

**TAMIL NADU POWER DISTRIBUTION CORPORATION
LIMITED
(Erstwhile TANGEDCO)**

**Tender Specification for Supply and Erection of
16 MVA, 33/11 KV Indoor, Cable Box Type Power
Transformers**

Through E-Tendering.

Specification No M.260/2026-27

**OFFICE OF THE CHIEF ENGINEER
MATERIALS MANAGEMENT
144, ANNA SALAI
CHENNAI-600 002
TAMIL NADU.**

E Mail: cemm@tnebnet.org

**Website for online bid submission: <https://tntenders.gov.in>
Service Provider: National Informatics Centre**

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INSTRUCTIONS FOR ONLINE BID SUBMISSION

The bidders are required to submit soft copies of their bids electronically on the TAMILNADU GOVERNMENT E PROCUREMENT Portal, using valid Digital Signature Certificates. The instructions given below are meant to assist the bidders in registering on the TAMILNADU GOVERNMENT E-PROCUREMENT Portal, prepare their bids in accordance with the requirements and submitting their bids online on the TAMILNADU GOVERNMENT E PROCUREMENT Portal. More useful information for submitting online bids on the TAMILNADU GOVERNMENT E-PROCUREMENT Portal may be obtained at: <https://tntenders.gov.in>.

A. REGISTRATION:

Bidders are required to enroll on the e-Procurement module of the Tamil Nadu Government E procurement Portal (URL: <https://tntenders.gov.in>)

- 1) By clicking on the link "**Online bidder Enrollment**" on the TAMILNADU GOVERNMENT E -PROCUREMENT Portal which is free of charge.
- 2) As part of the enrolment process, the bidders will be required to choose a unique username and assign a password for their accounts.
- 3) Bidders are advised to register their valid e-mail address and mobile numbers as Part of the registration process. These would be used for any communication from the TAMILNADU E PROCUREMENT Portal.
- 4) Upon enrollment, the bidders will be required to **register their valid Digital Signature Certificate(DSC)** (Class II or Class III Certificates with signing key usage) issued by any Certifying Authority recognized by CCA India (e.g. Sify /nCode/eMudhra etc.), with their profile.
- 5) Only one valid DSC should be registered by a bidder. Please note that the bidders are responsible to ensure that they do not lend their DSC's to others which may lead to misuse.
- 6) Bidder then logs in to the site through the secured log-in by entering their user ID / password and the password of the DSC / e-Token.

B. SEARCHING FOR TENDER DOCUMENTS:

- 1) There are various search options built-in in the TAMILNADU GOVERNMENT E - PROCUREMENT Portal, to facilitate bidders to search active tenders by several parameters. These parameters could include Tender ID, Organization Name, Location, Date, Value, etc. There is also an option of advanced search for tenders, wherein the bidders may combine a number of search parameters such as Organization Name, Form of Contract, Location, Date, Other keywords etc. to Search for a tender published on the TAMILNADU GOVERNMENT E - PROCUREMENT Portal.

- 2) Once the bidders have selected the tenders they are interested in, they may download the required documents / tender schedules. These tenders can be moved to the respective 'My Tenders' folder. This would enable the TAMILNADU GOVERNMENT E PROCUREMENT Portal to intimate the bidders through SMS / e-mail in case there is any corrigendum issued to the tender documents.
- 3) The bidder should make a note of the unique Tender ID assigned to each tender, in case they want to obtain any clarification / help from the Helpdesk.

C. PREPARATION OF BIDS:

- 1) Bidder should take into account any corrigendum published on the tender document before submitting their bids.
- 2) Please go through the tender advertisement and the tender document carefully to understand the documents required to be submitted as part of the bid. Please note the number of covers in which the bid documents have to be submitted, the number of documents - including the names and content of each of the document that need to be submitted. Any deviations from these may lead to rejection of the bid.
- 3) Bidder, in advance, should get ready the bid documents to be submitted as indicated. In the tender document / schedule and generally, they can be in PDF / XLS / RAR / DWF/JPG formats. Bid documents may be scanned with 100 dpi with Black and White option which helps in reducing size of the scanned document.
- 4) To avoid the time and effort required in uploading the same set of standard documents which are required to be submitted as a part of every bid, a provision of uploading such standard documents (e.g. PAN card copy, annual reports, auditor certificates etc.) has been provided to the bidders. Bidders can use "My Space" or "Other Important Documents" area available to them to upload such documents. These documents may be directly submitted from the "My Space" area while submitting a bid, and need not be uploaded again and again. This will lead to a reduction in the time required for bid submission process.

D. ELECTRONIC SUBMISSION OF BIDS:

The bidder shall submit online the requirements under qualification criteria and technical documents required and SCHEDULE OF PRICE /BOQ vide SCHEDULE-A. All the documents are required to be signed digitally by the bidder. After electronic online bid submission, the system generates a unique bid reference number which is time stamped. This shall be treated as acknowledgment of bid submission.

E. PROCEDURE FOR SUBMISSION OF BIDS:

- 1) Bidder should log - in to the site well in advance for bid submission so that they can upload the bid in time i.e. on or before the bid submission time. Bidder will be responsible for any delay due to other issues.
- 2) The bidder has to digitally sign and upload the required bid documents one by one as indicated in the tender document.
- 3) Bidder has to select the payment option as "online" to pay the tender fee / EMD as applicable and enter details of the instrument.

- i. The online payment Gateway has been enabled for TNPDCCL in TN Tenders portal (www.tntenders.gov.in). All the payments for the tenders like EMD will be carried out by the Bidders only through online payment mode.

Note: As the internet banking process (NEFT/RTGS) may take some time for confirming the receipt of EMD, bidders may planned such a way to pay the EMD accordingly to avoid any delay in bank confirmation. After getting success status of EMD payment only, the bidder can submit the bid.

- ii The EMD amount should be the exact amount and no excess or less amount should be transferred through **online payment gateway**. If excess or short, the tender status will be shown as invalid.

The bidder has to submit the tender document online well in advance before the Prescribed time to avoid any delay or problem during the submission process. If there is any delay, due to other issues, bidder only is responsible.

- 4) Bidder should prepare the EMD as per the instructions specified in the tender Document.

After confirming the EMD paid amount / Exemption uploaded, then only the system will allow to submit the technical and financial bids.

- 5) Bidders are requested to note that they should necessarily submit their financial bids in the format provided and no other format is acceptable. If the price bid has been given as a standard BoQ format with the tender document, then the same is to be downloaded and to be filled by the bidder. Bidders are required to download the BoQ file, open it and complete the white coloured (unprotected) cells with their respective financial quotes and other details (such as name of the bidder etc). No other cells should be changed. Once the details have been completed, the bidder should save it and submit it online, without changing the filename. If the BoQ file is found to be modified by the bidder, the bid will be rejected.

- 6) **The server time (which is displayed on the bidders' dashboard) will be considered as the standard time for referencing the deadlines for submission of the bids by the bidders, opening of bids etc. The bidders should follow this time during bid submission.**
- 7) All the documents being submitted by the bidders would be encrypted using PKI encryption techniques to ensure the secrecy of the data. The data entered cannot be viewed by unauthorized persons until the time of bid opening. The confidentiality of the bids is maintained using the secured Socket Layer 128 bit encryption technology. Data storage encryption of sensitive fields is done. Any bid document that is uploaded to the server is subjected to symmetric encryption using a system generated symmetric key. Further this key is subjected to asymmetric encryption using buyers/bid openers public keys.
- 8) The uploaded bid documents become readable only after the tender opening by the authorized bid openers.
- 9) Upon the successful and timely submission of bids (ie after Clicking "Freeze Bid Submission" in the portal), the portal will give a successful bid submission message & a bid summary will be displayed with the bid no. and the date & time of submission of the bid with all other relevant details.
- 10) The bid summary has to be printed and kept as an acknowledgement of the submission of the bid. This acknowledgement may be used as an entry pass for any bid opening meetings.
- 11) In all cases, bidder should use their own ID and Password along with Digital Signature certificate at the time of submission of their bid.
- 12) During the entire e-tender process, the bidders will remain completely anonymous to one another and also to everybody else.
- 13) The e-tender floor shall remain open from the pre-announced date & time and for as much duration as mentioned above.
- 14) All electronic bids submitted during the e-tender process shall be legally binding on the bidder. Any bid will be considered as the valid bid offered by that bidder and acceptance of the same by the Buyer will form a binding contract between buyer and the Bidder for execution of supply.
- 15) It is mandatory that all the bids are submitted with digital signature certificate otherwise the same will not be accepted by the system.
- 16) TNPDCCL reserves the right to cancel or reject or accept or withdraw or extend the tender in full or in part as the case may be without assigning any reason thereof.

