

**North Eastern Electricity Supply Company of Orissa Limited (NESCO)
Western Electricity Supply Company of Orissa Limited (WESCO)
Southern Electricity Supply Company of Orissa Limited (SOUTHCO)
Registered Office,
123, Sector-A, Zone-A, Mancheswar Industrial Estate, Bhubaneswar, Orissa-751010
Tel No. (0674) 2582728, Fax No. (0674) 2586343**

VOLUME- I

(Tender Notification : CSO/14/Breaker,CT,PT,Relay control Panel)

2008 - 2009

Date: 07.11.2008

Section – I

INVITATION FOR BIDS (IFB)

2008-09

(Tender Notification: CSO/14/Breaker, CT, PT, Relay control Panel)

Date: 07.11.2008

Registered Office of NESCO, WESCO & SOUTHCO

- 1.0 The Registered Office of NESCO, WESCO & SOUTHCO (here in after referred as **CSO**) invites Sealed tenders in Two part Bids (“Technical Bids” & “Commercial Bids”) for supply of Distribution Transformers from reputed manufacturers having requisite experience and financial capabilities as specified in clause 6.0 below. The sealed envelopes shall be duly superscribed as **“TENDER NOTICE/CSO/14/ Breaker,CT,PT,Relay control Panel due for opening on dt. 25.11.08”**.

Sl. No.	Item with capacity	Qty. (In Nos.) required for NESCO / SOUTHCO / WESCO
1	33 KV, 1250 A, Out Door Vacuum Circuit Breaker	210
2	11 KV, 630 A Out Door Vacuum Circuit Breaker	264
3	33 KV, 1ph. Out door Oil cooled Current Transformer	630
4	11 KV, 1ph. Out door Current Transformer	792
5	Out Door control Relay panel for 33 KV, 1250 A, VCB with Power pack	130
6	Indoor Door control Relay panel for 33 KV, 1250 A, VCB	80
7	Out Door control Relay panel for 11 KV, 630 A, VCB with power pack	143
8	Indoor Door control Relay panel for 11 KV, 630 A, VCB	121
9	11 KV, 1ph. Out door Potential Transformer	132
10	Out Door control Relay panel for 33 KV, 1250 A, VCB with Power pack and Numerical Relay	Unit Rate
11	Indoor Door control Relay panel for 33 KV, 1250 A, VCB with Numerical Relay	Unit Rate
12	Out Door control Relay panel for	Unit Rate

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	11 KV, 630 A, VCB with power pack and Numerical Relay	
13	Indoor Door control Relay panel for 11 KV, 630 A, VCB with Numerical Relay	Unit Rate

- 2.0 The schedule of specifications with detail terms & conditions can be obtained from address given below against demand draft of Rs. 5000/- plus 4% VAT drawn in favour of NESCO Ltd., payable at Bhubaneswar. The tender papers will be issued in all working days upto of each day & will continue upto 21.11.2008.

The tender documents can also be downloaded from the website of the three companies as stated below :-

wescoorissa.com, nescoorissa.com & southcoorissa.com

In case tender papers are downloaded from any of the above websites, then the bidder has to enclose a demand draft covering the cost of bid documents as stated above in a separate envelope with suitable superscription "Cost of Bid Documents : Tender Notice Ref : CSO/05/Distribution Transformer". This envelope should accompany the Bid Documents and to be enclosed in the envelope containing the "Technical Bid" & "Bid Security".

In case the prospective bidders wants that the tender documents are to be forwarded to him by post, the same can be availed by sending a request letter along with Demand Draft covering the cost of the bidding document + Rs.50.00. This office shall not take any responsibility for delay in receipt of such request letter by the purchaser or delay in receipt of tender documents by bidder in transit on account of any reasons what so ever.

- 3.0 Offers will be received upto 2.00 PM. on dt. 25.11.08 & the "Technical Bid" will be opened on the same day at 3.00 PM, in presence of the authorized representatives of the bidders. After evaluation of Technical Bids, the eligible bidders shall be intimated to attend the Opening of Commercial Bids not later than 15 days from the date of opening of the Technical Bid as stated earlier.
- 4.0 The schedule of specifications with detail terms & conditions are enclosed. It is the sole responsibility of the bidder to ensure that the bid documents reach this office on or before the cut off due date of tender opening.
- 5.0 The Purchaser reserves the right to reject any or all Tenders without assigning any reason thereof and alter the quantity of materials mentioned in the Tender documents at the time of placing purchase orders. Tender will be summarily rejected if:
- (i). Bid security @ 2% (Two percent) of the Tender value is not deposited in shape of Bank Draft in favor of NESCO, payable at Bhubaneswar or Bank Guarantee. Bid security if any

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submitted against previous Tenders, will not be adjusted towards Bid security against this Tender.

- (ii). The offer does not contain "FOR, WESCO/NESCO/SOUTHCO price indicating break-up towards all taxes & duties".
- (iii). Complete Technical details are not enclosed.
- (iv). Tender is received after due time due to any reason.

6.0 Qualification Criteria :-

The prospective bidder must qualify all of the following requirements to be eligible to participate in the bidding.

- a) Bidder must quote all items i.e. VCB, CT, PT, RC Panel
- b) Bidder must have successfully carried out Type Test of Transformers from any NABL Accredited Laboratory. The said Type Test report should not be prior to 5 yrs. from the date of opening of Technical Bid. Type test is mandatory for each capacity of transformer to be quoted.
- c) Bidder must quote at least 50% of the tender qty. against any one capacity or more than one capacity of Transformer.
- d) Bidder should have supplied at least 100% of the offered quantity to Electricity Distribution Utility / PSU in any one year out of the past 3 financial years. The bidder should enclose Performance Certificate of the user as proof of successful operation in field for minimum 1 years. The bidders must submit copies of relevant Purchase Orders, Supply Invoices/Challans in proof of having successfully supplied the required quantity. No further correspondence shall be made with the bidders regarding submission of proof of past supplies.

7.0 Project Completion Schedules :-

Description	Date
Issue of Tender Document	08.11.2008
Receipt of Queries from Bidders (if any)	15.11.2008
Replies to the Queries	18.11.2008
Submission of Bids	25.11.2008 by 2.00 PM
Opening of Technical Bids	25.11.2008 at 3.00 PM
Receipt of Clarification from Bidders (if any)	29.11.2008 (Tentative Date)
Intimation to Bidders for Opening of Commercial Bid	01.11.2008 (Tentative Date)
Opening of Commercial Bid (To be confirmed later)	06.11.2008 (Tentative Date)
Issue of LOI / Purchase Order	08.12.2008 (Tentative Date)
Supply completion	Phased manner & to be completed within 4 months from the date of issue of LOI / Purchase Order.

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8.0 All correspondences with regard to the above shall be made to the following address:

Dy. General Manager (Tech) / Sr. Manager (MAC)

Central Services Office

(NESCO, WESCO & SOUTHCO)

Plot No. 123, Sector – A, Zone – A

Mancheswar Industrial Estate

Bhubaneswar – 751 010

FAX : (0674) 2586343

Email : biswakeshdash@rediffmail.com / susantasarangi@sify.com

Mobile : 93382 14150 / 93376 46022

SECTION – II

**INSTRUCTION TO BIDDERS (ITB)
2008-2009**

(Tender Notification: CSO/14/Breaker, CT, PT, Relay control Panel)

Date: 07.11.2008

Registered Office of NESCO, WESCO & SOUTHCO

A. GENERAL

1.0 NESCO / WESCO / SOUTHCO, hereinafter referred to as the "Purchaser" is desirous of implementing the various Systems Improvement works at their respective licensed area in the state of Orissa. The Purchaser has now floated this tender for procurement of Distribution Transformers.

2.0 SCOPE OF WORK

The scope shall include Design, Manufacture, Shop Testing at works of 11/0.250 KV, 10 KVA & 11/0.250 KV, 16 KVA, 11/0.433 KV, 25 KVA, 33/0.433 KV, 100 KVA & 33/0.433 KV, 63 KVA Distribution Transformers conforming to the Technical Specifications enclosed along with Packing, Forwarding, Freight and Insurance and Unloading and proper stacking at Purchaser's stores.

3.0 DISCLAIMER

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

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

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

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

4.0 COST OF BIDDING

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

B. BIDDING DOCUMENTS

5.0 BIDDING DOCUMENTS

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

Volume - I

- | | | |
|-----|--------------------------------------|-----------------|
| (a) | Invitation for Bids (IFB) | - Section - I |
| (b) | Instructions to Bidders (ITB) | - Section - II |
| (c) | General Conditions of Contract (GCC) | - Section - III |
| (d) | Technical Specifications (TS) | - Section - IV |

Volume – II

- | | | |
|-----|--------------------------|------------------|
| (a) | Bid Form | - Annexure – I |
| (b) | BG Formats | - Annexure – II |
| (c) | Price Schedule | - Annexure – III |
| (d) | GTP Formats | - Annexure – IV |
| (e) | GTP Formats | - Annexure – V |
| (f) | Past Performance Details | - Annexure - VI |

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

6.0 AMENDMENT OF BIDDING DOCUMENTS

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

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

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

C. PREPARATION OF BIDS

7.0 LANGUAGE OF BID

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

8.0 DOCUMENTS COMPRISING THE BID

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

- (a) Bid Form, Price & other Schedules (STRICTLY AS PER FORMAT) and Technical Data Sheets completed in accordance with Clause 9.0, 10.0, 11.0 and Technical Specification;
- (b) All the Bids must be accompanied with the required bid security as mentioned in the Section-I against each tender.
- (c) Power of Attorney indicating that the person(s) signing the Bid have the authority to sign the Bid and thus that the Bid is binding upon the Bidder during the full period of its validity, in accordance with clause 12.0.

9.0 BID FORM

9.01 The Bidder shall complete an 'Original' and another one 'Copy' of the Bid Form and the appropriate Price & Other Schedules and Technical Data Sheets furnished in the Volume-II of the Bidding Documents.

9.02 Bid Security

Pursuant to Clause 8.0 (b) above, the bidder shall furnish, as part of its bid, a bid security amounting to 2% (Two percent) of the total bid value (FOR Destination) as already specified in the Section-I. The bid security is required to protect the Purchaser against the risk of Bidder's conduct which would warrant the security's forfeiture.

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

- (a) Bank Guarantee issued by any scheduled bank strictly as per the format enclosed and shall be valid for a period of thirty (30) days beyond the validity of the bid.
- (b) Bank Draft in favour of NESCO, payable at Bhubaneswar.

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

The successful bidder's bid security will be discharged upon furnishing the performance security as per clause 29.0.

The bid security may be forfeited :

- (a) if the Bidder:
 - i) withdraws its bid during the period of bid validity specified by the Bidder in the Bid Form; or
- (b) in the case of a successful Bidder, if the Bidder fails:
 - (i) to sign the Contract, or
 - (ii) to furnish the required performance security.

10.0 BID PRICES

10.01 Bidders shall quote with a break-up of prices for individual items. The total Bid Price shall also cover all the Supplier's obligations mentioned in or reasonably to be inferred from the Bidding Documents in respect of Design, Supply, Transportation to site, all in accordance with the requirement of Bidding Documents. The Bidder shall complete the appropriate Price Schedules included herein, stating the Unit Price for each item & total Price.

10.02 The prices offered shall be inclusive of all costs as well as Duties, Taxes and Levies paid or payable during execution of the supply work, break up of price constituents, should be there.

10.03 Prices quoted by the Bidder shall be "Firm" and not subject to any price adjustment during the performance of the Contract. A Bid submitted with an adjustable price quotation will be treated as non-responsive and rejected.

11.0 BID CURRENCIES

Prices shall be quoted in Indian Rupees Only.

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12.0 PERIOD OF VALIDITY OF BIDS

- 12.01 Bids shall remain valid for 120 days from the date of opening of the Commercial Bid.
- 12.02 Notwithstanding Clause 12.01 above, the Purchaser may solicit the Bidder's consent to an extension of the Period of Bid Validity. The request and the responses thereto shall be made in writing by Fax/e-mail.

13.0 ALTERNATIVE BIDS

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

14.0 FORMAT AND SIGNING OF BID

- 14.01 The original Bid Form and accompanying documents (as specified in Clause 9.0), clearly marked "Original Bid", plus one copy must be received by the Purchaser at the date, time and place specified pursuant to Clauses 15.0 and 16.0. In the event of any discrepancy between the original and the copies, the original shall govern.
- 14.02 The original and copy of the Bid shall be typed or written in indelible ink and shall be signed by the Bidder or a person or persons duly authorized to sign on behalf of the Bidder. Such authorization shall be indicated by written Power-of-Attorney accompanying the Bid.
- 14.03 The Bid shall contain no interlineations, erasures or overwriting except as necessary to correct errors made by the Bidder, in which case such corrections shall be initialed by the person or persons signing the Bid.

D. SUBMISSION OF BIDS

15.0 SEALING AND MARKING OF BIDS

- 15.01 Bid submission: One original & one Copy (hard copies) of all the Bid Documents shall be sealed and submitted to the Purchaser before the closing time for submission of the bid. One set print out of Section III & Section IV of the Bid Document duly signed and stamped at every page shall have to be submitted along with the bid.
- 15.02 The Technical Documents and the Bid Security shall be enclosed in a sealed envelope and the said envelope shall be superscribed with "Technical Bid & Bid Security". The price bid shall be inside another sealed envelope with superscription "Price Bid". Both these envelopes shall be sealed inside another big envelope. All the envelopes should bear the Name and Address of the Bidder and marking for the Original and Copy. The envelopes should be super-scribed with "Tender Notice No. & Due date of opening".
- 15.03 The Bidders have the option of sending the Bids in person. Bids submitted by Telex/Telegram/Fax will not be accepted. No request from any Bidder to the Purchaser to collect the proposals from Airlines/Cargo Agents etc shall be entertained by the Purchaser.

16.0 DEADLINE FOR SUBMISSION OF BIDS

- 16.01 The original Bid, together with the required copies, must be received by the Purchaser at the address specified no later than 4.00 PM. on 22.11.2008.

16.02 The Purchaser may, at its discretion, extend the deadline for the submission of Bids by amending the Bidding Documents in accordance with Clause 9.0, in which case all rights and obligations of the Purchaser and Bidders previously subject to the deadline will thereafter be subject to the deadline as extended.

17.0 ONE BID PER BIDDER

Each Bidder shall submit only one Bid either by itself, or as a partner in a Joint Venture. A Bidder who submits or participates in more than one Bid will cause all those Bids to be rejected. However, the bidder may indicate separate prices for supply to WESCO, NESCO & SOUTHCO.

