

JODHPUR VIDYUT VITARAN NIGAM LIMITED
MATERIAL MANAGEMENT CIRCLE
NEW POWER HOUSE, INDUSTRIAL AREA, JODHPUR-342003
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TENDER SPECIFICATION NO. JdVVNL/SE (MM&C)/EIAI/TN- 1596

Tenders are hereby invited in e-tender system for Purchase of **5.00 MVA 33/11 KV Power Transformers**.

Tenders are to be submitted online in electronic format on website <http://eproc.rajasthan.gov.in>. The details are as under-

S. No.	Name of Item	Quantity (Approx.)
1.	5.00 MVA 33/11 KV Power Transformers	95 Nos.

A	NIT No.	TN- 1596
B	Cost of tender specifications	Rs. 2500.00 + GST@18% = Rs. 2,950.00 (Non -Refundable) (Rs. Two Thousand Nine Hundred Fifty Only) Rs.1475/- (for MSME Units)
C	Processing fee of RISL	Rs. 1000.00 (One Thousand Only) (Non -Refundable)
D	Estimated Tender Value	Rs. 28,68,00,000.00
D	Bid Security to be deposited with the tender	(i) General Bidder: Rs. 57,36,000.00 (ii) Sick Unit : Rs. 28,68,000.00 (iii) SSI Units of Rajasthan: Rs. 14,34,000.00*
E	Validity	120 days from the next date of opening of techno-commercial bid.
F	Base date for price variation	01.06.2020 (Irrespective of tender opening date)

IMPORTANT DATES

S.N.	Events	Date & Time	Location
1	Date of downloading of tender specifications	Up to 13.07.2020 (06:00 PM)	www.jdvvn1.com & http://eproc.rajasthan.gov.in
2	Deposit of cost of Tender Specifications, Processing fee & Earnest Money	Up to 13.07.2020 (4:00 PM)	Office of Sr. A.O (Cash & CPC), JdVVNL , New Power House, Industrial Area, Jodhpur
3	Last Date & time of submission of electronic bid	Up to 14.07.2020 (12:00 NOON)	http://eproc.rajasthan.gov.in
4	Opening of Technical Bid	14.07.2020 (3:00 PM)	http://eproc.rajasthan.gov.in
5	Opening of Price Bid	To be intimated separately to the qualified bidders	http://eproc.rajasthan.gov.in

***In case SSI unit of Rajasthan quotes the less than the tendered quantity, then they are required to furnish Bid security @ 0.5% of the estimated value of the quantity offered by them, failing which bid shall be considered non-responsive.**

The Micro, Small & Medium Scale Industries of Rajasthan and Sick Industries, other than Small Scale Industries, whose cases are pending before the Board of Industrial and Financial

Reconstruction (BIFR) shall furnish self attested documentary evidence duly attested by notary to claim the above.

The bid security may be given in the form of banker's cheque or demand draft in favour of Senior Accounts Officer (Cash & CPC), JDVVNL, Jodhpur payable at Jodhpur or bank guarantee, in specified format, of a scheduled bank in favour of Superintending Engineer (MM&C), JDVVNL, Jodhpur, be deposited to the Sr. Accounts Officer (MM&C), JDVVNL, Jodhpur up to stipulated date & time, and obtain a receipt/acknowledgement thereof. No other mode of deposit shall be accepted.

At the time of depositing the Bid security amount in the office of the Sr. Accounts Officer (MM&C), JDVVNL, Jodhpur, the bidder shall also furnish self-attested documentary evidence duly attested by Notary of SSI unit of Rajasthan and of sick unit and also to submit a letter of quantity offered by them alongwith an Affidavit for MSME unit of Rajasthan in the enclosed format as per Schedule XI is to be furnished on non-judicial stamp paper of Rs.100/- duly attested by Notary public, to the office of Sr. Accounts Officer (MM&C), JDVVNL, Jodhpur. The Bid Security bank guarantee of requisite amount shall be furnished on non-judicial stamp paper of Rajasthan State. Also furnish the undertaking for the CA certificate in the enclosed format as per Annexure-I on non-judicial stamp paper of Rs.100/- duly attested by Notary public alongwith the original / notarised CA certificate as per requirement of tender specifications.

NOTE:-

- 1. Wherever EMD and Security Bank Guarantee (SBG), are appearing in the ITB, GCC & other Bidding Documents, same is hereby replaced by BID SECURITY as above.**
- 2. VENDOR REGISTRATION: The relaxation/exemption given to the registered vendors of the Nigam in respect of EMD/SBG, wherever appearing in the ITB, GCC & other Bidding documents, are hereby WITHDRAWN.**

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1. Tender documents will be made available on e-Tendering portal <http://www.eproc.rajasthan.gov.in/nicgep/app> . The bidders, in their own interest are requested to read very carefully the tender document before submitting the bid only through online on website <http://www.eproc.rajasthan.gov.in/nicgep/app>. The bidders can download bid upto 6.00 p.m. one day prior to schedule date of opening of respective bid mentioned above documents and submit their bids online upto 12.00 p.m. on schedule date of opening of respective bid mentioned above.
2. Eligible bidders should submit their bid well in advance instead of waiting till last date. JDVVNL will not be responsible for non-submission of Bid due to any website related problems.
3. The cost of Tender specification **Rs. 2,950/- (Non-Refundable)** to be paid by Demand Draft/Banker's Cheque in favour of the Sr. Accounts officer (Cash & CPC), JdVVNL, Jodhpur (payable at Jodhpur) and tender processing fees **Rs. 1000/- (Non- Refundable)** shall be payable by Demand Draft/Banker's Cheque in favour of The Managing Director RISL, Jaipur (payable at Jaipur). The bidders are required to deposit all these payments in the office of the SE(MM&C), JdVVNL, Jodhpur up to 3.00 PM one WORKING day prior to schedule date of opening of respective bid otherwise their bids are liable to be rejected. **Further, as per**

notification SO 165 issued by Fin. Dept. dt. 19.11.2015 on reference to RTPP rules, " clause 8(A)" bidding document shall be provided to MSME at 50% of prescribed cost.

4. The Bid Security amount (as applicable) to be paid by Demand Draft/Banker's Cheque in favour of SR. AO (CASH & CPC), JDVVNL, Jodhpur (payable at Jodhpur) **upto 4.00 p.m. upto one WORKING day prior to schedule date of opening** of respective bid or Bank Guarantee, in specified format, of a scheduled bank in favour of The Superintending Engineer (MM&C), JDVVNL, Jodhpur, be deposited to the Sr. Accounts Officer (MM&C), JDVVNL, New Power House, Industrial Area, Jodhpur-342003 **upto 4.00 p.m. upto one WORKING day prior to schedule date of opening** of respective bid **and obtain a receipt / acknowledgement thereof. No other mode of deposit shall be accepted.**
5. ***In case SSI unit of Rajasthan quotes the less than the tendered quantity , then they are required to furnish Bid security @ 0.5% of the estimated value of the quantity offered by them, failing which bid shall be considered non-responsive.**
6. **Further, while depositing the bid security in the office of the Sr. Accounts Officer (MM&C), JDVVNL, Jodhpur, the bidder shall also furnish self-attested documentary evidence duly attested by Notary of SSI unit of Rajasthan or of sick unit (as applicable) and also to submit a letter of quantity offered by them alongwith an Affidavit for MSME unit of Rajasthan in the enclosed format as per Schedule XI is to be furnished on non-judicial stamp paper of Rs.100/- duly attested by Notary public, to the office of Sr. Accounts Officer (MM&C), JDVVNL, Jodhpur. The Bid Security bank guarantee of requisite amount shall be furnished on non-judicial stamp paper of Rajasthan State. Also furnish the undertaking for the CA certificate in the enclosed format as per Annexure-I on non-judicial stamp paper of Rs.100/- duly attested by Notary public alongwith the original / notarised CA certificate as per requirement of tender specifications.**
7. The Bank Guarantee against Bid Security be issued by Nationalized / Scheduled Bank. The same may be accepted after confirmation by issuing Bank. If any Bid Security Bank Guarantee not is proper format / not confirmed by the issuing Bank the same would not be accepted and the bidder would be immediately shorted out from bid process.
8. The bidders are required to **upload the** receipt of depositing all above payments along with their tender at the relevant place on the scheduled date & time otherwise their bids are liable to be rejected.

- Note :-** 1. All eligible interested bidders are required to get enrolled on e-Tendering portal <http://www.eproc.rajasthan.gov.in/nicgep/app>.
2. If any difficulty arises, in down downloading/ uploading of tender you may contact in the RISL, Jaipur Rajasthan at following Contact/address.

Address of RISL: -

Raj COMP Info Services Limited (RISL)
 1st Floor, Yojana Bhawan, Tilak Marg, C-Scheme, Jaipur (Rajasthan)
 Phone: 0141- 5103902, 4031900 Fax: 0141-2228701
 Web: <http://risl.rajasthan.gov.in>
 Email: info.risi@rajasthan.gov.in

SECTION -III**TECHNICAL SPECIFICATION FOR PURCHASE OF 5.0 MVA 33/11 KV POWER TRANSFORMERS AGAINST TN- 1596****3.01 SCOPE :**

This specification covers the design, manufacture, stage inspection and testing at the manufacturer's works before despatch, supply and delivery at the destination in area of Jodhpur Discom, of 33/11KV Power Transformer having ratings of 5.0 MVA for the quantities as mentioned in this tender specification/NIT.

3.02 CLIMATIC CONDITIONS :

Max. ambient air temperature.	50 degree C.
Max. daily average ambient temp.	45 degree C.
Max. yearly weighted ambient temp.	35 degree C.
Min. ambient air temp.	(-) 5 degree C.
Max. humidity.	100%
Average number of thunder storm days per annum.	40
Average annual rain fall.	15 cm to 100 cm.
No. of months during which tropical monsoon conditions prevail.	4 months (June to Sept.)
Maximum wind pressure	195 Kg./Sq.M
Altitude above MSL	Varies from 61 meters to 815 meters
Average number of rainy days per annum.	120 days.

3.03 GENERAL REQUIREMENTS :

The intention of the specification is to provide information for the design of the above mentioned 33/11 KV power transformers to be fully suitable in every respect for the functions designated. It is required that the supplier in accepting the contract agrees to furnish all apparatus, appliance and material whether specifically mentioned or not, but which may be found necessary to complete, perfect, or test any of the herein specified units in compliance with the requirements implied in this specification without extra charges.

3.03.1 All terminal screws, studs, nuts and bolts shall be in accordance with the Indian Standards.

3.03.2 All electrical and mechanical equipments shall be designed and manufactured so that no damage will result from transportation, installation and operation of the equipment under the climatic conditions to which it will be subjected.

3.03.3 All materials used shall conform to this specification and appropriate standards and shall be new in all respects.

3.03.4 Consideration may be given to alternatives which the supplier considers advisable by reason of his own manufacturing requirements and

experiences, provided descriptive matter is submitted and the recommended device or arrangement equal to, or superior to that required by the accompanying specification and if the purchaser is convinced of the quality and/or superiority of the equipment.

3.04 STANDARDS :

The power transformers, their accessories and fittings, transformer oil, etc. shall conform to the latest edition of the following standards (as amended upto date) except where specified otherwise in this specification:

IS:5/1961: Colour for ready mixed paints
 IS 2026 (Part 1): 2011 GENERAL (Second Revision);
 IS 2026(Part2):2010 Temperature Rise (First Revision);
 IS 2026 (Part 3): 2009 Insulation Levels, Dielectric Tests and External clearance in Air (Third Revision);
 IS :2026 (Part IV)-1977 Reaffirmed 2011 - Terminal Markings, Tapping and Connections;
 IS 2026 (Part 5):2011 - Ability to withstand short circuit.
 IS:6600/1978:Guide for loading of oil immersed Transformers
 IS:335/1983:New insulation oils for Transformers
 IS:3347(PART-III/Sec-1 & 2): Dimensions of Porcelain parts & Metal parts for Transformer bushing (17.5 KV).
 IS:3637: Gas & Oil operated Relay.
 IS:3639/1966: Fittings & accessories for Transformers
 IS:1866/1978: Code of practice for maintenance & supervision of insulating oil in service.
 IS:9335: Specifications for insulating craft paper.
 IS:1576: Specifications for solid insulating press Boards for electrical purposes.
 IS:104: Ready mixed paint, brushing zinc chromate, painting
 IS:649: Testing of steel sheets and strips for magnetic circuits.
 IS:2362: Determination of water content in oil for porcelain bushing transformers.
 IS:4257: Dimensions for clamping arrangements for bushings.
 IS:6160: Rectangular conductor for electrical machines.
 IS:10028: Selection, Installation and maintenance of transformers
 IS:3401 : Silica gel
 IS:5561: Terminal Connector
 IS:2070: Method of impulse voltage testing

3.04.1 Equipment meeting the requirements of any other authoritative standards which ensures a quality equal to or better than that as per the standards mentioned above, shall also be acceptable. Where the equipment conforms to any other standards, salient points of difference between the standards adopted and the specified standards shall be clearly brought out in the tender.

3.05 DEPARTURE FROM SPECIFICATION :

Should the tenderer wish to depart from the specification in any respect, he should draw attention to such departures, stating the reasons there of under Schedule-VI. Unless this is done the departmental specification will hold good. In the event of this specification and contractor's drawings, specification, table etc. being found to disagree during the execution of the contract, the requirement of this specification shall be held as binding unless the departures have been duly approved in writing by the purchaser.

3.06 TROPICAL TREATMENT :

Under the climatic conditions prevalent at the site, the equipment supplied under the specification will be subjected to operation under the ambient temperature specified under clause 3.02 and very high relative humidity. All equipments shall, therefore be suitably designed and tested for normal life and satisfactory operation under the extreme climatic conditions prevalent at the site and shall be dust and vermin proof. All parts and surfaces which are subjected to corrosion shall be made of such material and shall be provided with such protective finishes as would protect the equipment installed from any injurious effects of excessive humidity. All electrical auxiliary equipment shall be specifically tested for tropical conditions and the materials for this treatment shall be as per modern engineering practices.

3.07 ELECTRICITY RULES :

All work shall be carried out in accordance with the latest edition of the Indian Electricity Act-1910, Electricity supply Act-1948, Electricity Act-2003, Electricity rules-2005 and rules formed there under and as amended from time to time.

3.08 TYPE AND RATING :

3.08.1 The transformers shall be of 3 phase, copper wound, core type construction, oil immersed and shall be suitable for outdoor service as step down transformers (At times however these may be required to work under reversal of power also).

3.08.2 The tentative requirement of 33/11 KV Power Transformers with off circuit tap changer (OCTC) are given below.

Rating -----	Tentative quantity -----
5.0 MVA with OCTC	95 Nos.

The quantity may however increase/decrease to any extent.

3.08.3 These transformers may be required to run in parallel with existing transformers of the similar capacity. The technical particulars of transformers required are as under:

- i) Maximum continuous rating at reference : 5.0 MVA
ambient temperature specified under clause 3.02
- ii) Frequency : 50 Hz
- iii) No. of phases : 3 phase
- iv) Rated primary Voltage on principal tapping : 33 KV
- v) Rated secondary Voltage : 11 KV
- vi) Winding connections:
 - a) HV side : Delta
 - b) LV side : Star
 - c) Vector group reference : Dyn11
- vii) Type of cooling : ONAN
- viii) Percentage impedance at normal voltage & 75 deg.C average winding temp.(on 20 MVA base) between HV-LV at.-

Tap No.	3.15	5.0	8.0	Tolerance
a) Normal tapping (Tap-3)	7.00%	7.00%	8.00%	± 10%
b) At max. tapping (+5%)	6.65%	6.65%	7.60%	± 15%
c) At min. tapping (-10%)	7.70%	7.70%	8.80%	± 15%

- ix) Off circuit tap changer: Having 6 equal steps (7 position) of 2.5% of each, to have voltage variation of +5% to -10% on HV side.
- x) Neutral unbalance current : Not exceeding 2.0%
- xi) Type of terminal : Vertical take off type suitable for ACSR "Panther" conductor on both sides.
- xii) Max. current density in all parts:
of HV and LV windings including tapped winding. 3Amp./Sq.mm for minimum tap in HV & LV.
- xiii) Bushing metal part for HV & LV : M -20 size (copper/brass)

3.09 EFFICIENCY :

The percentage loading for the max. efficiency shall be clearly stated in the tender at unity power factor as well as 0.8 p.f. lagging.

3.10 INSULATION :

3.10.1 The dielectric strength of the winding, given insulation and the bushings shall conform to the values given in IS:2026(Part.3)/2009 (or its latest amendment) for highest system voltage of 36KV,12KV and shall be suitable for the following impulse test \ power frequency test voltages.

SYSTEM VOL.	H.SYSTEM VOL.	IMPULSE TEST VOL.	PF TEST VOL.
33 KV	36 KV	170 KVp	70 KV
11 KV	12 KV	75 KVp	28 KV

H.V. & L.V. Winding of Transformer shall have uniform insulation.

3.11 TEMPERATURE RISE :

Each transformer shall be capable of operating continuously at their normal rating without exceeding temperature rise limits as specified below :

Type of cooling.	Temp.rise	External cooling
-----	-----	-----

			medium (Air)
1. Winding(Temp.rise measured by resistance method)	ONAN	50 degree C.	When the oil circulation is natural non directed
2. Oil (Temp.rise measured by thermometer method)	As above.	45 degree C.	-

The reference temperature conditions for which the transformers shall be designed are as under (as per clause 3.02).

- a) Maximum ambient temperature. : 50 degree C.
- b) Maximum daily average ambient temp. : 45 degree C.
- c) Maximum yearly weighted ambient temperature. : 35 degree C.

The hottest spot temperature shall not exceed 98 degree C when calculated over an annual weighted average ambient temperature of 35 degree C when transformer is loaded to its rated capacity. The transformer shall be capable of being over loaded to 150% of its rating in accordance of IS 6600-1972.

- i) Bushing and its terminal connectors shall have minimum continuous current rating corresponding to 120% rated current of transformer at lowest tap.

