



**TRANSMISSION CORPORATION OF TELANGANA LIMITED**  
**VIDYUT SOUDHA, HYDERABAD – 82**  
(TIN NO. 36270120612)

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From  
The Chief Engineer (P&MM),  
TGTransco,  
Vidhyut Soudha,  
Hyderabad – 500 082  
Email ID: ce.pmm@tgtransco.com

To  
M/s. BHEL-Regional Operation Division  
Qtr Nos 33-36 Type-C,  
Corporate R&D Division,  
Vikas Nagar, Balanagar,  
Hyderabad-500042.

P.O.No.4500003382/CE/P&MM/SE(P&MM)/DE2/ TGPMM 25-34/2024/160 MVA BHEL /D.No.1912,  
Dt.10-11-2025

Sirs,

Sub: Tender Specification TGPMM25-34/2024- Supply of 15 Nos 160MVA 220/132/11kV Auto Transformers ( Lot-I:8 Nos +Lot-II:7 Nos) with all accessories & with additional features as per Specification, including Spare 245 kV & 145 kV RIP Bushings - Detailed Purchase Order – Issued - Reg.

Ref: 1) Tender Specification No. TGPMM25-34/2024  
2) Your offer against Tender Specification No. TGPMM25-34/2024  
3) LOI.No.CE/P&MM/SE(P&MM)/DE2/ TGPMM 25-34/2024/160 MVA BHEL /D.No.1816, Dt.30-08-2025  
4) Lr.No.CE/P&MM/SE(P&MM)/DE2/ TGPMM 25-34/2024/160 MVA BHEL /D.No. 1821, Dt.04-09-2025  
5) Lr.No. RE24ESEC036, dated 05.09.2025  
6) Lr.No. RE24ESEC036, dated 10.09.2025  
7) Lr.No.CE/P&MM/SE(P&MM)/DE2/ TGPMM 25-34/2024/160 MVA BHEL /D.No.1836, Dt.15-09-2025  
8) Lr.No.CE/P&MM/SE(P&MM)/DE2/ TGPMM 25-34/2024/160 MVA BHEL /D.No.1844, Dt.22-09-2025

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I, acting for and on behalf and by the order and direction of TRANSMISSION CORPORATION OF TELANGANA LIMITED (hereinafter called the TGTransco), accept your offer against the Tender Specification No. TGPMM 25-34/2024, for supply of the equipment detailed in Clause-2 below, with the terms and conditions as per the Tender Specification TGPMM 25-34/2024..

- 1. SCOPE OF CONTRACT:** This contract relates to the supply of the material detailed in Clause-2 below and covers design, manufacture, testing before dispatch and delivery free at destination substations /stores (FADS) as detailed in this order.

## 2. SCHEDULE OF PRICES

**Lot:I: Supply of 8 Nos 160MVA 220/132/11kV Auto Transformers including Spare 245 kV & 145 kV RIP Bushings & including GST@18%**

Sl. N o.	Description of Material	Qty Nos.	Ex-Works price per unit in Rs.	Unit Packing & Forwarding Rs.	Unit Freight Price Rs.	Unit Insurance Price Rs.	Unit prices for supply (without GST) Rs.	IGST @18% Rs.	Unit FADS Price (with GST) Rs.	Total FADS Cost (with GST) Rs.
1	M/s. BHEL ' make 160 MVA 220/132/11kV Auto Transformers ONAN/ONAF cooling 3 phase 50c/s Auto Transformers (Vector group YNa0d1) complete with OLTC and RTCC cubicles and Sufficient quantity of oil necessary for first filling of all tanks, coolers and radiator at the proper level shall be supplied in non-returnable containers suitable for outdoor storage and having impedance (Min tap:8%, Normal Tap:10% and Max tap :12%) and with OLTC taps of -10% to +10% in steps of 1.25% for 132 kV variation on the 132kV line end and complete with all fittings, and NIFPS and accessories as per IS 2026/1977 vide Annexure-I. (HSN Code: 85042320)	8	11,40,00,000.00	0.00	25,00,000.00		11,65,00,000.00	2,09,70,000.00	13,74,70,000.00	109,97,60,000.00
2	Spare 245kV, 2000A RIP Bushings with metal parts & Gaskets and suitable clamps	3	17,00,000.00	0.00	1,00,000.00	0.00	18,00,000.00	3,24,000.00	21,24,000.00	63,72,000.00
3	Spare 145kV, 1250A RIP Bushings with metal parts & Gaskets and suitable clamps	3	10,00,000.00	0.00	50000.00	0.00	10,50,000.00	1,89,000.00	12,39,000.00	37,17,000.00
<b>Lot:I: Total Purchase Cost for Supply of 160MVA 220/132/11kV Auto Transformers including Spare 245 kV &amp; 145 kV RIP Bushings &amp; including GST@18%</b>										<b>Rs. 110,98,49,000.00</b>

**Lot:II: Supply of 7nos 160MVA 220/132/11kV Auto Transformers including Spare 145 kV RIP Bushings & including GST@18%**

Sl. No.	Description of Material	Qty Nos.	Ex-Works price per unit in Rs.	Unit Packing & Forwarding Rs.	Unit Freight Price Rs.	Unit Insurance Price Rs.	Unit prices for supply (without GST) Rs.	IGST @18% Rs.	Unit FADS Price (with GST) Rs.	Total FADS Cost (with GST) Rs.
1	M/s. BHEL ' make 160 MVA 220/132/11kV Auto Transformers ONAN/ONAF cooling 3 phase 50c/s Auto Transformers (Vector group YNa0d1) complete with OLTC and RTCC cubicles and Sufficient quantity of oil necessary for first filling of all tanks, coolers and radiator at the proper level shall be supplied in non-returnable containers suitable for outdoor storage and having impedance (Min tap:8%, Normal Tap;10% and Max tap :12%) and with OLTC taps of -10% to +10% in steps of 1.25% for 132 kV variation on the 132kV line end and complete with all fittings, and NIFPS and accessories as per IS 2026/1977 vide Annexure-I. (HSN Code: 85042320)	7	11,40,00,000.00	0.00	25,00,000.00		11,65,00,000.00	2,09,70,000.00	13,74,70,000.00	96,22,90,000.00
2	Spare 145kV, 1250A RIP Bushings with metal parts & Gaskets and suitable clamps	6	10,00,000.00	0.00	50000.00	0.00	10,50,000.00	1,89,000.00	12,39,000.00	74,34,000.00
<b>Lot:II: Total Purchase Cost for Supply of 7 Nos 160MVA 220/132/11kV Auto Transformers including Spare 145 kV RIP Bushings &amp; including GST@18%</b>										<b>Rs. 96,97,24,000.00</b>