18.0 LATE BIDS

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

19.0 MODIFICATIONS AND WITHDRAWAL OF BIDS

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

19.02 No Bid may be modified to the deadline for Bids.

E EVALUATION OF BID

20.0 PROCESS TO BE CONFIDENTIAL

Information relating to the examination, clarification, evaluation and comparison of Bids and recommendations for the award of a contract shall not be disclosed to Bidders or any other persons not officially concerned with such process. Any effort by a Bidder to influence the Purchaser's processing of Bids or award decisions may result in the rejection of the Bidder's Bid.

21.0 CLARIFICATION OF BIDS

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

22.0 PRELIMINARY EXAMINATION OF BIDS / RESPONSIVENESS

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

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

22.03 Prior to the detailed evaluation, Purchaser will determine the substantial responsiveness of each Bid to the Bidding Documents including production capability and acceptable quality of the Goods

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offered. A substantially responsive Bid is one, which conforms to all the terms and conditions of the Bidding Documents without material deviation.

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

23.0 EVALUATION AND COMPARISON OF BIDS

- 23.01 The evaluation of Bids shall be done based on the delivered cost competitiveness basis.
- 23.02 The evaluation of the Bids shall be a stage-wise procedure. The following stages are identified for evaluation purposes:

In the first stage, the Bids would be subjected to a responsiveness check. The Technical Proposals and the Conditional ties of the Bidders would be evaluated.

Subsequently, the Financial Proposals along with Supplementary Financial Proposals, if any, of Bidders with Techno-commercially Acceptable Bids shall be considered for final evaluation.

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

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

Bidders shall base their Bid price on the terms and conditions specified in the Bidding Documents.

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

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

F. AWARD OF CONTRACT

24.0 CONTACTING THE PURCHASER

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

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

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

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26.0 AWARD OF CONTRACT

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

27.0 THE PURCHASER'S RIGHT TO VARY QUANTITIES

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

28.0 LETTER OF INTENT/ NOTIFICATION OF AWARD

The letter of intent / Notification of Award shall be issued to the successful Bidder whose bids have been considered responsive, techno-commercially acceptable and evaluated to be the Lowest (L1). The successful Bidder shall be required to furnish a letter of acceptance within 7 days of issue of the letter of intent /Notification of Award by Purchaser.

29.0 PERFORMANCE SECURITY

Within 15 days of the receipt of Notification of Award/ Letter of Intent from the Purchaser, the successful Bidder shall furnish the Performance Security in the form of Bank Guarantee for an amount of 10% (Ten percent) of the Contract Price in accordance with the General Conditions of Contract in the Performance Security Form provided in Vol.-II, Annexure - II of the Bidding Documents. Upon submission of the performance security, the bid security shall be released.

30.0 CORRUPT OR FRAUDULENT PRACTICES

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

- (a) Defines, for the purposes of this provision, the terms set forth below as follows:
 - (i) "Corrupt practice" means behavior on the part of officials in the public or private sectors by which they improperly and unlawfully enrich themselves and/or those close to them, or induce others to do so, by misusing the position in which they are placed, and it includes the offering, giving, receiving, or soliciting of anything of value to influence the action of any such official in the procurement process or in contract execution; and
 - (ii) "Fraudulent practice" means a misrepresentation of facts in order to influence a procurement process or the execution of a contract to the detriment of the Purchaser, and includes collusive practice among Bidders (prior to or after Bid submission) designed to establish Bid prices at artificial non-competitive levels and to deprive the Purchaser of the benefits of free and open competition.
- (b) Will reject a proposal for award if it determines that the Bidder recommended for award has engaged in corrupt or fraudulent practices in competing for the contract in question;
- (c) Will declare a firm ineligible, either indefinitely or for a stated period of time, to be awarded a contract if it at any time determines that the firm has engaged in corrupt or fraudulent practices in competing for, or in executing, an contract.

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

SECTION - III

**(GENERAL CONDITION OF CONTRACT)
2008-2009**

(Tender Notification: CSO/14/Breaker, CT, PT, Relay control Panel)

Date: 07.11.2008

GENERAL CONDITION OF CONTRACT (GCC)

1.0 General Instructions

- 1.01 All the Bids shall be prepared and submitted in accordance with these instructions.
- 1.02 Bidder shall bear all costs associated with the preparation and delivery of its Bid, and the Purchaser will in no case shall be responsible or liable for these costs.
- 1.03 The Bid should be submitted by the Bidder in whose name the bid document has been issued and under no circumstances it shall be transferred/sold to any other party.
- 1.04 The Purchaser reserves the right to request for any additional information and also reserves the right to reject the proposal of any Bidder, if in the opinion of the Purchaser, the data in support of Tender requirement is incomplete.
- 1.05 The Bidder is expected to examine all instructions, forms, terms & conditions and specifications in the Bid Documents. Failure to furnish all information required in the Bid Documents or submission of a Bid not substantially responsive to the Bid Documents in every respect may result in rejection of the Bid. However, the Purchaser's decision in regard to the responsiveness and rejection of bids shall be final and binding without any obligation, financial or otherwise, on the Purchaser.

2.0 Definition of Terms

- 2.01 "Purchaser" shall mean WESCO/ NESCO / SOUTHCO.
- 2.02 "Bidder" shall mean the firm who quotes against this bid document issued by the Purchaser. "Contractor" or "Seller" shall mean the successful Bidder and/or Bidders whose bid has been accepted by the Purchaser and on whom the "Letter of intent" is placed by the Purchaser and shall include his heirs, legal representatives, successors and permitted assigns wherever the context so admits.
- 2.03 "Site" shall mean the Electricity Distribution Area of the Company.
- 2.04 "Specification" shall mean collectively all the terms and stipulations contained in those portions of this bid document known as Instruction to Bidder, Bid form and other forms as per Volume - III, General Conditions of Contract, Specifications and the Amendments, Revisions, Deletions or Additions, as may be made by the Purchaser from time to time.
- 2.05 "Letter of Intent" shall mean the official notice issued by the Purchaser notifying the Contractor that his proposal has been accepted and it shall include amendments thereto, if any, issued by the Purchaser. The "Letter of Intent" issued by the Purchaser shall be binding on the "Contractor". The date of Letter of Intent shall be taken as the effective date of the commencement of contract.
- 2.06 "Purchase Order" shall mean the Purchase Order and amendments thereof and the drawings, specifications and other documents / papers referred to therein which shall constitute the "Contract".
- 2.07 "Month" shall mean the calendar month and "Day" shall mean the calendar day.
- 2.08 "Codes and Standards" shall mean all the applicable codes and standards as indicated in the Technical Specification.
- 2.09 "Offer Sheet" shall mean Bidder's firm offer submitted to Purchaser in accordance with the specification.

- 2.10 "Contract" shall mean THE "letter of Intent" issued by the Purchaser.
- 2.11 "Contract Price" shall mean the price referred to in the "Letter of intent".
- 2.12 "Contract Period" shall mean the period during which the "Contract" shall be executed as agreed between the Contractor and the Purchaser in the Contract inclusive of extended contract period for reasons beyond the control of the Contractor and/or Purchaser due to force majeure.
- 2.13 "Goods" shall mean all items to be supplied under Purchase Order whether raw materials, processes materials, equipment, fabricated products, drawings or other documents as applicable.
- 2.14 "Store" shall mean the Purchaser store as defined elsewhere in this tender document.

3.0 Contract Documents & Priority

- 3.01 Contract Documents: The Specification, terms and conditions of the contract shall consist solely of these Tender conditions and offer sheet.
- 3.02 Priority: Should there be any discrepancy between any term hereof and any term of the Offer Sheet, the terms of these tender document shall prevail.

4.0 Scope of Work

- 4.01 The "Scope of Work" shall be on the basis of Bidder's responsibility, completely covering the obligations, responsibility and workmanship, provided in this Bid Enquiry whether implicit or explicit.
- 4.02 The Purchaser reserves the right to vary the quantity i.e increase or decrease, which shall be communicated to successful bidder during project execution.
- 4.03 All relevant drawings, data and instruction manuals and other necessary inputs shall be under the scope of contract.

5.0 General Requirements

- 5.01 The contractor shall supply, deliver best quality goods.
- 5.02 The company also reserves the right to add from the scope of work or delete from the scope of work so assigned to the Supplier, if the circumstances so warrant.
- 5.03 The contractor shall be responsible for loading and unloading of all materials with proper material handling equipment.

6.0 Quality Assurance and Inspection

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

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- 6.02 Witness and Hold points are critical steps in manufacturing, inspection and testing where the contractor is obliged to notify the Purchaser in advance so that it may be witnessed by the Purchaser. Final inspection is a mandatory hold point. The contractor has to proceed with the work past a hold point only after clearance by purchaser or a witness waiver letter from Purchaser.
- 6.03 The performance of waiver of QA activity by Purchaser at any stage of manufacturing does not relieve the contractor of any obligation to perform in accordance with and meet all the requirements of the procurement documents and also all the codes & reference documents mentioned in the procurement document nor shall it preclude subsequent rejection by the purchaser.
- 6.04 On completion of manufacturing the items can be dispatched only after issue of shipping release by the Purchaser.
- 6.05 All testing and inspection shall be done without any extra cost.
- 6.06 Purchaser reserves the right to send any material out of the supply to any recognized laboratory for testing. In case the material is found not in order with the technical requirement / specification, the charges of testing along with any other penalty which may be levied is to be borne by the bidder. To avoid any conflict the Seller is advised to send his representative to the stores to see that the material sent for testing is being sealed in the presence of bidder's representative.

7.0 Packing, Packing List & Marking

- 7.01 **Packing:** Seller shall pack or shall cause to be packed all Commodities in such a manner as shall be reasonably suitable for shipment by road or rail to Orissa Distribution Companies without any risk of damage in transit. The packing shall be sufficient to withstand, without limitation, rough handling during transit and exposure to extreme temperatures, salt and precipitation during transit, and open storage.
- 7.02 **Packing List:** One copy of the packing list shall be enclosed in each package delivered. There shall also be enclosed in one package a master packing list identifying each individual package, which is part of the shipment. On any packaging where it is not feasible to place the packing list inside the container, all pertinent information shall be stenciled on the outside and will thus constitute a packing list.
- 7.03 **Marking:** Seller shall mark each container, box or package for easy identification of his materials as follows:

Commodity Name:
Name of the Supplier:
Net Weight:
Size:

- 8.0 **Commissioning Spares :** The Seller shall replace, free of cost, any spares which may be found defective at the time of commissioning.

9.0 Price Basis

Bidders shall quote individual price breakup for the quoted items.

The price shall be inclusive of all taxes, Duties and other Levies of whatsoever nature, transportation to site and vice versa and in-transit Insurances.

The above Prices shall also include unloading and proper stacking at/ from Purchaser Stores to site / stores.

10.0 Terms of Payment

10.01 The Payment shall be made as under:

- a) 100% Payment with taxes & duties on Prorata basis within 45 days of receipt of goods in our specified stores in good condition subject to detailed verification thereof and approval of guarantee & test certificate.
- b) For claiming 100% payment a Bank Guarantee of 10% value of the value of the goods on prorate basis, is to be provided which shall remain valid for a period beyond 90 days from the warranty period as per clause no. 12.0. This BG is independent of the P.B.G prescribed in Clause-13.0

10.02 All Payments shall be made after certification from Purchaser's Engineer Incharge. All Payments are subject to receipt of correct Documents.

11.0 Price Validity

All bids submitted shall remain valid, firm and subject to unconditional acceptance by Purchaser for 120 days post bid opening date. For awarded Contract, the prices shall remain valid and firm till contract completion.

12.0 Warranty / Guarantee

12.01 The bidder shall guarantee for the equipments/workmanship for a minimum period of **60 months** from the date of commissioning or **66 months** from the date of last receipt of consignments at the Purchaser's stores, whichever is earlier. The manufacturer shall guarantee to replace or repair to the satisfaction of the purchaser the defective parts at site free of cost within the above period. Should however, the manufacturer fails to do so within a reasonable time, the purchaser reserves the right to effect repair or replacement and recover such charges for repair or replacement from the contractor. Contractor shall submit a performance Guarantee of 10% of the order value valid for a period of 90 days beyond the expiry of the warranty period.

12.02 If during the defect liability period any services performed found to be defective, these shall be promptly rectified by contract its own cost (including the cost of dismantling and reinstallation) on the instruction of Purchaser.

13.0 Contract Performance Bank Guarantee

13.01 Within Fifteen (15) days from the date of the Award notice, Seller shall submit a Performance Bank Guarantee (PBG) in favour of Purchaser equivalent to Ten percent (10%) of the total price of the Contract. (The Performance Bank Guarantees"). The PBG shall be valid for a period of 90 days beyond the warranty period as per clause no.12.01.

13.02 The Performance Bank Guarantee established under Clause 13.01 shall be forfeited without recourse to the seller and payable against the presentation by Purchaser to the bank with a claim that the seller has failed to comply with any term or condition set forth in the Contract.

13.03 The Performance Bank Guarantee established under will be automatically and unconditionally forfeited without recourse if Purchaser in its sole discretion determines that Seller has failed to comply with any Terms or Condition set forth in the contract.

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13.04 The Performance Bank Guarantees will be released without interest within thirty (30) days from the last date up to which the Performance Bank Guarantee has to be kept valid (as defined in Clause 13.01).

14.0 TECHNICAL INFORMATION / DATA.

The company and the contractor, to the extent of their respective rights permitting to do so, shall exchange such technical information and data as is reasonably required by each party to perform its obligations and responsibilities. The company and the contractor agree to keep each other in confidence and to use the same degree of care as it uses with respect to its own proprietary data to prevent its disclosure to third parties of all technical and confidential information. The technical information, drawings, records and other document shall not be copied, transferred, traced or divulged and / or disclosed to third party in full / part not misused in any other form. This technical information, drawing etc. shall be returned to the company with all approved copies and duplicates. In the event of any breach of this contract, the contractor shall indemnify the company against any loss, cost of damages or claim by any party in respect of such breach

15.0 Effective Date of Commencement of Contract:

The date of the issue of the Letter of Intent/Purchase Order which ever is earlier shall be treated as the effective date of the commencement of contract.

16.0 Taxes & Duties:

All taxes, duties, levies of whatsoever nature, octroi, turnover tax, service tax, income tax, work contract tax etc., levied by State or Central Governments or local bodies shall be to the contractor's account including any taxes, duties and levies which may be levied fresh by the Governments during currency of the Contract. The contractor shall furnish their Excise/Sales Tax registration number, PAN No. etc. in the bid documents as well as Invoice/Challans etc.