- 17) The server time shall be treated as final and binding. Bids recorded in the server before the bid closing time will only be treated as valid bid. Bidders are therefore, advised to submit their bids well before the closing time of e-tender. If any bid reaches the server after the bid closing time as per server time, the same will not be recorded and no complaint in this regard shall be entertained. The **Tender Inviting Authority (TIA)** will not be held responsible for any sort of delay or the difficulties faced during the submission of bids online by the bidders due to local issues.
- 18) Bidders are advised to exercise caution in quoting their bids in e-tender and E - reverse auction as the case may be to avoid any mistake. Bids once submitted can't be recalled.
- 19) Any order resulting from this bidding process shall be governed by the terms and conditions mentioned in the tender documents.
- 20) No deviation to the technical and commercial terms & conditions are allowed.

F. ASSISTANCE TO BIDDERS:

- 1) Any queries relating to the tender document and the terms and conditions contained therein should be addressed to the Tender Inviting Authority for a tender or the relevant contact person indicated in the tender.
- 2) Any queries relating to the process of online bid submission or queries relating to TAMIL NADU GOVERNMENT E PROCUREMENT Portal in general may be directed to the 24x7 TAMIL NADU GOVERNMENT E PROCUREMENT Portal Help desk.
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TAMIL NADU POWER DISTRIBUTION CORPORATION LTD

Online e-bids are invited from eligible and prospective bidders for the supply and erection of 16 MVA, 33/11 KV Indoor Cable Box Type Power Transformers through e-tender portal of <https://tntenders.gov.in>

1.	Tender Specification No.	:	M.260/2026-27
2.	Name of the work	:	E-tender for supply and erection of 16 MVA, 33/11 KV Indoor Cable Box Type Power Transformers under Rate Contract system.
3.	Quantity	:	32 Nos
4.	Method of Tender	:	E-Tender Two Part System (Part I - Techno – Commercial and Part II - Price bid) through https://tntenders.gov.in
5.	Mode of Payment of Earnest Money Deposit (EMD)		
	(a) Online Payment of EMD	:	Rs.51,22,000/- (Rupees Fifty One Lakh Twenty Two Thousand Only) i) The Online payment Gateway has been enabled for TNPDC in TN Tenders Portal. (www.tntenders.gov.in) All the payments for the tenders like EMD will be carried out by the Bidders only through online payment mode. : ii) The EMD amount should be the exact amount and no excess or less amount should be transferred through online payment gateway. If excess or short, the tender status will be shown as invalid. :
	(b) Electronic Bank Guarantee		Electronic Bank Guarantee (e-BG) for the above amount valid for One year. The e-BG amount should be the exact EMD amount. The bidder has to successfully complete the e-BG work flow process in the tender portal before submission of the bid. Bidders are requested to refer the e-BG user manual available in the tender portal. If the e-BG has been taken less than One year, the bidder has to extend the e-BG validity whenever TNPDC requires an extension of bid validity. The validity of e-BG can be extended by the bidder by requesting the issuing bank using the challan generated in tender portal. Issuing bank upon receiving request from bidders will extend the validity of e-BG and the same will be displayed in tender portal.
	(c) Permanent EMD		PEMD holders of Rs. 1 Crore and above at TNPDC Head quarters held on or after 03.12.2021 are eligible to participate in the tender.

			The bidder shall upload the necessary proof along with an under taking in a Non Judicial Stamp paper of value not less than Rs.500/- as enclosed in ANNEXURE- I(A) .
	(d) SSI Units		SSI units (Micro and small enterprises) located within the State of Tamil Nadu are eligible for exemption of EMD against submission of documents as detailed in Section-I.
6.	URL for online bid submission for e-tender	:	https://tntenders.gov.in
7.	Clarification Start date and time	:	30 .09.2026 @ 11:00 AM
8.	Clarification end date and time	:	09 .10.2026 @ 05:00 PM
9.	E-tender submission start date and time	:	15 .10.2026 @ 11:00 AM
10.	Last date and time for payment of EMD through Online	:	28.10.2026 @ 11:00 AM
11.	E-tender submission end Date & time	:	28 .10.2026 @ 11:00 AM
12.	Date & time of opening of tender electronically	:	29 .10.2026 @ 11:30 AM
13.	Specification at website	:	The tender specification will be placed on TNPDCCL web site (www.tangedco.gov.in) TN Govt. Website (www.tenders.tn.gov.in) and https://tntenders.gov.in The prospective bidders may download the same.
14.	The Documents to be uploaded by Tenderers during e-submission	:	EMD documents, BQR documents, Price Bid (BOQ), Schedules B to H and relevant Annexures, Technical documents and other necessary documents.
15.	Clarification to be sought for from	:	Chief Engineer/Material Management, 4 th Floor, Western Wing, NPKRR Maaligai, 144,Anna Salai, Chennai – 600 002 Email: cemm@tnebnet.org
16.	Place at which tenders will be opened	:	Office of the Superintending Engineer Material Management-III/Schemes, 4th Floor, Eastern Wing, 144,Anna Salai, NPKRR Maaligai, Chennai – 600 002

NOTE : If the due date for opening the tenders happens to be declared holiday, then the tender will be opened on the next working day, for which no prior intimation will be given.

Sd/-
CHIEF ENGINEER/
MATERIALS MANAGEMENT

SPECIFICATION NO. M.260/2026-27**E-TENDER FOR SUPPLY AND ERECTION OF 16 MVA, 33/11 KV INDOOR
CABLE BOX TYPE POWER TRANSFORMERS**

Sl. No.		DESCRIPTION
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2	SECTION – II	BID QUALIFICATION REQUIREMENTS
3	SECTION – III	REJECTION OF TENDERS
4	SECTION – IV	INSTRUCTION TO TENDERERS
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SECTION – I
EARNEST MONEY DEPOSIT

1.0. Tenderer should pay the specified amount towards Earnest Money Deposit as follows :

1.1 Earnest Money Deposit:Rs.51,22,000 Lakhs (Rupees Fifty One Lakh Twenty Two Thousand Only) to be paid through online payment Gateway mode/e-BG.

2.0. Mode of Payment:

a) i) The EMD payment should be made by the Bidders only through the e-Tender portal by online payment. (www.tntenders.gov.in).

ii) The Earnest Money Deposit payment to be made only single payment.

iii) The Earnest Money Deposit should be the exact amount and no excess or less amount should be transferred through online payment mode. If excess or short, the tender status will be shown as invalid

OR

b) The electronic Bank Guarantee (e-BG) **in lieu of EMD for the specified amount**, through e-Tender Portal (www.tntenders.gov.in) with a validity of **One year** as on the date of tender opening. The format is enclosed as **Annexure-I**. The scanned copy of the e-BG shall be uploaded in the EMD document.

The bidder has to successfully complete the e-BG work flow process in the tender portal before submission of the bid. Bidders are requested to refer the e-BG user manual available in the tender portal.

If the e-BG has been taken less than One year, the bidder has to extend the e-BG validity whenever TNPDCCL requires an extension of bid validity.

The validity of e-BG can be extended by the bidder by requesting the issuing bank using the challan generated in tender portal. Issuing bank upon receiving request from bidders will extend the validity of e-BG and the same will be displayed in tender portal.

2.1 If submitting Earnest Money Deposit as PEMD/Udyam(SSSI) (as mentioned in the specification), then select the exempted from EMD payment as "YES". Then upload the EMD exemption documents only in "pdf" files.