**Total Purchase Cost for Supply of 15 Nos 160MVA 220/132/11kV Auto Transformers(Lot-I:8 Nos +Lot-II:7 Nos) including Spare 245 kV & 145 kV RIP Bushings & including GST@18%: Rs. 207,95,73,000.00 (Rupees Two Hundred and Seven Crore Ninety Five Lakh Seventy Three Thousand Only)**

- a) The prices accepted above are free at destination sites/stores.
- b) The prices for Power Transformers are variable as per IEEMA with a ceiling of + 50% and no ceiling on negative variation. **The date of bid opening is 20.03.2025. The base indices will be as prevailing on 01-02-2025.** The applicable IEEMA PVC formulae are indicated in Annexure-II.
- c) The dispatch of the equipment is by road only. The transit insurance shall include storage cover for 45 days at stores/site. The policy will have a provision for extension to cover further storage if necessary at destination stores / site at TGTransco cost. The insurance beneficiary shall be TGTransco.
- d) The present rate of IGST @18% is applicable.
- e) The penalty, if any, arising due to delay in supplies over the contract delivery period will be deducted invariably at the rate indicated in clause-10, while raising Bills for the supplies made.
- f) All the contractual drawings shall be got approved by this office before commencement of delivery.
- g) The TGTransco shall have the right to vary the ordered quantity by  $\pm$  50% at any time during the execution of the order.
- h) You shall claim prices indicated in P.O. in your regular bills. The price variation bills will be paid separately, after approval of relevant price variation claims and after deduction of recoveries/penalties if any against the supplies made. If the date of delivery as defined in the P.V. formula is beyond the contracted delivery date, the scheduled delivery date or notified date of inspection or the actual delivery date which ever is advantageous to the Purchaser will form the basis for calculation of price variation.
- i) The Price is inclusive of all incidental charges such as packing, forwarding, handling, loading and other incidentals. However, unloading of the Transformer is to TGTransco account.
- j) e-invoicing (IRN) is mandatory for businesses whose aggregate turnover exceeds 5 crores in a financial year;
- k) A declaration for turnover shall be submitted in case of non applicability of e-invoicing.
- l) Copy of the GST payment challan and proof of filing of GST return (the latest bill copies or previous bill copies) shall be submitted along with the bills/invoices.
- m) If any payment is made erroneously, TGTransco reserves the right to recover the same from your future bills/BGs
- n) GUARANTEED LOSSES AND PENALTY:

Transformer Capacity	160MVA, 220/132/11kV
Maximum No Load Losses	30kW Max.
Maximum Load Losses	200 kW Max.
Maximum I <sup>2</sup> Rlosses	145 kW Max.
Maximum Auxiliary Losses	6 kW Max.

*Losses shall be within +2% tolerance .Capitalization will be done within +2% tolerance. Beyond which material shall be liable to rejection*  
*No benefit shall be given for supply of transformer, with losses (measured during routine tests) less than the losses specified.*

Capitalization will be done within +2% tolerance with following rate

Sl. No	Differential of specified losses vs Measured losses	RATE (in INR per KW)
1	No load Loss	Rs. 10,00,000/KW
2	I <sup>2</sup> R Losses/Load Losses (Differential of whichever loss is higher shall be considered for penalty)	Rs. 8,00,000/KW
3	Auxiliary Losses	Rs. 8,00,000/KW

**Note: For a fraction of a kW, the penalty shall be applied on pro ratabasis.**

### 3. DELIVERY SCHEDULE:

**For each Lot supplies** shall commence with 1No.transformer within **Ten** months from the date of issue of Letter of Intent and balance 1 No. in the next month thereafter. Accordingly, the delivery schedule of transformers is as follows:

Transformer Capacity	160 MVA 220/132/11kV Auto Transformers	
Number of Transformers	<b>Lot-I:8 Nos</b>	<b>Lot-II:7 Nos</b>
Delivery by		
(i) 30.06.2026	1 No. Tr.	1 No. Tr.
(ii) 30.07.2026	1 No. Tr.	1 No. Tr.
(iii) 30.08.2026	1 No. Tr.	1 No. Tr.
(iv) 30.09.2026	1 No. Tr.	1 No. Tr.
(v) 30.10.2026	1 No. Tr.	1 No. Tr.
(vi) 30.11.2026	1 No. Tr.	1 No. Tr.
(vii) 30.12.2026	1 No. Tr.	1 No. Tr.
(viii) 30.01.2027	1 No. Tr.	-----

#### **Delivery of Spare 245kV & 145kV Resin Impregnated Paper (RIP) bushings.**

All Spare 245kV & 145kV Resin Impregnated Paper (RIP) bushings Shall be supplied within Twelve (12) months from the date of issue of Letter of Intent i.e by **30.08.2026**.

The purchaser shall arrange for unloading of the transformer at the destination site.

**You are also requested to advance the deliveries as these transformers are urgently required for ongoing works.** As soon as dispatch is effected, the details with Serial Nos. of Transformers shall be sent within a week.

### 4. Challenge Testing for ascertaining the No Load Losses and Load Losses:

- A) Any qualified bidder participated in this tender as per the 'Qualification Requirements' mentioned in the Tender Specification, can request TGTransco for challenge testing of any of the following tests based on Tender Specification, duly furnishing the technical grounds in support of his challenge.
  - 1. No Load Losses Test
  - 2. Load Losses Test
- B) The conditions for allowing the challenge test by the qualified bidder are as follows.
  - i) The challenge test on one transformer per rating will be allowed if the ordered quantity of the transformers is more than 5Nos per rating. The challenger shall have to make written request to Chief Engineer (P&MM), TGTransco, Vidyut Soudha, Hyderabad for challenge testing giving details of manufacturer, P.O. and rating of the transformer along with the reasons for asking for challenge testing.
  - ii) The challenge test shall be conducted at CPRI.

iii) The challenger shall take all necessary precautions and care that the challenge testing is completed within one month. If the transformer is not returned to the site/designated location, a penalty @ 0.5% per week or part thereof subject to a maximum of 5% shall be levied. Therefore, a Demand Draft worth 5% value of the landed cost of the transformer shall be deposited in advance to TGTransco (by the challenger). Even, if the transformer is not returned after reaching 5% limit, the challenger shall pay the entire landed cost of the transformer along with interest from the date of receipt of transformer. Therefore, the challenger shall deposit a B.G. (from a Nationalized Bank) value equivalent to the landed cost of the transformer for its safe return. The challenger shall have to arrange insurance cover for full value of transformer against all the risk for the period starting from proposed date for lifting of the transformer from site/ manufacturing place till return back to site (anywhere in Telangana) after testing.

iv) The challenger shall request TGTransco to get the Transformer tested within one month of issue of Dispatch Instructions which will be intimated to the manufacturer and the challenger shall organize the testing of the Transformer at CPRI within one month. The selected sample shall be lifted after sealing the same in the presence of authorized representatives of the challenger, the party challenged and TGTransco. The absence of the representatives will be treated as their consent about sealing as well as challenge testing. The sealed Transformer shall be transported to CPRI by the challenger. The party challenged may accompany the truck during transportation. The challenger, the party challenged and TGTransco shall witness the tests. If any party fails to attend the testing, the sample will be tested in their absence and all parties have to accept the test results whatsoever.

