULARS FOR 24V DC DIFFERENTIAL TRANSFORMER PROTECTION RELAYS

<table>
<tr><th>Sl. No.</th><th>Description</th><th>Offered by Bidder</th></tr>
<tr><td>1</td><td>Relay Make
Model
Type
Ordering Information</td><td></td></tr>
<tr><td>2</td><td>STANDARDS :
The applicable standards of IED's are specified here below :
<table>
<tr><td>i.</td><td>Impulse withstand : 5 KV</td><td>IEC 60255-5</td></tr>
<tr><td>ii.</td><td>Fast Transients, Class IV</td><td>IEC 60255-22-4</td></tr>
<tr><td>iii.</td><td>Electromagnetic Radiation, Class III</td><td>IEC 61000-4-3</td></tr>
<tr><td>iv.</td><td>Degree of Protection, IP54 on front panel, IP20 for Rear panel</td><td>IEC 60529</td></tr>
<tr><td>v.</td><td>Vibration, Shocks, Earthquakes, class-II</td><td>IEC 60255-21-1,2, 3</td></tr>
<tr><td>vi.</td><td>The unit should have conformal coating for operation in hazardous atmosphere</td><td>EIA-364-65A</td></tr>
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<tr><td>3</td><td>COMPLIANCE : The relay manufacturers shall furnish the following statements to the TGSPDCL.
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<tr><td>PICS</td><td>:</td><td>Protocol Implementation Conformance statement.</td></tr>
<tr><td>PIXIT</td><td>:</td><td>Protocol Implementation Extra Information Statement.</td></tr>
<tr><td>MICS</td><td>:</td><td>Modeling Implementation Conformance statement.</td></tr>
<tr><td colspan="3">NABL accreditation certificate of Level A duly noting the relay version that are to be supplied and analyzed the UCA (Utility Communication Architecture) with KEEMA Tool.</td></tr>
</table></td><td></td></tr>
<tr><td>4</td><td>Communication Protocol
IED supports with IEC-61850 with IED 2 (loop in loop out) Fiber interfaces with RSTP Protocol.</td><td></td></tr>
<tr><td>5</td><td>Current Inputs
Total No. of CT's
Rated Current Rating
Rated Frequency
Burden per Phase CT and Ground CT
Thermal Withstand Capability for Continuous, 1 Sec
Dynamic Current Withstand Capability
VT's Inputs, Rated CT Current</td><td></td></tr>
<tr><td>6</td><td>Voltage Inputs
Total No. of VT's
Rated Voltage Rating
Rated Frequency
Burden per Phase at Rated Voltage
Continuous Withstand Voltage</td><td></td></tr>
</table>

<table>
<tr><td>7</td><td>Auxiliary Power Supply
Rated Auxiliary Power Supply
Min. Voltage to Power Up
Max. Permissible Voltage
Burden on Auxiliary Power Supply</td><td></td></tr>
<tr><td>8</td><td>Digital Inputs
Total No.of Digital Inputs
Total No.of Configurable Digital Inputs
Total No. of Digital Inputs with 2 Dedicated Terminals
Total No. of Digital Inputs with Common Terminal
Threshold Voltage for Binary Input
Max. Permissible Voltage
Current Consumption
Power Consumption
Pick Up Time</td><td></td></tr>
<tr><td>9</td><td>Digital Outputs
Total No.of Digital Output
Total No.of Configurable Digital Output
Total No. of Digital Outputs with 2 Dedicated Terminals
Total No. of Digital Outputs with Common Terminal
Watchdog Conact Availablitiy
Rated Voltage
Continuous Make & Carry Current Rating
Intermittent Make & Carry Current Rating with Duration
Breaking Capacity</td><td></td></tr>
<tr><td>10</td><td>LEDs
Total No. of LEDs
Total No.of Configurable LEDs,
Total Color avaiailable in Configurable LED(Mono Color/Bi Color/Tri Color)</td><td></td></tr>
<tr><td>11</td><td>Display
SLD available in Display
Total Configurable Screens in Display</td><td></td></tr>
<tr><td>12</td><td>Push Buttons
Total No. of Push buttons
Total No. of Configurable Push Button
Exclusive Push Button to Close & Trip
Exclusive Push Button to Reset Relay LEDs,Latchs</td><td></td></tr>
<tr><td>13</td><td>Software
Licencsed Software along with product key</td><td></td></tr>
<tr><td>14</td><td>Conformally Coated PCB's</td><td></td></tr>
<tr><td>15</td><td>Type of Terminals Provided for :
<table><tr><td>1</td><td>CTs</td></tr><tr><td>2</td><td>Auxiliary Supply</td></tr><tr><td>3</td><td>PTs</td></tr><tr><td>4</td><td>DIs</td></tr><tr><td>5</td><td>DOs</td></tr><tr><td>6</td><td>Analog Inputs</td></tr></table></td><td></td></tr>
<tr><td>16</td><td>Ports
Type of Ports offered and Data transfer Speed in each port
Front :
Rear :</td><td></td></tr>
</table>