2.2 After confirming the EMD paid amount / Exemption uploaded, then only the system /tender portal will allow to submit the technical and financial bids

3.0 PEMD holders of Rs.1 Crore and above with TNPDCCL or Erstwhile TANGEDCO/ Head Quarters account on or after 03.12.2021 **are eligible to participate in this tender.**

Firms who have PEMD in TANGEDCO less than that specified above are not eligible to participate on the basis of the PEMD even for lesser quantity and value. If the tenderer desires to become a Permanent E.M.D. holder, he is advised to deposit the required amount with the TANGEDCO as Permanent E.M.D. well in advance, obtain a certificate from the Financial Controller / Purchase and upload copy of the same along with the tender. PEMD of

TANTRANSCO will not be considered for TNPDC (Erstwhile TANGEDCO) tenders.

- 3.1 Scanned copy of proof of PEMD with an undertaking in a non-judicial stamp paper of value not less than Rs.500/- as per **Annexure-I(A)** shall be uploaded along with the tender and the original undertaking in lieu of PEMD shall be sent to the tender inviting authority within three working days after tender opening.

- 4.0 The EMD will not carry any interest.

- 5.0. **Any other mode of payment of EMD other than online payment/ e-BG/Udyam (SSI) (as mentioned in the specification) will not be accepted and the tenders will be rejected if EMD is not paid in the prescribed manner.**

6.0 EXEMPTION FOR PAYMENT OF EARNEST MONEY DEPOSIT (EMD):

- 6.1 The following categories of Industries are exempted from payment of EMD:

- i) SSI Units located inside the state of Tamil Nadu registered under Udyam portal for the tendered item (clearly mentioning the 5 digit NIC code)
- ii) Departments of the Government of Tamil Nadu.
- iii) Undertakings and Corporations owned by the Government of Tamil Nadu.
- iv) Labour Contract Co-operative Societies of Tamil Nadu
- v) The Tenderers who are having valid Permanent EMD with TNPDC (Erstwhile TANGEDCO).

- 6.2 Micro and small enterprises (SSI units) located **within the state of Tamil Nadu** are exempted from payment of EMD, only against production of **UDYAM** registration and shall upload Udyam Registration Certificate as proof of eligibility for exemption from payment of EMD.

- 6.3 **The SSI Units located outside the state of Tamil Nadu are not eligible for exemption from payment of EMD** even though registered in Udyam portal for tendered items.

- 6.4 Micro / SSI units having provisional registration certificate are not eligible for exemption.

- 6.5 Those tenderers who are exempted (from payment of EMD either against PEMD or SSI units located within state of Tamil Nadu shall upload a scanned copy of the undertaking in the form as per **Annexure-I(A)** to the effect to pay as penalty an amount equivalent to EMD in the event of non-fulfillment or non-observance of any of the conditions stipulated in the contract consequent to such breach of contract. The State Government, Public Sector Undertakings who are exempted from payment of EMD shall also pay as penalty an amount equivalent to the amount fixed as EMD in the event of non-fulfillment or non-observance of any of the conditions stipulated in the contract.

- a) In case of tenderers exempted from payment of EMD, the undertaking in

lieu of EMD shall be uploaded along with the tender.

- b) Tender will be rejected if the undertaking is not signed /authenticated in all pages of undertaking.
- c) Signature of witnesses should be affixed at the end of undertaking along with details of name and address.

The original undertaking shall be sent to the tender in the tender inviting within three working days after tender opening.

- 6.6. The Tenderer is deemed to accept to pay the amount equivalent to EMD immediately when a demand is raised by TNPDCCL against the Tenderer without any demur in the event of the following.
- 1. If he withdraws his tender or backs out after acceptance of the tender or fails to remit the Security Deposit.
 - 2. If he revises any of the terms quoted during the validity period.
 - 3. If he violates any of the conditions of the tender specification.

7.0. Government of India, Ministry of MSME Notification :

- 7.1. Government of India, Ministry of MSME, vide notification No.S.O1364(E) dated 21-03-2025 has notified certain composite criteria for classifying the enterprises as Micro, Small and Medium Enterprises and insisted Udyam registration in Udyam Registration Portal to obtain an e certificate Viz. Udyam Registration certificate calculation of turnover, calculation of investment, Registration of existing Enterprises and Updation and transition period in classification. The above notification may be adhered to by the tenderers and TNPDCCL will adopt the guidelines issued therein in evaluation of bids submitted by the tenderers.

7.2. Composite Criteria:

A composite criteria of investment in Plant and Machinery or equipments and turnover has been specified to classify an enterprises as Micro, Small and Medium. The composite criteria stipulated in the said notification are to be complied by the micro and small industries for claiming EMD exemption and purchase preference.

- 7.3. **Classification of Enterprises:** An enterprise shall be classified as a micro, small or medium enterprises on the basis of the following criteria, namely:
- i) A micro enterprise, where the investment in plant and machinery or equipment does not exceed 2.5 crores rupees and turnover does not exceed 10.0 crores rupees;
 - ii) A small enterprise, where the investment in plant and machinery or equipment does not exceed 25 crores rupees and turnover does not exceed 100 crores rupees; and
 - iii) A medium enterprise, where the investment in plant and machinery or equipment does not exceed 125 crores rupees and turnover does not exceed 500 crores rupees.

Calculation of Turnover: In calculation of turnover of an enterprises, Exports of goods or services or both, shall be excluded while calculating the turnover of any enterprise whether micro, small or medium, for the purposes of classification. However, it is suggested to insist a certificate from Chartered

Accountant, along with the bid from the bidders whose turnover includes export proceeds, for ascertaining the turnover achieved on export of goods or services or both and included in the total turnover.

Calculation of Investment: The Plant and Machinery shall have the same meaning as assigned to the plant and machinery in the Income Tax Rules, 1962 framed under the Income Tax Act, 1961 and shall include all tangible assets (other than land and building, furniture and fittings). The cost of certain items specified in the Explanation I to sub-section (1) of section 7 of the Act shall be excluded from the calculation of the amount of investment in plant and machinery. The investment value in Plant and Machinery for the purpose has to be certified by a Chartered accountant and the same is to be uploaded in the bid in case the bidder claims EMD exemption.

7.3. **Registration of existing enterprises:**

- i. All existing enterprises registered under EM-Part-II or UAM shall register again on the Udyam Registration portal on or after the 1st day of July, 2020.
- ii. All enterprises registered till 30th June, 2020, shall be re-classified in accordance with the said notification.
- iii. The existing enterprises registered prior to 30th June, 2020, shall continue to be valid only for a period up to the 31st day of March, 2021.
- iv. An enterprise registered with any other organisation under the Ministry of Micro, Small and Medium Enterprises shall register itself under Udyam Registration.

Updation and transition period in classification : An enterprise having Udyam Registration Number shall update its information online in the Udyam Registration portal, including the details of the ITR and the GST Return for the previous financial year and such other additional information as may be required, on self declaration basis. In case of an upward change in terms of investment in plant and machinery or equipment or turnover or both, and consequent re-classification, an enterprise will maintain its prevailing status till expiry of one year from the close of the year of registration. In case of reverse-graduation of an enterprise, whether as a result of re-classification or due to actual changes in investment in plant and machinery or equipment or turnover or both, and whether the enterprise is registered under the Act or not, the enterprise will continue in its present category till the closure of the financial year and it will be given the benefit of the changed status only with effect from 1st April of the financial year following the year in which such change took place.

The above notification may be adhered to by the tenderers and TNPDC will adopt the guidelines issued therein in evaluation of bids submitted by the tenderers.

- 8.0. Others viz. Central and other State Government Departments / Undertakings and Corporations other than those in Tamil Nadu shall have to pay Earnest Money Deposit.
- 9.0. The MSME units of Micro and Small category within Tamil Nadu shall upload Photocopy of UDYAM Registration certificate for the tendered item, as a proof of eligibility for exemption from payment of EMD.
- 10.0. The firm registered in Udyam Portal under **Medium Scale** is not eligible for exemption of EMD.
- 11.0. The tenderers shall upload the audited, attested copy of Profit and Loss account/ Balance Sheet and Investment value in Plant and Machinery certified by a Chartered accountant with UDIN along with the proof for exemption from payment of EMD. If the above documents are not furnished along with the proof of exemption of EMD and Undertaking, the tenders will not be evaluated.