C) The conditions stipulated after the outcome of the tests.

i) If the No Load and Load Losses thus obtained are equal to or less than the losses specified in the Purchase Order/Specification, the tested Transformer is said to have passed the test. So, the tested Transformer and the Transformers supplied against the Purchase Order will be accepted. If the losses are less than the guaranteed values offered by the supplier, no bonus will be allowed.

ii) ***Losses shall be within +2% tolerance .Capitalization will be done within +2% tolerance. Beyond which material shall be liable for rejection***

If the No Load Losses and Load Losses are greater than the losses specified in the PO/Specification, the Transformer is said to have failed in the testing and the following penalties will be imposed on the manufacturer.

a) The tested transformer and balance supplies if any will not be accepted.

b) The Transformers that are already supplied and accepted prior to knowing of the test results, compensation charges will be levied at twice the rate calculated based on the capitalization formula mentioned in CBIP manual.

c) If TGTransco, decides to accept the tested transformer, the necessary compensation charges for accepting the subject transformer will be levied at twice the rate calculated based on the capitalization formula mentioned in CBIP manual.

d) If the price variation for the tested transformer and the transformers that are supplied prior to the tested transformer, positive price variation will not be allowed. However, negative price variation will definitely be adopted.

- e) Further, the company will be blacklisted for 3 years with wide publicity.
- f) The manufacturer shall pay all costs of testing, to and fro transportation, insurance, and all incidental charges to the challenger.
- g) The challenger or any other technically qualified bidder shall not have any right to claim for placing order on their company, for the balance quantity that will be rejected. Separate procurement process will be initiated.
- h) TGTransco shall not be a party in any of the legal issues what so ever may be, that arise out of the challenge testing, and not liable for any claims by any of the said parties.
- i) The successful bidder on whom order is placed, shall submit an Additional Bank Guarantee in addition to the regular Performance Bank Guarantee, for an amount equivalent to the landed cost of 2Nos Transformer per rating, if the quantity of the Transformers of such rating is more than 5Nos and the Additional Bank Guarantee shall be valid for a period equivalent to the completion period of supplies against that particular Lot to take care of any eventuality arising out of challenge testing.
- j) Further, TGTransco reserves the right to conduct any tests by selecting one unit per rating against the Purchase Order, randomly for cross verifying the various parameters quoted by the bidder at CPRI Test Laboratory.
- k) The decision of TGTransco will be final in all the matters of the challenge testing, outcome of challenge testing, etc., what so ever it may be, and both the challenger and the manufacturer/supplier shall abide by the decision of TGTransco, and they shall not have any right to challenge the decision of TGTransco.

#### **5. DYNAMIC SHORT CIRCUIT WITHSTAND CAPABILITY TEST:**

As per your undertaking furnished along with the bid, **If during design review** of the Transformer for which Dynamic Short circuit withstand Test already conducted (report furnished by you along with the bid) is not meeting the criteria as per the IEC-60076-5 and not in line with CEA guidelines, with the offered design of this order, you shall conduct Dynamic Short circuit withstand Test on 1 No. 160MVA 220/132/11kV Auto Transformer on present Order as per the IEC-60076-5 and in line with CEA guidelines at National High Power Test Laboratory Pvt. Ltd(NHPTL),Madhya pradesh (Or) CPRI, Bangalore/Bhopal, in the presence of TGTransco inspectors. Detailed test procedure shall be submitted before short circuit test.

*All the Transformers will withstand to the Short Circuit faults. The entire responsibility of the design for the satisfactory performance ultimately lies with the manufacturer.*

#### **6. DESIGN REVIEW:**

Design reviews shall be conducted by the Purchaser at drawings approval stage following the Guidelines for conducting design reviews for transformers. These design reviews shall be carried out in detail to the specific design with reference to Guaranteed technical particulars committed by the bidder. However, the entire responsibility of the design for the satisfactory performance ultimately lies with the manufacturer.

## 7. **PERFORMANCE SECURITY:**

Performance security shall be furnished for an amount of 10% of the contract value i.e for **Rs. 20,79,57,300 /-** for proper fulfillment of the contract, which will include the warranty period and completion of performance obligations including Warranty obligations. The Performance security will cover 60 days beyond the date of completion of performance obligations including Warranty obligations.

In the event of any correction of defects or replacement of defective material during the warranty period, the warranty for the corrected/replaced material will be extended to a further period of 30 months and the Performance Bank Guarantee for proportionate value will be extended 60 days over and above the extended warranty period. The proceeds of the performance security will be payable to the Purchaser as compensation for any loss resulting from the Supplier's failure to complete its obligations under the Contract.

The performance security will be...

- (a) A Bank Guarantee issued by State Bank of India or its associate Banks/Nationalised Banks acceptable to the Purchaser, in the form provided in the bidding documents.
- (b) A banker's cheque or crossed DD or Pay Order payable at the head quarter of the Purchaser in favour of the Purchaser drawn on any scheduled Bank.

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

Failure of the successful Bidder to comply with the above requirement will entail cancellation of the award and forfeiture of the Bid Security.

In case where the performance security is not yet paid, the bid security will be forfeited and the balance to makeup the performance security deposit will be deducted from pending payments any due to the bidder from TGTransco on other orders. In addition the company will also became liable for black listed by TGTransco.

It is entirely your responsibility to extend the validity of this Bank Guarantee to cover the period of guarantee well before its expiry.

## 8. **PAYMENT:**

- a) 100% payment will be arranged from Banks/REC/PFC/ TGTransco within 45 days reckoned from the check measurement date in Form-13.

However payment in advance may be considered by TGTransco after availing a rebate/discount @ 0.3% per week or part thereof for the advancement depending on the availability of funds. The supplier shall directly address the Executive Director/Finance for release of advance payment against the discount offered duly submitting the Form-13.