17.0 Delivery Schedule:

The full quantity of the equipments shall be delivered in a phased manner but not later than 4 months from the date of issue of Letter of Award / Purchase Order which ever is earlier. The bidder must submit their delivery plan accordingly.

18.0 Time – The Essence of Contract

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

19.0 Liquidated Damages (LD)

19.01 If supply of items / equipments is delayed beyond the supply schedule as stipulated in clause no. 17.0 or as mutually decided and stated in the purchase order/LOI, then the bidder shall be liable to pay to the Purchaser as LD for such delay, a sum of 1% of the contract price for every week delay or part thereof. The LD shall be computed on the undelivered value of goods as per the delivery schedule.

19.02 The total amount of LD for delay under the contract will be subject to a maximum of ten percent (10%) of the contract price

19.03 The Purchaser may, without prejudice to any method of recovery, deduct the amount for such damages from any amount due or which may become due to the Contractor or from the Performance Bank Guarantee or file a claim against the contractor.

20.0 The Laws and Jurisdiction of Contract:

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

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

21.0 Events of Default

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

- (a) Seller fails or refuses to pay any amounts due under the Contract;
- (b) Seller fails or refuses to deliver Commodities conforming to this Bid document / specifications, or fails to deliver Commodities within the period specified in P.O. or any extension thereof
- (c) Seller becomes insolvent or unable to pay its debts when due, or commits any act of bankruptcy, such as filing any petition in any bankruptcy, winding-up or reorganization proceeding, or acknowledges in writing its insolvency or inability to pay its debts; or the Seller's creditors file any petition relating to bankruptcy of Seller;
- (d) Seller otherwise fails or refuses to perform or observe any term or condition of the Contract and such failure is not remediable or, if remediable, continues for a period of 30 days after receipt by the Seller of notice of such failure from Purchaser.

22.0 Consequences of Default.

- (a) If an Event of Default shall occur and be continuing, Purchaser may forthwith terminate the Contract by written notice.
- (b) In the event of an Event of Default, Purchaser may, without prejudice to any other right granted to it by law, or the Contract, take any or all of the following actions;
 - (i) present for payment, to the relevant bank the Performance Bank Guarantee;
 - (ii) purchase the same or similar Commodities from any third party; and/or
 - (iii) recover any losses and/or additional expenses Purchaser may incur as a result of Seller's default.

23.0 Force Majeure

23.01 The term "Force Majeure" as employed herein include, but are not limited to, acts of God or force of nature, landslide, earthquake, flood, fire, lightning, explosion, major storm (hurricane, typhoon, cyclone etc.) or major storm warning, tidal wave, shipwreck and perils of navigation, act of war (declared or undeclared) or public enemy, strike (excluding employee strikes, lockouts or other

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industrial disputes or action solely among employee of Contractor or its subcontractors) act or omission of sovereign states or those purporting to represent sovereign states, blockade, embargo, quarantine, public disorder, sabotage, accident or similar events beyond the control of the parties or either of them.

Force Majeure shall not include occurrences as follows:

- (a) Late delivery of materials caused by congestion at Seller's facilities or elsewhere, an oversold condition of the market, inefficiencies, or similar occurrences.
- (b) Late performance by Seller and/or Sub-Seller caused by unavailability of raw materials, supervisors or labour, inefficiencies or similar occurrences.
- (c) Mechanical breakdown of any item of Seller's or its Sub-Seller's equipment, plant or machinery.
- (d) Delays due to ordinary storm or inclement weather or
- (e) Non-conformance by Sub-Seller.

Unless the delay arises out of a Force Majeure occurrence and is beyond both Seller's and Sub-Seller's or Seller's control and an alternate acceptable source of services, equipment or material is unavailable. Additionally, Force Majeure shall not include financial distress of Seller or any Sub-Seller.

- 23.02 In the event of either party being rendered unable by Force Majeure to perform any obligation required to be performed by them under the Contract, the relative obligation of the party affected by such Force Majeure shall be suspended for the period during which such cause lasts. Time for performance of the relative obligation suspended by Force Majeure shall then stand extended by the period for which cause lasts.
- 23.03 Upon the occurrence of any Force Majeure event, the party so affected in the discharge of its obligation shall promptly, but no later than seven (7) days give written notice of such event to the other party. The affected party shall make every reasonable effort to remove or remedy the cause of such Force Majeure or mitigate its effect as quickly as possible. If such occurrence results in the suspension of all or part of the Work for a continuous period of more than, the parties shall meet and determine the measures to be taken.
- 23.04 Any delay or failure in performance by either party hereto shall not give rise to any claims for damages or loss of anticipated profits it, and to the extent, such delay or failure is caused by Force Majeure.

24.0 Transfer and Sub-Letting

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

25.0 Third Party Insurance

Contractor shall take the Insurance of Equipment during Transit. Any Claim pertaining to this shall be the responsibility of the Contractor.

26.0 Recoveries

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

27.0 Waiver

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

28.0 Indemnification

28.01 Notwithstanding contrary to anything contained in this Tender, Contractor shall at his costs and risks make good any loss or damage to the property of the Purchaser and/or the other Contractor engaged by the Purchaser and/or the employees of the Purchaser and/or employees of the other Contractor engaged by the Purchaser whatsoever arising out of the negligence of the Contractor while performing the obligations under this contract.

28.02 Subject to this Clause 23.0 Purchaser shall, at its sole cost and expense, defend, indemnify and hold harmless Contractor and his assignees /or the employees of the Contractor whatsoever arising out of the negligence or willful act or omission or from the default of the Purchaser in the performance of the Contractor.

SECTION - IV

(TECHNICAL SPECIFICATIONS)

2008-2009

(Tender Notification : CSO/14/Breaker,CT,PT,Relay control Panel)

Date: 07.11.2008

36 KV and 11 KV VACUUM CIRCUIT BREAKERS

1.1 SCOPE

- 1.1.1 This section of specification covers the design, manufacture, assembly, shop testing/inspection before dispatch, packing, forwarding, transportation to store, insurance (during transit,),supervision at site during testing and commissioning of 36 KV and 11 KV outdoor type vacuum circuit breakers at various 33/11 KV substations.
- 1.1.2 The scope of supply shall also include necessary special tools and plants required for erection, maintenance and necessary spares, required for normal operation and maintenance of the circuit breakers for a period of five years.
- 1.1.3, The circuit breakers should be complete in all respects with insulators, bimetallic connectors, interrupting chamber, operating mechanisms control cabinet, interlocks, auxiliary switches indicating devices, supporting structures, accessories, etc., described herein and briefly listed in the schedule of requirements. The spares/attachments which are necessary for the smooth functioning of the equipment and specifically are not mentioned here shall be assumed to be included the scope of supply.

1.2 STANDARDS

- 1.2.1 The circuit breaker shall conform in all respects to the requirements of latest issue of IS/IEC specifications except for modifications specified herein. The equipment manufactured according to any other authoritative standards which ensure an equal or better quality than the provision of IS/IEC specifications shall also be acceptable. The salient point of difference between the proposed standard and provision of these specifications shall be clearly brought out in the tender. A copy of English version of such specifications shall be enclosed with the tender.
- 1.2.2 The list of standards mentioned in this specification and to which the circuit conform is given below.

Sl.No.	IS	IEC	Description
1.	IS 13118	IEC-56	High Voltage A.C.Circuit Breakers
2.	IS 2099	IEC-137	Bushing for alternating Voltages above 1000 volts
3.	IS 12729	IEC-694	Common clauses for high voltages switchgear and control gear standards.
4.		IEC-815	Specification for Creepage distances.
5.	IS-4379		Identification of the contents of industrial gas cylinders.
6.	IS-3072		Installation and maintenance of switchgear
7.	IS-9135		Guide for testing of circuit breakers with respect to out of phase switching.

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8.		IEC 60	High voltage testing technique.
9.		IEC-17 A Study Group Dec. 1981	Sealing of interrupters/breakers
10.	IS-1554	IEC- 227	PVC insulated cables up to and including 1000 volts.
11.	IS-5		Colors for ready mixed paints and enamels.
12.		IEC529	Degree of protection provided enclosure
13.	IS 996	IEC 34	AC Motors
14.	IS 2629,2633	ISO 1460	Hot Dip Galvanizing.

1.3 SERVICE CONDITIONS

1.3.1. CLIMATIC CONDITIONS

The breakers and accessories to be supplied against this specification shall be suitable for satisfactory continuous operation under the tropical conditions described in General Technical Requirement.

1.3.2. AUXILIARY POWER SUPPLY

Auxiliary electrical equipment shall be suitable for operation on the following supply system.

- a) Power Devices (Like drive Motors) 415/240 Volts, 3 phase 4
wire 50 hz., neutral grounded AC supply
- b) DC Power, for Control and 24V DC/ungrounded 2 wire
Protective Devices.

The above supply voltage may vary as indicated below and all devices shall be suitable for continuous operation over the entire range of voltages.

- i) AC Supply Voltage + 10%/-15%
Frequency $\pm 5\%$
- ii) DC Supply Combined voltage and frequency +10%-15%
-15% to + 10%

1.4 GENERAL REQUIREMENT OF 36 KV AND 11 KV/OUTDOOR VACUUM CIRCUIT BREAKERS.

The vacuum type circuit breaker shall have vacuum interrupters, designed to provide a long contact life aft all currents up to rated making and breaking current during switching operations. The vacuum interrupters sealed for life shall be encapsulated by porcelain insulators for out door installation requirement. The breakers shall be suitable for out door operation under

climatic conditions specified without any protection from sun, rain and dust storm.

The vacuum interrupters of each phase shall be housed in a separate porcelain insulator. The three identical poles shall be mounted on a common base frame and the contact system of three poles should be mechanically linked to provide three pole simultaneous opening/closing.

- i) The performance of breakers shall be adequately proven by type tests for the designed rating at internationally reputed independent testing station.
- ii) The equipment shall be practically maintenance free over a long period.
- iii) The VCB shall be of MI class (as per IEC62271-100Cl.3.4.116).
- iv) Similar parts shall be strictly interchangeable. Parts requiring maintenance shall be easily accessible, without requiring extensive dismantling of adjacent parts.
- v) The circuit breaker shall be supplied complete with all auxiliary equipment, meant necessary for the safe operation, routine and periodic maintenance.
- vi) The breaker shall be totally restrike free under all duty conditions and shall be capable of performing the duties without opening resistor. The details of any device incorporated to limit or control the rate of rise of restriking voltage across the circuit breaker contacts shall be stated. The complete data for the phase factor, amp0litre factor, etc. for rate of rise of re-striking voltage shall be furnished in the tender.
- vii) An operation counters, visible from the ground level even with the mechanism housing closed shall be provided.

1.4.1 FIXED AND MOVING CONTACT.

The fixed and moving contacts of the breaker have to ensure permanent full contact during closing. All making and breaking contacts shall be hermetically sealed and free from atmospheric effects.

The contacts metallurgy and geometry shall be such that there is minimum contact burning and wear. Main contact shall have ample area and contact pressure for carrying the rated current and rated short time current without excessive temperature rise which may cause pitting or welding of the contacts.

The main contacts should have low contact resistance. The contact should be self cleaning type, i.e. the layer of copper oxide should be cleaned during rubbing of contacts. The contact area should be well-defined, spring used for contact shall be of gradually rising characteristic i.e., they should be soft. The contacts should not provide contact grip, i.e., electro-magnetic forces should not grip the contacts and oppose the opening process. Separate main contacts and arcing contacts shall be provided in order to have longer life of the contacts. The contours of the energized metal parts of the

breaker shall be such as to eliminate areas or points of high electrostatic flux concentration.

The circuit breaker units shall be suitable for installation on outdoor R.C.C. foundations. Ground clearance of the live parts of the breakers should be as per India Electricity Rules, 1956.

1.4.2. RECOVERY VOLTAGE AND POWR FACTOR

The circuit breaker shall be capable of interrupting rated power with recovery voltage equal to threaded maximum line to the line service voltage at rated frequency and at a power factor equal to or exceeding 0.15

1.4.3. AUTOMATIC RAPID RECLOSING

36 KV and 11 KV circuit breaker shall be suitable for 3 pole rapid reclosing. The dead time of the breaker shall be adjustable and the limits of the adjustment shall be stated in the tender.

1.4.4. OUT OF PHASE SWITCHING

The circuit breaker shall be capable of satisfactory operation even under conditions of phase opposition that may arise due to faulty synchronization. The maximum power that the breaker can satisfactorily interrupt under "Phase Opposition" shall be stated in the bid".

1.4.5. SEISMIC FACTOR

The insulators shall be capable to withstand the seismic acceleration of 0.5 g in horizontal direction and 0.6g in vertical direction.

1.5. TEMPERATURE RISE

The maximum temperature attained by any part of the equipment when in service at site and under continuous full load conditions and exposed to the direct rays of the sun shall not exceed the permissible limits fixed by IEC. When the standards specify the limits of temperature rise these shall noted exceeded when corrected for the difference between ambient temperatures specified in the approved specification.

The limits of temperature rise shall also be corrected for altitude as per IEC and stated in the bid.

1.6 INSULATOR SUPPORTS AND HOUSING

The basic insulation level of the external hollow insulator support shall be as per Clause 1.26.1 of the "Technical Parameters" and these shall be suitable for use under climatic conditions as per Clause 1.3.1 of this specification.

The porcelain used shall be homogenous, uniformly glazed including the internal surface, thoroughly vitrified and free from cavities and other flaws. The insulators shall be designed to have ample insulation, mechanical strength and rigidity for satisfactory operation under conditions specified above. All bushings of identical rating shall be interchangeable. The puncture strength of bushing shall be greater than the flash over value. The design of bushing shall be such that the complete bushing is a self-contained unit and no audible discharge shall be detected at a voltage up to a working voltage (Phase Voltage) plus 10%. The support insulator shall conform to IEC-137. Minimum clearance between phases, between live parts and grounded objects shall be as per IS-3072-1975 and should conform to Indian Electricity Rules-1956. The minimum creepage distance for severely polluted atmosphere shall be 25mm/KV the protected creepage distance shall be not less than 50% of total.

1.7 OPERATING MECHANISM GENERAL REQUIREMENTS

The operating mechanism shall be stored energy type in the form of spring charged. The operating mechanism shall be capable to perform the following functions efficiently.