12.0 REFUND OF EMD:

- (i) The Earnest Money Deposit paid in online mode by the unsuccessful tenderers will get refunded from the **Common pool Account created by the Finance Department, Government of Tamil Nadu within 24 hours from the date and time of rejection notified in the tender portal.**
- (ii) The Earnest Money Deposit paid in e-BG mode by the unsuccessful tenderers will be returned from the **Common pool Account created by the Finance Department, Government of Tamil Nadu within 24 hours from the date and time of rejection notified in the tender portal to the concerned Bank.**
- (iii) The Earnest Money Deposit will be refunded to the successful tenderer same as above, on receipt of detailed Purchase Order and also after acceptance of Security cum Performance Guarantee.

13.0. The following documents as applicable shall be uploaded by the bidder during submission of Techno-commercial bid for payment of EMD failing which the offer will be SUMMARILY REJECTED:

- i) The proof for payment of EMD/e-Bank Guarantee.
- ii) The proof for PEMD holder along with undertaking.
- iii) The proof of exemption of EMD along with undertaking.

14.0. The Earnest Money Deposit (EMD) furnished by the tenderer will be forfeited after e-tender opening if:

- (a) They withdraw the tender or backs out after acceptance.

- (b) They withdraw the tender before the expiry of validity period stipulated in the Specification or fail to remit the Security Deposit cum performance Guarantee.
- (c) They violate any of the provisions of these regulations contained herein.
- (d) They revise any of the terms quoted during the validity period.
- (e) The documents furnished with the offer is found to be bogus or the documents contain false particulars, the EMD paid by the tenderers will be forfeited in addition to blacklisting them for future tenders/contracts in TNPDC (erstwhile TANGEDCO)/ TANTRANSCO.
- (f) If the tenderer participating with PEMD backs out, an amount equivalent to EMD of this tender will be forfeited.
- (g) In case of any non-fulfillment of or non-observance of any of the conditions stipulated in the contract, the Supplier/Contractor shall pay an equivalent amount to EMD/SD or an amount equal to the actual loss incurred by the Board whichever is less.

**Sd/-
CHIEF ENGINEER/
MATERIALS MANAGEMENT**

SECTION-II

BID QUALIFICATION REQUIREMENTS

The Bidders shall become eligible to bid on satisfying the following “Bid Qualification Requirements” and on production of the required documentary evidences along with the Tender.

- 1) The tenderer should be a manufacturer of Power/Auto Transformers. The Documentary evidence to establish as manufacturer such as Udyam Registration Certificate, ISO certificate as applicable shall be uploaded.
- 2) The tenderer should have successfully manufactured and supplied minimum **8 Nos.** of tendered or higher capacity/higher voltage class Power/Auto transformers along with on-load tap changer arrangement during the preceding ten years as on date of tender opening, to any of the State Electricity Boards/ Govt.(or) Public Power Utilities/ Govt. Generating Companies/ any DISCOMS, either directly or through turnkey contracts. PO copies along with end user certificate towards documentary evidence for satisfactory supply shall be uploaded along with the tender.
- 2(a) Minimum of **8 Nos.** Power/Auto Transformer supplied as above should have been in satisfactory operation for a continuous period of three years. End user certificate **along with date of commissioning of Power Transformers for the above** towards documentary evidence for satisfactory performance of the transformer supplied shall be uploaded along with the tender.
- 3) Type/Special Test Report for tendered (or) higher capacity/voltage class Power Transformer as per Schedule-G & H, issued by the **NABL accredited** CPRI / ERDA / **any other Government approved** / Government recognized laboratory shall be submitted along with the tender. The Type test should have been conducted within 5 years as on the date of tender opening and uploaded along with the tender.

Note: If the type tests/short circuit test conducted on the tendered item is more than 5 years as on the date of opening of tender (or) if the type tests/short circuit test has been conducted on higher capacity/rating, then the tenderer has to conduct the Type tests & short circuit test on the 1st unit free of cost, if purchase order is placed on them and offers of such bidders may be considered subject to uploading of undertaking **in a Non-judicial stamp paper of value not less than Rs.500/-**.

- 4) The Annual Turnover of the bidder shall be more than **Rs.17.07 Crore** during any one of the last three years (i.e.,) 2022-2023, 2023-2024 & 2024-25. Audited financial statements like Profit and loss A/c statement and balance sheet pertaining to above the three years (or) Annual turnover certified by the practicing Chartered Accountant mentioning their **UDIN**, for the above three years are considered as a proof of annual turnover. The Bidder should upload the Annual Turnover details for all the three years.

5) NEW ENTRANT:

The TNPDCCL has right to place order on New entrant(s) upto 60% of tendered quantity provided,

1. (i). A tenderer shall be declared as "New entrant" who has no previous experience of supply for the tendered items or no satisfactory period of service or no financial turnover but have infrastructure/manufacturing facility as per the inspection report of Third party inspection or TNPDCCL or TANTRANSCO Engineers.

(ii). The tenderer who have lesser quantity of supply experience or lesser satisfactory period of service or lesser financial Turn-over criteria than prescribed in the tender document may also be considered under New entrant category.
2. The tenderer is eligible to be considered for placement of orders under New Entrant category if the bidder is the evaluated and negotiated L1 tenderer.
3. The tenderers who have been considered under New Entrant category shall satisfy all technical, commercial and BQR conditions for Manufacturer and Type test except BQR condition of quantity of previous experience of supply (or) satisfactory period of service (or) financial turnover criteria.

Note: For the New Entrants, the type tests & short circuit test for the tendered capacity Power Transformer is necessary. If the type tests/short circuit test conducted on the tendered item is more than 5 years as on the date of opening of tender (or) if the type tests/ short circuit test has been conducted on higher capacity/rating, then the tenderer has to conduct the Type tests & short circuit test on the 1st unit free of cost, if purchase order is placed on them and offers of such bidders may be considered subject to uploading of undertaking.

- a. TNPDCCL have right to place order on New Entrant bidder, who is evaluated L1, for the entire offered quantity,i.e., without any restriction of placing order for 60 % of the tendered quantity. In case more than one L1 new entrant exists having offered for the entire tendered quantity, the quantity allocation among them will be made equally. In other cases the quantity allocation will

be made in proportion to the offered quantity i.e., (Total tendered quantity / sum of offered quantities by more than one L1) x offered quantity of respective L1 New Entrant and the balance quantity will be ordered to all the evaluated L2 Regular tenderers who have matched the L1 rate, based on the Annual Turnover.

NOTE: The offer of the bidders who have stated to be previous suppliers to TNEB/TNPDCL/TNGECL/TNPGCL & TANTRANSCO will be considered for further evaluation, even though they have not enclosed copies of purchase orders or End user certificate etc., after ensuring with concerned purchase orders placing authorities. However, the tenderer has to furnish the Purchase Order No. and Date of Issue along with the details of Purchase Order issuing authority in Schedule-E.

The bidder shall upload documentary evidence for the Bid Qualification Requirements along with the Tender, failing which their offer will be summarily rejected.

The offers of Bidders not satisfying the above "Bid Qualification Requirements" will be summarily rejected.

**Sd/-
CHIEF ENGINEER/
MATERIALS MANAGEMENT**

SECTION – III
REJECTION OF TENDERS

- I. Tenders will be **SUMMARILY** rejected if;
- a. The EMD requirements are not complied with.
 - b. If the bids are received through Consortium or Joint venture, the same will not be considered and the bids will be rejected. Tenders received from Agents/Dealers will not be considered.
 - c. The Bid Qualification Requirements (**BQR**) as per **Section-II** of this Specification are not satisfied.
 - d. Not providing documentary evidence in support of Bid Qualification Requirements.
 - e. If it is found that there is no adequate infrastructure facilities to carry out manufacturing activities of tendered material during the factory inspection carried out by TNPDCI, in case of new entrants.
 - f. The offer of bidder who have quoted a quantity lesser than the minimum quantity prescribed in **clause 5.4 under section IV** of the specification.
 - g. The documents furnished with the offer are found to be bogus or the documents contains any false particulars, the EMD paid by the tenderer will be forfeited in addition to blacklisting them for future tenders in TNPDCI/TNGECL/TNPGCL/TANTRANSCO.
 - h. The BOQ (Price bid) file is found to be modified by the bidder.
- II. Tender is **LIABLE** to be rejected, if it is:
- a. Not covering the entire scope of supply of materials.
 - b. **If the declaration as specified in Schedule D is not signed and enclosed.**
 - c. With validity period offered is less than that stipulated in this specification.
 - d. Not in conformity with TNPDCI's Commercial terms and Technical Specifications (**Section – V & VI**).
 - e. Received from a tenderer who is directly or indirectly connected with Government service or Board Service or services of local authority.
 - f. From any black listed Firm or Contractor.
 - g. Received by Telex / Telegram / E-Mail/ Fax.
 - h. From a tenderer whose past performance / Vendor rating is not satisfactory.
 - i. Not containing all required particulars as per Schedule **A to I**.
 - j. Questionnaire as per **Schedule-I** is not duly filled up and properly signed by the tenderer.
 - k. The offer of bidders who have not furnished the GSTIN Number.