By way of Electronic Fund Transfer (EFT) with RTGS details of Bank Account of M/s. BHEL-Regional Operation Division , Hyderabad as follows:

1.	Name of the Bank	:	CANARA BANK
2.	Name of the Branch	:	SAROJINI DEVI ROAD
3.	Branch code	:	0845
4.	City	:	SECUNDERABAD
5.	Account No.	:	0845201000269
6.	MICR No.	:	500015026
7.	IFSC No.	:	CNRB0000845
8.	Income Tax PAN Number	:	AAACB4146P
9.	GST Registration Number	:	09AAACB4146P2ZC
10.	Date of GST Registration	:	28.07.2018
11.	Place of GST Registration	:	Jhansi

**The Bank account details as above are Final and shall not be revoked under any circumstances.**

- b) The 100% payment mentioned above is subject to submission of performance security by the supplier as per clause (7) above.
- c) The supplier should invariably submit test certificates and other documents, the purchaser specifies as soon as dispatch is made so that they can be checked and approved well in advance.
- d) The performance guarantee to be executed in accordance with this specification is to be furnished on a stamp paper of value Rs.100/-. The Bank Guarantee will be extended if required suitably. In accordance with the provisions of Performance Security Clause.
- e) If the supplier has received any over payments by mistake or if any amounts are due to the TGTransco due to any other reason, when it is not possible to recover such amounts under the contract resulting out of this specification, the TGTransco reserves the right to collect the same from any other amount and / or Bank Guarantees given by the company due to or with the TGTransco.
- f) When the supplier does not at any time, fulfill his obligations in replacing / rectifying etc. of the damaged / defective materials in part or whole, promptly to the satisfaction of the TGTransco Officers, the TGTransco reserves the right not to accept the bills against subsequent dispatches made by the supplier and only the supplier will be responsible for any demurrages, wharfages or damage occurring to the consignments so dispatched.
- g) Any incidental charge such as stamp duty, bank charges etc, shall be to the suppliers account and any charges in relation there to shall not be included in the bills submitted to the TGTransco.
- h) All payments will be made in non-convertible Indian Rupees.

## **9. RESPONSIBILITY OF THE SUPPLIER FOR LOSS/DAMAGE:**

- a) The supplier is responsible for the safe delivery of the goods in good condition at the destination. He should acquaint himself of the conditions obtaining for handling and transport of the goods to destination and shall include and provide for security and protective packing of the goods so as to avoid damage in transit.
- b) External damages or shortages that are *prima facie* the result of rough handling in transit or due to defective packing will be intimated within a fortnight of the receipt of the materials. Internal defects, damages or shortages of any internal parts which cannot ordinarily be detected on a superficial visual examination though due to bad handling in transit or defective packing will be intimated later. In either case the defective, or damaged materials should be replaced by the supplier free of cost to the TGTransco. If no steps are taken within 15 days of receipt of intimation of defects or such other reasonable time as the TGTransco may deem proper to afford, the TGTransco may without prejudice to its other rights and remedies cause to be repaired or rectified them defective material or replace the same and recover the expenditure incurred therefore from the deposit such as Earnest Money, Security and Performance or other monies available with the TGTransco or by resorting to legal action.
- c) For the purpose of any legal construction, the material shall be deemed to pass into TGTransco's ownership only at the final destination where they are delivered and accepted i.e. Form-13 is issued.
- d) As Insurance charges are included in your prices, you should cover the equipment against transit risks and also and also storage for 45 days at destination stores/sites before taking into stock. It is entirely your responsibility for arranging the insurance through your underwriters. The damages and shortages will be intimated to you as stipulated in Clause 8(b) and you shall arrange for replacement/repairs immediately without awaiting settlement from insurance authorities.

## **10. PENALTY FOR LATE DELIVERY:**

- a) The delivery period as per agreed delivery schedule shall be deemed to be the essence of the contract. In case of delay in delivery of materials at destination beyond the agreed delivery schedule or to perform the services within the period specified in the contract whatever be the reason the TGTRANSCO may at its option, demand and recover from the supplier from the contract price, as liquidated damages, a sum equivalent to 0.5% per week or part thereof on the undelivered portion subject to a maximum of 5% of total value of contract.
- b) For penalty, the number of days of delay would be rounded off to the nearest week and penalty calculated accordingly.
- c) Material/ equipment which are not of acceptable quality or are not conforming to specifications would be deemed to be not delivered.
- d) The penalty specified in clause 10(a) shall be levied and if they cannot be recovered in current bills, they would be adjusted against subsequent pending bills.
- e) The check measurement date in Form-13 i.e. the date of receipt of material at destination stores in good condition will be taken as the date of delivery.

## **11. FORCE MAJEURE**

- a) The Supplier will not be liable for forfeiture of its performance security, penalty for late delivery, or termination for default if and to the extent that its delay in performance or other failure to perform its obligations under the Contact is the result of an event of Force Majeure.
- b) For purposes of this clause, "Force Majeure" means an event beyond the control of the Supplier and not involving the Supplier's fault or negligence and not foreseeable. Such events may include, but are not restricted to, wars or revolutions fires, floods, epidemics, quarantine restrictions, and freight embargoes.
- c) If a Force Majeure situation arises, the supplier will promptly notify the Purchaser in writing of such condition and the cause thereof within 15 days. Unless otherwise directed by the Purchaser in writing, the Supplier will continue to perform its obligations under the Contract as far as is reasonable in practice, and will seek all reasonable alternative means for performance not prevented by the Force Majeure event. No price variance will be allowed during the period of force majeure.

## **12. TERMINATION FOR DEFAULT:**

- a) The Purchaser, without prejudice to any other remedy for breach of Contract, by written notice of default sent to the Supplier, may terminate this Contract in whole or in part:
  - i) If the Supplier fails to deliver any or all of the Materials / equipment within the period(s) specified in the Contract, or within any extension thereof granted by the Purchaser.
  - ii) If the Supplier fails to perform any other obligation(s) under the Contract. If the Supplier, in the judgment of the Purchaser has engaged in corrupt or fraudulent practices in competing for or in executing the Contract.

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

**13. TERMINATION FOR CONVENIENCE:**

- a) The Purchaser, by written notice sent to the Supplier, may terminate the Contract, in whole or in part, at any time for its convenience. The notice of termination will specify the termination is for the Purchaser's convenience, the extent to which performance of the supplier under the Contract is terminated, and date upon which termination becomes effective.
- b) However the Materials / equipment that are complete and ready for shipment within thirty (30) days after the supplier's receipt of notice of termination will be accepted by the Purchaser at the Contract terms and prices.

**14. WARRANTY:**

- a) The supplier will warrant for the satisfactory functioning of the material / equipment as per specification for a minimum period of **60 months** from the receipt of the material / equipment at TLC Stores or site in good condition. If during this period any of the material is found defective they shall be repaired or replaced by you free of all costs to the TGTransco. To and fro freight charges shall, however be to your account only.
- b) The Supplier warrants that the Materials / equipment supplied under the Contract are new, unused, of the most recent or current models, and that they incorporate all recent improvements in design and materials unless provided otherwise in the Contract. The supplier further warrants that all Materials / equipment supplied under this Contract will have no defect, arising from a design and / or materials as required by the Purchaser's specifications or from any act of omission of the Supplier that may develop under normal use of the supplied Materials / equipment.
- c) All the material will be of the best class and will be capable of satisfactory operation in the tropics under service conditions indicated in clause 23.1 of Tender Specification without distortion or deterioration. No welding filling or plugging of defective parts will be permitted, unless otherwise specified, they will conform to the requirements of the appropriate Indian, British or American Standards. (Where a standard specification covering the material in question has not been published, the standards of the American Society for testing of Materials should be followed).
- d) The entire designs and Construction will be capable of withstanding the severest stresses likely to occur in actual service and of resisting rough handling during transport.
- e) Unless otherwise specified the warranty period will be 60 months from the date of acceptance of the Materials / equipment. The Supplier will, in addition, comply with the performance guarantees specified under the contract. If, for reasons attributable to the Supplier, these guarantees are not attained in whole or in part, the supplier will at its discretion either, make such changes, modifications, and/or additions to the Materials / equipment or any part thereof as may be necessary in order to attain the contractual guarantees specified in the contract at its own cost and expense and to carry out further performance tests as per the relevant standards.