17	**Protection Functions & Supervision Functions in Relay**						

ANSI Code	Description	No. of Stages	Curves Available	Settings Range (Min, Max)	Step Change
51	IDMT Over Current Protection				
50	Instantaneous Over Current Protection				
51N	IDMT Earth Fault Protection				
50N	Instantaneous Earth Fault Protection				
49	Thermal Overload Protection				
46	Broken Conductor Protection				
51 V	Voltage Dependent Inverse Time Over Current Protection				
50BF	Breaker Failure Protection				
79	Auto Reclose				
27	Under Voltage Protection				
59	Over Voltage Protection				
59N	Neutral Displacement Voltage Protection				
68	*Cold load Pickup & Inrush*				
24	Over Excitation Protection				
32	Power Protection				
37	Undercurrent Protection				
47	Sequence Over Voltage Protection				
55	Power Factor Protection				
67	Directional Over Current Protection				
67N	Directional Over Current Protection				
87GH	Restrcted Earth Fault Protection High Impeadance				
87NL	Restricted Earth Fault Protection Low Impeadance				
87T	Transformer Bias Differential Protection				
74	Trip Circuit Supervision				
	CT Supervision				
	VT Supervision				
	Circuit Breaker Condition Monitoring				
	Temparature Supervision				

For 51, 51N Protection Function All standard IEEE/IEC curves shall be available in relay by default including **IEC 1.3 Sec Curve**. Also user configurable curve **must** be available for user to configure if required. For **Reset Curve Characteristics** user shall have all standard IEC/IEEE curves.
For 51, 51N Protection **2nd harmonic current blocking** must be available. For 87T Protection **2nd & 5th Harmonic current blocking** must be available.

<table>
<tr><td>18</td><td>Total Available Flexible Protection function allowing to configure the protections associated with Current, Voltage Inputs, DIs & DOs using logical conditions.</td><td></td></tr>
<tr><td>19</td><td>Total setting Groups Available
Total Stages in Each Group</td><td></td></tr>
<tr><td>20</td><td>Disturbance Records
Total Duration Available
Available Sampling Rates
Total Allowed Digital Channels in Distrubance Record
Total Allowed Analog Channels in Disturbance Record
Total Disturbance Records Available with 1 Sec Duration @ Min Sampling Rate
Total Disturbance Records Available with 1 Sec Duration @ Min Sampling Rate

Fault Log
Total Available Fault logs visible in HMI
Total Available Fault logs via Software