SECTION – IV

INSTRUCTION TO TENDERERS.

- 1.1 The tender is in **Two Part System** with (i). Technical Bid with Commercial terms & conditions and (ii). Price Bid (BOQ). All the tenders shall be prepared and uploaded strictly in accordance with the instructions set forth herein.
- 1.2 The Tamil Nadu Transparency in Tender Act 1998 and the Tamil Nadu Transparency in Tender Rules 2000 and subsequent amendments thereof are applicable to this tender.
- 1.3 **THE TENDERERS WHO DO NOT FULLFILL THE "BID QUALIFICATION REQUIREMENT" AS PER SECTION-II NEED NOT PARTICIPATE IN THE TENDER. OFFERS NOT SATISFYING THIS "BID QUALIFICATION REQUIREMENTS" WILL NOT BE CONSIDERED AND WILL BE SUMMARILY REJECTED.**
- 1.4 All the documents submitted by the tenderer shall be serially numbered.

2.0. SCOPE OF SUPPLY :

- 2.1 The scope of supply of the material (described in Schedule-A) includes design, engineering, manufacture, inspection, testing, packing, forwarding, transit cum storage insurance for 90 days and delivery of the power transformer detailed herein, at TNPDCCL substation site ie., un-loading on the plinth or nearer to the plinth in case the plinth is not ready as decided by the site Engineer, anywhere in Tamil Nadu, erection at site and assisting in testing and commissioning.
- 2.2 The quantity indicated in schedule of requirement is approximate. The quantity finally ordered may vary to the extent of 25 % either way of the approximate quantity indicated in the Schedule of requirement. The purchaser reserves the right to issue any number of indents for supply of materials during the rate contract period.

3.0. SUBMISSION OF TENDER OFFER:

- 3.1 The tenderer is expected to examine all instructions, Schedules and Annexures detailed in the Specification and submit the Schedule of Prices and other required particulars in the Schedules and Annexures called for in this Specification, only as per the formats prescribed herein.
- 3.2 **TWO PART E-TENDER:**
 1. The e-tender shall have Techno-Commercial Bid and Financial Bid.
 2. Techno-Commercial Bid shall contain Technical Bid with Commercial Terms (i.e.) BQR document and other documents (PAN, GSTIN, ESI, EPF etc.,) called for in this specification except Price Schedule.

3. Financial Bid shall contain the Financial Bid (BOQ format).
4. The Tenderers are requested to quote price & HSN code only in the BOQ template available in the e-tender. The bidder shall download the same and upload after filling relevant columns. The BOQ template should not be modified/ replaced by the bidder, else the bid is summarily to be rejected. Bidders are allowed to enter the Bidder Name and rates only.

4.0 QUESTIONNAIRE FILLING:

A Questionnaire is appended as Schedule-I —Questionnaire in this specification for Bid Qualification Requirements, Commercial and Technical details. It is obligatory on the part of the tenderer to furnish all details as per the "Questionnaire". In case, this is not filled up and signed at the bottom of each page of the questionnaire and enclosed with the offer, the Bid will be liable for rejection.

5.0. SUBMISSION OF TENDERS: -

- 5.1 The Tender Offer consisting of **Schedules- B to I** should be filled up and signed by the Tenderer or any person holding Power of Attorney authorizing him to sign on behalf of the Tenderer before submission of the Tender. The date of signature should invariably be indicated. The tender shall contain the name, residence and place of business of person or persons submitting the tender. The price bid format (BOQ) uploaded with the tender document shall be filled and uploaded.
- 5.2. In the event of tender being submitted by other than a firm, it must be signed by a partner (copy of partnership deed should be enclosed) and in the event of the absence of any Partner, it shall be signed on his behalf by a person holding a Power of Attorney agnetizing him to do so, Certified copies of which shall be enclosed.
- 5.3. Tender submitted on behalf of companies registered under the Indian Companies Act, shall be signed by person duly agnetizin to submit the tender on behalf of the company and shall be accompanied by certified true copies of the resolutions, extracts of the Articles of Association, special or general Power of Attorney etc. to show clearly the title, authority and designation of persons signing the tender on behalf of the company.
- 5.4. **The tenderer shall quote not less than 10% of the tendered quantity. The offer of the bidders who have quoted for lesser quantity than the minimum quantity prescribed above shall be summarily rejected.**
- 5.5. The tenderer should furnish the GSTIN numbers in the offer.
- 5.6. Bidders are not required to sign in each page of the tender specification. Instead bidders are required to sign a declaration document as specified in Annexure-VII of the specification.

6.0. Modifications / Clarifications to Tender Documents:

- 6.1. At any time after the commencement of e-Tender and before the closing of the event, TNPDCCL may make any changes, modifications or amendments to the tender documents and same will be intimated to the concerned Vendors through corrigendum which can be downloaded from the Vendor login.
- 6.2. In case any tenderer asks for a clarification to the tender documents before 48 hours of opening of tenders, the Chief Engineer /Material Management / TNPDCCL/ Chennai-2 will clarify the same.
- 6.3. If any tenderer raises clarifications after the opening of the tender, the clarified reply issued by the Chief Engineer/Material Management, TNPDCCL, Chennai- 600 002 on the clarifications will be final and binding on the Tender.
- 6.4. All tender offers shall be prepared by typing or printing in the formats enclosed with this specification.
- 6.5. All information in the tender offer shall be in ENGLISH only. It shall not contain interlineations, erasures or overwriting except as necessary to correct errors made by the tenderer. Such erasures or other changes in the tender documents shall be attested by the persons signing the tender offer.

7.0. QUOTATION OF RATES:

- 7.1. Rates should be quoted in the BoQ only (Price schedule in TN tender portal)
- 7.2. Offers giving lump sum price, without giving their breakup as per details required in the attached Price **Schedule-A** (BoQ) shall be liable for rejection.

8.0. PRINTED TERMS AND CONDITIONS IN TENDERS:

Bidder's printed terms and conditions will not be considered as forming part of the tender under any circumstances.

9.0. INCOMPLETE TENDERS:

Tender, which is incomplete, obscure or irregular is liable for rejection.

10.0. AMBIGUITIES IN CONDITIONS OF TENDERS:

In the case of ambiguous or contradictory terms / conditions mentioned in the bid, interpretation as may be advantageous to the purchaser may be taken without any reference to the Tenderer.

11.0 DISQUALIFICATION OF TENDERS:

- 11.1. The tender offer shall contain full information asked for in the accompanying schedules and elsewhere in the specification.
- 11.2. Tenderers shall bear all costs associated with the participation in the e-Tender and the **purchaser** will in no case be responsible or liable for these costs.
- 11.3. No offer shall be withdrawn by the Tenderer in the interval between the deadline for submission and the expiry of the period of validity specified / extended validity of the tender offer.

- 11.4. Attempt by any tenderer to bring to bear extraneous pressure on the Tender Accepting Authority shall be sufficient reason to disqualify the tender as per Rule 27 (3) of Tamil Nadu Transparency in Tenders Rules 2000.
- 11.5. **Only Manufacturers must quote.** If the bids are received through Consortium, the same will not be considered and the bids will be rejected.
- 11.6 The Tenderers are requested to furnish the exact location of their factories with detailed postal address and pin code, contact person, Phone, Mobile, Fax Nos. etc. in their tenders so as to arrange inspection by the TNPDC, if considered necessary.

12.0. DESTINATIONS-WHERE MATERIALS ARE REQUIRED:

The prices quoted should be on FOR Destination basis for delivery anywhere in Tamil Nadu.