3.12 PARALLEL OPERATION :

The transformers covered by this specification are to run in parallel with transformers which are either already installed or are being installed (for same rating) and as such the characteristics of the transformers covered in this specification for the sub station will be identical so as to enable these transformers to run in parallel.

3.13. IMPEDANCES :

Suppliers shall indicate the guaranteed impedances and tolerances taking into account the limits at minimum and maximum tap position so as to fulfill requirements of clause 3.12.

3.14. GUARANTEED LOSSES:

- 3.14.1. The Losses shall not exceed the values given below:

Rating	No load losses in KW	Load losses at 75 deg.C.in KW (At normal tap condition)
5.0 MVA	4 KW	23 KW

The above mentioned losses are maximum permissible and there shall not be any plus tolerance above this limit. Design calculations of No-load and load losses along with complete Technical details and

factors assumed will be enclosed Along with the GTP in tender documents.

- 3.14.2 In case during testing, the actual loss (es) are found within guaranteed figure, the transformers shall be accepted without any advantage to contractor for lower losses.
- 3.14.3 Measurements of losses shall form part of type test/ routine test.
- 3.14.4 The losses on transformer supplied shall also be guaranteed at the time of pre-commissioning test and transformers having losses exceeding figures mentioned in clause 3.14.1 above shall stand rejected.
- 3.14.5 The supplier shall supply two copies of the Routine test certificate to consignee with each transformer on receipt of despatch instructions.
- 3.14.6 The supplier shall provide along with the tender the design details of core assembly showing the construction details, core diameter, net/ gross sectional area of the core assembly etc. The information must also be given in respect of volts per turn at principal tap for normal voltage. The loss curves for type/grade of steel laminations being used for the core shall also be provided along with the tender.

3.15 COOLING :

- 3.15.1 Each transformer shall be provided with ONAN type cooling as specified under the schedule of requirements.
- 3.15.2 The ONAN cooling of the transformers shall be by natural circulation of air while the circulation of oil shall be effected by natural convection, the maximum oil flow being assured by a method whereby the return flow of cooled oil is made to enter the tank at a level coinciding with the bottom of the hot columns of oil thus avoiding centre heads of cold oil at the bottom of the tank. Out flow shall be arranged to coincide as nearly as possible with the hot oil level at the top of the tank so that the total available difference will be fully employed in circulating the oil round the shortest possible paths.
- 3.15.3 The windings of the transformers shall be designed to deliver continuously rated MVA corresponding to ONAN cooling.

Radiators shall be provided for cooling purpose. These shall be directly mounted on the tank on both sides in a balanced manner & not on one side only.
- 3.15.4 The Radiator to be used should be of PSR type for all three type of rating.
- 3.15.5 For heat dissipation calculation for tank surface at 45 Degree, 500 watt per Sq. meter will be considered and for Radiator, heat dissipation will be worked out as per manufacturing chart provided by manufacturer, firm will enclose the chart.

- 3.15.6 The cooling arrangement shall consist of detachable radiators which may be directly mounted on the transformers. Connections between the radiators and tank shall be made with flanges provided with gaskets and an indicating sheet valve provided at both connection ends, which can be fastened in either open or closed position.
- 3.15.7 The radiators shall be so arranged that these can be detached from the tank or bank without disturbing the oil in transformer. These shall be designed to withstand the vacuum and pressure specified for the tank.
- 3.15.8 Radiators shall be so designed as to be for cleaning & painting to prevent accumulation of water on the outer surface to completely drain oil from the tank or bank and to ensure against formation of gas pockets when the tank is being filled. All connections between the radiators and tank or bank and between the bank & tank shall be provided with flanges when the particular item is detached. Each radiator shall have a lifting eye, an oil drain and vent at top.
- 3.15.9 The height of the radiator should not be above the transformer tank & All the Radiator shall be so arranged that they can be directly be connected to tank without any bend.
- 3.15.10 The indication regarding state of opening/ closing of radiator valve should be clearly identified through paint-marking.

3.16 TRANSFORMER CORE :

- 3.16.1 The core shall be built up with thin lamination of high grade, non ageing, low loss, high permeability, cold rolled, grain oriented silicon steel specially suitable for transformer core. The particulars of laminated steel to be employed shall be supplied with the tenders along with DC magnetization, B-H and iron loss curves.
- 3.16.2 After being sheared the laminations shall be treated to remove all burrs and shall be re-annealed to remove all residual stresses. At least one side of each lamination shall be coated with a double baked enamel insulation coating which will not deteriorate due to pressure and the action of hot oil. The nature of insulation shall be specified in the tender.
- 3.16.3 Every care shall be exercised in the selection, treatment and handling of core steel to ensure that as far as practicable, the laminations are flat and the finally assembled core is free from distortion.
- 3.16.4 The design of the magnetic circuit shall be such as to avoid discharges, development of short circuit paths within itself or to the earthed clamping structure and the production of flux components at right angles to the plane of the laminations which may cause local heating.
- 3.16.5 The core shall be rigidly clamped to ensure adequate mechanical strength and to prevent vibration during operation. The core/clamping bolts shall not pass through Core/Yoke and clamping structure shall be so constructed that eddy currents will be minimum.

- 3.16.6 The core shall be provided with lugs suitable for lifting the complete core and coil assembly of the transformer. The core and the coil shall be so fixed in tank that shifting will not occur when the transformer is moved or during a short circuit.
- 3.16.7 The core shall be of high grade cold rolled grain oriented annealed steel laminations, having low loss and good grain properties, coated with hot oil proof insulation, bolted together to the frames firmly to prevent vibration or noise. All core clamping bolts shall be effectively insulated. The complete design of core must ensure the permanency of the core losses with continuous working of the transformers. The value of the flux density allowed in the designs and grade of laminations used shall be clearly stated in the offer, along with the curves. The transformer core shall be constructed out of the prime class of materials. The transformer core shall be of prime quality CRGO steel. The bidder shall import the core directly or shall purchase directly from the imported and he will furnish the following documents at the time of stage inspection of the transformer:-
- a) Invoice of supplier.
 - b) Mill's test certificate.
 - c) Packing list.
 - d) Bill of landing
 - e) Bill of entry certificate by custom.

Description of material, electrical analysis, physical inspection, certificate for surface defects, thickness and width of the material.

3.16.8 FLUX DENSITY :

The flux density in any part of the core built from cold rolled grain oriented steel shall not exceed 16000 lines per sq. cm. at any tap position necessary to maintain No Load terminal voltage of 11KV on LV side as required. The transformer shall also be suitably designed to withstand upto 10% upward primary voltage variation at normal tap continuously without saturation and excessive heating of the core and windings. Due regard shall also be given to limiting the flux density based on the characteristics of the material used.

The tenderer shall furnish magnetization curve for material indicating max working flux density without saturation. The tenderer shall indicate max. flux density in core/yoke at rated voltage to establish that the max. flux density at 10% over voltage (with reference to nominal voltage) does not cause core saturation.

The design calculations in support of flux density shall be furnished by the tenderer along with drawing of cores steps and calculations of effective cross sectional area of the core. For finding out no load current, average values of all the three limbs and phases should be taken into consideration.

3.17 WINDING :

- 3.17.1 The windings shall be so designed that all coil assemblies of identical voltage ratings shall be interchangeable and field repairs to the windings can be made readily, without special equipment. The coils shall be supported between adjacent sections by insulating spacers and bracers. Bracings and other insulation used in the assembly of the windings shall be arranged to ensure a free circulation of the oil and to reduce hot spots in the windings. The windings shall be designed to reduce to a minimum the out of balance forces in the transformer at all ratios.
- 3.17.2 The insulation of the coils shall be suitable to develop the full electrical strength of the windings. All materials used in the insulation and assembly of the windings shall be insoluble, non catalytic, and chemically inactive in the hot transformer oil, and shall not soften or otherwise be adversely effected under the operating conditions.
- 3.17.3 All threaded connections shall be provided with locking facilities. All leads from the windings to the terminal board and bushings shall be rigidly supported to prevent injury from vibration. Guide tubes shall be used where practicable.
- 3.17.4 The windings shall be clamped securely in place so that they will not be displaced or deformed during short circuits. The assembled core and windings shall be vacuum dried and suitably impregnated. The electrolytic copper conductor used in the coil structure shall be best suited to the requirements and all permanent current carrying joints in the windings and the leads shall be welded or braced except compression type which may be used for terminal connections. Bolted connection may be used at the bushings and at terminal board with suitable locking device. The drying out procedure of the core coil assembly shall be indicated in the tender.

3.18 FAULT WITHSTANDING CAPACITY OF WINDINGS :

All the windings shall be suitably designed to withstand short time rating for not less than 2 seconds by feeding the fault level of 1000 MVA on HV side, 750 MVA on 11 KV side respectively from both ends and considering the severe most form of system faults that can arise in service. Tenderer(s) should furnish the detailed calculations for thermal as well as dynamic ability of windings to withstand short circuits as prescribed above, failing which their quotations are likely to be ignored. The max. temp. attained for short time rating shall not exceed 250 degree C.

3.19 INSULATING OIL :

- 3.19.1 The oil for first filling shall be supplied with each transformer. The oil shall be EHV grade-I and shall comply IS:335/1993 latest version & amendment.
- 3.19.2 Particular attention shall be paid to deliver the oil for topping up free from moisture having uniform quality through out in the non-returnable new steel drums.

- 3.19.3 The quantity of oil for first filling of each transformer shall be stated in the tender . Quantity of oil required for filling of conservator and radiators shall be stated in the guaranteed technical particulars.
- 3.19.4 The transformer oil purchased from M/s. Savita Chemical, M/s. Apar, M/s. Raj Lubrichem, M/s. Raj Petroleum, M/s Tashkant, M/s Sharavathy, M/s Rinki/M/s Madras Petrochem and M/s. Lubrichem, M/s Columbia shall only be supplied. Invoice and test certificates of manufacturer of transformer oil shall have to be furnished as and when desired by the Nigam.

3.20 TANK :

- 3.20.1 The transformer tank and cover shall be fabricated from good commercial grade low carbon steel suitable for welding and of adequate plate thickness. The tank and the cover shall be of welded construction. All seams shall be welded and where practicable they shall be double welded. The transformer tank shall have sufficient strength to withstand without permanent distortion. The punching on all 4 sides of Power Transformer tank with letter size of 10x5mm will be carried out. The details to be punched are as under:-
- i) TN No.
 - ii Serial No.
 - iii) Make
 - iv) Rating.

The thickness of tank sheet shall be as under:-

S.No.	Dimensions of	5.0 MVA
i.	Top Cover	8mm
ii.	Side Cover	6mm
iii.	Bottom Cover	8mm

- 3.20.2 At least one manhole/inspection cover with a welded flange and a bolted cover shall be provided on the tank cover. The manhole shall be of a sufficient size to afford easy access to the lower ends of the bushings, terminals etc.
- 3.20.3 All bolted connections to the tank shall be fitted with suitable oil tight gaskets which shall give satisfactory service under the operating conditions. Special attention shall be given to the methods of making the hot oil tight joints between the tank and the cover as also between the cover and the bushing and all other outlets to ensure that the joints can be remade satisfactorily and with ease , with the help of semi-skilled labour. Where compressible gaskets are used, steps shall be provided to prevent over compression. Suitable guides shall be provided for positioning the various parts during assembly or dismantling.
- 3.20.4 Lifting eyes or lugs shall be provided on all the parts of the transformers requiring independent handling during assembly or dismantling. In addition the transformer tank shall be provided with

lifting lugs and bolts properly secured to the sides of the tank, for lifting the transformer either by cranes or by jacks.

- 3.20.5.1 The design of the tank, the lifting lugs and bosses shall be such that the complete transformer assembly filled with oil can be lifted with the use of these lugs without any damage or distortions. The tank shall be provided with two suitable copper alloy, lugs for the purpose of groundings.
- 3.20.5.2 The main body of the tank shall have sufficient strength to withstand and without permanent distortion
- i) A vacuum of 760mm of mercury.
 - ii) Continuous internal gas pressure of 0.7 atmosphere above atmosphere pressure with oil at operating level i.e. the transformer tank should be able to withstand 100% vacuum and also one atmosphere pressure above atmosphere internal pressure.
- 3.20.5.3 The tank cover shall be belled to the tank and the transformer design shall be such that at the tank will not split between the lowest and upper cooler connections.
- 3.20.5.4 Each tank shall be provided with the following
- a) Lifting lugs suitable for lifting the transformer complete with oil accessories lifted with oil by cranes.
 - b) A minimum of four jacking lugs, in accessible position to enable the transformers complete with oil to be raised or lowered using hydraulic or screw jacks.

The minimum height of jacking lugs above base shall be

- i) Transformer above 10 tonnes weight : 500 mm
- ii) Transformer upto and including 10 tons weight: 300 mm.

Horizontal plates with 50mm dia drew holes drilled therein shall be fitted adjacent to each corner of the rectangular tank at more than 750 mm from the base to permit haulage in any direction. On the rounded tanks drew holes shall be located on the diagonals of the rectangular formed by the overall boundaries of the tank.

- 3.20.6 Each tank cover shall be adequate strength and shall not distort when lifted. Inspection opening shall be provided to give easy access to lower ends of bushings, terminals etc. for changing ratio or winding connection or testing to each connections. These shall be of adequate to size not less than 450mm x 350mm
- 3.20.7 Suitable guides shall be provided for positioning the various parts during assembly or dismantling. Adequate space should be provided between the cores and winding and the bottom of tank for collection of any sediment.
- 3.20.7.1 The base channel for transformer shall be 250 x 6 x 82 mm.

3.20.7.2 Prismatic oil level gauge indicator on transformer tank shall be provided to indicate level of oil in Transformer tank at a suitable place on LV bushing side.

3.20.8 UNDER CARRIAGE :

3.21.1 The transformer tank shall be supported on a structural steel base.

3.21.2 Pulling eyes shall be provided to facilitate moving the transformer and they shall be suitably braced in a vertical direction so that bending does not occur when the pull has a vertical component.

3.22 OFF LOAD TAP CHANGER MECHANISM:

3.22.1 The off circuit tap changer shall be of high quality and robust in construction. It shall be located at a convenient position so that it can be operated from ground level by a standing operator. The handle of OCTC shall be provided with a locking arrangement, thus enabling the OCTC to be locked in position. Arrangement for indicating of tap position shall also be provided. It shall be suitable for local manual operations. The tap changer shall be capable of permitting parallel operation with other transformer of the same type. When one unit is in parallel with another of same type as mentioned in clause No.3.12 under normal condition, the tap changer shall not become out of step. The OFF Load Tap Changer should be of following makes only:-

- i) M/s Paragone Associates, Thane.
- ii) M/s Always, Bangalore.

AND Name of make shall be embossed on the handle/ operating wheel of the Off Load Tap Changer which shall be clearly visible & readable.

3.22.2 The OCTC shall be capable of carrying rated MVA on all taps. The breaking capacity of the OCTC shall be compatible with the highest system voltage and current based on maximum over loading permissible under IS:6600 -1972 (150% of rated value). The voltage rating for each step shall be 2.5% on HV side. However, each step of OCTC shall withstand voltage not less than 115% of rated step voltage. The rated through current of OCTC at this voltage will not be less than 150% of rated current of HV winding at lowest tap.

3.23 CONSERVATOR:

3.23.1. Oil preserving equipment shall be conventional conservator tank type. The minimum oil level in the conservator tank shall not be below the level of the bushing flanges.

3.23.2 Oil conservator tank shall be located well clear of the bare connection of the transformer terminals. The conservator tank shall have adequate capacity between highest and lowest permissible levels to meet the requirement of expansion of the total cold oil volume in the transformer and cooling equipment from min. amb. temperature to highest oil temp. as per desired.

- 3.23.3 The total volume of the conservator shall be min. 10% of the total quantity of oil in transformer. The inside diameter of the pipe connecting the conservator to the main tank shall be min.50mm and it should be projected into the conservator in such a way that its end is projected 30mm above the bottom so as to create sump for collection of impurities. The min. oil level should be above the sump level.
- 3.23.4 A conservator complete with sump and drain valve shall be provided in such a position as not to obstruct the electrical connections to the transformer, having a capacity between highest and lowest visible levels to meet the requirement of expansion of the total cold oil volume in the transformer and cooling equipment from the minimum ambient temperature shall be with 0 Deg. C to 90 Deg.C. The minimum indicated oil level shall be with the feed pipe from the tank covered with not less than 15mm depth of oil and the indicated range of oil level shall be minimum to maximum.
- 3.23.5 The oil connection from transformer tank to the conservator vessel shall be arrange at a rising angle of 3 Deg. to 9 Deg. to the horizontal up to gas and oil actuated relay and shall consist of 50mm inside diameter pipe.
- 3.23.6 Each conservator vessel shall be fitted with a breather in which silica gel is the dehydrating agent and designed so that
- The passage of air is through silica gel.
 - The external atmosphere is continuously in contact with silica gel.
 - The moisture absorption indicated by a change in colour of the tinted crystals can be observed from distance.
 - Breathers shall be mounted at approx. 1400 mm above ground level.

3.24 TEMPERATURE INDICATING DEVICE:

- 3.24.1 The tripping contacts of above temperature indicators shall be adjustable to close between 60 Deg.C and 120 Deg.C and alarm, contacts to close between 50 Deg. C & 10 Deg.C and both shall reopen when the temperature has fallen by above 10 Deg.C.

3.25 MARSHALLING BOX OR KIOSK

- 3.25.1 A sheet vermin proof well ventilated and weather proof marshalling box of the suitable construction shall be provided for the transformer ancillary apparatus. The box shall have domed or sloping roofs and the interior and exterior painting shall be in accordance with specification.
- 3.25.2 The marshalling box, wherever provided shall accommodate the following equipments alternatively weather proof instruments can be mounted outdoor.
- Temperature indicators.
 - Terminal boards and gland plates for incoming and out going cables.
- 3.25.3 All the above equipments except (b) shall be mounted on panels and back of panel wiring shall be used for inter connection.
- 3.25.4 The temperature indicators shall be so mounted that the dials are not more than 1600 mm from ground level and the door (s) are of adequate size.