- i) To provide means where the circuit breaker can be closed rapidly, without hesitation at all currents from zero to rated making current capacity.
- ii) To hold the circuit breaker in closed position till the tripping signal is received.
- iii) To allow the circuit breaker to open without delay immediately on receiving tripping signal.
- iv) To perform 3 phase auto reclosure duty cycle.

The closing spring shall be automatically charged by motor immediately after closing operation. In case of failure of supply to the spring charging motor, the spring shall be chargeable by hand-crank.

The contact pressure spring and tripping spring shall be charged/compressed during closing operation to ensure the breaker is ready to open. Mechanically ON/OFF indicator, spring charged indicator and operation counter shall be provided on the front of the control cubicle. The tripping spring shall ensure the tripping even in case of failure of any auxiliary spring.

The supply of auto reclosing scheme control circuit equipment does not form the part of this specification. The supplier shall however be required to co-ordinate the same with the supplier of control and relay panels.

a) **Tripping/Closing Coils**

The circuit breakers shall be provided with two trip coils and one closing coil per breaker. First trip coil shall be utilized for tripping the breaker on main protection fault detection. Second trip coil shall be used to trip the breaker when first trip coil fails to trip the breaker and backup protection comes into operation and shall also be used to trip the breaker on command. The trip coils shall be suitable for preclosing and after closing trip circuit supervision. All the breakers shall have provision for independent electrical operation of trip coils from local as well as remote through local/remote selector switch. The breaker shall be provided with suitable protection device against discrepancies in the operation of individual pole.

b) **Trip Free anti pumping Features**

The trip free mechanism shall permit the circuit breaker to be tripped by the protective relay even it is under the process of closing. An anti pumping device to prevent the circuit breaker from reclosing after an automatic opening shall be provided to avoid the breaker from pumping i.e., anti pumping relay should interrupt the closing coil circuit.

c) **Controls**

The circuit breaker shall be controlled by a control switch located in the control room. The control arrangement shall be such as to disconnect the remote control circuits of the breaker, when it is under test. Local/remote selector switch shall be provided for all breakers for selection of "Local" control/remote control.

Provision shall be made for local manual, closing tripping and spring charging controls. Necessary equipment's for local controls shall be housed in the circuit breaker cabinet of weather-proof construction.

Each circuit breaker shall have a mechanical open/closed and spring charge indicator Lamps for indicating, 'close, open and spring charged' position of the breaker shall also be provided.

Mechanical indicator, to show the 'open' and close' position of the breaker shall be provided in a position where it will be visible to a man standing on ground with mechanism housing open. An operation counter, visible from the ground even with the mechanism housing closed, shall be provided. Electrical tripping of the breaker shall be performed by shunt trip coils.

Closing coil shall operate correctly at all value of supply voltage between 85% and 110% of the rated voltage. Shunt trip coils shall operate correctly under all operating conditions of circuit breaker up to the rated breaking capacity and at all values of supply voltage between 85% and 110% of rated voltage. Bearings which require grease shall be equipped with pressure type fillings.

Bearing pins, bolts, nuts and other parts shall be adequately pinned or locked to prevent loosening or changing adjustment with repeated operation of the circuit breaker. It shall be possible to trip the circuit breaker even in the event of failure of power supply.

Operating mechanism and all accessories shall be enclosed in control cabinet. A common marshalling box for the three poles of the breaker shall be provided, along with supply of tubing, cables from individual pole operating boxes to the common marshalling box, local.

1.7.1. SPRING OPERATED MECHANISM

The operating mechanism shall have all the necessary auxiliaries, apparatus for operation and supervision, like motor starter with thermal overload release, one closing coil, two trip coils, push button for local electrical operation, local/remote control selector switch, push button for direct mechanical tripping, auxiliary switches, antipumping contactors, operation counter, socket for inspection, lamp and heater with switch. In addition mechanical interlocking system for interlocking with associated isolators shall be provided. Spring charging motor shall be standard single phase universal motor suitable for 220 volts supply.

- i) Operating voltages for closing/tripping coils shall be 24 Volts DC
- ii) Operating voltages for heater elements shall be 240 V AC 50 HZ. Other Features of the spring operated mechanism shall be as follows.
 - a) The spring operating mechanism shall have adequate energy stored in the operating to close and latch the circuit breaker against the rated making current and also to provide the required energy for tripping mechanism in case the tripping energy is derived from the operating mechanism.
 - b) The mechanism shall be capable of performing the rated operating duty cycle of O-0.3Sec.-CO-3Min-CO as per IEC-56.
 - c) The spring charging motor shall be AC/DC operated and shall not take more than 30 sec., to fully charge the closing spring made for automatic charging. Charging of spring by the motor should not interfere with the operation of the breakers.

- d) The motor shall be adequately rated to carry out a minimum of one duty cycle. Also provision shall be made to protect the motor against overloads.
- e) In case of failure of power supply to spring charging motor, the mechanism shall be capable of performing one open-close-open operation.
- f) Mechanical interlocks shall be provided in the operating mechanism to prevent discharging of the closing springs when the breaker is already in closed position. Provision shall be made to prevent a closing operation to be carried out with the spring partially charged.
- g) *Facility shall be provided form annual charging of closing springs.*

1.7.2 CONTROL CABINET

The switchgear operating mechanism, the control equipment such as switch for local electrical and manual closing and tripping the breakers, various control relays antipumping device, a set of terminal blocks for wiring connections, MCB's for disconnecting the control auxiliary power supplies including relays etc., shall be enclosed in a cabinet to be mounted on suitable structure at a convenient working height at the end of the breaker in the outdoor switchyard.

a) **Enclosure**

The enclosure shall be made out of cold rolled steel plates not less than 3 mm thick and of light section structural steel. It should be weather proof as well as dust and vermin proof. The enclosure shall have degree of protection IP 55 as per IS 13947. The cabinet shall have full width and full length hinged doors mounted on the front that swing fully open. The doors shall be provided with latches to securely hold it with cabinet. Doors shall be of sturdy construction, with resilient material covering, fully perimetrically contacting the cabinet frame to provide dust protection and prevent metal to metal contact except at the latch points. Filtered ventilation shall be provided along with the rigid supports for control and other equipment. Mounting cabinet members and equipment shall not restrict easy access to terminal blocks for terminating and testing external connection or to equipment for maintenance.

All screws and bolts used for assembling and mounting wire and cable termination, supports, devices and other equipment shall be provided with lock washers or other locking devices. All metal parts shall be clean and free of welds platter, rust and mill scale prior to application of double coat of zinc chromate primer which should be followed by an under coat to serve as base and binder for the finishing coat. The exterior of the cubicle shall be painted matt grey to shade No. 692 of IS-5 or shade No. 631 and interior to white shade. Sufficient quantity of paints shall also be supplied along with the cubicle to restore at site any damage during transportation. The mounting structure shall be galvanized and shall be as per IS-802-II-1978.

b) **Heaters**

Suitable space heaters shall be mounted in the cabinet to prevent condensation. Heaters shall be controlled by thermostat. ON/OFF MCB shall be provided. Heaters shall be suitable for 240 V AC supply voltage.

c) **Lighting**

One 20 watts fluorescent tube fixture and lamp holder working on 240 V 50 c/s AC supply shall be provided in each switchgear control cubicle section and shall be located to provide adequate interior lighting of the cubicle. A single-pole door operated 20 Amp. 'T' rated lighting switch shall be provided for each cubicle. One duplex 220 volt convenience outlet shall be provided inside each door or pair of doors inside each cubicle.

The lighting and convenient outlet circuits shall be completely wired in conduit and terminated on cubicle terminal blocks.

d) **Wiring and Cabling**

1. Unless otherwise specified control wire shall be stranded tinned copper switchboard wire with 1.1. KV PVC insulation conforming to the requirements of IS-1554.
2. All the control circuit and secondary wiring shall be wired completely and brought out preferably to a vertical terminal block ready for external connections in the control cabinet. The control wire shall not be of cross section less than 2.5 mm²
3. All spare auxiliary contacts of the circuit breaker shall be supplied wired up to terminal block. Each terminal in terminal block shall be suitable for at least 2 x 2.5 mm copper conductors.
4. At-least 20 number spare terminals shall be provided over and above the number required.
5. All wiring termination on terminal blocks shall be made through lugs. For current and DC supply circuits disconnecting stud type terminal blocks will be provided. For other control circuits, non-disconnecting snap on type terminal blocks shall be provided.
6. All wires shall be identified with non-metallic sleeve or tube type markers at each terminations.
7. Terminal blocks shall be made up of moulded non-inflammable plastic material with blocks and barriers moulded integrally have white marking strips for circuit identification and moulded plastic covers.

e) **Grounding**

A ground bus of copper bar not less than 6 mm by 25 mm shall be provided along the inside of the front or rear of the each cubicle and

equipment rack. The ground bus shall be bolted to the frame of each panel in such a way as to make good electrical contact with each panel or section. Earth terminals at two ends of the cabinet shall be provided for connection of the ground bus to the station earth mat.

1.8 ACCESSORIES

Each circuit breaker assembly shall be supplied with the following accessories.

- i) Line and earthing terminals and terminal connectors.
- ii) Bimetallic terminal connectors.
- iii) Control housing with:
 - a) One auxiliary switch with adequate number of auxiliary contacts, but not less than 20 nos. (10 No. + 10NC) for each breaker.
 - b) Operation counters
 - c) Position indicator (Close/Open/Spring Charged)
 - d) Necessary cable glands
 - e) MCB as required
 - f) Manual trip device and local test push buttons
 - g) Terminal blocks and wiring for all control equipment and accessories
 - h) Adequate number of heaters for continuous operation to prevent moisture condensation in the housing of operating mechanism.
 - i) Selector switch for local/remote control
 - j) Internal Illumination fluorescent lamp
 - k) 5 Amp plug point and socket
 - l) Motor for spring charging
- iv) Rating and diagram plate as per IS

1.9 SUPPORTING STRUCTURE

The circuit breakers shall be supplied complete with hot dip galvanized steel supporting structures, foundation and fixing bolts, etc. The structure shall be made of steel MS angle section conforming to IS 226. The galvanizing shall be as per IS. The mounting of the breaker shall be such as to ensure the safety of the operating staff and should conform to Indian Electricity Rules, 1956. Minimum ground clearance of live part from ground level shall be 3800mm.

The bidder shall submit detailed design calculations and detailed drawings in respect of supporting structures suitable for the equipment offered. The tenders shall specify the load which shall be transmitted to the equipment foundation under most adverse operating conditions of the breaker.

All material for making connections between the circuit breaker and its control shall also be included in the scope of supply. Extension brackets shall be provided for directly mounting 36 KV outdoor current transformers on the circuit breaker unit. Facility to earth the circuit breaker structure at two points shall be provided.

1.10 SURFACE FINISH

1.10.1 All interiors and exteriors of control cubicles and other metal parts shall be thoroughly cleaned to removal rust, scales, corrosion, greases or other adhering foreign matter.

1.10. 2 All metal surfaces exposed to atmosphere shall be phosphated as per IS 6005 and there after given two primer coats of zinc chromate and then two coats of epoxy paint with epoxy base thinner. All metal parts not accessible for painting shall be made of corrosion resisting material. All machine finished or bright surfaces shall be coated with a suitable preventive compound and suitably wrapped on otherwise protected. All paints shall be carefully selected to withstand tropical heat and extremes of weather within the limits specified. The paint shall not scale off or wrinkle or be removed by abrasion due to normal handling.

All external paintings shall be as per shade No. 631 of IS:5.

1.10.3 All ferrous hardware, exposed to atmosphere, shall be hot dip galvanized.

1.11 GALVANISING

1.11.1 All ferrous parts including all sizes of nuts, bolts, plain and spring washers, support channels, structures shall be hot dip galvanized conforming to latest version of IS:2629 or any other equivalent authoritative standard.

1.12 CABLE TERMINATION

Suitable cable glands for terminating the multicore cable shall be provided at the bottom of the control cabinet.

1.13 TERMINAL CONNECTIONS AND EARTH TERMINALS

1.13.1 Each circuit breaker connected with incoming and outgoing feeders shall be provided with bolted type bi-directional bimetallic terminal connectors suitable for ACSR conductor mentioned in 'Technical Parameter' clause 1.26.1

1.13.2 Each circuit breaker pole and control cabinet shall be provided with two grounding terminals and clamps for receiving ground connections.

1.14 INTERLOCKS

Necessary interlocks to prevent closing or opening of the breaker under low pressure of the contact spring and devices for initiating alarm shall be provided. Provision shall also be made to enable electrical interlocking with the isolators associated with the breaker to prevent opening or closing of the isolators. The detailed interlocking scheme based upon single line diagram of the substation shall be supplied with the write-up. General Requirement of interlock shall be as given below:

1. Isolators should not be operated unless the associated circuit breaker is in open position.

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2. Line isolator shall close only when the corresponding circuit breaker and earthing switch of the corresponding line are open. Both electrical and mechanical.
3. The circuit breaker shall close only after all isolators associated with it have been locked in closed position. Both electrical and Mechanical (casted type) interlock shall be provided for this.

In case of double bus bar arrangement following additional requirement for interlocking shall be provided.

1. One bus bar selector isolator of any bay excepting the bus coupler bay shall close only when,
 - a) The circuit breaker of corresponding bay is open and locked.
 - b) The other bus isolator of that bay is open
2. When one bus isolator of any bay excepting the bus coupler bay is closed. The other shall close only when the bus coupler circuit breaker and both the bus isolators are closed.
3. Bus isolator of bus coupler bay shall operate only when the bus coupler breaker is open.

1.15 VACUUM INTERRUPTER ASSEMBLY

Each pole of the circuit breaker shall be provided with vacuum interrupter of **rating 2000 Amps. & shall be of indigenous make only**, one for each phase, hermetically sealed for life and encapsulated by ceramic insulators. The interrupter shall be provided with steel chromium arc chamber. A further shield giving protection to the metal below shall also follow the travel of the moving contacts to seal the interrupter against the surroundings atmosphere.

It shall have high and consistent dielectric strength of vacuum unaffected by environment and switching operations. Bronzed joints should ensure retention of vacuum for life time. It shall have low and stable contact resistance due to absence of oxidation effects and shall ensure low power loss. The arcing voltage shall be low and minimum contact erosion.

1.16 DRAWINGS AND INSTRUCTION MANUALS

- 1.16.1 Within 30 days after the award of the contract, the contractor shall supply six sets of drawings which will describe the equipment in details, for the approval of Purchaser. All the drawings and manuals should be in English Language and dimensions and weights shall be in MKS units.