13.0. TENDER OPENING:

13.1 OPENING OF COMMERCIAL & TECHNICAL BIDS WITHOUT PRICE: (PART –I)

The Tender offers except price Bid will be **opened electronically on the date & time notified, at the Office of the Superintending Engineer / Material Management-III, 4th Floor, Eastern Wing, NPKRR Maaligai, 144, Anna Salai, Chennai-600002, through <https://tntenders.gov.in>.**

- 13.2 If the opening date happens to be a holiday, the tenders will be opened on the succeeding working day without any changes in the timings indicated.
- 13.3. In all cases, the amount of bid security and validity of the bid shall be scrutinized. Thereafter, the bidder's name and such other details as the Tender Inviting Authority may consider appropriate, will be recorded as bid opening summary and the same will be uploaded on the e-procurement portal.
- 13.4. **OPENING OF THE PRICE BIDS : (PART –II)**
The date and time of opening of Price Bids shall be later notified through tender portal to the Bidders who full fill the BQR criteria and whose bids are found to be commercially and technically acceptable.

14.0. INFORMATION REQUIRED AND CLARIFICATIONS:

- 14.1. In the process of examination, evaluation and comparison of tender offers, the TNPDC may at its discretion, ask the Tenderer for a clarification of his offers. All responses to requests for clarifications shall be in writing to the point only. No change in the price or substance of the offer shall be permitted.
- 14.2. The TNPDC will examine the tender offers to determine whether they are complete, whether any computational errors have been made, whether required sureties have been furnished, whether the documents have been properly signed and whether the offers are generally in order.

- 14.3. Prior to the detailed evaluation, the TNPDCCL will determine the substantial responsiveness of each offer to the Bidding Documents.
- 14.4. The Tender offers shall be deemed to be under consideration immediately after they are opened and until such time official intimation of award / rejection is made by the Tender Accepting Authority to the tenderers. **The Tenderers shall not make attempts to establish unsolicited and unauthorized contact with the Tender Inviting Authority, Tender Accepting Authority or Tender Scrutiny Committee after the opening of the tender and prior to the notification of the award and any attempt by any tenderers to bring to bear extraneous pressures on the Tender Accepting Authority shall be sufficient reason to disqualify the tenderer.**
- 14.5. After acceptance of the tender by the Tender Accepting Authority, the details will be arranged to be published in the Tender Bulletin of Tamil Nadu Government.
- 14.6. Mere submission of any Tender offer connected with these documents and Specification shall not constitute any agreement. The tenderer shall have no cause of action or claim, against the TNPDCCL for rejection of his offer. The TNPDCCL shall always be at liberty to reject or accept any offer or offers at its sole discretion and any such action will not be called into question and the Tenderer shall have no claim in that regard against the TNPDCCL.

15.0. EVALUATION AND COMPARISON OF THE TENDER OFFERS:

- 15.1. The tenders will be evaluated strictly as per the Tamil Nadu Transparency in Tenders Act, 1998 and the Tamil Nadu Transparency in Tender Rules, 2000 and its subsequent amendments till date.
- 15.2. The tender offers received will be examined to determine whether they are in complete shape, all required Data have been furnished, properly signed and generally in order and conforms to all the terms and conditions of the Specification without any deviation.
- 15.3. For the purpose of evaluation of tender offers, the following factors will be taken into account for arriving the evaluated price:
 - a) The quoted price will be corrected for arithmetical errors.
 - b) In case of discrepancy between the price quoted in words and figures lowest of the two will be considered.
 - c) The rate of CGST, SGST and IGST as applicable both in percentage and amount shall be indicated in the offer along with HSN code.
 - d) The evaluated price shall be arrived in compliance with the provisions of GST on the Transaction value ie. (Ex works price + P&F +Freight and Insurance) + GST. In case of import of goods would be treated as interstate supplies and would be subject to IGST in addition to applicable Customs duty.
 - e) Since GST is enacted wherein all taxes & duties are subsumed price evaluation shall be inclusive of applicable GST in all cases , i.e. even if the bidders are only within the state or bidders are within the state and outside TN.
 - f) The bidders should have registered under GST Act and furnish GSTIN.

g) In the event of bidder is within TN, SGST & CGST shall apply and if the bidder is outside TN, IGST shall apply.'

- 15.4. The rates quoted by the eligible lowest tenderer in the open tender shall be compared with the prevailing market rate and the rates of previous period and if the Tender Accepting Authority is of the view that the quoted rates are too high, the rates will be negotiated and the rate will be determined. All eligible bidders who accept the rate shall be enlisted.

In the event of L1 bidder offered a quantity less than the tendered quantity, the quantity allocation will be made as per the provisions specified in the Tamil Nadu Transparency in Tender rules 2000.

Tie breaker:

When more than one bidder have quoted same value during bid submission and accepted in Finance Evaluation, Evaluator is allowed to select any one combination of bidder value (i.e.the L1 bidder) to initiate for Financial bid resubmission for Tie break.

Online negotiation:

Provision to go for on line negotiation has been provided for the Tender Evaluator. The online negotiation process in the portal is similar to the process for negotiation under tie breaker process. However, financial rebid submission can be invited from only one bidder.

- 15.6. As per the provisions of Tamil Nadu Transparency in Tender Rules 2000, the bidder should not alter the quantity offered in the bid during price negotiation/ matching.
- 15.7. No changes, amendments which materially alter the tendered prices shall be permitted after the opening of the tender, except as per the procedure prescribed in sub-section (3) of section 10 of the Act the Tamil Nadu Transparency in Tender ACT 1998.
- 15.8. The TNPDCCL also reserves the right to allocate the quantity is as per Cl. No. 31.4 of Tamil Nadu Transparency in Tender rules, 2000.

16.0. PURCHASE PREFERENCE:

- 16.1. Purchase preference may be extended to the Domestic enterprises, Government departments, Public Sector Undertakings, Statutory Boards and other similar institutions and to Scheduled Caste and Scheduled Tribes as per the provisions in 30-A, 30-B & 30-C of Tamil Nadu Transparency in Tender Rules 2000.

16.2. PURCHASE PREFERENCE TO DOMESTIC ENTERPRISES :

In case of procurement of goods or services, where it is possible for the procuring entity to divide the award of tenders to more than one supplier or service provider, the tender document shall clearly indicate that up to **twenty five percent** of the total requirement in the procurement may be awarded to domestic enterprise, not being the lowest tender, in respect of only goods

manufactured or produced or services provided or rendered by them, if the following conditions are satisfied-

- (a) the lowest tender is not a domestic enterprise;
- (b) the preferential award shall extend only to the lowest tender among the domestic enterprises who are substantially responsive and technically qualified; and
- © Such domestic enterprise is willing to match the price of the lowest tender:

Provided that where the Tender Inviting Authority is of the view that in the interest of the participation of domestic enterprise in the tender to avail the above benefit, a less stringent set of technical qualification parameters are required, he shall specify a separate set of technical qualifications for domestic enterprises in the tender documents with the approval of the Government.

16.3 **PURCHASE PREFERENCE TO GOVERNMENT DEPARTMENTS, PUBLIC SECTOR UNDERTAKINGS, STATUTORY BOARDS AND OTHER SIMILAR INSTITUTIONS:**

In case of procurement of goods or services, where it is possible for the procuring entity to divide the award of tenders to more than one supplier or service provider, the tender document shall clearly indicate that up to **forty percentage** of the total requirement in the procurement may be awarded to Government departments, Public Sector Undertakings, Statutory Boards and other similar institutions as may be notified by the Government, in respect of only of goods manufactured or produced or services provided or rendered by them, if such tenderer is willing to match the price of the lowest tender."

16.4 **PURCHASE PREFERENCE TO SCHEDULED CASTE AND SCHEDULED TRIBES:**

In case of procurement of goods, services, where it is possible for the procuring entity to divide the award of tenders to more than one supplier or service provider, the tender document shall indicate that **Five Percent** of the total requirement shall be awarded to enterprises owned by persons belonging to the Scheduled Castes or Scheduled Tribes in respect of only of the goods manufactured or service rendered by it, if the following conditions are satisfied, namely:

- (a) the lowest tenderer is not in enterprise owned by persons belonging to the Scheduled Castes or Scheduled Tribes and
- (b) such enterprises are willing to match the price of the lowest tenderer.

In order to claim purchase preference for domestic enterprises belonging to Scheduled Castes and Scheduled Tribes, the supporting documents necessary to evidence the same in respect of each type of domestic enterprise owned by SC/ST are specified below.