- 3.25.5 To prevent internal condition an approved type of metal clad heater shall be provided controlled by a suitable switch. Ventilation louvers shall be provided.
- 3.25.6 All incoming cables shall enter the kiosk from the bottom and the gland plate shall be not less than 450mm from the base of box. The gland plate and associated compartment shall be sealed in suitable manner to prevent the ingress of moisture from the cable trench.

3.26 DIAGRAM AND RATING PLATE

Each transformer shall be provided with a non-detachable brass or stainless steel plate mentioning complete information as given in clause 7 of latest version of IS 2026 (Part 1): 2011 and diagram of winding connection and taps shall be provided. The property of respective Discom and specification no. shall be engraved on the plate Guaranteed values of No-Load loss and Load loss at 75 Deg.C without and plus tolerance along with measured values as well as temperature rise figures should also be inscribed on the diagram and rating plates.

3.27 BUSHINGS :

- 3.27.1 All main winding and neutral leads for 33/11 KV transformers shall be brought out through outdoor type bushings. The electrical characteristics of bushing shall be in accordance with IEC-137 as well as IS-3347/8603 and IS-2099. The bushing shall be rated for highest voltage and current rating of the respective windings. The current ratings of bushing shall be at least 150% of the rated current at minimum tap to permit overloading.
- 3.27.2. The bushings shall have high factor of safety against leakage to ground and shall be so located as to provide adequate electrical clearances between bushings and between the bushings and ground parts. The spacing between the bushings shall be adequate to utilize full flashover strength preventing flashover between the phases or between phase and ground parts under all conditions of operation. The creepage distance of bushing shall not be less than 25 mm per KV.
- 3.27.3. All bushings shall be equipped with suitable solder less terminals of approved type. The type and size shall be specified in the tender. All external current carrying contact surfaces shall be placed adequately.
- 3.27.4. Bushings of identical voltage ratings shall be interchangeable .
- 3.27.5 Special adjustable arcing horns shall be provided with HV & LV bushings. Each bushings shall be so coordinated with the transformer insulation that all flashover occur outside the tank.
- 3.27.6. All porcelain used in bushings shall be of the wet process homogeneous impervious to moisture and free from cavities or other flaws and throughout vitrified and smoothly glazed. The glazing shall be of the uniform colour and free from blisters, burns and other defects. All bushings shall have puncture strength greater than the dry flashover voltage.
- 3.27.7. The crepage distance of 33 KV bushing surfaces shall not be less than 900 mm & for 11 KV shall not be less than 300 mm.

- 3.27.8. Terminal conductor of HV & LV shall be vertical take off type and suitable for ACSR PANTHER.

3.28 (A) SUPPRESSION OF HARMONICS:

The transformer shall be designed with particular attention to the suppression of harmonics voltages especially in the third & fifth harmonics so as to eliminate wave form distortion and any possibility of high frequency disturbances.

3.28 (B) MARKING

All transformers shall have the marking in paint on the body for identification as per Indian Standards or as instructed by purchaser.

3.29 CENTRE OF GRAVITY.

The centre of gravity of the assembled transformer shall be low and as near the vertical centre line as possible. The transformer shall be stable with or without oil. If the centre of gravity is eccentric relative to track either with or without oil its location shall be shown in the outline drawing in all the views showing their position of Transformer track also.

3.30. FITTINGS AND ACCESSORIES :

- 3.30.1. Each transformer shall be provided with the following fitting and accessories in accordance as specified in IS:2026:

- (i) Oil Temperature Indicator (OTI)

The transformer shall be provided with one 150 mm dial type, oil Temperature Indicator for indicating top oil temperature. The indicator shall have adjustable electrically independent ungrounded alarm and trip contacts with **Micro Switches** and maximum reading pointer. The temperature-sensing element shall be suitably located in a pocket on the top of the transformer and shall be connected to the oil temperature indicator by means of capillary tubing protected with a metal sheath. The accuracy class of the OTI shall be +/- 1%

Suitable contacts shall also be provided for remote indication of oil temperature.

- (ii) Winding Temperature Indicator:-

The Transformer shall also be provided with a device for indicating the temperature of winding (HV and LV separately). It shall comprise the following:-

- a) Temperature sensing element suitably located on the top cover of the transformer.
- b) 150 mm dial, local indicating instrument with maximum reading pointer, mounted in the cooler control cabinet and two adjustable electrically independent ungrounded contacts with **Micro switches** (beside that required for control of cooling equipment). The tripping contacts shall be adjustable to close between 60 Deg. C and 120 Deg.C

and alarm contacts to close between 50 Deg. C and 100 Deg. C and both shall reopen when the temperature has fallen by a desired amount between 5 Deg. C and 50 Deg.C. All contacts shall be adjustable on a scale. They shall be accessible on removal of the cover and it shall be possible to check the operation of the contacts and associated equipments. Connections from the contacts shall be brought down to the terminal Block, placed inside the marshalling box. The accuracy class of the WTI shall be +/- 1%.

c) Calibration device:

Suitable contacts shall also be provided for remote indication of oil temperature.

iii) One filter valve located at the top of the tank on the LV side. The opening of this valve shall be baffled to prevent aeration of oil.

iv) One drain cum filter valve with sampling valve for main tank with plug or core plate of suitable size with locking arrangement located near the bottom of the tank on the HV side of the transformer but diagonally opposite to LV side.

The above filter/drain valves shall be located on non-bushing side of the Transformer. It should be placed on bottom side of tap changer and on top of the diagonally opposite side.

v) Air release device. It shall be of adequate capacity and shall be provided to release the trapped air during/after filling of the oil.

vi) Explosion vent (Pressure release device).

vii) One No. double float Buchholz relay shall be provided with alarm and tripping contacts to detect accumulation of gas and sudden changes of oil pressure, complete with shut-off valves on either side and flange coupling to permit easy removal without lowering oil level in the main tank, a bleed valve for gas venting and a test valve. The Buchholz relay shall be of best indigenous make having ISI certification. Buchholz relay must be made of cast iron/ aluminum.

viii) Detachable radiators complete with shut off valves as necessary for cooling as per clause 3.15.

ix) An oil conservator having detachable end plates, with following provisions.

a) Magnetic type oil level gauge:-

The conservator shall be fitted with one magnetic oil level gauge with nitro-phyll float having:

i) Dial with minimum, maximum & normal (at 30 Deg.C) Oil level marking and a pointer.

ii) Low Oil level alarm contacts of 0.5 Amp. 110V/ 30V DC.

- b) One oil filling hole with plug and drain valve on the conservator.
- c) one prismatic oil level gauge having painted/embossed marking as min., normal, and max. oil level.
- d) Silica gel breather with Oil seal and Dehydrating agent.
- x) Eye bolts and lugs on all parts for ease of handling.

- xi) Two grounding terminals as per clause No.3.20.5.

- xii) Rating, Diagram and terminal marking plates :

 Rating, diagram and terminal marking plates of stainless steel or brass for transformers and other accessories giving details as per IS:2026 shall be provided. Value of full wave (1.2/50 micro second) impulse level, short circuit current. its duration, weights of all important items, Impedances, loss values at normal/extreme taps and Postal address. Performance guarantee clause 3.43 shall also be indicated.

- xiii) All transformers shall have the marking in paint on the body for identification as per Indian Standard or as instructed by purchaser. Further, the following should be embossed at the top of the tank cover.
 - a) Sr. No. of the transformer.
 - b) The details of P.O. i.e. Order No. & Date.
 - c) Name of the firm.
 - d) Month and year of manufacture.

- xiv) Bimetallic terminal connectors suitable for "ACSR Panther" for HV and LV bushing and earthing clamps should be as per IS:5561.

- xv) Suitable weather proof cubicles (Marshalling box) for housing the local control equipment for fans, terminal blocks, for current transformer secondary and for mounting winding temperature indicators and oil temperature indicator as (i) and (ii) above.

- xvi) HV and LV bushings with adjustable arcing horns 3 Nos. and 4 Nos. respectively.
- xvii) Triple pole type off load tap changer as per cl.no.3.22
- xviii) Skids :
- xix) Hauling Eyes : Hauling eyes shall be provided on all the four sides of the transformer base.
- xx) Jacking Pads :Four, sturdy jacking pads shall be provided for lifting complete transformer. Lifting height and safe capacity of jacks shall be specified in Bid.
- xxi) Lifting Lugs : Two sets of forged or tested mild steel plate lifting lugs, one set for top cover, core and coil assembly and other set of complete transformer shall be provided. Lifting lugs shall be of adequate strength and size for attaching steel rope slings. Should lugs for lifting complete transformer be located on the base, sling guides shall be provided on cover.

xxii) Inspection Covers :One inspection covers of sufficient size for access to the interior of the tank shall be provided on the cover. The inspection covers shall be provided with suitable lifting arrangements.

All type of valves shall be of gun metal except radiator shut off valves which may be of cast iron/steel. All valves shall be provided either with blind companion flanges or with pipe plugs for protection. The makes of fitting & accessories will be as under:-

S.No.	Fitting & Accessories	Makes
1	Buchholz relay	Atvus, Sukrat, Suvidha.
2	Winding Temperature Indicator/ Oil Temperature Indicator	OTI/WTI Model integrated RTD Scheme for ROTI/RWTI with remote indicator of M/s Preci Measure Control Pvt. Ltd./Thermal System, Belltek
3	Magnetic type oil level gauge	Atvus, Sukrat, Instrument & Control
4	Radiator Valve	Hari Industries, Atvus, Vinayak, Vimal Techno, Petsun, Kailash
5	Filter valve & Drain valve	Zolote, L&T, G.G., Leader, Uttam, Punjab Metal (ELMS mark), Leader, Hari Ind., Newman Ind.

Radiator valves shall have clear & distinct OPEN/CLOSE indication embossed/ casted as well as painted on the both sides of main body of valve. Radiator valve should have zero leakage with cap remove.

The new makes of fitting & accessories may be accepted with the approval of ACE(MM), JdVVNL, Jodhpur on the basis of ISI approval certificate/ tests reports from any NABL accredited Lab./Govt. Lab./ performance report from utilities.

3.30.2 LOCKING ARRANGEMENT

To curb the theft of oil from power transformers, the following parts are either required to be blocked/ plugged or provided under provisions of locking:-

S. No.	Transformer Part	Mode of blocking
1.	Conservator drain plug/ valve	Cap shall be provided as per drawing `b'.
2.	Both oil filtration valves	Cap shall be provided as per drawing `a'.
3.	Transformer Oil drain valve.	Cap shall be provided as per drawing `a'.
4.	Radiator drain plug (Bottom)	Cap shall be provided as per drawing `c'.
5.	Radiator Air release plug (Top)	Locking on top for which provision is to be provided by firm and informed to SE(MM) for approval.
6.	Conservator filling hole.	To provide locking arrangement for which provision is to be provided by firm and informed to SE(MM) for approval.

7.	Air release plug on top cover.	To provide wire mesh cap arrangement so that only air can be released.
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Drawing is enclosed.

3.31 FACTORY ASSEMBLY AND TESTS :

- 3.31.1 The transformer shall be completely assembled and tested at the Factory. It shall be at the option of the purchaser to send a representative(s) for carrying out stage inspection and various tests during actual manufacture and assembly of transformer(s) so as to satisfy regarding the quality of product and material being used.
- 3.31.2 All Type and Routine tests as per specification are to be conducted and no deviation in respect of conducting these tests will be acceptable. No extra charges for these tests will be paid. Test charges shall be part of cost of the equipment. Even if charges for such test are indicated elsewhere in the tender, it will be presumed that these tests will be conducted free of cost. If purchaser selects to send a representative, all tests shall be carried out in his presence.

3.32 STAGE INSPECTION :

Before carrying out the stage inspection the following documents shall be given to Inspecting Officer(s) for verification:

- a) Invoice of supplier
- b) Mill's test certificate
- c) Packing list
- d) Bill of landing
- e) Bill of entry certificate by custom
- f) description of material, electrical analysis, physical inspection, certificate for surface defects, thickness and width of the material.

The purchaser's representative may carry out stage inspection of the transformers during manufacturing/ assembling stage. The purchaser shall have absolute right to reject the raw material/ component/ sub assemblies or complete equipment not found to be conforming to the requirement of the specification or being of poor quality/ workmanship. The stage inspection will particularly include following tests/ check besides the general routine tests to be conducted during manufacturing stages as per manufacturer's standard practice.

- a) Physical inspection/checking of winding insulating material, core material and other accessories/fitting of transformer.
- b) Measurement of core area, cross sectional area of winding(s), number of turns in each winding.
- c) Verification of HV and LV Coils, conductor size, I.D., O.D., Axial Length, Weight, Insulation covering etc.

- d) Measurement of thickness of tank plates (Bottom and sides) and to conduct pressure & vacuum tests as per CBIP manual for transformer tests to ensure the adequate strength of tank plates.
- e) Sample testing of core material for checking specific loss, magnetization characteristics (i.e. B.H. Curve plot) and thickness.
- f) Visual and dimensional check during assembly stage of core.
- g) high voltage test(2KV,50Hz for one minute) between all core-bolts if provided and agreed to frame bars/fish plates etc. and ferro-magnetic steel of core.
- h) Check on completed core for measurement iron loss and check for any hot spot by exciting the core so as to induced the design values flux density.
- i) Check for proper provisions of spacers and bracings to arrest the movement of core and winding assembly inside the tank.
- j) Check complete transformer against approved outline drawing, provision for all fittings, finish oil level etc.

The purchaser at his option may collect the sample of the following raw material/ component for independent testing:

a)	CRGO Laminations	One specimen sheet of 300-500mm length and 50-75mm width (for each lot).
b)	HV winding wire	1250 mm length specimen for each type
c)	LV winding wire	1250 mm length specimen for each type
d)	Transformer oil	2 samples of 5 litres each.

To facilitate stage inspection, the supplier should intimate complete schedule of manufacturing programme of the transformers at least 15 days in advance to the SE (MM) of respective Discom. At least 50% of the transformers shall be offered in the shape of finished core-coil assembly. (The inspecting Officer during the course of stage inspection shall seal these core-coil assemblies for purpose of identification of the core coil assembly. The manufacturing programme shall not be interrupted in case purchaser's representative does not reach within seven days of the date of intimation.

3.33 ROUTINE TESTS :

Each completed transformer shall be subjected to following routine tests as per IS:2026 Part.I & III (latest amendment). No extra charges for any of the tests shall be paid. No deviation shall be acceptable. If the supplier desires, he may not fix radiators on transformers(other than the one which is to be type tested) during routine testing. However in that case, radiator manufacturer's test certificate shall be furnished for reference of inspecting officer with undertaking that supplier shall be responsible for proper alignment/fixing of radiator on transformer at site.

- a) Measurement of resistance of each winding.
 - b) Measurement of turns ratio between HV-LV windings at each tap.
 - c) Checking of polarity and phase relation-ships for each winding.
 - d) Measurement of no load loss and no load current .
 - e) Positive phase sequence impedance/short circuit impedance between HV-LV windings on minimum ,maximum and normal taps.
 - f) Separate source voltage withstand test.
 - g) Test certificate along with invoice of original manufacture of transformer oil as per IS:335 (latest amended) and to meet the requirement of EHV grade oil shall be furnished and provided to Nigam's representative during inspection & shall be attached with Inspection Report. However, EHV Grade Transformer Oil shall be subject to BDV test.
 - h) Induced over voltage withstand test.
 - i) Measurement of neutral unbalance current.
 - j) Regulation at rated load at unity, 0.90 and 0.80 lagging power factor.
 - k) Load losses measured at rated frequency by applying voltage sufficient to produce the rated relevant current in one winding with the other winding short circuited.
 - l) Measurement of insulation resistance.
 - m) The total losses shall comprise of the No Load Losses, load losses at rated output duly converted at 75 degree C average winding temperature and shall also be indicated in the test report. Load losses shall be that corresponding to rated load on HV & LV winding.
 - n) Routine dielectric tests as per IS:2026 (Part.I & III).
- Sticker/ Poly-carbonate seals will be provided on locking chamber of Top filter wheel valve & Bottom drain/sampling wheel valve by Inspecting Officers and details of seals will be mentioned in their inspection report.

3.34 TYPE TEST CERTIFICATE WITH TENDER :

The detailed legible test certificates for the similar transformers manufactured in the recent past for all the type tests mentioned in the IS:2026 (amended upto date) shall be furnished along with the tender in absence of which tender is liable for rejection. However, the requirement of furnishing of valid type test certificate along with tender shall not be insisted from those bidders who are considered to be meeting the type test criteria as per Qualifying Requirement Schedule-III-A.

- 3.34.1 The firm (s) having authenticated type tests certificates viz. (a) Impulse test with chopped wave test, (b) Thermal and dynamic ability to withstand short circuit test and (c) Temperature Rise Test, got conducted from a Govt. approved/ Govt. Recognized/ NABL Accredited laboratory/ ILAC i.e. International laboratory Accreditation Corporation (in case of foreign laboratory) of the offered rating/ type and design (having same losses as specified by them under GTP), not older than **Five** years as on date of opening of the tender from the date of conducting type tests shall be considered as meeting the type test criteria and such firm(s) shall not be insisted for arranging fresh type tests. The type test certificate by in house laboratory of bidding firms, even if it is Govt. approved/ Govt. Recognized/ NABL Accredited / ILAC Accredited laboratory shall not be accepted, in case of their own bid. This will not apply if bidding firm is Govt. Company / Public Sector Undertaking. The bidder should furnish documentary evidence in support of laboratory whose type test certificates have been

furnished, that the said laboratory is a Govt. approved/ Govt. Recognized/ NABL Accredited laboratory/ ILAC Accredited. The bids of only those bidders will be considered to be meeting the type test criteria who will furnish complete valid type test certificates with the bid as per above provisions.

The above Type test shall be carried out by the firm at the Testing house as specified above. Type test carried out by above testing house at firm's works will not be considered.

- 3.34.2 In case firm(s) are not having type test reports in respect of offered rating/ type and design (not having same losses as specified in GTP) shall have to arrange type tests for i) Impulse Voltage Withstand Test, ii) Short Circuit Thermal & Dynamic Ability Test and iii) Temperature Rise Test on one unit free of cost.