- f) The Purchaser will promptly notify the supplier in writing of any claims arising under this warranty.
- g) "Upon receipt of such notice, the Supplier will within 30 days repair or replace the defective Materials / equipment or parts thereof, free of cost at the ultimate destination. The supplier will take over the replaced parts/Materials/equipment at the time of their replacement. No claim whatsoever will lie on the Purchaser for the replaced parts/Materials/equipment thereafter". In the event of any correction of defects or replacement of defective material during the warranty period, the warranty for the corrected/replaced material will be extended to a further period of 30 months.
- l) If the Supplier, having been notified, fails to remedy the defect(s) within the above period, the Purchaser may proceed to take such remedial action as may be necessary, at the Supplier's risk and expense duly deducting the expenditure from subsequent bills / bank guarantee and without prejudice to any other rights which the Purchaser may have against the Supplier under the Contract.

To and fro freight charges shall, however be to your account only.

## **15. GOODS AND SERVICES TAX:**

The Goods and Services Tax is payable on Ex-works + Freight+ Insurance+ Packing and forwarding charges.

## **16. STATUTORY VARIATIONS:**

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

Statutory variation if any allowed, it is allowed only once during delivery period i.e., at the time of delivery of goods at factory".

In case of sub-vendor items, taxes & duties are inclusive in tender price. No statutory variation is applicable.

In cases where the bidder assumes less tax rates and become lowest, upward variation of taxes will not be considered. In case of the bought out items for which the prices are quoted all inclusive of taxes, statutory variation shall not be applicable.

## **17. DESPATCH INSTRUCTIONS:**

The dispatch instructions for the equipment will be furnished separately on satisfactory scrutiny of acceptance test certificates.

The prices indicated in Clause (2) above shall remain unaltered whatever be the destination.

The manufacturers serial No.of the transformer shall be punched on the Yoke with 25mm size no. punch near yoke HV R phase tapping point and LV B Phase tapping point. The no. may also be punched on lifting lugs before offering for inspection

**18. INSPECTION:**

- a) The TGTransco may at its option get the materials inspected by a third party if it feels necessary. In such case, inspection charges shall be borne by supplier.
- b) The accredited representative of the TGTransco shall have access to you or your sub-contractor's works at any time during the working hours for the purpose of inspecting the manufacture of the plant and equipment and or testing, any selected samples from the material going into the plant and equipment. You shall on such occasions provide proper and adequate facilities for testing the selected samples at any time. Adequate notice of 15 days shall be given for deputing the departmental representatives for witnessing the tests on the equipment. The equipment should not be dispatched without final inspection of the tests or specific waiver thereof from this office.

**19. TESTS & TEST CERTIFICATES:**

- (a) As per the Annexure-D of Tender Specification, all the prescribed Routine tests shall be conducted on all the Transformers and **Type/Special tests shall be conducted on 1 No. 160MVA 132/11kV Auto Transformer per each Lot.**
- (b) You shall furnish the following details during stage inspection
  - i) Grade of CRGO used.
  - ii) W/Kg of the CRGO
  - iii) Core area and weight (by calculation)
  - iv) Conductor cross section of HV & LV Coils
  - v) Net quantity of Copper used in HV & LV coils (by calculation)
- (c) You will have to conduct the tests on Transformer oil before and after filling up of oil in Transformer at your works and also after delivery at TGTransco site/stores. The test results should be matched in accordance with the test reports produced by manufacturers of Transformer oil.

During final inspection of Transformer, the oil test certificates of the Transformer oil shall be submitted.

All standard routine tests in accordance with relevant ISS/BSS/IEC Specifications shall be conducted on each transformer. Additional routine tests viz. Magnetic Circuit test, oil leakage test on transformer tank, measurement of capacitance & tan delta tests and pressure relief device test shall also be carried out.

You shall intimate this office at least 15 days in advance as to the date when you propose to conduct the tests for deputing TGTransco representative to witness the test. Three copies of the test certificates containing the results of all the tests carried out shall be supplied for approval.

The test certificates shall be submitted immediately after the tests are conducted and got approved before the equipment is dispatched. A copy of the test results shall be sent to the destination along with the transformer (by keeping in OLTC drive mechanism box).

**The Test Procedures (as per IS/IEC standards) and Quality Assurance plan (Stage/Final inspection), BASIC MANUFACTURING FACILITY & Manufacturing environment (Clean, dust free and humidity controlled environment), Painting procedures shall be as per CEA approved guidelines for Transformers and in line with Tender Specification No.TSPMM25-34/2024.**

## 20. CONTRACT DRAWINGS:

- Submit the Design review documents(As per Annexure-G) of Specification, along with the data & Calculations ,Guaranteed Technical Particulars (GTP), QAP, Sub Vendor list and All Drawings (A2 size) as per the Annexure-J, duly incorporating and ensuring the recommendations in line with Tender Specification & ref(4).
- **Guaranteed Technical Particulars (GTP), QAP, Sub Vendor list and All Drawings (A2 size) pertaining to the above Transformers, in line with specification and CEA guidelines shall be submitted for approval.**
- the following calculations pertaining to above design a) No Load Losses calculations ,b)Load Losses calculations, c)Auxiliary Losses calculations, d)Eddy Current/Stray losses calculations, e)Temperature rise calculations, f)Heat dissipation calculations and g)Dynamic Short circuit withstand test calculations shall be submitted.
- **In addition to the above, the following are to be submitted for approval.**
  - i. NIFPS as per Tender Specification ( Sub vendor and drawings to be submitted for approval)
  - ii. Transformer online Temperature Monitors (Sub vendor along with their latest performance and drawings to be submitted for approval)
  - iii. Rubber Membrane /Air Cell rupture relay ( Sub vendor along with their latest performance and drawings to be submitted for approval)
  - iv. Capacitive Bushing Monitor ( Sub vendor along with their latest performance and drawings to be submitted for approval)
  - v. Online Dissolve Gas analysis system( Online DGA) ( Sub vendor and drawings to be submitted for approval)
  - vi. Detailed Drawings pertaining to Transformer monitoring cum Tap Changing system
  - vii. Complete Quality assurance Plan and Sub vendor List are to be submitted for approval.