In case of such domestic enterprise been a sole proprietary firm having registered in Udyam portal located within Tamil Nadu, Udyam Registration

Certificate contains the social category of enterprise. However, in order to ensure that no change in social category of enterprise has happened consequent of having registered in Udyam portal, an undertaking from the sole proprietor may be insisted as per Annexure-XVI (a)

In case of such domestic enterprise is partnership firm been registered in Udyam portal, social category of enterprise can be ascertained from the community certificate of not less than three-fourths of the partners belong to the Scheduled Castes or Scheduled Tribes along with copy of registered partnership deed. However, a certificate from chartered accountant may also be obtained certifying that no change in social category of enterprise has happened consequent of the said registered partnership deed as per Annexure-XVI (b).

In case domestic enterprise is a company having its registered office and place of business in the State, a certificate from practicing company secretary as per Annexure-XVI © may be obtained certifying that more than fifty per cent of the ordinary shareholdings pertain to persons belonging to the Scheduled Castes or Scheduled Tribes and the control of the company, as defined in section 2 (27) of the Companies Act, 2013 (Central Act 18 of 2013) vests with persons belonging to the Scheduled Castes or Scheduled Tribes and the same is duly confirmed for the purpose of submission of bid against the provisions of tender specification No.

Note: "Scheduled Castes" and "Scheduled Tribes" shall have the meanings assigned to them respectively under clauses (24) and (25) of Articles 366 of the Constitution. "State" means the State of "Tamil Nadu".

17.0. VALIDITY:

- 17.1. Tender offer shall be kept valid for acceptance for period of **90 days** from the date of opening of offers. The offers with lower validity period are liable for rejection.
- 17.2. Further, the tenderer shall agree to extend the validity of the Bids without altering the substance and prices of their Bid for further periods, if any, required by the TNPDCCL.
- 17.3. **The rejected bidders shall furnish a consent stating that they are accepting for revocation of rejection by the TNPDCCL within the validity period, if insisted.**

18.0. RIGHTS OF THE TNPDCCL:

18.1. Rights to reject the tenders:

- 18.1.1. After negotiation with the Tenderer and before passing the order accepting a tender, if the Tender Accepting Authority decides that the price quoted by such tenderer is higher by the percentage as may be prescribed over the schedule of rates or prevailing market rates, the tender shall be rejected.
- 18.1.2. The Tender Accepting Authority before passing the order accepting a tender, may also reject all the tenders for the reasons such as changes in the scope

of procurement, lack of anticipated financial resources, court orders, accidents or calamities and other unforeseen circumstances.

18.2. Notwithstanding anything contained in this Specification, the TNPDCCL reserves the rights:

- (a) to vary the quantity finally ordered to the extent of 25% either way of the quantity indicated in the Tender document, as the quantity indicated in the schedule of requirement is approximate.
- (b) to split the Tendered Quantity and place orders on one or more than one firm as per the Tamil Nadu Transparency in Tender Rules 2000 since the tendered material is so vital in nature and the failure in supply would affect the public interest.
- (c) to recover losses, if any, sustained by TNPDCCL, from the supplier who pleads his inability to supply and backs out of his obligation after award of contract. The security deposit paid shall, be forfeited.
- (d) to cancel the orders for not keeping up the delivery schedule
- (e) to vary the delivery period based on the requirement and contingencies at the time of placing of order.
- (f) to accept the lowest eligible tender.
- (g) to reject any or all the tenders or cancel without assigning any reasons therefore.
- (h) to relax or waive or amend any of the conditions stipulated in the tender Specification wherever deemed necessary in the best interest of the TNPDCCL.
- (i) To cancel the order along with the forfeiture of EMD if SD cum Performance guarantee is not furnished within **30 days** from the date of receipt of PO. In that event, the award may be made to subsequent L2 tenderer. The belated payment of Security Deposit shall not be accepted.

18.3. The purchaser reserves the right to request for any additional information and also reserves the right to reject or accept the proposal of any tenderer, if in the opinion of the purchaser, the qualification data is incomplete or in the opinion of the TNPDCCL the bidder is found not qualified to satisfactorily perform the contract.

19.0. LOSSES:

19.1 The maximum losses (without positive tolerance) shall not exceed the limit as follows:

No load loss	:	10.0KW(max)
Load loss	:	58.0KW (max)
Auxiliary loss	:	1.0KW (max)

19.2 Offers with losses higher than the maximum losses specified will be rejected and their price bids will not be opened.

19.3 If the losses exceeds the guaranteed losses during routine test at the supplier's works, the TNPDCCL has the right to reject the unit or to cancel the

order placed on them. If the figures of the losses are less than the guaranteed values, then no bonus will be allowed.

19.4 TNPDCCL reserves the right to conduct tests to determine the losses on one or more units at its cost. The vendor shall provide all assistance to conduct the above tests.

19.5 Apart from 19.3 & 19.4, one unit of ordered Power transformer selected at the discretion of TNPDCCL shall be tested for measuring No-load and Load losses by CPRI or any other Govt. recognized High Voltage testing laboratory as decided by TNPDCCL.

19.6 If the losses are found to be higher than the guaranteed values, necessary compensation charges (for excess over losses) shall be levied as per the following Capitalisation formula for Transformer Losses (CBIP,2006 edition) :

Capitalized Cost = IC+3,44,904W_{id} + 1,40,721 W_{cd} + 1,37,961W_{ad}

Where IC = Quoted Ex-works price of the transformer

W_{id} = Differential No load loss in KW (Maximum)

W_{cd} = Differential Load loss in KW (Maximum)

W_{ad} = Differential Auxiliary loss in KW (Maximum)

The compensation shall also be applicable to the units supplied prior to the selected unit by TNPDCCL for which loss measurement test conducted by CPRI or Govt. recognized laboratory and to the subsequent units, even if all the test results are within specified limits in respect of those units. The arrangements connected towards testing shall be made by the supplier and recouped from TNPDCCL on actuals, if the losses are proved to be within the guaranteed limits. (Applicable for the Power Transformers supplied after award of contract only.)

20.0 DEVIATIONS:

20.1 The offers of the Tenderers with Deviations in Commercial terms and Technical Terms of the Tender Document are liable for rejection. Such deviations if any may be furnished in the **Schedule – C1 & C2.**

20.2 No alternate offer will be accepted.

21.0. BAR OF JURISDICTION:

Save as otherwise provided in the Tamil Nadu Transparency in Tenders Act 1998, taken by any officer or authority under this Act shall be called in question in any court, and no injunction shall be granted by any court in respect of any action taken or to be taken by such officer or authority in pursuance of any power conferred by or under this Act.

22.0. APPEAL:

Any Tenderer aggrieved by the order passed by the Tender Accepting Authority under Section-10 of the Tamil Nadu Transparency in Tenders Act

1998 may appeal to the Government within 10 (Ten) days from the date of receipt of order.

23.0. TENDER DOCUMENT:

"All the intending e-tenderers are informed that in the event of the documents furnished with the offer being found to be bogus or the documents contain false particulars, the EMD paid by such tenderers will be forfeited in addition to blacklisting them for future tenders / contracts in TNPDC" and also cancelling the award of contract issued to them."

SECTION – V **COMMERCIAL**

1.0 SCOPE:

The scope of supply of the material (described in Schedule-A) includes design, engineering, manufacture, inspection, testing, packing, forwarding, transit cum storage insurance for 90 days and delivery of the power transformer detailed herein, at our substation site ie., un-loading on the plinth or nearer to the plinth in case the plinth is not ready as decided by the site Engineer, anywhere in Tamil Nadu, erection at site and assisting in testing and commissioning.

2.0 PERIOD OF CONTRACT:

The period of contract is **24 Months** from the date of receipt of contract.

3.0 DETAILS OF CONSTITUTION OF FIRM:

The tenderers shall furnish documentary evidence for the constitution of the firm such as Memorandum and Articles of Association, Partnership Deed etc. with details of Name, Address, Telephone, FAX Nos. E-Mail, Electricity Board Service Connection No., etc. of the manufacturing plants.

4.0 LEGAL STATUS OF THE FIRM:

The tenderer should furnish necessary document evidencing their legal status of the firm along with their offer.