Bidder should also furnish the test certificates of bushing from original manufacturer of bushings along with the tender. The detailed certified drawing of such transformers shall also accompany the tender document indicating clearly that the transformers offered are of same tested design.

3.35 TYPE TESTS :

One transformer (Complete in all respects) of each rating, selected at random, out of the first lot of minimum two numbers (of respective rating) shall be subjected to the following type tests. No extra charges shall be paid for these tests. Type tested unit shall be guaranteed for satisfactory normal use. The sample for type test at random shall be selected by purchaser's representative. The tests shall be arranged by transformer manufacturer at any of the testing house as mentioned in clause No. 3.34 at their own cost. All the testing shall be witnessed by the representative of the purchaser for which programme(s) indicating date and place of type tests shall be intimated in advance enabling purchaser to depute his representative. The original preliminary/provisional type test results shall have to be forwarded by testing house directly to the purchaser in sealed cover for consideration/approval of tests as having been satisfactorily withstood by the transformer. Detailed reports shall also be forwarded at the earliest.

- a) Dielectric test : The lightning impulse test along with chopped wave test shall be made in accordance with IS:2026 (Part.3), 2009 (latest amended) on complete transformer i.e. on all the three limbs of the transformer of both HV and LV. The tests on three phases of high voltage winding of transformers shall be performed on extreme tapings and the principal tapping respectively i.e. one terminal will be with minimum tap other with maximum and third with principal tap position.
- b) Short circuit test, Thermal & Dynamic ability test shall be conducted as per IS: 2026 (Part.1)/2011 (Latest amended). No load losses (**Normal tap**) and load losses during the short circuit test (**IS: 2026 Part-5/ 2011**) at normal and minimum tap shall be measured and mentioned in the test report. These losses shall be final for acceptance of the transformers. The un-tanking of type tested Transformer at testing house shall also be done mandatorily in presence of representative of purchaser.

- c) Temperature rise test : It shall be conducted as per IS 2026 (Part2):2010 at min tap by feeding max total guaranteed losses relevant to min. tap.
- d) Leakage/pressure on completely assembled transformer as per CBIP specification. This test can also be carried out at firm's work, **subject to condition that test has been carried out by any of the testing house as mentioned in clause No. 3.34 and report has been furnished on letterhead of such agency**

No supplies shall be accepted without successful type testing of selected transformer. However, in case some supplies are accepted prior to getting the type tests on selected transformer conducted, and if the transformer fails to withstand such type tests, the supplier shall have to replace the supplies already made and no further transformers shall be accepted based on such design. However the purchaser at his option may accept the transformers already supplied with double the normal guarantee period and the bank guarantee shall have to be extended accordingly.

- 3.36** The requirement of arranging Short Circuit Test (both Thermal & Dynamic Ability), Impulse Voltage Withstand Test and Temperature Rise Test shall however not be insisted on the suppliers who have arranged these type Tests within last **Five** years as on the date of opening of this tender specification from the date of conducting type tests on similar design(having same losses as specified).

3.37 CHALLENGE CLAUSE

The other manufacturer who have either participated in the instant tender enquiry can request challenge testing for tests covered in this clause based on specification & losses. The challenger would request for testing with testing fee. The cost of to & fro transportations of all transformer tested under the provision of this clause along with loading & unloading and transit insurance at actual shall be borne by Challenger firm. The challenge testing fees shall be at least three times the cost of testing. The challenger would have the opportunity to select the sample from the store. The party challenged ,challenger & the utility could witness the challenge testing. The challenge testing would cover the

- i. Measurement of Magnetizing current
- ii. No Load Losses test
- iii. Load Losses test
- iv. Temperature Rise Test.

The challenge test could be conducted at any Govt. / NABL accredited Lab. like ERDA / CPRI. If the values are within limits as per specification including tolerance allowed in CTL, the products gets confirm else not confirmed. If the product is not confirmed, the manufacturer will pay the challenge fee and challenger would get the fee refunded. However, as a redressal system, the manufacturer (challenged firm) would be allowed to ask for fresh testing of two more samples from the store and the same be tested in a NABL/Govt. laboratory in presence of party challenged, challenger & the utility. If any one or both sample does not confirm the tests then the product is said to have failed the test. In such cases, the manufacturer (challenged firm) will be declared as unsuccessful manufacturer for the said product and balance

supply shall not be availed and the balance order shall be cancelled with levy of maximum penalty. Firm shall also be debarred for one year or participating against next tender for that rating, whichever is later. The transformers already supplied (including tested in challenge testing) shall be accepted with the following conditions:

- i) Guarantee period of the supplied Transformers shall be increased by double the normal guarantee period.
- ii) Bank guarantee shall be extended to cover the additional guarantee period.

3.38 TESTS AT SITE :

After erection at site all transformer(s) shall be subjected to the following tests:

- i) Insulation resistance test.
- ii) Ratio and polarity test.
- iii) Dielectric test on oil.

In case the equipment is not found as per the requirements of the purchase order, all expenses incurred during site testing will be to the tenderer's account and the material shall be replaced by him at site, free of cost.

3.39 FURTHER TESTS :

The purchaser reserves the right of having other reasonable tests carried out at his own expenses either before despatch or at site to ensure that the transformer complies with the requirements of this specification.

3.40 TEST REPORTS :

After all tests have been completed, seven certified copies of each test report shall be furnished. Each report shall supply the following information:-

- i) Complete identification data including serial number of the transformer.
- ii) Method of application, where applied duration and interpretation of results for each tests.
- iii) Temperature data corrected to 75 degree C including ambient temperature.

3.41 FREQUENCY AND SYSTEM VOLTAGE :

The transformer shall be suitable for continuous operation with a frequency variation of plus minus 3% from normal of 50 cycles per second without exceeding the specified temperature rise. The highest system rated voltage shall be 145 KV. However the flux density requirements shall be as per clause 3.16.8.

3.42 DRAWINGS :

3.42.1 The drawings, calculation and the technical literature list below shall be submitted by each tenderer with the tender.

- i) General outline drawings showing front, side elevations and plan views of the transformer and all accessories and external features with detailed dimensions, net and shipping weight, crane lift for

untanking and for erection/ removal of bushing, size of lifting and pulling eyes, HV & LV terminal clearances, live terminal to ground clearances, quantity of insulating oil etc.

- ii) Assembly drawings of HV and LV bushing.
- iii) Wiring diagrams and drawings showing temperature indicator/ recorder circuits alarm circuit.
- iv) Drawing showing typical sectional views of the winding with details of insulation, cooling circuit method of coil bracing and core construction along with flux density & current density calculations.

Core assembly drawing showing complete constructional details and flux density calculations.

- v) Detailed drawings showing loading for the design of foundations for transformers.
- vi) Drawings showing position of variable fittings.
- vii) Drawings showing construction and mounting details of marshalling boxes.
- viii) Drawing showing loadings and centre of gravity of transformer.
- ix) Drawings giving details of name plate, terminal marking and connection diagrams.
- x) Drawings of bimetallic terminal connectors with test certificates within 15 days of unless otherwise specified of order.

Thermal/dynamic calculations to provide transformers capability to withstand short circuit under worst conditions.

3.42.2 In the event of an order the supplier shall also supply 3 sets of the above drawings/documents listed at 3.42.1, based on final design to the purchaser for approval within 15 days of receipt of order unless otherwise specified. The purchaser will review the drawings and return one copy to the contractor within 15 calendar days after their receipt.

3.42.3 Each drawing returned by the purchaser will be stamped (a) "Generally Approved" or (b) "Generally approved subject to observation". In case of (a), no further resubmission of drawings shall be required for purchaser's approval. In case of (b), the contractor shall correct his original drawings to conform to the comments made by the purchaser and resubmit in the same manner as stated above within two weeks after the receipt of the marked up print by him.

3.42.4 Should the supplier wish to resubmit a revision or change for approval such resubmission shall be made in three prints. The contractor shall also supply prints of each approved revised drawing(s) within 15 days of receiving the approved revised drawing(s).

3.42.5 Any shop work done prior to approval of the drawing shall be at the supplier's risk. The supplier shall make all such changes in the design as are considered necessary to make the equipment conform

to the provisions and intent of this specification without any additional cost to the purchaser.

- 3.42.6 Each drawing shall be identified by a drawings number and each subsequent resubmission/ revision or addition to the drawings or procedure. All drawings shall be thoroughly checked for accuracy and completeness and signed or initialed by a responsible officer of the contractor.
- 3.42.7 Checking and approval of the drawings by the purchaser is for the benefit of the supplier and shall not relieve the supplier of full responsibility for ensuring correct interpretation of design drawings and specifications or for completeness and accuracy of the shop drawings and relevant specifications.
- 3.42.8 The supplier shall report and incorporate only after purchaser's approval, all deviations, concessions, omissions changes etc. occurring through the manufacturing assembly and testing phases and submit a complete set of drawings in reproducible forms within 30 days of the date of the equipment is considered to be placed in satisfactory operating condition.
- 3.42.9 All drawings shall be in English language and dimensions in metric system.

3.43 PERFORMANCE GUARANTEE :

Performance guarantee of transformer shall be for the period of **36** (Thirty Six) months from the date of receipt in stores of purchaser of such transformer complete in all respect. The period during which transformer remained defective/ failed will not be accounted in this performance guarantee period. The period of defective will be reckoned from the date of first intimation to date of delivery after repair.

3.44 REPAIR GUARANTEE :

The transformer got damaged/failed during the guarantee period due to manufacturing defects or poor workmanship shall be repaired by the supplier within 60 days period from the date of information to the supplier without any liability on the purchaser. In case the transformer warrants return to the firms works the same can be done as per clause 1.32.6 of GCC. The failed Power Transformers shall be mandatorily lifted by the firm from site/ store wherever same is lying failed/ defective.

The GP failed transformer after due repair & inspection by the purchaser, will be routed through Nigam's in-house Testing Laboratory (CTL) and deliver to the store where CTL exists. Mandatory Testing as mentioned at Clause No. 3.46 (B) shall be carried out and transformer will be accepted on the basis of CTL results. In case Excess No Load /Load losses found than Guaranteed losses, penalty will be levied as per provision of clause 3.46 (B). The difference in penalty on account of excess No Load/Full load losses observed at CTL at the time of original supply and 'GP failed' repaired supply will be recovered.

The repaired transformer shall bear a repair warrantee for further 12 months after repair or unexpired period of 36 months from the date of supply whichever is later.

The firm shall provide non-detachable metallic plate with engraved following details of the repaired transformers for the purpose of identification:-

- 1) Date of first failure
- 2) Date of expiry of GP after 1st repair under G.P.
- 3) Date of second/third failure
- 4) Date of expiry of GP after 2nd /3rd re-repair under G.P.

The above details shall also be punched/embossed on the cover of the transformer. On every re-repair of transformer the date of repair and date of expiry of guarantee period shall have to engraved on rating plate by the contractor. The original name plate of transformer will be retained on the repaired transformers.

3.45 CLEANING AND PAINTING:

- i) Before painting or filling with oil, the external surfaces of transformer tank and structural steel work shall be completely cleaned and made free from rust, scale and grease by applying shot blasting or sand blasting. Cavities on castings shall be filled by metal depositions.
- ii) The interior of transformer tank, other oil filled chambers and internal structural steel work shall be cleaned of all the scales and rust by application of standard approved methods. Thereafter these surfaces shall be painted with hot-oil resistant varnish or paint.
- iii) Except for nuts, bolts and washers which may have to be removed for maintenance purposes all external surfaces shall receive minimum of four coats of paint. The total paint thickness shall be in the range of 52 to 60 microns.
- iv) The 1st and 2nd coats of painting shall be of primer and shall be applied immediately after cleaning. The 3rd coat shall be of an oil and weather resisting quality of a shade or color easily distinguishable from the primary coats and shall be applied after the primary coats have been touched up where necessary. The final coats shall be of glossy oil finish and weather resisting non-fading paint of shade No.632 (Admiral grey) of IS 5 or relevant International Standard Primer paint shall be ready mix Zinc Chromates as per IS 104 or relevant International Standard Intermediate and final coat of paint shall be as per IS:2932 or relevant International Standard.
- v) Metal parts not accessible for painting shall be made of corrosion-resistant material.
- vi) Marshalling box shall also be painted with Admiral grey as per shade-632 of IS-5
- vii) Dry Film Thickness:-
 - a) To the maximum extent practicable, the coats shall be applied as a continuous film of uniform thickness & free of pores. Overspray,

- skips, runs, sags & drips should be avoided. The different coats may or may not be of the same colour.
- b) Each coat of paint shall be allowed to harden before the next is applied as per manufacturer's recommendation.
 - c) Particular attention must be paid to full film thickness at the edges.
 - d) Except for nuts, bolts and washers which may have to be removed for maintenance purposes, all external surfaces shall receive minimum of four coats of paint. The total paint thickness shall be in the range of 52 to 60 microns.
- viii) Test for painted surface:-
- a) The painted surface shall be tested for paint thickness.
 - b) The painted surface shall pass the cross hatch adhesion test and impact test as acceptance tests and salt spray test and hardness test as type test as per the relevant ASTM standards.
 - c) Supplier shall guarantee the painting performance requirement for a period of not less than 5 years.

3.46 RANDOM SELECTION AND TESTING (RST):

A) The purchaser's may select transformer(s) from the supplied lot(s) at random from the stores for conducting the type tests, at any test house(s) as mentioned at clause 3.35, The supplier shall arrange these tests viz. (a) Impulse test with chopped wave test, (b) Thermal and dynamic ability to withstand short circuit test and (c) temperature Rise including loading, unloading and to and fro transportation from our stores to the test house(s). The charges for such tests shall be reimbursable to the suppliers on actual basis on production of documentary evidence in case the selected sample successfully withstands type test(s). In case of otherwise, no charges will be reimbursed.

1. Short circuit withstand test for Dynamic & Thermal ability. Measurement of no load and load loss shall form part of routine tests conducted before and after the short circuit test and recorded in the test report.
2. Impulse test as per clause no. 13 of IS: 2026 (Part-III).
3. Temperature rise test as per IS:2026 (Part.2):2010 at min tap by feeding max guaranteed losses relevant to min. tap

B) MANDATORY TESTING/VERIFICATION AT STORES:-

The supplier shall route the power transformers through specified lab headquarter for testing and checking of No Load, Load Loss, Magnetizing Current, Percentage Impedance & Fitting & Accessories. Every transformer shall be tested for measurement of losses, Magnetizing Current & Percentage Impedance before delivery of the transformer at the respective store/ site destination. The verification of fitting & accessories of each Transformer shall also be carried out at Stores. The inspecting officer shall issue a provisional Form-9 after satisfactory inspection. However, the No Load, Load Loss, Magnetizing Current & Percentage Impedance measured and verification of fitting & accessories at CTL shall be final.

- i) Each & Every Transformer shall route through CTL Testing. In CTL, Transformers will be subjected to the following tests:-
- a) No Load Losses at 100% & 110% of rated voltage and Magnetizing current will be measured at both voltages.
 - b) Load losses by Resistance Calculation method.
 - c) Percentage Impedance.
 - d) Verification of fittings & accessories.
 - e) Measurement of tank thickness.
 - f) No load voltage ratio (Transformer turns ratio) shall be checked in CTL with the tolerance as per specifications/IS: 2026 on the transformer.**
 - g) The facility is being developed at CTL to test the transformer oil B.D. value. Therefore, the same shall be tested at CTL.**
 - h) Any other test/s may be carried out in CTL for witch testing facility is/are available in CTL.**

XEn (CTL) shall provide 2 Nos. Poly-carbonate Seals on diagonally opposite side of Transformer after successful testing in CTL as a token of proof that Transformers have been tested at CTL.

(a) No Load Losses:

10% tolerance is allowable. Penalty shall be leviable @ **Rs.386.00 per watt** for losses exceeding 4000 watts and upto 4400 watts for 5.0 MVA rating.

(b) Load Losses:

3% tolerance is allowable. Penalty @ **Rs.178.00 per watt** on losses exceeding 23000 watts and upto 23690 watts for 5.0 MVA rating.

The transformers having measured No Load Losses/ Load Losses beyond the above permissible limit shall be stand rejected.

(c) Magnetizing Current & Percentage Impedance:

The transformer selected for No Load and Load Losses shall also be subjected to magnetizing current and percentage impedance test and in case found beyond the limit mentioned in specification, the lot shall stand rejected. The tolerance will be as $\pm 10\%$ for Normal Tap and $\pm 15\%$ for any other Taps for percentage impedance.

- (d) The following makes of fittings & accessories shall be verified jointly by the concerned ACOS (consignee) & XEn (CTL) at the time of CTL testing of Power Transformers:-

- a. Buchholz Relay
 - b. WTI & OTI.
 - c. MOG
 - d. Radiator Valve.
 - e. Filter valve & Drain valve.
 - f. Off Circuit Tap Changer.
- (e) Measurement of Transformer tank thickness shall be done as follows:-

1.	Top Cover	At 2 places to be measured & average is to be taken.
2.	Bottom cover	-do-
3.	Side walls	On all four sides (average is to be taken)

The nominal value of sheet thickness shall be considered as mentioned in the above specification.

The following rolling tolerance shall be allowed as per IS:1852 with latest amendments and no penalty shall be charged on such measured thickness till tolerance limit of IS:-

Tolerance on Thickness (in mm)

Thickness of Sheet	Over 5.0mm upto and including 8.0 mm	Over 8.0mm upto and including 10.0 mm
Tolerance in mm	+/- 0.35	+/- 0.40

If the observed values of thickness are within or upto 5% less after allowing rolling tolerance as per above, the Transformer may be accepted with levy of penalty after imposing double the penalty of the approximate amount saved by using thin sheet (e.g. if the observed value of thickness are say 5% less after accounting for rolling tolerance and transformer tank weight is 120 Kg. (say), the penalty imposed will be $5/100 \times 120 \times 80$ (considering present price of sheet steel is Rs.40/- per Kg. approx. $\&80=2 \times 40$)= Rs.480/-.

Highest percentage variation on negative side shall be taken for accounting the penalty.

If the tank thickness is found beyond 5% of tolerance limit after allowing rolling tolerance, the transformer will be rejected.