9. Approval by the TGTransco to the supplier's drawings shall not relieve the supplier of his responsibility for correctness thereof or from results arising out of error or omission there in or from any obligation or liability under the contract. Any supplementary drawings necessary to permit the complete design of the installation prior to receiving the equipment shall also be supplied. 6sets of all approved drawings along with soft copy and one set of reproducible drawings shall be furnished. One set of drawings and instruction manuals may be sent along with each equipment at the time of dispatches. Copies of drawings and manuals shall also be sent to other offices as indicated below.

Consignee : 3 sets of approved drawings per each Transformer along with instruction manuals.  
S.E.Incharge : 3 sets of approved drawings with instructions manuals per Transformer.

## 21. Transportation

- a) The supplier shall be responsible to select and verify the route, mode of transportation and make all necessary arrangement with the appropriate authorities for the transportation of the equipment. The dimension of the equipment shall be such that when packed for transportation, it shall comply with the requirements of loading and clearance restrictions for the selected route. It shall be the responsibility of the supplier to coordinate the arrangement for transportation of the transformer for all the stages from the manufacturer's work to site.
- b) The supplier shall carry out the route survey along with the transporter and finalise the detail methodology for transportation of transformer and based on route survey; any modification/extension/improvement to existing road, bridges, culverts etc. if required, shall be in the scope.

c) The inland transportation of the transformer shall be on multi-axel low platform trailers of adequate capacity and equipped with GPS system for tracking the location of transformer at all times during transportation from manufacturer works to designated site. The supplier shall intimate to purchaser about the details of transporter engaged for transportation of the transformer for tracking the units during transit. **Requirement of Hydraulic trailer is envisaged for a load of more than 40 T.** The transportation during monsoon period should be avoided as far as possible.

d) All metal blanking plates and covers which are specifically required for transportation and storage of the transformer shall be considered as part of the transformer and shall be handed over to the Purchaser after completion of the erection. Bill of quantity of these items shall be included in the relevant drawing/document.

e) **The supplier shall despatch the transformer filled with dry air conforming to EN 12021 at positive pressure.** The necessary arrangement shall be ensured by the supplier to take care of pressure drop of dry air during transit and storage till completion of oil filling during erection. A dry air pressure testing valve with necessary pressure gauge and adaptor valve shall be provided. **The duration of the storage of transformer at site with dry air, shall preferably be limited to three months (including the duration of transportation), after which the recommendation of manufacturer is to be followed if it is not filled with oil.** The dry air cylinder(s) (with regulating valves) provided to maintain positive pressure can be taken back by the supplier after oil filling.

f) In case turret, having insulation assembly, is transported separately then positive dry air pressure shall be ensured.

g) The largest / heaviest package of transformer shall be sufficiently lashed and same shall be checked before dispatch from the manufacturing unit.

h) Transformer shall also be fitted with at least 2 numbers Electronic impact recorders (on returnable basis) in diagonally opposite position (to eliminate chances of loss of data to failure of recorder) during transportation to measure the magnitude and duration of the impact in all three directions. The impact recorder shall be mounted on the upper side of the tank (width wise). The acceptance criteria and limits of impact, which can be withstood by the equipment during transportation and handling in all three directions, shall not exceed “3g” for 50 msec (20Hz) or as per OEM standard, whichever is lower.

i) Following setting of impact recorder shall be ensured at the time of installation with transformer unit before despatch from factory:

<b>1g</b>	<b>Start recording</b>
<b>2g</b>	<b>warning</b>
<b>3g</b>	<b>Alarm</b>

Further, drop-out setting shall be 1g and threshold setting shall be in the range of 5g to 10g.

Points to be checked after receipt of transformer at site in presence of manufacturer's and purchaser's representative:

- The transformer **unloading and handling work at site** should be **carried out by skilled people, under the supervision of manufacturer's representative.**
- A careful external inspection must be made when transformer arrives at site. Condition of each package and its contents and visible parts of transformer etc. shall be checked for any damage and recorded.
- Pressure and Dew point of dry air shall be checked after receipt of transformer at site. It should be within permissible band
- In case of transportation of transformer in oil filled condition, oil level & leakage (if any) shall be checked.
- In case of any damage or dry air/ oil leakage beyond permissible limit, the manufacturer shall be informed immediately.
- In case of dry air leakage is beyond permissible limit, the dry air pressurisation to be done on a continuous basis to safe guard the transformer Core Coil Assembly (CCA) condition till the problem is located and solved.
- Core Insulation Test shall be carried out to check healthiness of insulation between core to tank, core to yoke clamp (frame) and yoke clamp (frame) to tank.
- The data of impact recorder shall be analysed jointly by the purchaser in association with the manufacturer. In case the **impact recorder indicates shocks of  $\geq 3g$  during shipment, further course of action for internal inspection shall be taken jointly by the manufacturer & supplier.** Impact Recorder should be detached from the Transformer, preferably after the main unit has been placed on its foundation.
- Unpacking and inspection of all accessories shall be carried out taking all precautions so that the tools used for opening do not cause damage to the contents. Proper storage of all accessories shall be ensured after unpacking in line with the OEM's recommendation. Fragile instruments like oil level gauge, temperature indicators, etc. are to be stored indoor. Any damaged or missing components shall be reported to equipment manufacturer and insurance agency so that the same can be investigated or shortage made up as per the terms/ conditions of the contract. All accessories for long storage shall be packed by OEM in special packing case.

**Note: Erection, testing and commissioning will be in TGTransco scope. However Supervision of Transformer erection, testing and commissioning by the company will be free of cost.**

**22. ERECTION OPERATION & MAINTENANCE MANUALS:**

Erection, Operation and Maintenance manuals with soft copy shall be supplied as per distributions given below giving detailed instructions with illustrations along with the equipment. They shall contain clear instructions on erection and maintenance of the equipment and recommended schedule of maintenance for the guidance of the operating staff. Any items requiring the special attention of the operation engineer should be highlighted.

3 sets to this office

- a) Consignee: 1 set per each Transformer.
- b) 3 sets for each Substation. These shall be sent to the concerned Divisional Engineer/ Executive Engineer.
- d) S.E. incharge: 2 sets of manuals.

**23. COMPLETENESS OF CONTRACT:**

All minor accessories that are normally necessary for satisfactory and efficient operation of the equipment shall be supplied by you free of cost to TGTransco whether these are specially mentioned or not in the Specification, your tender schedules or in this purchase order and the equipment shall be complete in itself.

**24. GENERAL CONDITIONS OF CONTRACT:**

Except in so far as it is provided otherwise in this contract you shall abide by the terms and conditions appended to the specification. Except as specifically accepted in this order, the terms and conditions mentioned in your quotation under reference are not accepted.