Events Log
Total Available Event Logs
Total Available Security Logs</td><td></td></tr>
<tr><td>21</td><td>Total No. of Authorizations Available for access
(1) Viewing Protection Settings
(2) Editing Protection Settings & Parameter Settings</td><td></td></tr>
<tr><td>22</td><td>Metering Functionality of IED Relay</td><td></td></tr>
<tr><td></td><td>
<table>
<tr><th>S.No</th><th>Measurement Functionality of Relay</th></tr>
<tr><td>1</td><td>Three Phase Currents RMS, Max, Avg, Instantaneous Magnitude & Phase Angle of HV Side</td></tr>
<tr><td>2</td><td>Neutral Current RMS, Max, Avg, Instantaneous Magnitude & Phase Angle of HV Side</td></tr>
<tr><td>3</td><td>Three Phase Currents RMS, Max, Avg, Instantaneous Magnitude & Phase Angle of LV Side</td></tr>
<tr><td>4</td><td>Neutral Current RMS, Max, Avg, Instantaneous Magnitude & Phase Angle of LV Side</td></tr>
<tr><td>5</td><td>All Bias, Difference Currents RMS, Max, Avg, Instantaneous Magnitude & Phase Angle</td></tr>
<tr><td>6</td><td>Phase to Phase Voltage RMS, Max, Avg, Instantaneous Magnitude & Phase Angle</td></tr>
<tr><td>7</td><td>Phase to Earth Voltage RMS, Max, Avg, Instantaneous Magnitude & Phase Angle</td></tr>
<tr><td>8</td><td>All Sequence Voltages with Magnitude & Phase Angle</td></tr>
<tr><td>9</td><td>All Sequence Currents with Magnitude & Phase Angle</td></tr>
<tr><td>10</td><td>Active Power Per Phase & 3 Phase</td></tr>
<tr><td>11</td><td>Reactive Power Per Phase & 3 Phase</td></tr>
<tr><td>12</td><td>Apparent Power Per Phase & 3 Phase</td></tr>
<tr><td>13</td><td>Power factor Phase wise & 3Phase</td></tr>
<tr><td>14</td><td>All Energy Measurement KWH, KVARH, KVAH</td></tr>
<tr><td>15</td><td>Maximum Demand, Minimum Demand recorded Hourly, Daily, Weekly, Monthly</td></tr>
<tr><td>16</td><td>Frequency</td></tr>
<tr><td>17</td><td>Oil Temparature</td></tr>
<tr><td>18</td><td>Winding Temparature</td></tr>
</table>
</td><td></td></tr>
</table>

23	Supply of IED configuration and Programming software for extracting ICD, CID files and settings, required cables.	
	Communication **IEC 61850 protocol Edition 2.0** with optical loop in and loop out ring topology with RSTP Protocol. Relay should communicte with Other make IED relays Via GOOSE and it has to be demonstrated in POC.	
	The relay should have one serial port **or** USB port in front for relay programming, **Also it should have one serial port at rear for service purpose.**	
	Parameters to be Reported by Feeder IED to Remote Control Centre	

Digital Inputs	**Digital outputs**
Breaker ON	Breaker close
Breaker off	Breaker trip
Breaker spring charge	TCS on Close alarm
Breaker trip circuit supervision	Two output for goose
SCADA IN	
SCADA OUT	**Analog Inputs**
Buchholz Alarm Operated	Oil Temparature
Buchholz Trip Operated	Winding Temparature
Low Oil Alarm Operated	
OLTC Buchholz Trip Operated	
OLTC Buchholz Alarm Operated	
Soft Signals to be Reported	**Soft Signals to be Reported**
Breaker tripped on 51R> with set values and acted values	Breaker tripped on 51Y>with set values and acted values
Breaker tripped on 51B>with set values and acted values	Breaker tripped on 50N>with set values and acted values
Breaker tripped on 51R>>with set values and acted values	Breaker tripped on 51Y>>with set values and acted values
Breaker tripped on 51B>>with set values and acted values	Breaker tripped on 50N>>with set values and acted values
Breaker failure protection	Breaker tripped on REF with set values and acted values
Oil Tempararature Alarm Operated	Oil Temparature Trip Operated
Winding Tempararature Alarm Operated	Winding Temparature Trip Operated
Breaker tripped on Differential with set values and acted values	Current of R
Current of Y	Current of B
Voltage of RY	Voltage of YB
Voltage of BR	KWH import and export
KVAH import and export	KVARH import and export
PF Phase wise and Average	MD Maximum and average
CT Supervision	VT Supervision
Facility to communicate the disturbance recording in COMTRADE 2000 Format through IEC 61850 and it shall be saved in substation LDMS	Facility to communicate the Fault Record with time stamping through IEC 61850 and it shall be saved in substation LDMS
The relays All BOs and All LEDs shall be RESET from Control Center and LDMS when command is given remotely.	