(ii) No Load and Load Losses:

The No Load & Load Losses for various ratings of transformers shall be as under (without tolerance):

Rating	No Load Losses in Watts	Load Losses in Watts
-----	-----	-----
5.0 MVA	4000	23000

3.47 FAILURE IN RANDOM SELECTION TEST:

Failure in Type Test(s) :

In the event of failure / unsatisfactory results of the transformer(s) in short circuit test / impulse test / Temperature rise Test, the supplier shall have to replace the supplies already made and no further transformers shall be accepted. The purchaser, however, at his option, may accept the transformers already supplied with the following conditions:

- i) Guarantee period of the supplied transformers issued to the field shall be Increased by double the normal guarantee period.
- ii) Bank guarantee shall be extended to cover the additional guarantee period.
- iii) For failure in any of the type tests listed under RST, i.e. Short circuit test, Impulse withstand test and Temperature rise Test , no further supplies shall be accepted. The Type Test Charges shall also not be reimbursable in this case and shall be borne by the supplier.
- iv) The transformers lying in the stores shall be replaced as per sub para (v) below.
- v) The bidder shall , however, be allowed to check the reasons of failure and if need be, to improve / modify the design. Further supplies, including replacement against supplies already made, shall be accepted only after successful type test(s) are arranged on fresh transformer selected by the purchaser. All the type tests shall be arranged in case there is change in the design, otherwise, type test shall be repeated only for the test in which failure has occurred. Charges for such test(s) shall be borne by the supplier. However, in the event of failure of transformer in the repeat type tests, the purchaser may take following actions:
 - a) Cancel pending orders of the rating in which failure(s) has occurred, &
 - b) Not place any order of power transformers on the firm for one year.

3.48 INSTALLATION & COMMISSIONING

Mainly following activities are required to be carried out before commissioning of Power Transformers:-

- a) Assembling of Power Transformer accessories.
- b) Testing activities in presence of XEn (P&EA/AEn (P&EA)/ XEn(O&M /HTM/Proct.)/AEn(O&M/HTM/Proct.)/Feeder Manager or Engineer nominated by concerned SE(O&M/M&P) such as
 - (i) Ratio Test
 - (ii) Megger Value
 - (iii) Magnetic balance.
 - (iv) Oil BDV
 - (v) Earth Resistance
 - (vi) Buchholz Relay checking.

- (vii) WTI/OTI/MOLG (oil level) checking.
- (viii) Checking of points of leakage of oil from Transformer body/Radiator/Valve.
- (ix) Setting of Relays in Panel & Sealing by Protection Wing.

Installation & Commissioning will be carried out in presence of firm's representative for which concerned AEn (O&M) will intimate to firm and AEn (P&EA)/ XEn(P&EA) XEn(O&M/HTM/Proct.)/ AEn(O&M/HTM/Proct.)/Feeder Manager or Engineer nominated by concerned SE(O&M/M&P) by FAX/Telegram/Telephone.

3.49 The variation in quoted prices of power transformers shall be as Schedule-III(A). **The prices are variable with base date as 01.06.2020, as per IEEEMA latest circular.**

3.50 ADDITIONAL ORDER

Repeat orders for additional quantities, upto 50% of original ordered quantities, may be placed by the Nigam, on the same rates, terms and conditions given in the contract.

3.51 QUALITY ASSURANCE PLAN :

3.51.1 The Bidder shall invariably furnish following information along with his offer, failing which the offer shall be liable for rejection. Information shall be separately given for individual type of equipment offered.

- i) Statement giving list of important raw materials, names of sub-suppliers for the raw materials, list of standards according to which the raw material are tested, list of tests normally carried out on raw material in the presence of Supplier's representative, copies of test certificates.
- ii) Information and copies of test certificates as in (i) above in respect of bought out items.
- iii) List of manufacturing facilities available.
- iv) Level of automation achieved and list of areas where manual processing exists.
- v) List of areas in manufacturing process, where stage inspections are normally carried out for quality control and details of such tests and inspections.
- vi) Special features provided in the equipment to make it maintenance free.
- vii) The bidder should have adequate facilities to carryout accurately all required tests during manufacturing and routine/acceptance tests as per relevant ISS/IEC standards at the final end routine/acceptance. The supplier will ensure that all testing/measuring instruments/apparatus are calibrated at regular periodicity from reputed test house as per relevant standards and a certificate of testing authority is made available to purchaser's inspector at the time of inspection. Such calibration certificates, in any case shall not be older than one year on the date of such tests".
- viii) List of testing instruments and apparatus along with their last date of calibration, available with the Bidder for testing of equipment specified and test plant limitation, if any, vis-a-vis the type, special, acceptance and routine tests testing during manufacture specified in the relevant

standards. These limitations shall be very clearly brought out in "Schedule of Deviations".

3.51.2 The Supplier shall also submit the following information to the Purchaser, along with drawings/GTPs/BOM of ordered material, within 15 days of placement of order for purchaser's approval:-

- i) Name of the raw material as well as bought out accessories and the names of sub-suppliers selected from those furnished along with the offer.
- ii) Type test certificates of the raw material and bought out accessories.
- iii) Quality Assurance Plan (QAP) with hold points for Purchaser's inspection. The QAP and Purchaser's hold points shall be discussed between the Purchaser and the Supplier before the QAP is finalized.

3.51.3 The Supplier shall submit the routine test certificates of bought out items and raw material at the time of routine/acceptance testing of the fully assembled equipment.

3.52 Purchasing on the Risk & cost of supplier, in case of non-execution of order/ delay in delivery.

If at any time during the currency of the contract, the performance in whole or in part be prevented or delayed, the purchaser reserves the right to procure the material/equipment on order or part thereof from any other source at the risk and cost of the contractor/ supplier.

IMPORTANT NOTES :

1. The tenderer should read the clause No. 3.30 carefully and indicate specifically any deviation in the fittings and accessories as required to be provided on the transformers. In absence of such indicating in the tender it will be presumed that all fittings and accessories would be provided as per specification.

2. The Tolerance in weight and Dimension of the transformer shall not be more than plus/minus five percent subject to maintenance of all specified external/ internal electrical clearance. However, there shall be no negative tolerance in tank dimensions, radiator tube lengths, conservator dimensions, and core cross section area. Phase-Phase electrical clearance on 11kV side shall not be less than 280mm with bi-metallic connectors in position.

3. Make of each accessories/components shall be clearly and invariably indicated in the GTP/bill of material.

Schedule – I**SCHEDULE OF REQUIREMENT**

5.00 MVA 33/11 KV POWER TRANSFORMERS UNDER SPECIFICATION NO. JdVVNL/SE (MM&C)/EIAI/TN- 1596.

Sr. No.	Item/Rating	Quantity (in Nos.)
1	5.00 MVA 33/11 KV Power Transformers (with base date 01.06.2020)	95 Nos.

NOTE:-The quantities as mentioned in the schedule of requirements are tentative and may increase/decrease as per the requirement of the Jodhpur Discom.

SCHEDULE- II**PRICE ADJUSTMENT FORMULA****PRICE VARIATION FORMULA FOR COPPER WOUND POWER TRANSFORMERS COMPLETE WITH ALL ACCESSORIES AND COMPONENTS (TN- 1596).****IEEMA**

IEEMA/PVC/DIST-CU_2.5-10 MVA/2015

Effective from: 1st June 2015**PRICE VARIATION CLAUSE FOR COPPER WOUND DISTRIBUTION TRANSFORMERS COMPLETE WITH ASS ACCESSORIES AND COMPONENTS (For Single and Three Phase of ratings above 2500 KVA up to 10 MVA and voltage up to 33 KV) supplied against domestic contracts**

This price variation clause is applicable for 'copper Wound Distribution Transformers', with rating above 2500 KVA up to 10 MVA and voltages up to 33 KV; supplied against domestic contracts. A separate price variation clause IEEMA/PVC/DIST-CU_2.5-33 KV/DE/2015 has been evolved for above types of Transformers supplied against export/deemed export contracts under special imprest licensing scheme.

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

$$P = \frac{P_o}{100} \left(10+33 \frac{C}{C_o} + 24 \frac{ES}{ES_o} + 8 \frac{IS}{IS_o} + 4 \frac{IM}{IM_o} + 6 \frac{TO}{TO_o} + 15 \frac{W}{W_o} \right)$$

Wherein,

- P = price payable as adjusted in accordance with the above formula.
P_o = Price quoted /confirmed.
C_o = 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_o = Price of CRGO Electrical Steel Lamination (refer notes)
This price is as applicable on the 1st working day of the month, one month prior to the date of tendering
IS_o = Price of MS Plate of 6 mm thickness (refer notes).
This price is as applicable on the 1st working day of the month, one month prior to the date of tendering.
IM_o = Price of insulating Material (refer notes)
This price is as applicable on the 1st working day of the month, one month prior to the date of tendering.
TO_o = Price of Transformer Oil (refer notes)
This price is as applicable on the 1st working day of the month, one month prior to the date of tendering.

W_o = 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 1st working day of the month, three months prior to the date of tendering.

For example, if date of tendering falls in December 2015,, applicable prices of Copper (C_o), Transformer Oil (TO_o) CRGO Steel Sheets (ES_o), MS Sheet (IS_o) and insulating material (IM_o) should be as on 1st Nov 2015 and all India average consumer price index no. (W_o) should be for the month of September 2015.

The above prices and indices are as published by IEEMA vide circular reference number IEEMA(PVC)/DIST_PWR_TRF/_/_ 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, one month prior to the date of delivery.

ES = Price of CRGO Electrical Steel Lamination (refer notes).
This price is as applicable on the 1st working day for the month, one month prior to the date of delivery.

IS = Price of MS Plate of 6 MM thickness (refer notes).
This price is as applicable on the 1st working day of the month, one month prior to the date of tendering

IM = Price of Insulating Materials (refer notes)
This price is as applicable on the 1st working day for the month, one month prior to the date of delivery.

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

For example, if date of tendering falls in December 2015,, applicable prices of Copper (C_o), Transformer Oil (TO_o) CRGO Steel Sheets (ES_o), MS Sheet (IS_o) and insulating material (IM_o) should be as on 1st Nov 2015 and all India average consumer price index no. (W) should be for the month of September 2015.

The above prices and indices are as published by IEEMA vide circular reference number IEEMA(PVC)/DIST_PWR_TRF/_/_ one month prior to the date of tendering.

The date of delivery is 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 is to be considered as the date of delivery) or the contracted delivery date (including any agreed extension thereto), whichever is earlier.

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

deemed export contract under special imprest licence, some raw materials which are imported are of duty free. While modvatable CVD is already excluded, the customs duty is also not considered while arriving at the raw material price of imported items.

- (b) Most of the prices are as on first working day of the month.
- (c) Date of Tendering is the due date of tender submission or date of tender opening whichever is earlier.
- (d) The details of prices are as under:
1. The LME price of Copper Wire Bars (in Rs./MT) is the LME average settlement price of Copper wire bars converted in to Indian Rupees with average exchange rate of the month.
 2. The price of CRGO Electrical Steel Lamination suitable for Transformers of rating up to 10 MVA and voltage up to 33 KV (Non-BEE & energy efficiency levels not as per IS-1180 (part-1):2014) in Rs./MT is the average price as quoted by processing centers of overseas mills and lamination suppliers which is same as applicable for Power Transformers (of rating above 10 MVA or voltage above 33 KV) after removing the applicable Customs duty on the CRGO Electrical Steel.
 3. Price of steel is the average retail price of MS Plate 6 mm thickness as published by Joint Plant Committee (JPC) in Rs./MT as on 1st working day of the month.
 4. The average price of Insulating materials (in Rs./Kg) of pre-compressed pressboards of size 3 mm and 10 mm thick, 3200 mm x 4100 mm C&F price in free currency per MT converted into Indian Rupees with applicable exchange rate prevailing as on 1st working day of the month as quoted by primary suppliers.
 5. The price of Transformers Oil (in Rs./K. Ltr) is the average price on ex-refinery basis as quoted by two manufacturers for supply in drums.
- (e) Some purchase are purchasing oil immersed Transformers from manufacturers without first filling of oil, Oil for first filling is procured and filled by the purchasers. For such supplies PVC formula, excluding Oil will apply as under:

$$P = \frac{P_o}{94} \left(10 + 33 \frac{C}{C_o} + 24 \frac{ES}{ES_o} + 8 \frac{IS}{IS_o} + 4 \frac{IM}{IM_o} + 15 \frac{W}{W_o} \right)$$

Where description of P, P₀, C, ES, IS, IM, W etc. remains same as mentioned earlier.

Note: - 1. The base date will be 01.06.2020 irrespective of date of tender opening.

2. If there is any contradiction observed in above formula than IEEMA circular IEEMA/PVC/DIST-CU_2.5-10 MVA/2015 Effective from: 1st June 2015 is final and also available in tender documents namely IEEMA formula at eProcurement documents under TN-1596.

SCHEDULE-II-A**PRICES & PRICE VARIATION**

- a) The prices quoted shall be variable as per Price Variation Formula given in the Specification (Schedule-III-A) without any ceiling.
- b) If the price variation formula is changed, the same shall be applicable for the price variation. During the transit period when both old and new indices are being circulated, then the admissible Price Variation shall be applicable, which is advantageous to Nigam, and the period from which the old indices are discontinued then the P.V. shall be admissible with the new indices.
- c) The date of delivery applicable for claiming price variation shall be the date prevailing on the first day of Calendar month which shall be determined in the manner prescribed hereunder:-
- (i) When the material is offered within stipulated delivery schedule : For allowing P.V. the date of delivery shall be considered the date on which material is notified as being ready for inspection or date of receipt of inspection call in the office.
- (ii) When the material is offered after expiry of stipulated delivery schedule : For allowing P.V. in the cases supplies are made after the expiry of scheduled delivery, the price prevailing in the last month of the stipulated scheduled delivery or the date on which material is notified as being ready for inspection or date of receipt of inspection call in the office, whichever is beneficial to Nigam shall be allowed.
- (iii) When the material is offered ahead of delivery schedule on the request of Vidyut Vitran Nigam Limited : Normally supplies ahead of delivery schedule shall not be accepted. However in case of urgency of material, if supplies are accepted ahead of delivery schedule, PV shall be allowed on the basis of the material is notified as being ready for inspection or date of receipt of inspection call in the office.
- (iv) When the material is offered ahead of delivery schedule by firm at their own and accepted by Nigam on the request of firm: Normally the request of the firm to accept the material ahead of delivery schedule will not be accepted. In case firm offers supplies ahead of delivery schedule at their own and such request is accepted by Nigam, the price prevailing in the last month of stipulated delivery schedule or the date on which material is notified as being ready for inspection or date of receipt of inspection call in the office, whichever is beneficial to Nigam shall be allowed.

Schedule – III**JODHPUR VIDYUT VITRAN NIGAM LIMITED****A Govt. of Rajasthan Undertaking
Prescribed technical specification for supply of**

(Name of Material/Equipment/Machinery/T&P etc.)

S.No.	Technical specification to which material/equipment/Machinery/T&P shall confirm	Name of IS/other standard specification to which material should confirm	Other particulars if any.
-------	---	--	---------------------------

Certified that we agree to all the aforesaid technical specification except at S.No. í . for which our technical specification shall be as under:-

S.No.	Technical specification to which material/equipment/Machinery/T&P shall confirm	Name of IS/other standard specification to which material should confirm	Other particulars if any.	to
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(Signature)Name & Designation
with seal of the bidder.

SCHEDULE-III-A**QUALIFICATION REQUIREMENT****ITEM:- 5.00 MVA 33/11 KV Power Transformers****TN- 1596**

The bidder should fulfill following qualifying requirements for successful participation in the tender along with relevant documentary evidence supporting each qualifying requirement without which the offer shall be considered non-responsive & rejected.

1.0 STATUS OF BIDDER:-

- a) The bidder should be a Manufacturer of offered items. The offers from sole selling agent/ authorized dealers shall not be entertained.
- b) Old/ New suppliers:- Any bidder located within or outside the state of Rajasthan has participated for the first time in a particular Discom & meeting minimum qualification requirement and has supplied the tendered material/or of higher rating in other utility shall be treated as an old supplier. Rajasthan's firms although supplied in past but not meeting minimum quantity supplied criterion including altogether new units which have not supplied any quantity but having adequate & required manufacturing and testing facility and technical know-how of the tendered material shall be considered as new firms and would be eligible for trial order only. In case of supply made to the licensed power utility outside India, the C.A. certificate furnished by firm shall be considered.

2.0 PAST SUPPLY & PERFORMANCE CRITERIA :-

The bidder shall meet both past supply and performance criteria as detailed below for opening of tenders:-

2.01 PAST SUPPLY:-

- 2.01.1 The bidder is required to quote for minimum **10%** of tendered quantity failing which their offer may be considered Non-Responsive.
- 2.01.2 **The bidder should have designed, manufactured / fabricated, tested and supplied to utility / Discoms / Govt. Departments at least 2 X QQ (QQ being the quoted quantity) of similar item / higher rating of power transformers in last 3 financial years from the date of opening of technical-commercial bid).**

Note: Requirement of quantity manufactured, minimum quantity to be offered and amount of Bank Guarantee to be furnished in absence of test certificate shall be reduced to 25% for Rajasthan based units.

- 2.01.3 In support of fulfillment of the past supply criteria, the bidder shall furnish documentary evidence in the form of certificate from Chartered Accountant in the enclosed prescribed proforma only. This prescribed proforma should be furnished either in original or copy duly attested by Notary. The bidder shall also sign and affix seal on the C.A. Certificate. The certificate should have membership number with the name & address of the chartered accountant. Certificate should clearly indicate the quantity supplied, period of supply, voltage Class, Rating of the Transformer etc. in the format prescribed, any deviation to format or information diverted format, will not be considered and rejected.

Note:-The material supplied and accepted for same/higher rating for Turnkey projects to a licensed power utility/Govt. shall be considered for the purpose of evaluating criteria. The certificate given by C.A. shall indicate above quantity separately.