Following drawings and documents for each item are to be supplied as part of the contract.

- a) General outline drawings, showing dimensions, front and side elevations and plan of the circuit breaker and its local control panel.
- b) Outline drawing of support insulators showing dimensions and number of sheds and creepage distance.
- c) Assembly and sub-assembly drawings with numbered parts.
- d) Sectional views showing the general constructional features, operating mechanism and arc extinguishing chamber, etc.
- e) Dimension and assembly of important auxiliaries.
- f) Detailed drawings of operating mechanism
- g) Test certificates and oscillographs.
- h) Detailed drawings of mounting structure
- i) Spare parts and catalogue.
- j) Wiring diagram showing the local and remote control scheme of breaker.
- k) Write up on working of control schematic of breaker.
- l) Foundation plan including weights of various components and impact loadings for working foundation design.

Seven copies for each sub-station of the above drawings and instruction manuals covering instructions for installations, operation and maintenance shall be supplied by the contractor(s) without any extra cost.

1.17 TESTS

1.17.1 TYPE TESTS

Each circuit breaker shall comply with requirements of type tests prescribed in IEC publication No. 62271-100.

1.18 ROUTINE TESTS

Routine Tests as IEC-56 shall be carried out on each breaker in presence of purchaser's representative at the manufacturer's expenses at his works except, where agreed to otherwise. All test reports should be submitted and should be got approved from the Purchaser before dispatch of the equipment.

1.19 SITE TESTS ON CONTROL AND AUXILIARY CIRUIT

The following tests shall be conducted at site before commissioning.

- 1) Voltage tests on control and auxiliary circuit.
- 2) Measurements of resistance of the main circuit
- 3) Mechanical Operation Tests
- 4) Insulation Resistance test

1.20 NAME PLATE

1.20.1 Equipment should be provided with name plate giving full details of manufacture, capacities and other details as specified in the relevant IS

1.21 TECHNICAL PARAMETERS

1.21.1

S.NO	DESCRIPTION	VALUES
i)	Rate voltage (KV rms)	: 36KV/ 12KV
ii)	Rated frequency(Hz)	: 50
iii)	System neutral earthing	: Solidly grounded system
iv)	Type of are quenching medium	: Vacuum
v)	Rated normal current at sitge conditions (Amps)	: 1250 Amps / 630 Amps
vi)	Number of poles	: 3
vii)	Installation	: Outdoor type
viii)	Temperature rise	: As per IEC56(Table-4) Page-19
ix)	Rated short circuit	:
	a) Interrupting capacity	: 25 KA
	b) The percentage DC components	: As per IEC56 & (Ref. Page 51, 21 of IEC)
x)	Rated short circuit making	: 62.5 KA
xi)	First pole to clear factor	: 1.5
xii)	Rated short time current	: 25 KA
xiii)	Rated duration of short circuit	: 3 Seconds
xiv)	Total break time for any current upto the rated breaking current with limiting condition of operating and quenching media pressure (ms)	: < 80ms
xv)	Closing time (ms)	: <150 ms <80ms
xvi)	Mounting	: Hot dip galvanized lattices steel

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			support structured bolted type.
xvii)	Phase to phase spacing in the switch yard i.e. interpole spacing for breaker (min)	:	400 320
xviii)	Required ground clearance from the lowest line terminal if both the terminals are not in same horizontal plane (cum)	:	2820 2000
xix)	Height of concrete plinth (mm)	:	150 150
xxi)	Minimum creepage distance of support insulator (mm)	:	900 500
xxiii)	Standard value of rated transient recovery voltage for terminal fault.	:	As per IEC-56
xxv)	Rated operating	:	
	a) duty cycle	:	0-0.3 Second-CO-3 Minutes-CO
xxvi)	Rated insulation level under heavy pollution condition 1.2/50 micro second lightning Impulse withstand voltage (KV peak) to earth.	:	170 KV 95 kV
xxvii)	Power frequency withstand voltage KV(rms) to earth (KVrms)	:	70KV 35KV
xxviii)	Rated characteristic for out of Phase breaking	:	
	a)Out of phase breaking capacity	:	25% of rated breaking capacity
	b) Standard values of transient recovery	:	As per IEC-56
	c) Operating mechanism	:	Spring operated, Anti pumping and Trip free mechanism
	d)Power available for operating mechanism	:	Three phase 415 Volts 50 C/S or single phase50 C/S 240 volts.
xxix)	a)Rated supply voltage of closing and operating devices and auxiliary circuits	:	1) 24VDC 2) Series Trip Type system requiring no DC supply. Closing in this case shall be operating on 240 Volts AC 50 C/S single phase.
	b) Permissible voltage variation.	:	1) In case of DC Power supply voltage variation shall be between 85% to 110% of normal voltage. 2) In case of AC power supply voltage variation shall be of the normal voltage as per IS-15% to +10%
	c) Combined variation of frequency and voltage	:	±15%
xxx)	Number of auxiliary contacts	:	10 NO and 10 NC on each pole

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		Continuous current rating 10 Amps, DC at 110/30 volts DC
xxxi)	Number of coils	: 2 (Two) trip coils and 1 close coil with anti pumping arrangement.

1.21.2 MANDATORY SPARES WITH EACH BREAKER :

The bidder should supply the following spares with each Breaker at free of cost –

1. Spring charging motor = 1 No.
2. Tripping coil = 1 No.
3. Closing coil = 1 No.

1. POTENTIAL TRANSFORMER

TECHNICAL PARAMETERS OF PT

1.	Type	Single phase, outdoor, oil filled & hermetically sealed.
2	Rated Primary Voltage	36 KV / 12 KV
3	Rated Secondary Voltage	110 V
4	Rated Voltage factor	1.2 continuous
5	One min. power frequency withstand voltage for primary terminal	70 KV (rms)
	secondary winding	3 KV (rms)
6	Minimum creepage distance	25 mm / KV of highest system voltage
7	Details of secondary Cores	Core – I Core - II
	Application	Metering Protection
	Accuracy class	0.5 3P
	Burden (VA)	50 50

1.2 Performance Guarantee

The equipment along with all accessories shall be capable of performing intended duties under specified conditions. The Bidder shall guarantee the reliability and performance of the individual equipment as well as of the complete

1.3 GENERAL TECHNICAL REQUIREMENTS

1.3.1 PORCELAIN HOUSING

It shall be single piece of homogeneous. Vitreous porcelain of high mechanical & dielectric strength. It will be glazed with uniform Brown or Dark Brown color with smooth surface finish.

The bidder shall clearly detail in his bid the details of attaching the metallic flange to porcelain, pressure release valve and also how primary & secondary terminals shall be brought out.

1.3.2 WINDING

PRIMARY WINDING:

It shall be made of insulated electrolytic copper wire. The neutral end of winding shall be brought out side for earthing.

The primary terminal shall be of standard size of 30 mm dia x 80 mm length of heavily tinned (min. thickness 15 micron) electrolytic copper of 99.9% conductivity.

SECONDARY WINDING:

It shall be made of insulated copper wire of electrolytic grade. The terminal box shall be dust free & vermin proof. The size of the terminal box shall be big enough to enable easy access and working space with the use of normal tools.

The secondary terminals studs shall be provided with at least 3 nuts and two plain washers; these shall be made of brass. Duly nickeld. The min. stud outer dia shall be 6 mm and length 15 mm. The min spacing between the centers of the adjacent studs shall be 1.5 time the outer dia of the stud.

1.3.3 POLARITY

The polarity shall be marked on each PT at the secondary terminals in the terminal box. There shall be MCB of suitable rating at secondary terminals.

1.3.4 TANK & HARDWARES

The tank shall be fabricated of MS steel sheet of min. 3.15mm for sides & 5 mm for top & bottom. The tank will be finished with min. 2 coats of zinc rich epoxy paint externally. The inner surface shall be painted with oil resistance white enamel paint.

All ferrous hard wares, exposed to atmosphere shall be hot dipped galvanized.

1.3.5 INSULATION OIL

The first filling of oil in PT shall be in bidder's scope. The oil shall be as per IS335. To ensure the prevention of oil, the bidder will give the details supported by drawings:

1. Location of emergence of Primary & Secondary terminals

2. Interface between porcelain & metal tanks

3. Cover of the secondary terminal box.

Any nut & bolt and screw used for fixation of the interfacing porcelain bushing for taking out the terminals shall be provided on flanges cemented to the bushings & not on the porcelain.

If gasket joints are used, Nitrite Butyl Rubber gasket shall be used. The grooves shall be machined with adequate space for accommodating gasket under pressure.

The PT shall be vacuum filled with oil after processing. It will be properly sealed to eliminate breathing & to prevent air & moisture from entering the tank. The sealing methods/arrangement shall be described by the bidder & be approved by the owner.

1.3.6 OIL LEVEL INDICATOR

The PT shall be fitted 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. To compensate oil volume variation due to temperature variation. Nitrogen cushion or the stainless steel bellows shall be used. Rubber diaphragms are not permitted for this purpose.

1.3.7 EARTHING

Two earthing terminals shall be provided on the metallic tank of size 16 mm dia & 30 mm length each with one plain washer & one nut for connection to the station earth mat.

1.3.8 LIFTING & MOUNTING ARRANGEMENT

The PT shall be provided with two lifting eyes to lift the PT. This shall be so positioned so as to avoid any damage to the PT during lifting for instillation or transportation purpose. This shall be detailed in General Arrangement drawing.

1.3.9 TESTING

The following test shall be conducted on PT

1. Insulation resistance
2. Polarity test
 - (a) Ratio test on all cores
 - (b) Any other tests prescribed in IS - 3156 .

1. 33 & 11 KV CURRENT TRANSFORMER

1.1 SCOPE OF WORK.

This specification covers design, manufacturing, supply, transportation, insurance (transit and storage), erection testing & commissioning of 36 KV /12 kV Current Transformer (CT) suitable for outdoor service. Any other parts not specifically mentioned in this specification but otherwise required for proper functioning of the equipment should be included by the bidder in the offer.

It is not the intent to specify, completely here in all the details of design and construction of the CT. However, the CT shall conform, in all respects to high standard of engineering, design and workmanship. It shall be guaranteed in a manner acceptable to the owner who will interpret the meaning of drawings and specification and shall have power to reject any work or material, which, in his judgment, is not in accordance therewith.

SPECIFIC PARAMETERS & LAYOUT CONDITIONS.

The CT supplied against this specification shall be suitable for satisfactory continuous operation under the tropical conditions. Detailed condition is mentioned in general technical requirement.

1.2 APPLICABLE STANDARDS

Sl. No.	IS	IEC	ITEM
1	IS2705(1-IV)	IEC 185, IEC 44(4)	Current transformers
2	IS 2165		Insulation coordination: Part 1 Phase to earth insulation coordination principles and rules
3	IS 2099		Bushings for alternating voltages above 1 000 volts.
4	IS3347		Dimensions for Porcelain Transformer
5	IS 2071	IEC 270,IEC 60	Methods of High Voltage Testing
6	IS 335		New insulating oils
7	IS 13947(Part I)		Glossary of terms relating to metal containers.
8	Indian electricity Rules 1956		Indian electricity Rules 1956
9		IEC 815	Guide for the selection of insulators in respect of polluted condition.

1.3 RATING AND FUNCTIONAL CHARACTERISTICS

TECHNICAL PARAMETERS OF CT

		36 KV	12 KV
1.	Type	Single phase, dead tank, outdoor, oil filled & hermetically sealed.	Single phase, dead tank, outdoor, oil filled & hermetically sealed.
2.	Type of mounting	Pedestal type	Pedestal type
3	Rated Primary current	150 A	150A
4	Rated continuous thermal current	120% of rated Primary current.	120% of rated Primary current
5	Rated short time withstand requirement for sec. winding.	As per IS2705 Pt.1	As per IS 2705 Pt.1
6	Rated short time withstand Current (kA rms)	25	25
7	Rated dynamic withstand current (kA rms)	62.5	62.5
8	Max temp. rise	As per IEC-185/IS 2705	As per IEC-185/IS 2705
9	Minimum Creepage distance of porcelain housing (mm)	25mm/kV	25mm/kV
10	One min. power frequency withstand voltage between secondary terminal & earth	3kV	3kV
11	Details of secondary Cores	Metering Prot. Prot	Metering Prot. Prot
	Current ratio	600-300-150/ 1-1-1 A -do- - do-	400-200-100/ 1-1-1 A -do- -do-
	Accuracy class	0.5 5P20 PS	0.5 5P20 PS
	Burden (VA)	15 15 15	15 15 15
	Instrument security factor	<5 -	<5 -

1.4 Performance Guarantee

The equipment along with all accessories shall be capable of performing intended duties under specified conditions. The Bidder shall guarantee the reliability and performance of the individual equipment as well as of the complete

1.5 GENERAL TECHNICAL REQUIREMENTS

PORCELAIN HOUSING

It shall be single piece of homogeneous. Vitreous porcelain of high mechanical & dielectric strength. It will be glazed with uniform Brown or Dark Brown color with smooth surface finish.

The bidder shall clearly detail in his bid the details of attaching the metallic flange to porcelain, pressure release valve and also how primary & secondary terminals shall be brought out.

WINDING

PRIMARY WINDING:

It shall be made of high conductivity rigid copper wire. The primary winding current density shall not exceed the limit of 1.6 Amp per sq. mm for normal rating.

The design current density for short circuit current as well as conductivity of metal used for primary winding shall be as per IS2705.

The primary terminal shall be of standard size of 30 mm dia x 80 mm length of heavily tinned (min. thickness 15 micron) electrolytic copper of 99.9% conductivity.

SECONDARY WINDING:

It shall be made of insulated copper wire of electrolytic grade. Type of insulation used shall be described in the offer. For multi ratio design, the multi ratio will be achieved by reconnection of the primary winding or secondary winding. The excitation current of the CT shall be as low as possible. The bidder shall furnish the magnetization curves for all the cores.

The terminal box shall be dust free & vermin proof. The size of the terminal box shall be big enough to enable easy access and working space with the use of normal tools.

The secondary terminals studs shall be provided with at least 3 nuts and two plain washers; these shall be made of brass. Duly nickeld. The min. stud outer dia shall be 6 mm and length 15 mm. The min spacing between the centers of the adjacent studs shall be 1.5 time the outer dia of the stud.

POLARITY

The polarity shall be marked on each CT at the secondary terminals in the terminal box.

TANK & HARDWARES

The CT will be dead tank type. The tank shall be fabricated of MS steel sheet of min. 3.15mm for sides & 5 mm for top & bottom. The tank will be finished with min. 2 coats of zinc rich epoxy paint externally. The inner surface shall be painted with oil resistance white enamel paint.