**25. RISK:**

The risk in the property is entirely yours till the goods are received in good condition at the destination.

**26. PACKING:**

Each of the equipment shall be securely packed separately in such a manner as to withstand rough handling during rail and road transit upto site and as per latest IS/BSS/IEC. There shall be separate packing for each item.

**27. MAXIMUM WEIGHTS & DIMENSIONS OF PACKAGES:**

You are responsible for obtaining prior information of the facilities that exist for road transport upto the destination station, such as maximum weight and size of packages and crane lift, etc.

**28. MATERIAL & WORKMANSHIP:**

All the materials shall be of the best class and shall be capable of satisfactory operation in the tropics under service conditions without distortion or deterioration. No welding or filling or plugging of defective parts shall be permitted, unless otherwise specified they shall conform to the requirement of the appropriate Indian,

British or American standards (where a standard specification covering the material in question has not been published the standards of the American society for testing of materials should be followed).

The entire design and construction shall be capable of withstanding the several stresses likely to occur in actual services and of resisting rough handling during transport.

**29. INSURANCE**

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

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

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

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

All costs on account of insurance liabilities covered under the contract will be on supplier's account and will be deemed to have been included in the bid price.

The documentary proof towards insurance shall be submitted while transporting the material/equipment to the purchasers destination

**30. INTERCHANGEABILITY:**

All similar material and removable parts of similar equipment shall be interchangeable with each other.

**31. SPARES:**

You shall supply any spares required for the equipment that will be supplied under this order, whenever called upon to do so at fair prices and at the TGTRANSKO's standard terms of payment.

**32. PROGRESS REPORTS:**

You shall furnish the program of works and progress reports on the manufacture of equipment to this office every month in triplicate till the supplies are completed.

**33. CORRESPONDENCE:**

- a) Your acknowledgement of this order and all correspondence of general or technical nature shall be addressed to the Chief Engineer (P&MM), TGTransco, Vidyut Soudha, Hyderabad –500 082.
- b) All correspondence regarding dispatches, payments and any other field matters shall be addressed to concerned Paying Officer. Copies of such correspondence shall be marked to the concerned Superintending Engineer and to the Chief Engineer (P&MM), TGTransco, Vidyut Soudha, Hyderabad – 500 082. Copies of the correspondence regarding payments should also be marked to the FA&CCA/ Accounts & CFO, TGTransco, Vidyut Soudha, Hyderabad –500 082.

**34. JURISDICTION:**

All and any disputes or differences arising out of or touching this order shall be decided only by courts or tribunals situated in Hyderabad or Secunderabad cities. No suit or other legal proceedings shall be instituted elsewhere.

**35. SUPERVISION OF TESTING AND COMMISSIONING:**

You have to provide services of qualified personnel for supervision of erection, testing and commissioning of the transformers wherever required at free of cost.

**36. ACKNOWLEDGEMENT:**

Please acknowledge the receipt of this Purchase Order with confirmation of its acceptance by you and extra copy enclosed herewith may please be returned with your signature in token of your acceptance.

Encl.: (i) Annexure - I & II

Yours faithfully,

Chief Engineer (P&MM),

(Acting for and on behalf of TGTRANS CO)  
WE ACCEPT THE TERMS AND CONDITIONS OF THIS PURCHASE ORDER

SIGNATURE OF THE CONTRACTOR  
WITH SEAL AND DATE

CC to:

The Chief Engineer/ Transmission /TGTRANS CO/Vidyut Soudha/Hyderabad  
The Chief Engineer/ Construction / TGTRANS CO /Vidyut Soudha/Hyderabad  
The FACCA(Accounts & CFO)/ TGTRANS CO /Vidyut Soudha/Hyderabad.  
The Chief Engineer/Warangal Zone, TGTRANS CO, Warangal (\*)  
The Chief Engineer/Metro Zone, TGTRANS CO, Erragadda, Hyderabad (\*)  
The Chief Engineer/Rural Zone, TGTRANS CO, Hyderabad (\*)  
The Chief Engineer/Karimnagar Zone, TGTRANS CO , Karimnagar (\*)

Copy to

The Superintending Engineer/ Transmission/ TGTRANS CO /Vidyut Soudha/Hyderabad  
The Superintending Engineer/QC&QA/ TGTRANS CO /Vidyut Soudha/Hyderabad  
The SAO (Pay & Accounts)/ TGTRANS CO /Vidyut Soudha/Hyderabad.  
To all Superintending Engineer /OMC Circles (\*)

(\* Copy of this PO is available on <http://tgto.telangana.gov.in/>

**ANNEXURE - I**

1. Standards : The Transformer shall conform to IS:2026/1977 and Specification No.TGPMM25-34/2024.

2. Oil : The Transformer Oil shall conform to IS/IEC standards detailed in Specification No. TGPMM25-34/2024.

Sufficient quantity of oil necessary for first filling of all tanks, coolers and radiator at the proper level shall be supplied in non-returnable drums suitable for outdoor storage.

The Bidder shall despatch the transformer filled with dry air confirming to EN 12021 at positive pressure. Necessary arrangement shall be ensured by the Bidder to take care of pressure drop of nitrogen during transit and storage till completion of oil filling during erection. A gas pressure testing valve with necessary pressure gauge and adapter valve shall be provided.

3.
  - (a) Conservator for main tank with aircell, oil filling hole and cap, isolating valves, drain valve, magnetic oil level gauge, prismatic oil level gauge and dehydrating silica gel filter breather with flexible connection pipes to be used during replacement of any silica gel breather.
  - (b) Conservator for OLTC (for transformer) with drain valve, oil surge relay, filling hole with cap, magnetic oil level gauge, prismatic oil level gauge and dehydrating breather (for transformer only) with flexible connection pipes to be used during replacement of any silica gel breather.
  - (c) Pressure relief devices with special shroud to direct the hot oil
  - (d) Buchholz relay (double float, reed type) with isolating valves on both sides, bleeding pipe with pet cock at the end to collect gases and alarm/trip contacts.
  - (e) Conservator air cell rupture detection relay
  - (f) Air release plug
  - (g) Inspection openings and covers
  - (h) **HV & IV Bushings-RIP Bushings** and LV Bushings-Porcelain. Bushing of each type with metal parts and gaskets to suit the termination arrangement
  - (i) Winding & Oil temperature indicators (local & remote)
  - (j) Cover lifting eyes, transformer lifting lugs, jacking pads, towing holes and core and winding lifting lugs
  - (k) Protected type alcohol in glass thermometer or magnetic or micro-switch type dial type temperature indicator as applicable (mercury should not be used)
  - (l) Rating and diagram plates (in English & Hindi or as specified by the utility) on transformers and auxiliary apparatus
  - (m) Roller Assembly (flanged bi-directional wheels)