2.02 **PERFORMANCE CRITERIA:-**

- 2.02.1 i) If a bidder has supplied up to 50% of ordered quantity in previous tender up to date of opening of subsequent tender and scheduled delivery period expired, the bid of such bidder will not be opened in the Discom for that item.

ii) However, if the supplies have been completed for a quantity more than 50% but not completed up to date of opening of subsequent tender and scheduled delivery period expired, the quantity equal to the quantity pending in previous tender for that item shall be reduced from the subsequent tender quantity to be allocated to the bidder.

3.0 **TYPE TEST CRITERIA:-**

- 3.01 The bidder shall furnish valid and authenticated type test certificates from a Govt. approved / Govt. recognized / NABL Accredited laboratory / ILAC i.e. International Laboratory Accredited Laboratory (in case of foreign laboratory) of similar rating and design of tendered material/equipment. Such type test certificates should not be older than 5 years as on the date of opening of tender. For this purpose date of conducting type test will be considered.

The type test certificate by in house laboratory of tendering firm even if it is a Govt. approved / Govt. recognized / NABL accredited / ILAC accredited, shall not be accepted, in case of their own tender. This will not apply if tendering firm is Govt. company / public Sector undertaking.

The above Type test shall be carried out by the firm at the Testing house as specified above. Type test carried out by above testing house at firm's works will not be considered.

- 3.02 The bidder should furnish documentary evidence in support of the laboratory whose type test have been furnished, that the said laboratory is a Govt. / a Govt. approved / a Govt. recognized / NABL accredited laboratory / ILAC accredited (in case of foreign laboratory).

- 3.03 The type test certificates shall be furnished either in original or copy duly attested by notary.
- 3.04 The bids of only those bidders shall be considered to be meeting the type test criteria who furnishes complete type test certificate with the bid as per above provision.

However, in the following cases the bid of the bidder may be considered meeting the type test criteria if the bidder furnishes an undertaking stating that valid type test certificate from a Govt. / Govt. approved / Govt. recognized / NABL accredited / ILAC accredited laboratory shall be furnished from first lot (without asking any delivery extension) along with bank guarantee with the technical bid from a Nationalized / Scheduled Bank in prescribed proforma at Schedule-III C or DD/ Pay Order amounting to Rs.5 Lac / Rs.1.5 Lac / Rs.0.5 Lac in case where the value of the purchase (corresponding to tendered quantity) under consideration is more than 1.5 Crore / up to 1.5 Crore/ Upto 0.5 Crore respectively. The initial validity of Bank Guarantee shall be nine months with claim period of three months in addition.

- i) A new Rajasthan based unit who does not possess valid type tests reports subject to technically competent.
- ii) Where one or more type tests is/ are older than 5 (Five) years.
- iii) Where new type tests have been added in the specification.
- iv) Where some changes in respect of type test procedure of existing type tests have been introduced in the relevant standard.
- v) Where a new item is being purchased by Nigam for the first time.
- vi) The Rajasthan & outside Rajasthan firm who does not possess valid type tests certificates, if type test reports of higher rating are furnished.

4.0 POOR RECORD OF PERFORMANCE AND DELIVERY :

The bidder who have been black listed **in any of the state Discom** or with whom business relations have been severed in Jodhpur Discom shall not be considered. Severment of business relations will be done in case of following circumstances for the period and with the recovery mentioned against each:

i) When vendor does not accept order awarded on its accepted price and terms and conditions or does not comply with contractual formalities.	Forfeiture of EMD/cancellation of vendor registration to recover amount of EMD along with severment of business relations for three years from the date of issue of order.
ii) When vendor complies with contractual formalities but does not commence supplies.	Levy of maximum recovery on account of delay in delivery along with severment of relations for a period of 2 years from the date of issue of order or in next two bids whichever is later along with forfeiture of EMD / cancellation of vendor registration.

5.0 (A) Black listing of a firm:

After having given Show Cause Notice of 30 days, and having established & cogent reasons for blacklisting of the firm as given below, the firm should immediately be blacklisted for a period of 5 years indicating reasons of doing so, in the letter itself, and a copy of such blacklisting should be given to the firm, with the approval of CLPC:-

(i) There are sufficient and strong reasons to believe that the supplier or his employee has been guilty of malpractices such as manhandling/misbehavior with Government official by supplier or his partner/employee, bribery, corruption or abatement of such a offence in a position where he could corrupt Nigam's official, fraud, vitiating fair tender process including substitution of or interpolation in tender, misrepresentation, pilfer-aging or unauthorized use or disposal of Nigam's material issued for specific work etc.

(ii) Where a supplier or his partner or his representative has been convicted by a court of Law for offences involving moral turpitude in relation to the business dealing or where security considerations including suspected disloyalty to the Nigam/state so warrant the blacklisting.

(iii) If the State Bureau of Investigation or any other authorized investigating agency recommends for blacklisting after completing the investigation.

Note: - 1 If a supplier after having tendered for a supply or after negotiations gives application voluntarily vitiating the fair tendering process, it shall also tantamount to malpractice.

Note:-2 A register containing the reasons for blacklisting the supplier as also the names of all the partner of the suppliers and the allied concerns coming within the effective influence of the blacklisted supplier will be maintained.

Note: - 3 A register of black listed supplier will be maintained which will not only include suppliers enlisted with the Enlisting Authority but also black listed suppliers in Nigam.

Note :-4 A Black listed supplier (i) shall not be entitled for registration in any of the Discom (ii) shall not be awarded any supply order in future in any Discom during the notified period.(iii) his registration if any shall stand cancelled immediately and his registration security /EMD/S.D. shall stand forfeited. (iv) In case of blacklisting of the firm by any one of Discom for the cogent prescribed reason(s) as stipulated above, the same shall be applicable to all the three Discoms and as a consequence of blacklisting, all the pending orders to that firm, will be cancelled in all three (3) Discoms with immediate effect. However in respect of completed/executed contract G.P. obligations as well as other liabilities shall be fulfilled by the supplier.

B) Severment of Business relation:

(a) After having given Show Cause Notice of 30 days, and having established & cogent reasons for Severment of business relation as given below, the firm should immediately be severed the business relations for a period of 2

to 3 years indicating reasons of doing so, in the letter itself, and a copy of such severment should be given to the firm, with the approval of CLPC:-

(i) The supplier continuously refuses to pay Nigam dues without showing adequate reasons and where the purchasing authority is satisfied that no reasonable dispute attracting reference to Settlement Committee or Court of Law exists for the supplier's action of non-supply.

(ii) When vendor does not accept LOI/detailed purchase order awarded on its accepted prices and terms & conditions or does not comply with the contractual formalities.

(iii) When vendor/supplier who otherwise completed contractual formalities but does not commence supplies on the date of opening of technical bid of the fresh tender/completion of schedule delivery period whichever is later.

Note-1-In case supplier does not deposit outstanding dues towards Nigam, even after completion of severment period, the period of severment will continue.

2. Severment done purely/ mainly on account of non-deposition of dues against the supplier/vendor/contractor could be lifted by CLPC, if the dues are deposited prior to the expiry of such severment period.

3. Severment done by one Discom for non-supply of material and /or corresponding non-recovery of dues will not be effective in other Discoms except in respect of common purchase cases of three Discom.

4. On severment of business, the EMD/SD/vendor registration security will be forfeited.

5. The orders in execution satisfactorily will not be cancelled other than the order on which severment have been done.

(C) **DEBARMENT**

Reasons on which Debarment can be made:-

(i) The competent authority may debar the supplier on account of his performance or other disabilities, if it is no longer considered fit to remain under vendor registration as per his obligation under vendor registration.

(ii) If at any subsequent stage of inspection of firms after award of contract, it is found that firm does not have sufficient tech. staff or required/necessary technical equipments, the purchasing authority can debar the firm for one year or next tenders whichever is later. The debarment will be lifted only on re-inspection of firm's works; the defects noticed earlier are fully rectified to the satisfaction of Nigam.

(iii) When contract agreement executed and supplies commenced but could supply only up to 50% of ordered quantity and scheduled delivery period expired, then the firm can be debarred for one year or next tender whichever is later in that Discom only for that particular item/rating/ capacity/size etc.

(iv) The suppliers who have been awarded contract for supply of material is not adhering to the periodic delivery schedule, the contract awarding authority reserve the right to terminate the contract and may debar the firm in participating in tender for a period of 2 to 3 years.

Note:-1. On debarment, the EMD/ SD/Vendor Registration security shall be forfeited.

Note:-. 2. If the firm is debarred in one Discom for any reasons then the same should not be applicable in other Discom subject to exception that in case of common Discoms purchases such debarment of a firm would be

applicable to all three Discoms for that particular item and rating/capacity/size etc.

6.0 APPEALS AND APPLICATIONS:-

Appeal against the order of blacklisting, severment and debarment can be filed before BOD within a period of 3 months from the date of intimation. The letter of appeal will be addressed to the order placing authority. Who will process the case for placing the matter in B.O.D. with in a period 60 days. The BOD may reduce or waive the penalty, if sufficient reasons/supporting documents are furnished by the supplier.

GENERAL CONDITIONS : - (ALL CONDITIONS BE DULY SIGNED & SEALED)

- I) The bidder shall clearly indicate the deviations such as 'Technical Deviation & Commercial Deviations' in the prescribed proforma only. The deviations indicated elsewhere in the bid shall not be accepted.
- II) The bidder must clearly fill up each and every particular of guaranteed technical particulars annexed with Technical Specifications otherwise he will be responsible for Technical Non-responsiveness.
- III) All documents required in the prescribed format are to be furnished along with the bid itself only except an attested copy of BIS license (wherever it is required), failing which the bid will be summarily rejected.
- IV) However, a copy of BIS License may be submitted by the bidder up to the official working hours of one working day prior to the schedule / notified date of opening of price bid.
- V) The date of conducting type test shall be before the date of opening of Technical Bid. The date of issuing of type Test Bank Guarantee in lieu of non-furnishing of Type Test reports shall be before the date of opening of technical bid & the Type Test BG issued on or after opening of technical bid shall not be accepted.**

Schedule - III -B**BANK GUARANTEE IN LIEU OF FURNISHING OF TYPE TEST CERTIFICATE
UNDER TN- 1596****(On Rajasthan Non-Judicial Stamp Paper of appropriate value)**

To,

The Superintending Engineer (MM&C)
Jodhpur Vidyut Vitran Nigam Limited
New Power House Premises,
Industrial Area,
Jodhpur.

Dear Sir,

Whereas Jodhpur Vidyut Vitran Nigam Limited, Jodhpur (hereinafter called the Purchaser) has issued a tender enquiry under TN_____ for procurement of _____ (name of material).

Whereas M/s _____ (hereinafter called the bidder) has furnished a bid for supply of _____ to the Superintending Engineer (MM&C), Jodhpur Vidyut Vitran Nigam Limited, Jodhpur or his nominated officer(s).

Whereas in accordance with the provision of the specification of the aforesaid TN_____, the bidder can deposit a bank guarantee in lieu of the requirement of furnishing the type test certificates.

Whereas M/s _____ (the bidder) have requested us (Name of the Bank) to furnish the bank guarantee, in lieu of the type test certificate, for an amount equivalent to Rs._____ (in words also) only.

Under this Bank Guarantee, we (Name of the Bank) hereby undertake unconditionally and irrevocably to guarantee as primary obligator and not as Surety merely, the payment to the purchaser on his first demand without whatsoever right of objection on our part and without his first claim to the bidder, in the amount not exceeding (amount of guarantee in figures and words).

Payment pursuant to this undertaking will be demanded by the purchaser from the Bank and will be met by the Bank without question in the case in which the bidder, on receipt of the order and/ or after the acceptance of this tender, makes default in furnishing the required type test certificates. As to whether the occasion or ground has arisen for such demand the decision of the Superintending Engineer (MM&C), Jodhpur Vidyut Vitran Nigam Limited, Jodhpur shall be final.

The liability of the Bank shall not at any time exceed Rs._____ (Rupees _____).

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

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

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

All disputes arising under the said guarantee between the Bank and the bidder or between the bidder and the purchaser pertaining to the guarantee shall be subject to the jurisdiction of Courts only at JODHPUR in Rajasthan.

The Bank further undertake not to revoke this guarantee during its currency except with the previous consent of the Superintending Engineer (MM&C), Jodhpur Vidyut Vitran Nigam Limited, Jodhpur.

Notwithstanding anything contained herein before, the Bank's liability under this guarantee i.e. restricted to Rs. _____ (Rupees _____) and the guarantee shall remain in force upto _____. Unless demand or claim in writing is presented on the Bank within three months from that date, the Bank shall be released and discharged from all liabilities there-under. However, the validity of the bank guarantee shall be extended as and when required by the purchaser.

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

Yours faithfully,

(Bankers)
EXECUTANT

Witnesses:

1.

2.

SCHEDULE-IV `A`**Must be filled-in by the tenderer and attach with technical bid (Part-I)**

To,

The Superintending Engineer (MM&C),
Jodhpur Vidyut Vitran Nigam Limited,
Jodhpur.

Dear Sir,

With reference to your invitation to tender against specification No JDVVNL/SE (MM&C)/E1A1/TN- 1596 we agree to supply the following quantity:-

S. No	Particulars of item	Tendered Quantity	Qty. Offered	Justification of quantity offered as per Qualifying Requirement.	Status of Type Test Certificates.
1	2	3	4	5	6
1	5.00 MVA 33/11 KV Power Transformers	95			

- The offer is valid for a period of 120 days from the next date of opening of this tender.
- Bidders are requested to quote separate price of both i.e. Transformer & M&P Box otherwise their bid offer shall be ignored/rejected.** The base date for transformer will be **01.06.2020** irrespective of date of tender opening.
- It is noted that the quantities as mentioned in the specification are approximate and we agree to supply any quantity as per your requirement.
- The delivery shall strictly be in accordance with our delivery clause as given in **Schedule-VIII** of this specification. In case we fail to deliver the material as indicated in the clause No. 1.23, we are liable to pay recovery for delay in delivery as per clause No. 1.24 of this Schedule-II of this specification. The material shall conform to your specification No. JDVVNL/SE(MM&C)/TN-1596 and as per relevant ISS in all respect.
- We confirm that we agree to all the terms & conditions as well as the technical stipulations of your specification No. JDVVNL/SE(MM)/TN- 1596 and there are no deviations other than as specified in the **Schedule VI (A&B)**.

Yours faithfully,

Signature of tenderer
with stamp
Date

JODHPUR VIDYUT VITRAN NIGAM LIMITED**A Govt. of Rajasthan Undertaking**

Statement of guaranteed technical particulars and other performance data for supply of
 í í í í í í í í í í í í í í í .. (Name of material) against specification
 no..í í í í í í í í í í ..

S.No. Particulars of technical & other performance data guaranteed.

Certified that we agree to all the aforesaid technical particulars and other performance
 data except following :-

S.No.	Particulars of technical & other Performance data	Reasons for deviations/departure.
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(Signature)

Name & Designation
 with seal of the bidder.

Schedule – V(A)
(To be filled by the Bidder)

**Schedule of Guaranteed Technical Particulars Against TN-1596 for Supply of
3 phase, copper wound, core type construction, oil immersed (suitable for
O/D service as step down transformers) 33/11 KV, 5.0 MVA Power
Transformers: -**

Sr. No.	Description	Unit	Details to be filled by the Bidder
1	Manufacturer's Name		
	a) Postal Address:		
	b) Manufacturer's Works Address:		
2	Make & Country of origin:		
3	Standards to which material conforms at reference specified under clause 3.04 of tech. specification.	Yes/No	
	Equipment meeting the requirements of any other authoritative standards which ensures a quality equal to or better than that as per the standards specified under clause 3.04 of tech. specification.	Yes/No	
4	Climate conditions as per clause no. 3.02 of tech. spec.:	Yes/No	
5	Tropical treatment as per clause no. 3.06 of tech. spec.:	Yes/No	
6	Continuous Rating of Power Transformer at reference ambient temperature specified under clause 3.02 of tech. specification:	MVA	----- with OCTC
7	Type & Designation:		
8	Frequency:	Hz	
9	No. of phases:	No.	
10	a) Rated Primary Voltage on principal tapping:	KV	
	b) Rated Secondary Voltage:	KV	
	c) Rated HV Current:	Amp.	
	d) Rated LV current:	Amp.	
11	Type of cooling:		
12	OCTC having 6 equal steps (7position) of 2.5% of each, to have voltage variation of +5% to -10% on HV side:	Yes/No	
13	Neutral unbalance current (Max.):	%	
14	Type of terminal suitable for ACSR %Banther+on both sides:		
15	Current density in all parts of HV and LV windings of 5.0 MVA power transformer including tapped winding for minimum tap in HV & LV:	Amps. / Sq. mm (Max.)	

16		Size of bushing metal part for HV & LV bushing (copper/brass):		
17		Continuous Max. Rating (CMR) under peak ambient air temp. 50 deg. C with temperature rise as per item 7	KVA	
18	a	Over load for time of one hour	Min.	
	b	20%overload duration	Min.	
	c	10%overload duration	Min.	
19		Winding connections:		
	a	HV side		
	b	LV side		
	c	Vector group reference		
21	i	Each transformer shall be capable of operating continuously at their normal rating without exceeding temperature rise limits as specified below :		
	a	Temp. rise of winding (Temp. rise measured by resistance method) (Type of cooling: ONAN):	deg C	õ õ õ (Max.)
	b	Temp. rise of oil (Temp. rise measured by thermometer method) (Type of cooling: ONAN):	deg C	õ õ õ (Max.)
	ii	The hottest spot temp. when calculated over an annual weighted average ambient temp. of 35 deg. C when transformer is loaded ti its rated current:	deg C	õ õ õ (Max.)
22		The power transformer shall be capable of being over loaded to 150% of its rating in accordance of IS 6600-1972:	Yes/No	
23		PSR type of radiator:	Yes/No	
24		For heat dissipation calculation for tank surface at 45 Degree:	Watt per Sq. meter	
25		Indoor/outdoor installation		
26		Range of voltage variation		
27		% Variation of steps & No. of steps /positions		
28		Is volts/turn constant regardless of tap position?		
29		Magnetizing current in Amp. &P.F. at rated voltage &frequency		
30		Maximum Guaranteed No Load Losses at rated current, rated frequency & rated voltage	KW	õ õ .. (Max.)