All ferrous hard wares, exposed to atmosphere shall be hot dipped galvanized.

INSULATION OIL

The first filling of oil in CT shall be in bidder's scope. The oil shall be as per IS335. To ensure the prevention of oil, the bidder will give the details supported by drawings:

1. Location of emergence of Primary & Secondary terminals
2. Interface between porcelain & metal tanks
3. Cover of the secondary terminal box.

Any nut & bolt and screw used for fixation of the interfacing porcelain bushing for taking out the terminals shall be provided on flanges cemented to the bushings & not on the porcelain.

If gasket joints are used, Nitrite Butyl Rubber gasket shall be used. The grooves shall be machined with adequate space for accommodating gasket under pressure.

The CT shall be vacuum filled with oil after processing. It will be properly sealed to eliminate breathing & to prevent air & moisture from entering the tank. The sealing methods/arrangement shall be described by the bidder & be approved by the owner.

OIL LEVEL INDICATOR

The CT shall be fitted 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. To compensate oil volume variation due to temperature variation. Nitrogen cushion or the stainless steel bellows shall be used. Rubber diaphragms are not permitted for this purpose.

EARTHING

Two earthing terminals shall be provided on the metallic tank of size 16 mm dia & 30 mm length each with one plain washer & one nut for connection to the station earth mat.

LIFTING & MOUNTING ARRANGEMENT

The CT shall be provided with two lifting eyes to lift the CT. This shall be so positioned so as to avoid any damage to the CT during lifting for installation or transportation purpose. This shall be detailed in General Arrangement drawing.

The CT shall be of pedestal mounting type suitable for outdoor installation on steel/cement concrete structures. All the clamps, bolts, nut and washers etc. required for mounting shall be galvanized. The bidder shall supply all the terminal connectors etc., required for connection to the CT.

TESTING

The following test shall be conducted on CT

1. Megger between winding and winding terminals to body
2. Polarity test
 - (a) Ratio identification checking of all ratios on all cores by primary injection of current
 - (c) Magnetization characteristics & secondary winding resistance.
3. Any other tests prescribed in relevant IS .

CONTROL RELAY PANEL - 33 KV AND 11 KV

1.1 Control Relay Panel (CR Panel)

INDOOR CONTROL PANEL:-The Control and Relay Panel Boards shall consist of panel, vertical independent, floor mounted with equipment mounted on front and having wiring access from rear. Doors shall have handles with built-in locking facility.

OUTDOOR CONTROL PANEL :-The Control and Relay Panel Boards shall consist of panel, vertical independent, structure mounted with equipment mounted & wiring access on front and having double door protection (Inside door to be glass covered) to prevent water entry inside the panel. Doors shall have handles with built-in locking facility

It may please be noted that except at substation where provision has been kept for 24 Volt DC supply, at all other places where there is no DC supply, **Outdoor control relay panel** with suitable power pack arrangement is to be provided.

2.1 CONSTRUCTIONAL FEATURES

- 2.1.1 Panels shall be completely 3 mm sheet metal clad and shall be dust, moisture and vermin proof. The enclosure shall provide a degree of protection not less than **IP- 4 X (For Indoor CRP) & IP – 55 (For out door CRP) in accordance with IS; 13947 & 2147.**
- 2.1.2 Panels shall be free standing, floor mounting type and shall comprise structural frames completely enclosed with specially selected smooth finished, cold rolled sheet steel of thickness not less than 3 mm. There shall be sufficient reinforcement to provide level transportation and installation.
- 2.3 All doors, removable covers and panels shall be gasketed all around with neoprene gaskets. Ventilating louvers to be if provided shall have screens and filters. The screens shall be made of either brass or GI wire mesh.
- 2.4 Design, materials selection and workmanship shall be such as to result in neat appearance, inside and outside with no welds, rivets or bolt head apparent from outside, with all exterior surfaces true and smooth.
- 2.5 Panels shall have base frame with smooth bearing surface, which shall be fixed on the embedded foundation channels/insert plates.
- 2.6 Cable entries to the panels shall be from the bottom. Double Compression cable gland plate fitted on the bottom of the panel shall be connected to

earthing of the panel/station through a flexible braided copper conductor rigidly. The gland shall conform to IS 12943.

3.0 MOUNTING

- 3.1 All equipment on and in panels shall be mounted and completely wired to the terminal blocks ready for external connections. The equipment on front of panel shall be mounted flush. No equipment shall be mounted on the doors.
- 3.2 Equipment shall be mounted such that removal and replacement can be accomplished individually without interruption of service to adjacent devices and are readily accessible without use of special tools. Terminal marking on the equipment shall be clearly visible.
- 3.3 The centre lines of switches, push buttons and indicating lamps shall be not less than 750mm from the bottom of the panel. The centre lines of relays, meters and recorders shall be not less than 450mm from the bottom of their panel.
- 3.4 The center lines of switches, push buttons and indicating lamps shall be matched to give a neat and uniform appearance. Like wise the top lines of all meters, relays and recorders etc. shall be matched.

4.0 PANEL INTERNAL WIRING

- 4.1 Panels shall be supplied complete with interconnecting wiring provided between all electrical devices mounted and wired in the panels and between the devices and terminal blocks for the devices to be connected to equipment outside the panels. When panels are arranged to be located adjacent to each other all inter panel wiring and connections between the panels shall be furnished and the wiring shall be carried out internally.
- 4.2 All wiring shall be carried out with 1100V grade, single core, stranded FRLS tinned copper conductor wires with PVC insulation conforming to IS1554. The minimum size of the multi-stranded copper conductor used for internal wiring shall be as follows:
 - All circuits except current transformer circuits and voltage transformer circuits meant for energy metering and AC & DC power circuit-one no 2.5 sq. mm. per lead
 - All current transformer circuits two nos. 2.5sq. mm per lead.
 - Voltage transformer circuit (for energy meters): Two 2.5 sq.mm. per lead.
 - AC/DC Power Circuit-One 4 Sq.mm.per lead.
- 4.3 All internal wiring shall be securely supported, neatly arranged, readily accessible and connected to equipment terminals and terminal blocks. Wiring gutters and troughs shall be used for this purpose.

- 4.4 Auxiliary bus wiring for AC and DC supplies, voltage transformer circuits, annunciation circuits and other common services shall be provided near the top of the panels running throughout the entire length of the panels.
- 4.5 Wire termination shall be made with solder less crimping type and tinned copper lugs, which firmly grip the conductor. Insulated sleeves shall be provided at all the wire terminations. Engraved core identification plastic ferrules marked to correspond with panel wiring diagram shall be fitted at both ends of each wire. Ferrules shall fit tightly on the wire and shall not fall off when the wire is disconnected from terminal blocks. All wires directly connected to trip circuit of breaker or device shall be distinguished by the addition of red coloured unlettered ferrule.
- 4.6 Longitudinal troughs extending throughout the full length of the panel shall be preferred for inter panel wiring. Inter-connections to adjacent panel shall be brought out to a separate set of terminal blocks located near the slots of holes meant for taking the inter-connecting wires.

5.0 TERMINAL BLOCKS

- 5.1 All internal wiring to be connected to external equipment shall terminate on terminal blocks. Terminal blocks shall be 1100 V grade and have 10 Amps continuous rating, moulded piece, complete with insulated barriers, stud type brass terminals, washers, nuts, lock nuts and identification strips. Markings on the terminal blocks shall be on marking strips and shall correspond to wire number and terminal numbers on the wiring diagrams. All terminal blocks shall have shrouding with transparent unbreakable material. Terminal Block of disconnecting type at CT & PT junction box and Stud-type in CB marshalling kiosk shall be provided. All marking shall confirm to IS 11353. All Terminal Blocks shall be stud type. All Marking shall confirm to IS 11353.
- 5.2 Disconnecting type terminal blocks shall be used for CT/PT secondary circuits. In addition to this Current transformer secondary leads shall be provided with short circuiting and earthing facilities. These leads should have testing facilities.
- 5.3 At least 20% spare terminals shall be provided on each panel and these spare terminals shall be uniformly distributed on all terminal blocks.
- 5.4 Unless otherwise specified, terminal blocks shall be suitable for connecting the following conductors of external cable on each side.
- All CT & PT circuits: minimum of two of 2.5mm Sq. copper.
 - AC/DC Power Supply Circuits: One of 4mm Sq. Copper.
 - All other circuits: minimum of one of 2.5 Sq. Copper.
- 5.5 There shall be a minimum clearance of 250 mm between the first row of terminal blocks and the associated cable gland plate or panel side wall. Also the clearance between two rows of terminal blocks edges shall be minimum of 150mm.

- 5.6 Arrangement of the terminal block assemblies and the wiring channel within the enclosure shall be such that a row of terminal blocks is run in parallel and close proximity along each side of the wiring-duct to provide for convenient attachment of internal panel wiring. The side of the terminal block opposite the wiring duct shall be reserved for the external cable connections. All adjacent terminal blocks shall also share this field wiring corridor. All wiring shall be provided with adequate support inside the panels to hold them firmly and to enable free and flexible termination without causing strain on terminals.
- 5.7 All necessary cable terminating accessories such as gland plates, supporting clamps & brackets, wiring troughs and gutters etc, for external cables shall be included in the scope of supply.

6.0 PAINTING

- 6.1 All sheet steel work shall be phosphate in accordance with the IS: 6005 "Code of Practice for Phosphating Iron and Steel".
- 6.2 Rust, scale, oil, grease, dirt and swarf shall be removed by 7 tank process.
- 6.3 After phosphating, thorough rinsing shall be carried out with clean water followed by final rinsing with dilute dichromate solution and oven drying.
- 6.4 The phosphate coating shall be sealed with application of two coats of ready mixed, stoved type zinc chromate primer. The first coat may be "flash dried" while the second coat shall be stoved.
- 6.5 After application of the primer, two coats of finishing synthetic enamel paint shall be applied, each coat followed by stoving. The second finishing coat shall be applied after inspection of first coat of painting. The exterior colour of paint shall be of a slightly different shade to enable inspection of the painting. The final coat should present a hard glass finish.
- 6.6 A small quantity of finished paint shall be supplied for minor touching up required at site after installation of the panels
- 6.7 In case the bidder proposes to follow any other established painting procedure like electrostatic or powder coating, the procedure shall be submitted for Purchaser's review and approval.

7.0 NAME PLATES AND MARKINGS

- 7.1 All equipment mounted on front and rear side as well as equipment mounted inside the panels shall be provided with individual name plates with equipment designation engraved. Also on the top of each panel on front as well as rear side, large and bold name plates shall be provided for circuit/feeder designation.
- 7.2 All front mounted equipment shall also be provided at the rear with individual name plates engraved with tag numbers corresponding to the one shown in the panel internal wiring to facilitate easy tracing of the wiring.

- 7.3 Each instrument and meter shall be prominently marked with the quantity measured e.g. KVA, MW, etc. All relays and other devices shall be clearly marked with manufacturer's name, manufacturer's type, serial number and electrical rating data.
- 7.4 Name plates shall be made for non-rusting metal or 3 ply lamicaid. Nameplates shall be black with white engraving lettering.
- 7.5 All the panels shall be provided with nameplate mounted inside the panel bearing LOA No. & Date, Name of the Substation & feeder and reference drawing number.

8.0 MISCELLANEOUS ACCESSORIES

8.1 Plug Point:

A 240V, Single phase 50Hz, 15 Amp AC socket with 15 Amps standard Indian plug, shall be provided in the interior of each cubicle with ON-OFF switch.

8.2 Interior Lighting:

Each panel shall be provided with a 20 W fluorescent lighting fixture rated for 240 Volts, single phase, 50 Hz supply for the interior illumination of the panel controlled by the respective panel door switch.

8.3 Switches and Fuses:

Each panel shall be provided with necessary arrangements for receiving, distributing, protecting and isolating DC and AC supplies for various control, signaling, lighting and space heater circuits. The incoming and sub-circuits shall be separately provided with miniature circuit breakers (MCB). Selection of the main and sub-circuit faults. MCBs shall conform to IS: 13947. Each MCB shall be provided with one potential free contact and the same shall be wired for annunciation purpose. However, voltage transformer circuits for relaying and metering shall be protected by fuses. All fuses shall be HRC cartridge type conforming to IS: 13703 mounted on moulded structure plug-in type fuse carriers fitted to bases as per IS 1300 bases. Fuse carrier base as well as MCBs shall have imprints of the fuse 'rating' and 'voltage'.

8.4 Space Heater:

Each panel shall be provided with a space heater rated for 240 V, single phase, 50Hz AC supply for the internal heating of the panel to prevent condensation of moisture. The heater shall be complete with thermostat controlled and a switch unit.

9.0 EARTHING

- 9.1 All panels shall be equipped with an earth bus securely fixed. The material and the sizes of the bus bar shall be at least 25 X 6 sq. mm perforated copper strip with threaded bores at a gap of 50 mm with a provision of bolts and nuts for connection with cable armours and mounted equipment etc for effective earthing suitable connectors for this purpose shall be provided. When several panels are mounted adjoining each other, the earth bus shall be made continuous and necessary connectors and clamps for this purpose shall be included in the scope of supply of Contractor. Provision shall be made for extending the earth bus bars to future adjoining panels on either side.
- 9.2 All metallic cases of relays, instruments and other panel mounted equipment including gland plate, shall be connected to the earth bus by copper wires of size not less than 2.5 sq.mm. The colour code of earthing wires shall be green.
- 9.3 Looping of earth connections which would result in loss of earth connection to other devices when the loop is broken, shall not be permitted. However, looping of earth connections between equipment to provide alternative paths to earth bus shall be provided.
- 9.4 VT and CT secondary neutral or common lead shall be earthed at one place only at the terminal blocks where they enter the panel. Such earthing shall be made through links so that earthing may be removed from one group without disturbing continuity of earthing system for other groups.
- 9.5 The earth bar shall be terminated into two earthing terminals of adequate size with nuts and washer for connecting to the station earthing system.

10.0 INDICATING INSTRUMENTS

All instruments and meters shall be enclosed in dust proof, moisture resistant, black finished cases and shall be suitable for tropical use. Frequency meters shall be provided with individual transducers and these shall be calibrated along with transducers to read directly the primary quantities. They shall be accurately adjusted and calibrated at works and shall have means of calibration check and adjustment at site.