- (n) One complete set of all metal blanking plates & covers
- (o) On load tap changing gear, OLTC DM Box, individual marshalling box/Common Marshalling Box, Cooler control cabinet, and Conventional RTCC Panel
- (p) Cooling equipment including fans (as applicable)
- (q) Bushing current transformers, Neutral CT
- (r) Terminal marking plates
- (s) Valves schedule plate
- (t) Bottom oil sampling valve, Drain valves (provided to drain each section of pipe work independently), Filter valves at top and bottom with threaded male adaptors, Shut off valves on the pipe connection between radiator bank & the main tank, Shut off valves on both sides of Buchholz relay, Sampling gas collectors for Buchholz relay at accessible height, Valves for Radiators, Valve for vacuum application, Flow sensitive Conservator Isolation Valve (if applicable), and other valves as specified in the specification.
- (u) Ladder (suitably placed to avoid fouling with bushing or piping) to climb up to the transformer tank cover with suitable locking arrangement to prevent climbing during charged condition. Additional ladder for conservator in case it is not tank mounted.
- (v) Suitable platform for safe access of flow sensitive non-return valve and buchholz relay shall be provided, in case these are not accessible from transformer top.
- (w) Haulage/lifting lugs
- (x) Suitable terminal connectors on bushings(aa) Suitable neutral bus connection
- (y) Brass/tinned copper grounding bar supported from the tank by using porcelain insulator and flexible conductor for earthing of neutral, LV terminals as per specification  
The supplier has to provide two Nos. earthing flats 100 x 16 mm hot dip galvanized steel flat for the suitably supported on the tank over insulated supports. The grounding flat has to terminate at ground level on transformer tank with 4 Nos. M 16 bolts (if possible Cadmium bolts) and spring washers for each flat for connection to purchasers grounding level. Earthing terminal pad should be flat for easy connection of earth flat.

4. Oil Sampling Bottle (2 Nos each of 2 Liter capacity for each Transformer)
5. Control Circuit : Stud type only terminals
6. Terminal Connectors : Terminal connectors for HV & LV side shall be suitable for single/double Zebra ACSR(28.62mm) or moose and suitable for horizontal or vertical take off and suitable for several runs of required XLPE cable (or) Bus duct. Confirmation from the Purchaser shall be obtained regarding type of terminal connectors during detailed engineering.
7. Nitrogen Injection Fire protection System
8. Transformer online Temperature Monitors
9. Rubber Membrane /Air Cell rupture relay
10. Capacitive Bushing Monitor
11. Online Dissolve Gas analysis
12. The FCC shall be mounted on the main tank of the ATR to avoid separate civil works for mounting of the FCC.
13. Potential Equalizers should be provided for power transformer for equalizing potential
14. RATING & DIAGRAM PLATE as per Specification No.TGPMM25-34/2024

**ANNEXURE - II**

**PRICE VARIATION CLAUSE FOR 160MVA 220/132/11kV Auto Transformer**

The Price variation formula applicable as per IEEMA circular No. IEEMA/PVC/PWR TRF\_Upto 400 KV/2021, dt: 01.09.2021, communicated by IEEMA transformer division.

$$P = \frac{P_o}{100} \left\{ 6 + 32 \frac{C}{C_o} + 27 \frac{ES}{ES_o} + 12 \frac{IS}{IS_o} + 4 \frac{IM}{IM_o} + 9 \frac{TO}{TO_o} + 10 \frac{W}{W_o} \right\}$$

Where,

P = Price payable as adjusted in accordance with the above formula.

P<sub>o</sub> = Price quoted/confirmed

C<sub>o</sub> = Average LME settlement price of copper wire bars (refer notes)  
This price is as applicable for the month, ONE month prior to the date of tendering.

ES<sub>o</sub> = Price of CRGO Electrical Steel Lamination (refer notes)  
This price is as applicable on the 1<sup>st</sup> working day of the month, ONE month prior to the date of tendering.

IS<sub>o</sub> = Average price of Steel Plates 10mm thick (refer notes)  
This price is as applicable on the 1<sup>st</sup> working day of the month ONE month prior to the date of tendering.

IM<sub>o</sub> = Price of Insulating Materials (refer notes)  
This price is as applicable on the 1<sup>st</sup> working day of the month, ONE month prior to the date of tendering.

TO<sub>o</sub> = Price of Transformer Oil (refer notes)  
This price is as applicable on the 1<sup>st</sup> working day of the month, ONE month prior to the date of tendering.

W<sub>o</sub> = All India average consumer price index number for industrial workers, as published by the Labour Bureau, Ministry of Labour, Govt. of India (Base: 2001=100)  
This price is as applicable on the 1<sup>st</sup> working day of the month, THREE months prior to the date of tendering.

The above prices and indices are as published by IEEMA vide circular reference number No. IEEMA/PVC/PWR TRF\_Upto 400 KV/2021, / / one month prior to the date of tendering.

C = Average LME settlement price of Copper wire bars (refer notes)  
This price is as applicable for the month, TWO months prior to the date of delivery.

ES = C&F price of CRGO Electrical Steel Sheets (refer notes)  
This price is as applicable on the 1<sup>st</sup> working day of the month, TWO months prior to the date of delivery.

IS = Average price of Steel Plates 10mm thick (refer notes)  
This price is as applicable on the 1<sup>st</sup> working day of the month TWO month prior to the date of delivery.

IM = Price of Insulating Materials (refer notes)  
This price is as applicable on the 1<sup>st</sup> working day of the month, TWO months prior to the date of delivery.

TO = Price of Transformer Oil (refer notes)  
This price is as applicable on the 1<sup>st</sup> working day of the month, ONE month prior to the date of delivery.

W = All India average consumer price index number for industrial workers, as published by the Labour Bureau, Ministry of Labour, Govt. of India (Base: 2001=100)

This index number is as applicable on the 1<sup>st</sup> working day of the month, THREE months prior to the date of delivery.

The above prices and indices are as published by IEEMA vide circular reference number no. IEEMA/PVC/PWR TRF\_Upto 400 KV/2021, one month prior to the date of delivery.

The “date of delivery “ shall be the date on which the Transformer is notified as being ready for inspection/dispatch ( in the absence of such notification, the date of manufacturer’s dispatch note shall be considered as the date of delivery) or the contracted delivery date (including any agreed extension thereto),whichever shall be earlier for calculation Price Variation applicable.

**Irrespective of the increase in the prices of raw materials the price variance (increase) will be limited to a maximum of 50% over the ex-works price and no ceiling for negative variation.**

The proportionate GST on such increase or decrease in the price is to the TGTRANSCO’s account, as per actual on production of the gate pass relating to the consignments for which price variation is claimed.

If the date of delivery as defined in the P.V. formula is beyond the contracted/ scheduled delivery date, the scheduled delivery date or the actual (Form-13) delivery date whichever is advantageous to the Purchaser will form the basis for calculation of price variation.

Chief Engineer (P&MM)