		(At normal tap condition):		
31	a	Maximum Guaranteed Load Losses at rated current, rated voltage & rated freq. at 75 deg. C (At normal tap condition):	KW	õ õ .. (Max.)
	b	Maximum Guaranteed Load Losses at rated current, rated voltage & rated freq. at 75 deg. C (At max. tap condition):	KW	õ õ .. (Max.)
	c	Maximum Guaranteed Load Losses at rated current, rated voltage & rated freq. at 75 deg. C (At min. tap condition):	KW	õ õ .. (Max.)
	d	Max. Total guaranteed losses at rated current, rated voltage & rated freq. at 75 deg. C (At normal tap):	KW	õ õ .. (Max.)
	e	Max. Total guaranteed losses at rated current, rated voltage & rated freq. at 75 deg. C (At min. tap for heat run test only)	KW	õ õ .. (Max.)
32	a	Resistance of HV winding per phase at 75 deg. C(App. at normal tap)	Ohm	
	b	Resistance of LV winding per phase at 75 deg. C	Ohm	
33		Efficiency at 75 deg. C		
	a	At Unity Power Factor :-		
	i	100% Load	%	
	ii	75% Load	%	
	iii	50% Load	%	
	iv	25%Load	%	
	b	Maximum efficiency and corresponding % load at which Occurs	%	
	c	At 0.8 power factor lagging		
	i	100% Load	%	
	ii	75% Load	%	
iii	50% Load	%		
iv	25%Load	%		
34		Reactance drop at rated current and rated freq.	%	
35		% Guaranteed Impedances & tolerances taking into account the limits at Min., Normal & Max. tap position (at normal voltage & 75 deg. C average winding temp., on 20 MVA base, between HV-LV):		
	a	At Normal tapping (Tap-3):	%	

	b	At Maximum tapping (+5%):	%	
	c	At Minimum tapping (-10%):	%	
36		Duration of thermal Short Circuit with reference to impedance voltage	Sec.	
37		Regulation on full load		
	a	At unity power & temperature of 75 deg.	%	
	b	At 0.8 power factor and temperature of 75 deg.	%	
38		Impulse strength on 1.2/50 ms in KV (peak)		
	i	of HV winding	KVP	
	ii	of LV winding	KVP	
39		Power frequency withstand voltage of		
	i	HV winding	KVrms	
	ii	LV winding	KVrms	
40		Minimum clearance to earth		
	a	of primary winding		
	i	in oil	mm	
	ii	out of oil	mm	
	b	of secondary winding		
	i	in oil	mm	
	ii	out of oil	mm	
	c	Width oil duct between		
	i	Core & LV	mm	
	ii	LV & HV	mm	
	iii	out of oil	mm	
42		Whether oil temp. indicator with alarm contacts provided		
43		Whether two winding temp. indicator with alarm contacts provided		
44		Make, Type & Size of oil temperature indicator		
45		Make, Type of magnetic oil level indicator		
46		Make, Type & Size of prismatic oil level gauge		
47		Make, Type & Size of gas operated relay (Buchloz relay)		
48		Ratio & type of CT used for W.T. indicator		
	a	H.V.	Ratio	
	b	L.V.	Ratio	
49		Make of Winding Temperature Indicator		
50		Make of Radiator valve		

51		Make of filter valve & Drain valve		
52		Type of resistance used for W.T. Indicator		
53		No. of breaters provided & type thereof		
54		Type of dehydrating agent used for breathing & quantity		
55		Outline dimensions		
	i	overall height	mm	
	ii	overall Length	mm	
	iii	overall Breadth	mm	
56		Tank Dimensions		
	i	Height	mm	
	ii	Length	mm	
	iii	Breadth	mm	
57		Weight in Kg. of		
	a	Transformer Core	Kg.	
	b	Copper	Kg.	
	c	Transformer Core coils and insulations	Kg.	
	d	Tank & Fittings	Kg.	
	e	Oil	Kg.	
	f	Transformer tank only	Kg.	
58		Oil :		
	A	Quantity required for first filling		
	a	Total	Ltrs.	
	B	In Radiators	Ltrs.	
	C	In Conservator	Ltrs.	
	B	Class & specification to which it conforms		
	C	Make, Type & Brief description		
59		Particulars of Tap Changing Device/tap changer		
	a	Make, Type & Brief description		
	b	Is an indication arrangement fitted to show the voltage which the circuit tap in circuit gives off		
	c	Can it be locked in position?		
	D	Position of tap changing wheel of the transformer		
	e	% variation of OFF LOAD tap changing switch		
60		Accessories and list of fittings with each transformer		
	f	Number of steps/positions		
61	i	Minimum electrical clearance between phases		

	a	H V	mm	
	b	L V	mm	
	ii	Min. clearance between phase and earth(in air)		
	a	H V	mm	
	b	L V	mm	
62		State whether the transformer comply fully with this specification and its requirement.		
63		Whether make, rating, Sr. No. & TN No. punched at four side of Transformer Tank		
64		Whether Radiator valve have OPEN/ CLOSE Indication embossed/ casted as well as Painted on both sides of main body of Valve.		
65		The hottest spot temperature when calculated over an annual weighted average ambient temperature of 35 degree C when transformer is loaded to its rated capacity.	Deg. C	ō ō ō ō . (Max.)
66		The transformer is capable or not, if transformer of being over loaded to 150% of its rating in accordance of IS 6600-1972 (in Yes/No).		
67		Bushing and its terminal connectors shall have minimum continuous current rating corresponding to 120% rated current of transformer at lowest tap (in Yes/No).		
68		Design calculations of No-load and load losses along with complete technical details and factors assumed is enclosed or not (in Yes/No).		
69		The design details of core assembly showing the construction details, core diameter, net/ gross sectional area of the core assembly etc. provided along with bid or not (in Yes/No).		
70		Volts per turn at principal tap for normal voltage.		

71		The loss curves for type/grade of steel laminations being used for the core provided along with bid or not (in Yes/No).		
Additional Technical Guaranteed Particulars Against TN-1596				
Sr. No.		Particulars	Unit	
1		Whether painting at site is required & provided for.		
2		Maximum out of balance force in windings on short circuit with external reactance zero	MT	
3	i	Magnetizing current & power factor at 110% rated voltage & rated frequency in Amps.	Amp	
	ii	Neutral Unbalanced current	Amp	
4		No load loss at 110% of rated voltage & rated frequency	kw	
5	a	Max. flux density in core/yoke at rated/normal voltage and frequency	Lines / Sq.cm	
	b	Max. flux density in core/yoke at 110% of rated/normal voltage and frequency	Lines/ cm Sq.	
	c	Time capability of the transformer to withstand 110% of normal voltage & frequency		
6		WINDING DETAILS		
	a	Max. current density in winding		
	i	H V Winding (all parts including tapped winding min. tap)	Amps/ sq.mm	
	ii	LV winding	Amps/ sq.mm	
	b	No. of HV coils/phase		
	c	No. of LV coils/phase		
	d	No. of turns/coil (HV)		
	e	No. of turns/coil (LV)		
	f	Weight of HV coil (3)	kg	
	g	Weight of LV coil (3)	kg	
	h	Voltage per coil (HV)	kv	
	i	Voltage per coil (LV)	kv	
	j	Inside dia of HV coil	mm	
	k	outside dia of HV coil	mm	
	l	Inside dia of LV coil	mm	
	m	outside dia of LV coil	mm	
	n	Axil length of coil	mm	
7		Type of Transformer shell or core		

8		Type of Winding		
	a	H V		
	b	L V		
9		Type of axial Coil supports		
10		Type of radial Coil supports		
11		Type of insulation used		
	a	Core Bolts		
	b	Core Washers		
	c	Core laminations		
12		End clearance from top of HT coil to Yokes	mm	
13		Cooling arrangements		
	a	No. of radiators bank		
	b	Size of radiator	mm	
	c	No. of fins	Nos.	
	d	Total Cooling surface		
	i	Tank surface	Sq.mtr.	
	ii	Radiators surface	Sq.mtr.	
	iii	Size of radiators fins (Length,Width etc.)	mm	
	e i	Vertical distance between transformers core & live parts of trfs.		
	ii	Horizontal distance between Radiators.		
14		Material used for gasket		
15		Fittings & parts to be detached for transport		
16		Material & size of relief Outlet diaphragm		
17		Type of tank		
18		Thickness of mild steel plate used in the constructions of tank		
	a	Side walls	mm	
	b	Top cover	mm	
	c	Bottom plate	mm	
19		Type of insulation used		
	a	H V Conductor		
	b	L V Conductor		
	c	L V to core		
	d	L V to H V		
	e	Tappings		
	f	Tapping connections		
20		Section of copper used		
	a	For H V winding	Sq.mm	
	b	For L V winding	Sq.mm	
21		Type terminal arrangement		
22		Grade of core Laminations used		

23		Make & Type of bushing		
	a	H V		
	b	L V		
	c	Neutral		
	d	Creepage distance between HV & LV	mm	
24		Reference No. & voltage class to which the bushing conform		
	a	H V	KV	
	b	L V	KV	
	c	Neutral	KV	

Name of Firm
Signature of Bidder
Designation & Seal
Date

Schedule – VI (A)

JODHPUR VIDYUT VITRAN NIGAM LIMITED
A Govt. of Rajasthan Undertaking
DEPARTURE/DEVIATION FROM TECHNICAL SPECIFICATION

The bidder shall state under this schedule the departure from the Purchaser's specification in respect of technical is as under:-

S.No.	Main Deviations from Technical Specification.
-------	---

Certified that we agree to all the technical specification of the NIT except for the deviation to the extent indicated above.

(Signature)
Name & Designation
with seal of the bidder.

Schedule – VI (B)**JODHPUR VIDYUT VITRAN NIGAM LIMITED****A Govt. of Rajasthan Undertaking****DEPARTURE FROM COMMERCIAL TERMS & CONDITIONS OF THE
SPECIFICATION**

The bidder shall state under this schedule the departure from the Purchaser's specification in respect of Commercial terms & conditions:-

S.No.	Main Deviations from Specification.
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Certified that we agree to all the commercial terms & conditions as laid down in General Conditions of Contract to the specification except for the deviation to the extent indicated above.

(Signature)

Name & Designation
with seal of the bidder.

Schedule – VII**JODHPUR VIDYUT VITRAN NIGAM LIMITED****A Govt. of Rajasthan Undertaking
LIST OF PAST SUPPLIES**

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

S. No.	Detailed particulars of Items supplied	Qty. in Nos.	Order No. & Date	Name & details of purchasing authority	Date of Completion
1	2	3	4	5	6

If executed partially to be mentioned (Qty. in Nos.)	whether still to be executed	Delivery stipulated in order	Remarks
7	8	9	10

Note: Separate schedules are to be furnished by the bidder for past supply to the JDVVNL/AVVNL/JdVVNL, other State Electricity Boards and other Departments /Organisations.

Signature)

Name & Designation with seal of the bidder.

SCHEDULE-VIIA**TN- 1596****TO WHOMSOEVER IT MAY CONCERN**

This is to certify that M/s. _____ (Complete with address) have manufactured and supplied the goods / equipments / material during the following financial year(s) to the Licensed Power Utilities / Government Departments / Discoms/ SEBs as detailed out below:

FOR THE LAST THREE FINANCIAL YEARS FROM THE DATE OF OPENING OF TECHNO-COMMERCIAL BID.

S.No	Financial year in which material supplied	Detailed Particulars of item(s) supplied	Name and particulars of purchasing authority	Order No. & date against which item(s) supplied	Unit	Ordered		Actual Supplied during the financial year		Remarks
						Quantity	Value (Rs)	Quantity	Value (Rs)	
1	2	3	4	5	6	7	8	9	10	11

Signature ,
Name & Designation
With Seal of the Bidder
Date _____
Place _____

Signature of C.A
Name :
Address:
Membership No

The above particulars are true and correct based on explanations, records and books of accounts produced before us. Further the above certificate issued on the request of the company

CA Firm (_____)

Note:- The CA Certificate should be furnished on the letter head of CA and must be signed by the bidder and C.A. firm. The details i.e. address of C.A. & membership No. shall clearly be mentioned on C.A. certificate. In case C.A. certificate is not signed by the bidder/furnished without membership No. & address of C.A. then same may not be considered for which responsibility rests with the bidder.

SCHEDULE-VIII

**JODHPUR VIDYUT VITRAN NIGAM LIMITED
DELIVERY SCHEDULE AGAINST TN- 1596**

PART-A

The delivery schedule of the material by the Purchase Officer is as mentioned hereunder:

Sr. No.	Particulars of Material	Commencement period	Rate of supply per month of delivery of entire material	Period for completion of delivery material
1.	5.00 MVA 33/11 KV Power Transformers	After 60 Days from the date of receipt of detailed Purchase Order.	_____ Nos. per month (to be quoted by tenderer)	Completion in eight months at equal monthly rate excluding commencement period.

PART-B

In case bidder deviates from the delivery schedule mentioned by the purchaser in Part-A then the delivery schedule shall be indicated/mentioned by the bidder as under:-

S.No.	Particulars of Material	Commencement period per Month.	Rate of supply per Month	Period for completion of delivery of entire material

- Note:** 1. During the commencement period the process of model assembly and submission of B.O.M. for approval shall be got completed.
2. During the commencement period the contractual formalities shall be got completed.

Signature

Name & Designation
With seal of the tenderer

Schedule – IX**JODHPUR VIDYUT VITRAN NIGAM LIMITED****A Govt. of Rajasthan Undertaking****List of Equipments and Technical Hands Available with the Firm**

To be filled in by the bidders & enclosed with the bid)

Manufacturers and / or their authorized agents who are quoting against this bid are requested to furnish the following information along-with the bid. The Purchaser will have the discretion to ignore the bid without the under noted particulars and/or ignore the bid particulars.

1.	Name and Address of Manufacturer (with landline Phone No, Mobile No. & Fax No.)	
2.	Official email ID	
3.	GSTIN	
4.	Whether firm is proprietorship/partnership/ Limited (Please give details and also enclose copy of memorandum of constitution of firm along with name of directors/ partners/proprietor & their address.	
5.	Place where works exist (indicate the name of the only one works from where you want to supply the offered material).	
6.	Details of machinery particularly with B.H.P. of each item installed.	
7.	Details of staff employed in the works	
8.	Date when started the manufacturing of item under reference	
9.	List of items manufactured.	
10.	Literature and drawings of items manufactured showing their description, size, design and other important technical particulars	
11.	Details of order so far, executed alongwith the names of organization to whom supplied.	
12.	Manufacturing capacity.	
13.	Is the workshop open for inspection by the representative of the board, if required?	
14.	Statement of financial resources and Banking Reference along with Balance-Sheet for previous two years	
15.	Testing facilities available for the manufactured articles in the testing laboratory of works.	
16.	Whether the Firm is a small/medium/large scale industry.	
17.	Registration No. with :-	
	i. Small Scale, National/State.	
	ii) DGTD	
	iii) State Industries Department	

(Signature)

Name & Designation
with seal of the bidder.

SCHEDULE-X**GENERAL PARTICULARS ABOUT THE TENDER IN BRIEF****JODHPUR VIDYUT VITARAN NIGAM LIMITED****MATERIAL MANAGEMENT CIRCLE****NEW POWER HOUSE, INDUSTRIAL AREA, JODHPUR-342003****Phone: (0291)2742223/Fax: (0291) 2746539/E-Mail-semmcjdvvnl@gmail.com****SPECIFICATION FOR SUPPLY OF 5.00 MVA 33/11 KV POWER TRANSFORMERS UNDER SPECIFICATION NO.JDVVNL/SE(MM&C)/EIAI/TN-1596.**

A	NIT No.	TN- 1596
B	Cost of tender specifications	Rs. 2500.00 + GST@18% = Rs. 2,950.00 (Non -Refundable) (Rs. Two Thousand Nine Hundred Fifty Only) Rs.1475/- (for MSME Units)
C	Processing fee of RISL	Rs. 1000.00 (One Thousand Only) (Non -Refundable)
D	Estimated Tender Value	Rs. 28,68,00,000.00
D	Bid Security to be deposited with the tender	General Bidder: Rs. 57,36,000.00 Sick Unit : Rs. 28,68,000.00 SSI Units of Rajasthan: Rs. 14,34,000.00*
E	Validity	120 days from the next date of opening of techno-commercial bid.
F	Base date for price variation	01.06.2020 (Irrespective of tender opening date)

IMPORTANT DATES

S.N.	Events	Date & Time	Location
1	Date of downloading of tender specifications	Up to 13.07.2020 (06:00 PM)	www.jdvvn.com & http://eproc.rajasthan.gov.in
2	Deposit of cost of Tender Specifications, Processing fee & Earnest Money	Up to 13.07.2020 (4:00 PM)	Office of Sr. A.O (Cash & CPC), JdVVNL , New Power House, Industrial Area, Jodhpur
3	Last Date & time of submission of electronic bid	Up to 14.07.2020 (12:00 NOON)	http://eproc.rajasthan.gov.in
4	Opening of Technical Bid	14.07.2020 (3:00 PM)	http://eproc.rajasthan.gov.in
5	Opening of Price Bid	To be intimated separately to the qualified bidders	http://eproc.rajasthan.gov.in

***In case SSI unit of Rajasthan quotes the less than the tendered quantity , then they are required to furnish Bid security @ 0.5% of the estimated value of the quantity offered by them, failing which bid shall be considered non-responsive.**

The Micro, Small & Medium Scale Industries of Rajasthan and Sick Industries, other than Small Scale Industries, whose cases are pending before the Board of Industrial and Financial Reconstruction (BIFR) shall furnish self attested documentary evidence duly attested by notary to claim the above.

The bid security may be given in the form of banker's cheque or demand draft in favour of Senior Accounts Officer (Cash & CPC), JDVVNL, Jodhpur payable at Jodhpur or bank guarantee, in specified format, of a scheduled bank in favour of

Superintending Engineer (MM&C), JDVVNL, Jodhpur, be deposited to the Sr. Accounts Officer (MM&C), JDVVNL, Jodhpur up to stipulated date & time, and obtain a receipt/acknowledgement thereof. No other mode of deposit shall be accepted.