	The relay shall have Cyber security feature such as Security logs, signed firmware etc. The relay shall have Role Based Access Control(RBAC) feature. Every relay should comply with SNTP Protocol.	
	Goose signal should be freely configurable for any kind of signals using graphic tools/user friendly open software without use of any external converter	

Reputed makes of various materials

Sl. No.	Description	Make1	Make2	Make3	Other reputed makes
VCB					
1.	Anti Pumping Device, RATING 6A/250VAC	RE400	SELECTRON	EAPL	Ashida, Solenoid, CSPC, **L&T/any reputed**
2	TNC Switch , RATING 22A /250VAC	kaycee	SALZAR	Switron	Recon
3	Local /Remote Selector Switch, RATING 20A/250V AC	kaycee	SALZAR	Switron	Recon
4	Timer / CONTACT-1C/O SR RATING 0-300 seconds 24V DC	SELETRON	EAPL	Siemens	
5	Push buttons with 1 NO contact ,RATING 6A/ 250V SIZE 22.5 dia	Technic	SIEMENS	VAISHNO	ESSEN
6	MCB 2POLE DC VOLTAGE ,RATIND 6KA 16A/ 24/ SALZAR 24V DC	SIEMENS	ABB	L&T	C&S, Havells, Schneider,ALSTOM
7	Auxiliary switch , RATING 20A/250VAC	kaycee	SALZAR	Switron	ASVINI IND
7	Contactor for contact multiplier WITH 2NO+2NC/RATING 10A/440ACV	Siemens	ABB	L&T	C&S/HAVELLS
8	Ammeter selector switch R-Y-B-N-OFF/ 4 POSITIONS/ RATING 10/250VAC	kaycee	SALZAR	Switron	Recom
9	Voltmeter selector switch NO OF POSITIONS -7NO'S RN,YN,BN,RY,TB,BR,OFF/ RATING **10A** 250V AC	kaycee	SALZAR	Switron	Recom,ABB
10	Indicating "LED" type lamps DIA 22.5MM, RATING 24V DC	Technic	SIEMENS	ESSEN	VAISHNO
11	Digital Ammeter – 96x96 mm, CT RATIO 200-400/1A for feeder Ratio 300-600/1 for LC ,WITH 110 AC AUX SUPPLY	A.E	MECO	RISHAB	Schneider/**ICD/ Elmeasure /Conzerv**
12	Test Terminal Block 3 PHASE-4WIRE TYPE/ RATING 36A/250AC V	Teknic	DAV	Delco	Magna/ **Dhoot**
13	Spring charge motor SINGLE PHAE AC MOTOR 250VAC +or-10% voltage OR 250V UNIVERSAL	DELCO	BHEL	IMP	Agni/Precise
14	AUTO MANUAL SWITCH, RATING 22A/250V	KAYCEE	SALZAR	Switron	
15	BELL, ELECTRONIC 24V DC	ALAN	JVS	VAISHNO	Avana, INTEL EC, R.K
16	TERMINAL BLOCKS ,36AMPS/250VAC	ELMEX	CONNTWELL	JOHNSON	
17	LIMIT SWITCH FOR MOTOR 6A/250VACSPRING CHARGE 6A/250V AC	Kaycee	JAI BALAJI		
18	ELECTRONIC TRIVECTOR METER – 3PHASE 4WIRE/ CT RATIO 200-400/1A for feeder and 300-600/1-1A AND PT RATIO 11OOO/ 110V **COMPATIBLE WITH DLMS COMPATIBLE.**	SECURE	L&T	ELESTER	HPL
19	DIGITAL VOLT METER SIZE 96X96 MM RATIO;11OOO/110V WITH 110V AUX SUPPLY	A.E	MECO	RISHAB	Elmeasure/ICD

RELAYS					
15	Trip circuit supervision relays WITH PRE AND POST CLOSE SUPERVISION 24V DC	AREVA	EASUN	Ashida	EE, JVS, Crompton,C&S
16	Master trip relay 3no+1NC,HR 3NO+2NC FLUSH TYPE 24V DC	AREVA	ABB	EASUN	EE,ASHIDA, CSPC, Crompton
17.	Aux Relay/OR CONTRACTOR for 24V DC Supervision	AREVA	EASUN	ABB	EE,L&T,JVS,ASHIDA, S&S, Crompton,C&S
18.	TTB(Terminal Block)	Shall be DAV make only			

Note: Any of the make specified above acceptable subject to compliance to the technical specification only.