- 10.1 Unless otherwise specified, all electrical indicating instruments shall have circular 240 degree scale and with a dial of 96mm x 96mm. They shall be suitable for flush mounting.
- 10.2 Instruments dial shall be with white circular scale and black pointer and with black numerals and lettering. The dial shall be free from warping, fading, and decolouring. The dial shall also be free from parallax error.
- 10.3 Digital frequency meters shall be of class:0.5 and shall have digital display of 5 and 4 digits respectively, with display size, not less than 25 mm (height).

11.1 TRANSDUCERS

- 11.1 Transducers (for use with Indicating Instruments) shall in general conform to IEC: 688-1
- 11.2 The energy meter capability shall be used for measurement of active power, reactive power, voltage, current and frequency in three phase four wire unbalanced system.
- 11.3 One 33 kV C&R panel shall be installed for each incomer of 33 KV (Line incomer and 33 KV side of transformer). Each panel shall consist of energy meter, protection schemes, indication and control etc. One 11 kV C&R panel shall be provided for each 11 kV outdoor type VCB for incomer and feeder.
- 11.4 Voltage signal (440 Volt ac L-L) for voltmeter, PF meter, frequency meter, KW meter etc to be provided in the C&R panel shall be tapped from the respective PTs through a separate/ independent copper cable.

12.0 ENERGY METER

Provision to be there to provide Static TVM energy meter as per the technical specification covered in the chapter of technical specification of TVM energy meter.

13.0 ANNUNCIATION SYSTEM for 33 kV for 33 C&R Panel.

- 13.1 The annunciator facia shall be provided with translucent plastic window for alarm point with approximate size of 35 mm x 50 mm. The facia plates shall be engraved in black lettering with respective inscription. Alarm inscriptions shall be engraved on each window in not more than three lines and size of the lettering shall not be less than 5 mm.
- 13.2 Each annunciation window shall be provided with two white lamps in parallel to provide safety against lamp failure. Long life lamps shall be used. The transparency of cover plates and wattage of the lamps provided in the facia windows shall be adequate to ensure clear visibility of the inscriptions in the control room having high illumination intensity (350 Lux), from the location of the operator's desk.
- 13.3 All Trip facia shall have red colour and all Non-trip facia shall have white colour.
- 13.4 Sequence of operation of the annunciator shall be as follows:

Sl No.	Alarm condition	Fault Contact	Visual Annunciation	Audible Annunciation (by Hooter)
1	Normal	Open	Off	OFF
2	Abnormal	Close	Flashing	ON
3	Accept	Close	Steady on	OFF

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	push button pressed.	Open	Steady on	OFF
4	Reset push button is pressed.	Close Open	On Off	OFF OFF
5	Lamp test Push button pressed	Open	Steady On	OFF
6	Alarm test	Open	Flashing	ON

- 13.5 Audible annunciation for the failure of DC supply to the annunciation system shall be provided and this annunciation shall operate on 240 Volts AC supply. On failure of the DC to the annunciation system for more than 2 or 3 seconds. (adjustable setting), a bell shall sound. A separate push button shall be provided for the cancellation of this audible alarm alone but the fascia window shall remain steadily lighted till the CD supply to annunciation system is restored.
- 13.6 A separate voltage check relay shall be provided to monitor the failure of supply (240 V AC). If the failure of supply exists for more than 2 to 3 seconds, this relay shall initiate visual and audible annunciation. This annunciation shall operate on DC and buzzer shall sound.
- 13.7 The total number of windows shall be 16 and the matter for engraving shall be indicated to the contractor in due course.

14.0 SWITCHES

- 14.1 Control and instrument switches shall be rotary operated type with escutcheon plates clearly marked to show operating position and circuit designation plates and suitable for flush mounting with only switch front plate and operating handle projecting out.
- 14.2 The selection of operating handles for the different types of switches shall be as follows:
- | | |
|---------------------------|-------------------------|
| Breaker Control switches: | Pistol grip, black |
| Selector switches | : Oval or knob, black |
| Instrument switches | : Round, knurled, black |
- 14.3 The control switch of breaker shall be of spring return to neutral type. The switch shall have spring return from close and trip positions to “after close” and “after trip” positions respectively. It shall be necessary to press the switch before tuning to close or command position.
- 14.4 Instrument selection switches shall be of maintained contact (stay put) type.
- 14.5 The contacts of all switches shall preferable open and close with snap action to minimize arcing. Contacts of switches shall be spring assisted and contact faces shall be with rivets of pure silver or silver alloy. Springs shall not be used as current carrying parts.

14.6 The contact rating of the switches shall be as follows:

Description	Contact rating in Amps
Continuous	24 V DC or 240 Volts AC Supply, 10 Amps
Make and carry	24 V DC or 240 Volts AC Supply, 30 Amps
Break for Resistive load Supply, 20 Amp.	24 V DC or 240 Volts AC

15.0 INDICATING LAMPS

15.1 Indicating lamps shall be multiple LED, panel mounting type with rear terminal connections. Lamps shall have translucent lamp covers to diffuse lights coloured red, green, amber, clear white or blue as specified. The lamp cover shall be preferably of screwed type, unbreakable and moulded from heat resisting material.

15.2 Lamps and its parts shall be interchangeable and easily replaceable from the front of the panel.

15.3 The indicating lamps shall withstand 120% of rated voltage on a continuous basis.

16.0 SEMAPHORE INDICATORS

16.1 Position indicators of "SEMAPHORE" type shall be provided as part of the mimic diagrams on panels for indicating the position of circuit breakers, isolating/earthing switches etc. The indicator shall be suitable for semi-flush mounting with only the front disc projecting out and with terminal connection from the rear. Their strips shall be of the same colour as the associated mimic.

16.2 Position indicator shall be suitable for DC Voltage as specified. When the supervised object is in the closed position, the pointer of the indicator shall take up a position in line with the mimic bus bars, and at right angles to them when the object is in the open position. When the supply failure to the indicator occurs, the pointer shall take up an intermediate position to indicate the supply failure.

16.3 The rating of the indicator shall not exceed 2.5 W.

16.4 The position indicators shall withstand 120 percent of rated voltage on a continuous basis.

17.0 RELAYS

- 17.1 All relays shall conform to the requirements of IS: 32231 or IEC-60255 or other applicable standards. Relay shall be suitable for flush or semi-flush mounting on the front with connections from the rear.
- 17.2 All protective relays shall be in draw out type in modular cases with proper testing facilities in the form of blocks. Necessary test plugs shall be supplied loose and shall be included in Contractor's scope of supply.
- 17.3 The protective relays shall be suitable for efficient and reliable operation of the protection scheme described in the specification. Necessary auxiliary relays, timers, lockout relay etc., required for the complete protection schemes described in the specification shall be provided. All protective relays shall be provided with at least two pairs of potential free isolated output contacts. Auxiliary relays and timers shall have pairs of contacts as required to complete the scheme. Contacts shall be silver faced with spring action. Relay case shall have adequate number of terminals for making potential free external connections.
- 17.4 All protective relays, auxiliary relays and timers shall be provided with hand reset type contacts. They shall also be provided with hand reset type external operation indicators with suitable inscription to be informed in due course of time.
- 17.5 No control relay which shall trip the power circuit breaker when the relay is de-energized shall be employed in the circuits.
- 17.6 Provision shall be made for easy isolation of trip circuits of each relay for the purpose of testing and maintenance.
- 17.7 All protective relays and alarm relays shall be provided with one extra isolated pair of contacts wired to terminals.
- 17.8 The setting ranges of the relays offered, if different from the ones specified shall also be acceptable if they meet the functional requirements.
- 17.9 Any alternative or additional protections or relays considered necessary for providing complete effective and reliable protection should also be offered separately. The acceptance of this alternative/additional equipment shall lie with the Purchaser.
- 17.10 All relays shall have capability to withstand test voltage of 2 kV rms for one minute.
- 17.11 All relays and their drawings shall have phase indications as R-Red, Y-Yellow, and B-Blue.

18.0 TESTS

- 18.1 The following type tests shall be conducted on the Protective relays.
- a) Insulation tests as per IEC 60255-5
 - b) High frequency disturbance test as per IEC 60255-4 (Appendix-E)-Class III (not applicable for electromechanical relays.
 - c) Fast transient test as per IEC 1000-4, Level III (not for applicable for electromechanical relays.)
 - d) Relay characteristics, performance and accuracy test as per IEC 60255
 - o Steady state Characteristics and operating time.
 - o Dynamic
 - e) Tests for thermal and mechanical requirements as per IEC60255-6.
 - f) Tests for rated burden as per IEC 60255-6
 - g) Contact performance test as per IEC 60255-0-25
 - h) Any other tests prescribed in relevant IS .

18.2 Steady state & Dynamic characteristics tests on the relays (current differential protection relays), as type test, shall be carried out based on general guide lines specified in CIGRE Committee 34 report on simulator/net work analyzer/PTL

19.0 CONFIGURATION OF C&R PANELS (33kV & 11kV)

Each panel shall consist of the following:

Sl.No.	Description of Relays	33Kv RC PANNEL	11kV RC PANNEL
1.	Ammeter with selector switch.	1	1
2	Pistol grip CB control switch	1	1
3	Red indicating lamp for indicating close position of CB	1	1
4	Green indicating lamp for indicating open position of CB	1	1
5	Yellow indicating lamp for auto trip	1	1
6	Blue indicating lamp for	1	1

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	spring charging		
7	Annunciation windows with associated annunciation relay	1	1
8	Push buttons for Alarm accept/Reset/Lamp test	1	1
9.	Voltmeter with selector switch	-	1
10	Cut out mounting and wiring for WTI and selector switch	1	1
11	Trip Circuit supervision relays	1	1
12	DC supply supervision relay	1	1
13	AC supply supervision relay	1	1
14	Flag relays, aux relays, timers trip relays etc as per scheme requirement	1 set	1 set
15	Auxiliary relay for Buchholz	1	1
16	3 O/C & 1 E/F Electromagnetic relay with High set	1	-
17	2 O/C & 1 E/F Electromagnetic relay with High set	-	1
18	Master Trip Relays suitable for operation at 24 V DC with sufficient number and configuration of contacts.	1	1
19	Auxiliary Relays for Anti-pumping, Density switch, Contact multiplier etc. as may be required.	1LOT	1LOT

VOLUME- II

(Sample Forms)

2008-2009

(Tender Notification : CSO/15/Breaker,CT,PT,Relay control Panel)

Date: 07.11.2008

BID FORM

DESIGN & SUPPLY OF VCB,CT,PT,RC PANEL TO WESCO/ NESCO/ SOUTHCO

To

**Central Services Office
(NESCO, WESCO & SOUTHCO)
Plot No. 123, Sector – A, Zone – A
Mancheswar Industrial Estate
Bhubaneswar – 751 010**

Sir,

1. We understand that NESCO/WESCO/SOUTHCO are desirous of procuring 10 KVA, 16 KVA & 25 KVA Distribution Transformers in their respective licensed distribution network area in the state of Orissa.
2. Having examined the Bidding Documents for the above named works, we the undersigned, offer to deliver the goods in full conformity with the Drawings, Conditions of Contract and specifications for the sum of..... (figures.....) or such other sums as may be determined in accordance with the terms and conditions of the contract. The above amounts are in accordance with the Price Schedules attached herewith and are made part of this bid.
3. If our Bid is accepted, we undertake to deliver the entire goods within 90 days (3 months) from the date of award of purchase order/letter of intent.
4. If our Bid is accepted, we will furnish a performance bank guarantee for an amount of 10% (Ten) percent of the total contract value for due performance of the Contract in accordance with the General Conditions of Contract.
5. We agree to abide by this Bid for a period of 120 days from the date fixed for bid opening under clause 9.0 of GCC, and it shall remain binding upon us and may be accepted at any time before the expiration of that period.
6. We declare that we have studied the provision of Indian Income Tax Law and other Indian Laws for supply of equipments/materials and the prices have been quoted accordingly.
7. Unless and until Letter of Intent is issued, this Bid, together with your written acceptance thereof, shall constitute a binding contract between us.
8. We understand that you are not bound to accept the lowest, or any bid you may receive.
9. There is provision for Resolution of Disputes under this Contract, in accordance with the Laws and Jurisdiction of Contract, Clause 19 of GCC.

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

Signature..... In the capacity of

.....duly authorized to sign for and on behalf of
(IN BLOCK CAPITALS)

FORMAT FOR BID SECURITY BANK GUARANTEE

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

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

KNOW ALL PEOPLE by these presents that WE [name of bank] at [Branch name and address], having our registered office at [address of the registered office of the bank] (hereinafter called "the Bank"), are bound unto North Eastern Electricity Company of Orissa Ltd., with it's Registered Office at Plot 123, Sector A, Zone A, Mancheswar Industrial Estate, Bhubaneswar – 751 010, (hereinafter called "the Purchaser") in the sum of Rsfor which payment well and truly to be made to the said Purchaser, the Bank binds itself, its successors, and assigns by these presents. Sealed with the Common Seal of the said Bank this ____ day of _____ 20____.

THE CONDITIONS of this obligation are:

1. If the Bidder withdraws its Bid during the period of bid validity specified by the Bidder on the Bid Form; or
2. If the Bidder, having been notified of the acceptance of its Bid by the Purchaser during the period of bid validity:
 - (a) fails or refuses to execute the Contract Form, if required; or
 - (b) fails or refuses to furnish the performance security, in accordance with the Instructions to Bidders/ GENERAL CONDITIONS.;

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

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

(signature of the bank)

Signature of the witness

Registered Office of NESCO, WESCO & SOUTHCO

PROFORMA FOR BANK GUARANTEE FOR CONTRACT PERFORMANCE

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

Bank Guarantee No.....
Date.....
Ref.

To

**NESCO/ WESCO /SOUTHCO (As the case may be)
Registered Office at :
Plot No. 123, Sector – A, Zone – A
Mancheswar Industrial Estate
Bhubaneswar – 751 010**

Dear Sirs,

In consideration of the (WESCO/NESCO/SOUTHCO) here in after termed as "Purchaser" having awarded to M/s. with its Registered Office/Head Office at..... (hereinafter referred to as the 'Contractor' which expression shall unless repugnant to the context meaning thereof, include its successors administrators, executors and assigns), a Contract by issue of Letter of Award No.dated.....and the same having been acknowledged by the Contractor, resulting in a Contract bearing No. dated.....valued at.....for.....and the Contractor having agreed to provide a Contract Performance Guarantee for the faithful performance of the entire Contract equivalent to *.....% (.....percent) of the said value of the Contract to the Purchaser.