At the time of depositing the Bid security amount in the office of the Sr. Accounts Officer (MM&C), JDVVNL, Jodhpur, the bidder shall also furnish self-attested documentary evidence duly attested by Notary of SSI unit of Rajasthan and of sick unit and also to submit a letter of quantity offered by them alongwith an Affidavit for MSME unit of Rajasthan in the enclosed format as per Schedule XI is to be furnished on non-judicial stamp paper of Rs.100/- duly attested by Notary public, to the office of Sr. Accounts Officer (MM&C), JDVVNL, Jodhpur. The Bid Security bank guarantee of requisite amount shall be furnished on non-judicial stamp paper of Rajasthan State. Also furnish the undertaking for the CA certificate in the enclosed format as per Annexure-I on non-judicial stamp paper of Rs.100/- duly attested by Notary public alongwith the original / notarised CA certificate as per requirement of tender specifications.

NOTE:-

- 3. Wherever EMD and Security Bank Guarantee (SBG), are appearing in the ITB, GCC & other Bidding Documents, same is hereby replaced by BID SECURITY as above.**
- 4. VENDOR REGISTRATION: The relaxation/exemption given to the registered vendors of the Nigam in respect of EMD/SBG, wherever appearing in the ITB, GCC & other Bidding documents, are hereby WITHDRAWN.**

VERY VERY IMPORTANT

The bids not accompanied with qualification requirement, technical requirement indicated in the specification and other requirement given here under will be considered as incomplete offer and sufficient grounds for offer to be passed over:

1. Capacity, capability and competency proofing documents.
 - a. Capacity/orders of similar and higher rating of tendered equipment booked as on date of bidding with type and rating and construction details of equipment for which order received be indicated.
 - b. Copy of purchase orders of Erstwhile RSEB /SEB`S / Electric Utilities / Govt.
2. Departments / Discom for similar or higher rating equipment latest executed.
3. Year wise past experience for last 5 years of similar or higher rating of tendered equipment.
4. The details of testing facilities available at the works and copies of latest type test certificates, carried out on similar ITEM.
5. Quality assurance plan.
6. Complete guaranteed technical particulars, out lines and general arrangement drawings along with Bill of Material.
7. Bids without Section-I, II, III & Schedules (I to X) shall be rejected.
8. Bids shall be furnished **through online**.
9. JDVVNL has the right to reject any offer on the basis of track record of poor performance in execution of previous order / equipment supplied /after sales service while evaluating the Techno-Commercial bid.
10. JDVVNL reserves the right to accept minor deviations in standard terms and conditions and also in technical and constructional features as specified in the technical specification (**Schedule-III**).
11. Deviation of any kind shall not be quoted in price bid, if found quoted, the same shall be ignored.
12. The following facilities are to be provided by the supplier at his own cost to the inspecting officer of Nigam (JdVVNL):-
 - i. Suitable accommodation.
 - ii. Local conveyance between arrival point, place of stay, works and departure point.
 - iii. The supplier shall assist in arranging return ticket and reservation on the request of the inspecting officer for which the payment shall be made by the inspecting officer. In case of joint inspection, single or shared double room accommodation shall be provided

AMENDMENT IN ITB AND GCC

- 1) **Wherever EMD and Security Bank Guarantee (SBG), are appearing in the ITB, GCC & other Bidding Documents, same is hereby replaced by BID SECURITY as under:-**

BID SECURITY

Bid security shall be 2% **of the estimated value of subject matter of procurement put to bid.** In case of Small Scale Industries of Rajasthan it shall be 0.5% of the **quantity offered** for supply and in case of sick industries, other than Small Scale Industries, whose cases are pending with Board of Industrial and Financial Reconstruction, it shall be 1% of the value of bid. Every bidder, if not exempted, participating in the procurement process shall be required to furnish the bid security as specified in the notice inviting bids.

In case SSI units of Rajasthan quote less than the tendered quantity then they are required to furnish Bid Security @ 0.5% of the estimated value of quantity offered on the basis of estimated unit FOR destination price.

Further, while depositing the bid security amount in the office of Accounts Officer (MM), AVVNL, Ajmer, the bidders shall also furnish a certificate of SSI unit of Rajasthan/ sick unit and also to submit a letter mentioning the quantity offered by them.

The Bid Security amount (as applicable) to be paid by Demand Draft/Banker's Cheque in favour of the Sr. AO (EA & Cash), AVVNL, Ajmer (payable at Ajmer) or Bank Guarantee, in specified format (**Appendix-A**), of a scheduled bank in favour of the Superintending Engineer (MM), AVVNL, Ajmer, be deposited in the office of the Superintending Engineer (MM), AVVNL, Panchsheel, Ajmer-305004 upto 2.00 p.m. upto one WORKING day prior to schedule date of opening of respective bid.

The Micro, Small & Medium Scale Industries of Rajasthan and sick industries, other than Small Scale Industries, whose cases are pending before the Board of Industrial and Financial Reconstruction (BIFR) shall furnish self-attested documentary evidence duly attested by Notary to claim the above.

In lieu of bid security, a bid securing declaration shall be taken from the:-

- (i) Departments/ Boards of the State Government or Central Government;
- (ii) Government Companies as defined in clause (45) of section 2 of the Companies Act, 2013;
- (iii) Company owned or controlled, directly or indirectly, by the Central Government, or by any State Government or Governments, or partly by the Central Government and partly by one or more State Governments which is subject to audit by the Auditor appointed by the Comptroller and Auditor-General of India under sub-section (5) or (7) of section 139 of the Companies Act, 2013; or
- (iv) Autonomous bodies, Registered Societies, Cooperative Societies which are owned or controlled or managed by the State Government or Central Government.

Bid security instrument or cash receipt of bid security or a bid securing declaration shall necessarily accompany the sealed bid.

- 2) **Wherever Performance Bank Guarantee (PBG) and Composite Bank Guarantee (CBG) are appearing in the ITB, GCC & other Bidding Documents, same are hereby replaced by PERFORMANCE SECURITY as under:-**

PERFORMANCE SECURITY

- (i) Performance security shall be solicited from all successful bidders except the department's of the State Government and undertakings, corporations, autonomous bodies, registered societies, co-operative societies which are owned or controlled or managed by the State Government and undertakings of the Central Government. However, a performance security declaration shall be taken from them. The State Government may relax the provision of performance security in particular procurement or any class of procurement.
- (ii) Performance security from the successful bidder shall be taken or may adopt option after approval of purchaser to withheld **5%** (in case of established suppliers)/ **1%** (in case of Micro, Small & Medium scale industries of Rajasthan)/ **2%** (in case of sick industries) / **10%** (in case of other suppliers) amount in lieu of performance security from each bill on pro-rata/ proportionate basis. In case of successful bidder, the amount of bid security may be adjusted in arriving at the amount of the performance security, or refunded if the successful bidder furnishes the full amount of performance security.
- (iii) The Provision regarding performance security shall remain as per rule 75 of RTTP Rules, 2013.

3) VENDOR REGISTRATION

The relaxation/exemption given to the registered vendors of the Nigam in respect of EMD/SBG, wherever appearing in the ITB, GCC & other Bidding documents, are hereby WITHDRAWN.

- 4) **The indirect taxes i.e. Excise Duty, Service Tax, VAT/CST, Entry Tax etc. mentioned in G.C.C., may now be read as G.S.T.**

5) The clause No. 1.43 of General Conditions of Contract has been amended to the extent as under:

- 1.43 Payment shall be due and payable by the purchaser in accordance with the provision of the contract within a reasonable period from the date of receipt of each invoice by the contractor / supplier duly supported by a certificate of the Engineer. The purchaser will take all possible effort to make payment to the contractor/ supplier generally on **45th day** after receipt of duly verified challans/ receipts/ bill in the office of paying authority (Sr. Accounts Officer (CPC)/ Concerned Circle Accounts Officer) and completion of contractual formalities. But in case of delay in payment the purchaser shall not be liable to pay any interest on the outstanding amount to the contractor/supplier.
- 6) The GST will be charge extra at the prevailing rate on all the settlement fees as applicable and amended time to time.
- 7) In case the terms & conditions mentioned in the PO, ITB & GCC are modified/differ from RTTP Act, then RTTP Act shall supersede.

ADDENDUM IN ITB

Addendum in the provision of Instruction to Bidder (ITB) in the clause No. 1.12.2 for quantity allocation as per award criteria of purchase manual in accordance to the clause no. 74 of RTPP rules:

1.12.2 (A) for quantity allocation

(i) Trial order under Para No. 22.17 (a) & (b) of purchase manual

(a) Any bidder located within or outside the state of Rajasthan has participated for the first time in a particular Discom& meeting minimum qualification requirement and has supplied the tendered material/or of higher rating in other utility shall be treated as an old supplier. Rajasthan's firms although supplied in past but not meeting minimum quantity supplied criterion including altogether new units which have not supplied any quantity but having adequate & required manufacturing and testing facility and technical know-how of the tendered material shall be considered as new firms and would be eligible for trial order only. In case supply made to the licensed power utility outside India, the C.A. certificate furnished by the firm shall be considered.

Note:- The material supplied and accepted for same/higher rating for turnkey project (s) to a licensed power utility/Govt. shall be considered for the purpose of evaluating criteria. The certificate given by C.A. shall indicate above quantity separately.

(b) (i) The trial order for a particular item shall not generally exceed 10% of the total quantity considered for placement of order. This ceiling may, however, be relaxed by the corporate level purchase committee up to the extent of 30% to take the advantage of lower price where situation of differential price offering is arising.

(ii) The capacity & capability assessment of a bidder located outside state of Rajasthan who otherwise qualifies but is participating for the first time shall not be carried out.

Similarly, for the tendered item(s) where the valid BIS license is an essential qualification requirement and the bidder possesses the valid BIS but new to the utility. The capacity/capability assessment of such a bidder shall also not be carried out.

(ii) Award criteria under Para No. 10.2 (iii) of purchase manual

(a) In case of distribution transformers of rating 40 KVA and below, LT cables & conductors and fabricated steel items, order quantity may be distributed in the following manner:-

20% to L1

15% to L2

10% to L3

05% to L4

50% to be distributed equally among other firms subject to the condition that not more than 5% of the quantity to be purchased will be allotted to any one of such firms. The balance, if any will be distributed in the same proportion as indicated above among the first four firms.

(b) In case of other items except poles, order quantity may be distributed in the following manner:-

40% to L1

20% to L2

10% to L3

06% to L4

The balance quantity may be equally distributed among other firms subject to the condition that not more than 4% of the quantity to be purchased will be allotted to any one of such firm. The balance, if any will be distributed in the same proportion as indicated above among the first four firms.

(c) In case of poles, the order may be awarded on the basis of landed cost (material and transportation taken together). The allocation of quantity location/destination wise may be made among the eligible firms in equal proportion as far as possible.

APPENDIX-A**Bank Guarantee No.** _____.

Security Amount : _____.

Issued on dated : _____.

Valid upto : _____.

Claim upto / Grace period: _____.

PERFORMA OF BANK GUARANTEE FOR BID SECURITY

(Bank Guarantee in lieu of bid Security on non-judicial Stamp Paper of Rajasthan State of 0.25% of the B.G. value or Rs.25,000/-, whichever is less)

To,

The Superintending Engineer (MM&C),
Jodhpur Vidyut Vitaran Nigam Limited,
Jodhpur.

1. Whereas _____ (name of the Bidder) (hereinafter called "the Bidder") has submitted its bid dated _____ (date of submission of bid) for _____ (name of contract/ name of the material with Bid no. / TN No. _____) (hereinafter called "the Bid").
2. KNOW ALL PEOPLE by these presents that WE _____ (name and address of branch of Bank) of _____ (name of country), having our registered office at _____ (addresses of bank) (hereinafter called "the Bank"), are bound unto _____ (name of Purchaser) (hereinafter called "the Purchaser") in the sum of Rs. * _____ for which payment well and truly to be made to the said Purchaser, the Bank binds itself, its successors, and assigns by these presents sealed with the Common Seal of the said Bank this _____ day of _____ 20____.
3. THE CONDITIONS of this obligation are :
 - i. If the bidder withdraws its Bid during the period of bid validity specified by the Bidder in the Bid Form; or
 - ii. If the bidder refuses to accept the correction of error in his Bid; or
 - iii. If the bidder, having been notified of the acceptance of its Bid by the purchaser during the period of bid validity:
 - a. Fails or refuses to execute the Contract Agreement within the time specified in purchase / work order, if required, or
 - b. Fails or refuses to furnish the performance security within the time specified in purchase / work order in accordance with the GCC, or
 - c. Fails to commence supply of goods or services or execute work as per purchase / work order within time specified.
 - iv. If the bidder breaches any provision of the Code of integrity specified in the RTPP Act and Chapter VI of the RTPP Rules.
4. We undertake unconditionally and irrevocably to guarantee as primary obligator and not as surety merely to pay to the purchaser a sum of Rs. _____ (in words Rs. _____) upon receipt of its first written demand, without the purchaser having to substantiate its demand, provided that in its demand the Purchaser will note that the amount claimed by it is due to it owing to the occurrence of one or all of the three conditions specifying the occurred condition or conditions.

5. The decision of the Superintending Engineer (MM&C), Jodhpur Vidyut Vitaran Nigam Limited, Jodhpur shall be final whether breach has been committed on the right to demand the amount of guarantee from us which has accrued to the purchaser.
6. This guarantee shall not cease or determine, if the purchaser grants time or indulgence or vary the terms of the contract with the Contractor or without our consent or knowledge.
7. The guarantee herein contained shall not be affected by any change in the constitution of the Contractor.
8. We _____ (Bank Name) further undertake not to revoke this guarantee during its currency except with the previous consent of the Superintending Engineer (MM&C), Jodhpur Vidyut Vitaran Nigam Limited, Jodhpur.
9. All disputes arising under the said guarantee between the Bank and the Nigam or between the Contractor and the Nigam pertaining to the guarantee, shall be subject to the jurisdiction of the Courts in Jodhpur, Rajasthan alone.
10. This guarantee will remain in force up to and including one hundred eighty (180) days after the date of the opening of bids, i.e. upto _____, with a further grace period of Ninety (90) days and any demand in respect thereof should reach the Bank not later than the above date.

Yours faithfully,

Bankers (EXECUTANT)

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

Witness :

1. _____.
2. _____.

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

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

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

APPENDIX-B**Format of Affidavit for MSME Unit**

(On Non-Judicial Stamp Paper of Rs. 100/- attested by Notary Public/ First Class Magistrate)

I, _____ S/o _____ Aged ___ Years residing at
 _____ Proprietor/ Partner/ Director of M/s
 _____ do hereby solemnly affirm and declare that:-

- (a) My/ our above noted enterprise M/s _____ has been issued acknowledgement of Entrepreneurial Memorandum Part-II by the District Industries Center, _____. The acknowledgement No. is _____ dated _____ and has been issued for manufacture of following items:-
- (i)
 - (ii)
 - (iii)
 - (iv)
- (b) My/ our above noted acknowledgement of Entrepreneurial Memorandum Part-II has not been cancelled or withdrawn by the Industries Department and that the enterprise is regularly manufacturing the above items.
- (c) My/our enterprise is having all the requisite plant and machinery and is fully equipped to manufacture the above noted items.
- (d) The present status of the firm is as per acknowledgment of Entrepreneurial Memorandum Part-II issued on the date of District Industries Center, _____.

Place

Signature of Proprietor/ Director/
 Authorized Signatory with Stamp and Date

VERIFICATION

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

DEPONENT

Annexure-I**UNDERTAKING FOR CA CERTIFICATE**

(TO BE FURNISHED ON NON-JUDICIAL STAMP WORTH Rs.100/- & DULY NOTARIZED)

I/WE UNDERTAKE THAT THE CA CERTIFICATE SUBMITTED AS PER THE REQUIREMENT OF PRE-QUALIFICATION REQUIREMENTS, FOR ADJUDGING THE PAST SUPPLIES ,UNDER THE SUBJECT TENDER, TN-**1596**, IS CORRECT AND I , UNDERSIGNED WILL BE SOLELY RESPONSIBLE FOR ANY DEVAITION/DISCREPANCY/IN-CORRECT INFORMATION , IF EVER NOTICED IN THE CA CERTIFICATE.

FURHER, IN CASE, IF ANY DEVAITION/DISCREPANCY/IN-CORRECT INFORMATION IS NOTICED IN THE CA CERTIFICATE FURNISHED WITH THE BID, AT ANY STAGE DURING PROCESSING/ CURRENCY OF TENDER, DISCOM CAN TAKE THE ACTION AGAINST THE FIRM M/s _____AS

PER THE RULES & REGULATIONS.

(SIGNATURE)
NAME & DESIGNATION
WITH SEAL OF THE BIDDER.

Annexure 'A'**(SELF ATTESTED UNDERTAKING TO BE GIVEN ON FIRM'S LETTER HEAD)**

We, the undersigned declare that:

1. Our firm, its affiliates of subsidiaries including any subcontractor or suppliers for any part of the contract have not debarred by the state government or the procuring entity or a regulatory authority under any applicable law.
2. We declare that we have complied with and shall continue to comply with the provision of the code of integrity including conflict of interest as specified for bidders in the RTPP Act 2012, RTPP Rules 2013 and the bidding document during the procurement process and execution of contract till completion of all our obligation under contract.
3. I/We possess the necessary professional, technical, financial and managerial resources and competence required by the bidding document issued by the procuring entity.
4. I/We have fulfilled my/ our obligation to pay such of the taxes payable to the Union and the State Government or any local authority as specified in the bidding document.
5. I/We are not insolvent, in receivership, bankrupt or being wound up, not have my/ our affairs administered by a court or a judicial officer, not have my/ our business activities suspended and not the subject of legal proceeding for any of the foregoing reasons.
6. I/We do not have, and our directors and officers not have, been convicted of any criminal offence related to my/ our professional conduct or the making of false statements or misrepresentations as to my/ our qualifications to enter into a procurement contract within a period of three years preceding the commencement of this procurement process, or not have been otherwise disqualified pursuant to debarment proceedings.
7. I/We do not have a conflict of interest as specified in the Act, Rules and the bidding document, which materially affects fair competition.

Firm's Name
Seal & Signature