SECTION – VI
QUALIFICATION REQUIREMENTS

1. The bidder should be a manufacturer who must have designed, manufactured, tested and supplied **to Govt. power utilities/Distribution power utilities at least 40% of the quoted quantity of the goods/equipment of same or higher class indicated in the "Schedule of material" in one continuous period of 12 months during last 5 years period** and **its financial turnover during any one year of the last five years should have been equal or more than 100% value of the material now quoted**. The qualification requirements of principal manufacturer will be considered for evaluation.

   At least 20% of similar material offered against this Specification should be in successful operation since 2 years as on the date of opening of the Bid. Fresh bidders can be given order up to 15% of the total quantity as a trial order, if equipment justified. **However, for placing the trial order the destination price shall be lower by at least 5% of L1 price. Performance Certificates issued by the purchasing authority will only be considered.**

   Any company/vendor/supplier/contractor which is blacklisted/debarred by any other power utility is not eligible to participate in the tenders.

   The bidders shall have to furnish an undertaking in the prescribed format-9 regarding any relation to the promoters of blacklist/debarred companies by any utility. Any false information furnished in the declaration while rendering bid, such contract is liable for termination as well as recovery of damages.

2. The bidder should furnish the information on all past supplies and satisfactory performance in proforma under Format-VI. Copies of Purchase Orders, invoices and other documents in support of the above supplies should be enclosed.

3. All bids submitted will also include the following information:
   i. Copies of original documents defining the constitution or legal status, place of registration and principle place of business of the company or firm or partnership, etc.,
   ii. The bidder should furnish a brief write-up, backed with adequate data, explaining his available capacity and experience (both technical and commercial) for the manufacture and supply of the required equipment within the specified time of completion after meeting all their current commitments.
   iii. The bidder should clearly confirm that all the facilities exist in his factory for inspection and testing and these will be made available to the purchaser or his representative for inspection.
   iv. Reports on financial standing of the Bidder such as profit and loss statement, balance sheets and auditor's report for the past three years, bankers certificates etc.

4. The bidder will furnish Type Test Results. The type tests must have been conducted on the material offered as per the relevant IS/International Standards in recognized laboratory NABL/International labs as per the latest revision of the Technical Specification and the **date of Type tests will not be later than 5 years**. **The Bids received without type test reports in complete shape inclusive of drawings will be treated as Non-Responsive.**

5. Even though the bidder meets the above qualifying criteria, they are subject to be disqualified if they have…
   a. made misleading or false representations in the forms statements and attachments submitted in proof of qualification requirements and / or
   b. record of poor performance such as not properly completing the contract, inordinate delays in supply completion, litigation history or financial failure etc.

6. Not withstanding anything stated above the purchaser reserves the right to assess bidder's capability and capacity to perform the contract should circumstances warrant such an assessment in the overall interest of the purchaser.

SECTION - VII
SAMPLE FORMS
1. BID FORM (FORMAT-I)

Date. .....

TO: (Name and Address of Purchaser)
Gentlemen and/or Ladies:

Having examined the Bidding documents, the receipt of which is hereby duly acknowledged, we, the undersigned, offer to supply and deliver. ..... (Description of Materials / equipment) in conformity with the said bidding documents as may be ascertained in accordance with the schedule of prices **(On-line Commercial stage only)** and made part of this Bid.

We undertake, if our Bid is accepted, to deliver the Materials / equipment in accordance with the delivery schedule specified in the Schedule of materials.

If our Bid is accepted, we will obtain the guarantee of a bank in a sum equivalent to. 10% of the Contract Price for the due performance of the Contract, in the form prescribed by the Purchaser.

We agree to abide by this Bid upto ……. (for the Bid Validity Period) specified in Clause and it will remain binding upon us and may be accepted at any time before the expiration of that period.

Until a formal contract is prepared and executed, this Bid, together with your written acceptance thereof and your notification of award, will constitute a binding Contract between us.

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

We certify / confirm that we comply with the eligibility requirements as per clause of the bidding documents.