We.....(Name & Address) having its Registered Office at..... hereinafter referred to as the 'Bank', which expression shall, unless repugnant to the context or meaning thereof, include its successors, administrators, executors and assigns) do hereby Guarantee and undertake to pay the Purchaser, on demand any and all monies payable by the Contractor to the extent of.....**.....as aforesaid at any time upto(days/month/year) without any demur, reservation, contest, recourse or protest and/or without any reference to the Supplier. Any such demand made by the Purchaser on the Bank shall be conclusive and binding notwithstanding any difference between the Purchaser and the Contractor or any dispute pending before any Court, Tribunal, Arbitrator or any other authority. The Bank undertakes not to revoke this Guarantee during its currency without previous consent of the Purchaser and further agrees that the Guarantee herein contained shall continue to be enforceable till the Purchaser discharges this Guarantee.

The Purchaser shall have the fullest liberty without affecting in any way the liability of the Bank under this Guarantee, from time to time to extend the time for performance of the Contract by the Contractor. The Purchaser shall have the fullest liberty, without affecting this Guarantee, to postpone from time to time the exercise of any powers vested in them or of any right which they might have against the Contractor, and to exercise the same at any time in any manner, and either to enforce or to forbear to enforce any covenants, contained or implied, in the Contract between the Purchaser and

Registered Office of NESCO, WESCO & SOUTHCO

the Contractor or any other course or remedy or security available to the Purchaser. The Bank shall not be released of its obligations under these presents by any exercise by the Purchaser of its liberty with reference to the matters aforesaid or any of them or by reason of any other act of forbearance or other acts of omission or commission on the part of the Purchaser or any other indulgences shown by the Purchaser or by any other matter or thing whatsoever which under law would, but for this provision have the effect of relieving the Bank.

The Bank also agrees that the Purchaser at its option shall be entitled to enforce this Guarantee against the Bank as a principal debtor, in the first instance without proceeding against Supplier and notwithstanding any security or other Guarantee the Purchaser may have in relation to the Contractor's liabilities.

Notwithstanding anything contained hereinabove our liability under this Guarantee is restricted toand it shall remain in force upto and including and shall be extended from time to time for such period (not exceeding one year),as may be desired by M/s..... on whose behalf this Guarantee has been given.

Dated this..... day of 20..... at.....

WITNESS

(Signature)..... (Signature).....

(Name)..... (Name).....

..... (Official Address)

(Designation with Bank Stamp)

Attorney as per Power of Attorney No.....

Dated.....

NOTE:

1. *This sum shall be Ten percent (10%) of the Contract price.

**The date will be ninety (90) days after the end of Warranty Period as specified in the Contract.
2. The stamp papers of appropriate value shall be purchased in the name of issuing bank.
3. Performance security is to be provided by the successful bidder in the form of a bank guarantee, which should be issued by any Scheduled Bank.

Registered Office of NESCO, WESCO & SOUTHCO

PROFORMA FOR BANK GUARANTEE FOR EQUIPMENT PERFORMANCE

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

Bank Guarantee No.....
Date.....
Ref.

To

NESCO/ WESCO /SOUTHCO (As the case may be)
Registered Office at :
Plot No. 123, Sector – A, Zone – A
Mancheswar Industrial Estate
Bhubaneswar – 751 010

Dear Sirs,

In consideration of the (WESCO/NESCO/SOUTHCO) here in after termed as “Purchaser” having awarded to M/s. with its Registered Office/Head Office at..... (hereinafter referred to as the ‘Contractor’ which expression shall unless repugnant to the context meaning thereof, include its successors administrators, executors and assigns), a Contract by issue of Letter of Award No.dated.....and the same having been acknowledged by the Contractor, resulting in a Contract bearing No. dated.....valued at.....for.....and the Contractor having agreed to provide an Equipment Performance Guarantee as per the Warranty & Guarantee obligations under the said Contract equivalent to *.....% (.....percent) of the said value of the Contract to the Purchaser.

We.....(Name & Address) having its Registered Office at..... hereinafter referred to as the ‘Bank’, which expression shall, unless repugnant to the context or meaning thereof, include its successors, administrators, executors and assigns) do hereby Guarantee and undertake to pay the Purchaser, on demand any and all monies payable by the Contractor to the extent of.....**.....as aforesaid at any time upto(days/month/year) without any demur, reservation, contest, recourse or protest and/or without any reference to the Supplier. Any such demand made by the Purchaser on the Bank shall be conclusive and binding notwithstanding any difference between the Purchaser and the Contractor or any dispute pending before any Court, Tribunal, Arbitrator or any other authority. The Bank undertakes not to revoke this Guarantee during its currency without previous consent of the Purchaser and further agrees that the Guarantee herein contained shall continue to be enforceable till the Purchaser discharges this Guarantee.

The Purchaser shall have the fullest liberty without affecting in any way the liability of the Bank under this Guarantee, from time to time to extend the time for performance of the Contract by the Contractor. The Purchaser shall have the fullest liberty, without affecting this Guarantee, to postpone from time to time the exercise of any powers vested in them or of any right which they might have against the Contractor, and to exercise the same at any time in any manner, and either to enforce or to forbear to enforce any covenants, contained or implied, in the Contract between the Purchaser and

Registered Office of NESCO, WESCO & SOUTHCO

the Contractor or any other course or remedy or security available to the Purchaser. The Bank shall not be released of its obligations under these presents by any exercise by the Purchaser of its liberty with reference to the matters aforesaid or any of them or by reason of any other act of forbearance or other acts of omission or commission on the part of the Purchaser or any other indulgences shown by the Purchaser or by any other matter or thing whatsoever which under law would, but for this provision have the effect of relieving the Bank.

The Bank also agrees that the Purchaser at its option shall be entitled to enforce this Guarantee against the Bank as a principal debtor, in the first instance without proceeding against Supplier and notwithstanding any security or other Guarantee the Purchaser may have in relation to the Contractor's liabilities.

Notwithstanding anything contained hereinabove our liability under this Guarantee is restricted toand it shall remain in force upto and including and shall be extended from time to time for such period (not exceeding one year),as may be desired by M/s..... on whose behalf this Guarantee has been given.

Dated this..... day of 20..... at.....

WITNESS

(Signature)..... (Signature).....

(Name)..... (Name).....

..... (Official Address)

(Designation with Bank Stamp)

Attorney as per Power of Attorney No.....

Dated.....

NOTE:

1. *This sum shall be Ten percent (10%) of the Ex-Works price of goods.
**The date will be ninety (90) days after the end of Warranty Period as specified in the Contract.
2. The stamp papers of appropriate value shall be purchased in the name of issuing bank.
3. Performance security is to be provided by the successful bidder in the form of a bank guarantee, which should be issued by any Scheduled Bank.

Registered Office of NESCO, WESCO & SOUTHCO

ANNEXURE - III

TENDER NOTICE NO. CSO/13/Distribution Transformer dtd. 07.11.08

Price schedule for Goods Offered

Name of Bidder _____ Page _____ of _____

1	2	3	4	5							6	7
SL. No.	Item Description	Tender Qty(In No.)	Offered Qty(In No.)	Ex Works	Excise Duty Amnt@ of	Sales Tax / VAT Amnt@ of with surcharge(If any)	Packing & Forwarding	Inland transportation, in surface & other local costs incidental to delivery	Entry Tax @ of	Any other taxes and duties	Unit price(a+b+c+d+e+f+g) in Rs.	Total Price(col4x6) in Rs
				(a)	(b)	©	(d)	(e)	(f)	(g)		

Signature of Bidder _____

Note : 1. In case of discrepancy between unit price & total the unit shall prevail

2. Separate price schedules may be enclosed for three companies WESCO,NESCO,SOUTHCO. In case of submission of one price schedule, it shall be presumed that rate is same for three companies.

ANNEXURE - IV

**GUARANTEED & OTHER TECHNICAL PARTICULARS FOR 33kv & 11 KV VCB
(To be furnished by the Manufacturer)**

- | S. No. | Description |
|--------|--|
| 1 | Rated voltage and frequency |
| 2 | Rated short time withstands current and its duration with breaker as housed in the panel. |
| 3 | Making current (Peak) |
| 4 | One minute power frequency withstand voltage |
| 5 | Impulse withstand voltage |
| 6 | Maximum temperatures rise over ambient specified. |
| 7 | Interchangeability of similar equipment |
| 8 | Duty cycle |
| 9 | Whether horizontal drawout |
| 10 | Standard applicable |
| 11 | Whether anti pumping device provided |
| 12 | Whether control circuitry suitable for monitoring of closing and tripping circuit |
| 13 | Maximum design voltage |
| 14 | a) Symmetrical breaking capacity for various breakers (in kA)
b) Asymmetrical breaking capacity for various breakers (in kA). |
| 15 | a) Rated continuous current rating for various breakers & corresponding temperature
b) Rated continuous current rating for various breakers at the specified ambient temperature. |
| 16 | Number of breaks/phases |
| 17 | Type of material of contacts:
a) Main
b) Arcing |
| 18 | Whether contacts silver are plated and thickness of plating
Whether breaker designed to close and latch on making or fitted with making current release? |
| 19 | Whether trip free or fixed trip mechanically and electrically. |
| 20 | Type of closing |
| 21 | Type of tripping |
| 22 | Normal voltage of
a) Closing/tripping mechanism
b) Spring charging motor. |
| 23 | Allowable variation of voltage for above |
| 24 | Power required at normal voltage for
a) Trip coil
b) Closing coil
c) Spring charging motor |
| 25 | Weight of circuit breaker with arc extinguishing medium |
| 26 | Opening time in cycles |
| 27 | Making time in cycles |
| 28 | Opening time at:
a) 10% of rated short circuit current.
b) 50% of rated short circuit current.
c) 100% of rated short circuit current. |
| 29 | Heat dissipation at normal current (kW) |
| 30 | |

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- Whether 12 Nos adjustable (either in 'NO' or 'NC') auxillary contacts over and above those
- 31 required for breaker operation/annunciation have been provided or not.
 - 32 Current carrying capacity of auxilliary switches.
 - 33 No. of breaker operations necessary (before inspection and maintenance) of :
 - a) Switching at rated load
 - b) Faults of 100% capacity
 - c) Faults of 50% capacity
 - d) Making under fault conditions
 - 34 Accessibility of line connection
 - 35 Whether terminals suitable for XLPE cable
 - 36 Minimum value of pick up current for
 - a) Closing coil
 - b) Tripping coil
 - 37 Schematic control diagram of circuit breaker enclosed
 - 38 Make of interrupter
 - 39 Vaccum Breakers (Technical details)
 - a) Pressure inside the interrupter mm Hg
 - b) Contract wear indication provided
 - c) Mechanical facility for checking loss of vaccum provided
 - d) Vaccum monitoring relay provided
 - e) Adequate shielding against X-Ray radiations provided
 - 40 Switching over voltages generated by the circuit breakers with and without surge suppressors.

GUARANTEED & OTHER TECHNICAL PARTICULARS FOR RELAY CONTROL PANEL
(To be furnished by the Manufacturer)

- 1 Tenderer name and address :
 - 2 Validity of tender :
 - 3 Guaranteed Delivery Schedule :
 - 4 Type :
 - 5 Terms of payment :
- A Protective Relays
- a) Manufacturer's name & address:
 - b) Non-directional over current and earth fault
 - I. Name
 - II. Type
 - III. Current coil rating
 - IV. Tape range
 - V. VA Burden
 - VI.
 - a) Highest tap
 - b) Lowest tap
 - VII. Time of operation at maximum time dial setting at
 - VIII. Type of Characteristic
 - IX. Trip contacts ratings (amp)
 - X. Whether seal in contact provided or not
 - XI. Description leaflet reference submitted.
 - XII. Impulse withstand test voltage (PEAK)
 - XIII. Over all dimensions
 - XIV. Total weight
 - XV. Mounting details
 - XVI. Characteristic curves
- B Panel Wiring
- I. Size of wiring conductor for the following
 - a) PT Circuits (Only for 11 KV VCB)
 - b) CT Circuits
 - c) DC supply Circuits
 - d) Other Circuits.
 - II. Size of earthing bar safety earthing
 - III. Type of terminals provided on wirings
 - IV. Wiring conductor aluminium/cooper
 - V.
 - VI. Bus bar materials aluminium / cooper
- C Instrument and Meters
- I. Type of instruments and manufacturer's name and address
 - II. Size
 - III. Whether magnetically shielded or not
 - IV. Limits of error in the effective range

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- V. Maximum scale length
- VI. Whether tropicalised
- VII. Short time over load
- VIII. VA Burden
 - a) Current coil
 - b) Potential coil
- IX. Temperature at which the instruments are calibrated
- X. Description leaflet reference nos submitted
- XI. Maker's name
- XII. Type of selector switch

**GUARANTEED & OTHER TECHNICAL PARTICULARS FOR CT,
(To be furnished by the Manufacturer)**

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**GUARANTEED & OTHER TECHNICAL PARTICULARS FOR PT
(To be furnished by the Manufacturer)**

- 1 Type of tank/Installation
- 2 Type of mounting
- 3 Conforming to standard
- 4 Type & manufacturer name and address
- 5 Rated primary voltage
- 6 No. of secondary winding
- 7 Rated secondary voltage
- 8 Ratio Burden
- 9 Accuracy class
- 10 Maximum ratio error with rated burden 5% normal primary voltage
- 11 Quantity of oil
- 12 Temperature rise at 1.1 times rated voltage with rated burden with
- 13 Rated voltage factor & time
- 14 One minute power frequency withstand test voltage

ANNEXURE - V

SOURCE OF MATERIALS / PLACES OF MANUFACTURE, TESTING AND INSPECTION

Sl. No.	Item	Source of Material	Place of Manufacture	Place of testing and inspection
1.	Vacuum Interrupter			
2.	Structural Materials			
3.	Relays			
4.	Bushing / Limb			
5	Oil			
6	Other Items if any			

PAST PERFORMANCE DETAILS

Description	FY	Name/Address of the Costumer	Order Ref	Order Qty	Supply Qty	Date of Supply	Performance Certificate Ref
33 kv VCB, CT,RC Panel	2003-04						
	2004-05						
	2005-06						
	2006-07						
	2007-08						
11 kv VCB, CT, PT,RC Panel	2003-04						
	2004-05						
	2005-06						
	2006-07						
	2007-08						
	2004-05						
	2005-06						
	2006-07						
	2007-08						

- Note :
- 1) Copies of necessary documents in support of above details needs to be submitted along with the bid.
 - 2) The Purchaser reserves the right to make correspondence with the costumers regarding confirmation of any/all of the above facts.