Dated this. .....day of. .....20___

_____

_____

[Signature] *[in the capacity of]*

Duly authorized to sign Bid for and on behalf of _____

2. BID SECURITY FORM (FORMAT -II)

Whereas. ..... (hereinafter called "the Bidder") has submitted its Bid dated (date of submission of bid) for the supply of. .....(name and /or description of the Materials / equipment) (hereinafter called "the Bid").

KNOW ALL PEOPLE by these presents that WE. .....(name of bank) 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 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 200 .

THE CONDITIONS of this obligation are:

1. If the Bidder
   a) withdraws its Bid during the period of bid validity specified by the Bidder on the Bid Form; or
   b) does not accept the correction of errors in accordance with the Bid Specification, or
2. If the Bidder, having been notified of the acceptance of its bid by the Purchaser during the period of bid validity;
   (a) fails or refuses to furnish the performance security, in accordance with the Bid Specification.
   (b) fails or refuses to execute the Contract Form if required; or

   We undertake to pay 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 both of the two conditions, specifying the occurred condition or conditions.

This guarantee will remain in force up to and including forty five (45) days after ……(Specification Date) the period of the bid validity, **i.e., total for 135 days from the date of bid opening** and any demand in respect thereof should reach the Bank not later than the above date.

. .....

(Signature of the Bank)

NOTE: This will be executed on a Rs.100/- non-judicial stamp paper issued by any **Nationalized/Scheduled** Bank.

3. PERFORMANCE SECURITY FORM (FORMAT-III)

To:_____(Name of Purchaser)

WHEREAS……..(Name of Supplier)
(hereinafter called "the Supplier") has undertaken, in pursuance of Contract No.....dated.....200 to supply. .....(Description of Materials / equipment and Services)
(hereinafter called "the Contract").

AND WHEREAS it has been stipulated by you in the said Contract that the Supplier will furnish you with a Bank Guarantee by any **Nationalized/Scheduled Bank** for the sum specified therein as security for compliance with the Supplier's performance obligations in accordance with the Contract.

AND WHEREAS we have agreed to give the Supplier a Guarantee:

THEREFORE WE hereby affirm that we are Guarantors and responsible to you, on behalf of the Supplier, up to a total of. ..... (Amount of the Guarantee in Words and Figures) and we undertake to pay you, upon your first written demand declaring the Supplier to be in default under the Contract and without cavil or argument, any sum or sums within the limit of..... (Amount of Guarantee) as aforesaid, without your needing to prove or to show grounds or reasons for your demand or the sum specified therein.

This guarantee is valid until the. ... day of. ..... 200.

Signature and Seal of Guarantors
.....
Date. .....200.
.....
.....
Address:.....….
.....
.....

NOTE: This will be executed on a Rs.100/- non-judicial stamp paper by a scheduled Bank.

4. CONTRACT FORM (FORMAT-IV)

THIS AGREEMENT made the. ..... day of. ..... 200 Between. .....(Name of Purchaser) of the one part and. .....(Name of Supplier) of the other part:

WHEREAS the Purchaser invited bids for certain Materials / equipment and ancillary services viz.,
.....(Brief description of Materials / equipment and Services) and has accepted a bid by the Supplier for the supply of those Materials / equipment and services in the sum of. .....(Contract Price in Words and Figures)(hereinafter called "the Contract Price").

NOW THIS AGREEMENT WITNESSETH AS FOLLOWS:

1. In this Agreement words and expressions will have the same meanings as are respectively assigned to them in the Conditions of Contract referred to.

2. The following documents will be deemed to form and be read and construed as part of this Agreement, viz.:

   (a) the Bid Form and the Price Schedule submitted by the Bidder;

   (b) the Schedule of Requirements;

   (c) the Technical Specifications;

   (d) the General Conditions of Contract;

   (e) the Purchaser's Notification of Award.

3. In consideration of the payments to be made by the Purchaser to the Supplier as hereinafter mentioned, the Supplier hereby covenants with the Purchaser to provide the Materials / equipment and services and to remedy defects therein in conformity in all respects with the provisions of the Contract.

4. The Purchaser hereby covenants to pay the Supplier in consideration of the provision of the Materials / equipment and services and the remedying of defects therein, the Contract Price or such other sum as may become payable under the provisions of the Contract at the times and in the manner prescribed by the Contract.

Brief particulars of the Materials / equipment and services which will be supplied/ provided by the Supplier are as under:

Sl. No.	Brief Description of Materials / Equipment & services	Quantity to be supplied	Unit Price Rs.	Total Price Rs.	Delivery Terms

TOTAL VALUE: (Rupees _____only)

DELIVERY SCHEDULE:

IN WITNESS whereof the parties hereto have caused this Agreement to be executed on the day and year first above written.

Signed, Sealed and Delivered by the

said. .....(for the Purchaser)

in the presence of. .....

Signed, Sealed and Delivered by the

said. .....(for the Supplier)

in the presence of. .....

NOTE: To be executed on a Rs.100/- Non-judicial stamp paper.

5. DETAILS TO BE FURNISHED BY THE MANUFACTURER (FORMAT-V)

1. Specification No.	:	
2. Name of the Material	:	
3. Quantity to be procured	:	
4. Last date and time for submission of Bid	:	
5. Date and time for opening of Bid	:	
6. State whether Bid security is enclosed	:	
7. State whether the quotation in two parts has been submitted.	:	
8. State whether 20% minimum quantity for each item is quoted	:	
9. Whether willing to furnish performance B.G**. @ 10%** if order is placed	:	
10. Indicate the month wise delivery Schedule.	:	
11. Prices whether Firm	:	
12. Whether any other tax payable. If so give details and the same is included / not included.	:	
13. State whether TGSPDCL terms of payment are accepted.	:	
14. Quantity offered for supply	:	
15. State whether 90 days validity offered	:	
16. Whether sample is enclosed (if specified)	:	
17. Whether the material/equipment offered conforms to the relevant TGSPDCL Specification	:	
18. Whether you have executed orders of the TGSPDCL previously for these items. (Please give details)	:	
19. Similar details in respect of supplies made to other utilities	:	
20. Whether Bid security exemption letter enclosed, if exempted in case of Govt. firms.	:	
21. Whether GSTR 3B Returns enclosed	:	
22. Whether Income-tax clearance certificate enclosed.	:	
23. Whether Warranty clause accepted	:	
24. Whether Penalty clause accepted	:	
25. Whether delivery schedule accepted	:	

Place :

Date :

Signature of the Bidder :

Name :

Business address:

6. PROFORMA FOR PERFORMANCE STATEMENT (FORMAT-VI)

Bid No._____ Date of Opening_____

Time _____ Hours

Name of the Firm_____

Order placed by (full address of purchaser)	Order No. and Date	Description and quantity of ordered equipment	Date of Completion of Delivery	
			As per Contract	Actual

Remarks indicating reasons for late delivery, if any	Has the equipment been satisfactorily functioning? (Attach a Certificate from the Purchaser)

Signature of the Bidder _____

_____

_____

7. SCHEDULE OF DEVIATION

(i) TECHNICAL (FORMAT-VII (A))

Sl. No.	Requirements / Equipment	Specification Clause No.	Deviations	Remarks

It is hereby conformed that except for deviations mentioned above, the offer conforms to all the other features specified in Technical Specification Section ____ of this Bid Document

Place :

Date :

Signature of the Bidder :

Name :

Business address:

(ii) COMMERCIAL (FORMAT-VII (B))

Sl. No.	Requirements / Equipment	Specification Clause No.	Deviations	Remarks

It is hereby conformed that except for deviations mentioned above, the offer conforms to all the other features specified in Commercial Specification Section ____ of this Bid Document

Place :

Date :

Signature of the Bidder :

Name :

Business address:

8. Declaration to be given by the Company in regard to relation to promoters of Blacklisted/debarred companies by any power utilities (FORMAT-VIII).

I declare that our firm was not blacklisted/debarred by any utility and also certify that myself or any of the representatives of my company/firm do not have any relatives with promoters of blacklisted/debarred companies by any utilities.

It is certified that the information furnished above is true to the best of my knowledge and belief. It is hereby undertaken that in the event of the above information found to be false or incorrect at a later date, the TGSPDCL is entitled to terminate the contract/ agreement entered into besides recovering damages as may be found necessary, with due notice.

Signature of authorized representative

Terminal Connector Drawing