5.0 DETAILS OF PURCHASE ORDERS ALREADY EXECUTED:

The tenderers shall furnish documentary evidence with details of various Purchase Orders placed on them by other State Electricity Boards/Power Utilities/Central/State Public Sector etc., and executed during the last **ten years** as on date of tender in the **Schedule-E**.

6.0. PLACING OF ORDERS ON RATE CONTRACT BASIS :

- 6.1 It is not binding on the TNPDCCL to accept the lowest or any tender. The TNPDCCL reserves the right to split and place orders for the items with different tenderers and for revising the quantities at the time of placing the orders for sustained supply. The TNPDCCL reserves the right to vary the quantity finally ordered to the extent of 25% either way of the requirement indicated in the tender documents.
- 6.2 i. The award of contract will be issued to the successful tenderer with all TNPDCCL's terms and conditions, duly indicating the final negotiated approved and accepted unit price (without updated unit rates) subject to the following,
 - a. In the event of increase in raw material cost (as per Price Variation formula), the Purchase Order will be issued duly indicating the final negotiated approved and accepted unit price (without updated unit rates).
 - b. In the event of decrease in raw material cost, the unit rate will be updated (as per Price Variation formula) and Purchase Order will issued.

- ii. The approved rates will be VARIABLE based on the IEEMA Price Variation formula with no ceiling on the price as per the issue of purchase order and valid for two years from the date of receipt of the contract.
- 6.3. During the period of the contract, the TNPDCCL will send indent to the contractor indicating the quantity to be supplied and the delivery schedule according to TNPDCCL's requirement. The quantity proposed to be ordered will be indicated in the purchase order and is only tentative.

7.0. PRICE:

- 7.1 The tenderers are requested to quote variable price for Transformer & OLTC and FIRM price for freight charges, transit insurance and erection, valid from the date of issue of purchase order until completion of contract.
- 7.2 Split- up details of the all- inclusive price should be furnished as below without fail.
- i. The base prices of the materials / components are those as prevailing on the month prior to the date of tender opening, as per IEEMA's circular. The Unit Price for supply of goods shall remain valid during the entire period of 24 months from the date of award of contract.
 - ii. Unit ex-works price variable as per IEEMA's price variation formula/circular issued from time to time/enclosed with no ceiling on **upward and downward**.
 - iii. The award of contract will be issued to the successful tenderer with all TNPDCCL's terms and conditions, duly indicating the final negotiated approved and accepted unit price (without updated unit rates) subject to the following,
 - (a) In the event of increase in raw material cost (as per Price Variation formula), the Purchase Order will be issued duly indicating the final negotiated approved and accepted unit price (without updated unit rates).
 - (b) In the event of decrease in raw material cost, the unit rate will be updated (as per Price Variation formula) and Purchase Order will issued.
 - iv. GST if any payable in percentage and amount.
 - v. Freight, Insurance and all other charges for delivery at any destination in Tamil Nadu is FIRM price.
 - vi. The above breakup details should be clearly indicated in the BoQ, in the absence of which the offer shall be liable for rejection.
 - vii. It is the responsibility of the tenderer to make sure about the correct rates of duty/tax leviable on the materials at the time of tendering. If the rates assumed by the Tenderers are less than the current rates prevailing at the time of tendering, the TNPDCCL Ltd will not be responsible for the mistake.⁷
- 7.3 The price shall be for delivering and erecting the complete equipment and all its accessories at TNPDCCL substation (on the plinth), anywhere in Tamil Nadu. The price shall include charges towards freight, packing and forwarding and storage insurance for 90 days and unloading the transformer and accessories at site (on the plinth). The transformer oil required for first filling includes wastages during processing at site.

- 7.4 The erection charges shall be for erecting the complete equipment with all its accessories fit for commissioning.
- 7.5 Prices and rates quoted shall include the cost of all materials, labour, supervision, crafts, tools, equipments and plants, agnetizin and agnetizing , fuels, lubricants, fixtures, setting and transport duty and taxes on raw materials bought out items if any, royalties, octroi, temporary and permanent works, local taxes, levies if any etc., and other costs those are not specifically mentioned herein but will be incurred by the tenderers for the satisfactory and timely completion of the works.
- 7.6 **The price variation payable only on Ex-works price with no ceiling limit on either ways on the price** as per the issuance of perusal letter for draft purchase order, as per IEEMA formulae indicated in Annexure- IV.
- 7.7 The claims of verification in prices on account of changes in the indices of materials and labour shall be examined and approved by the consignee Superintending Engineer on receipt of all documents in support of their claim. The price variation claim shall be forwarded for verification even if there is no claim for price increase. A copy of the price variation approval shall be sent to CE/MM.
- 7.8 For the delayed supply, the price variation as per IEEMA's formula will be worked out for the actual date of delivery, scheduled date of delivery and the date of testing whichever is less and advantageous to the TNPDCCL will be allowed.
- 7.9 The type tests and routine tests as specified shall be conducted FREE of cost.
- 7.10 TNPDCCL reserves the right to revise the prices downward at any time if there is reduction in the prices of the raw materials.
- 7.11 **INPUT TAX CREDIT :**
- 7.11.1. **The benefit of Input Tax Credit (ITC) if any availed by the bidder shall be passed on to TNPDCCL.** Necessary GST ITC undertaking as per **ANNEXURE-VI** shall be submitted by the L1 tenderer after evaluation for compliance with section 171 of GST Act by the bidder.
- 7.11.2. In the event of eligible evaluated bidders submitting the declaration as NIL ITC benefit, a certificate from Chartered Accountant has to be submitted certifying the same since the bidder may be ignorant of provisions of GST Act.
- 7.11.3. As per Letter No. CFC/GI/FC/TAXATION/AAO/F.GSTZEN/D.143/2023 dated 25.04.2023, TNPDCCL cannot avail input tax credit from suppliers whose turnover exceeds Rs.10 crores without an e-invoice or e-invoiced debit note or e-invoiced credit note. E-Invoice is a system in which B2B invoices are authenticated electronically by GSTN for further use on the common GST

portal. Under the electronic invoicing system, an identification number will be issued against every invoice by the Invoice Registration Portal (IRP) to be managed by the GST Network (GSTN).

The bidders having annual turnover exceeding Rs.10 crores shall claim payment by raising e invoice only.

7.12. PERMANENT ACCOUNT NUMBER AND GSTIN NUMBER:

The Tenderer shall indicate the Permanent Account No. in **Schedule 'I'** of the specification and should enclose the details of PAN issued by Government of India, Income Tax Department and **GSTIN number** of the firm with proof with the tender.

8.0. GOODS AND SERVICES TAX [GST]:

- 8.1. i. Goods and Services Tax [GST] as a modern law, has been brought after Article 366(12A) of the Constitution as amended by 101st Constitutional Amendment Act, 2016. GST is an indirect tax system, commonly used by both the Central Government and the State/UT to final consumption with credit of taxes paid at previous stages available as set off. In a nutshell, only value addition will be taxed and burden of tax Governments on goods and services. GST is a destination based tax on consumption of goods and services. It is proposed to be levied at all stages right from manufacture up to be borne by the final consumer. GST has been rolled out w.e.f. 01.07.2017, across India.
- ii. The GST to be levied by the Centre on intra-State supply of goods and /or services would be called the Central GST (CGST) and that to be levied by the States/ Union territory would be called the State GST (SGST)/ UTGST. Similarly, Integrated GST (IGST) will be levied and administered by Centre on every inter-state supply of goods and services.
- iii. Any supplier of goods and service Provider of services who makes a taxable supply with an aggregate turnover of over Rs.20 lakhs in a financial year is required to obtain GST registration. In special category states, the aggregate turnover criteria are set at Rs.10 lakhs. In simple words every business whose taxable supply of goods or services under GST (Goods and Service Tax) and whose turnover exceeds the threshold limit of Rs. 20 lakhs / 10 Lakhs as applicable will be required to register as a normal taxable person.

iv. GST Registration Number:

TNPDCL has migrated into GST regime on 15.06.2017 by duly uploading various mandatory data as required by the GST portal. The provisional ID issued to TNPDCL is 33AADCT4784E1ZC. The details are also posted in TNPDCL web portal.

- v. GST Registration Number or GSTIN is 15 Digit identification number which is allotted to each applicant who applied for GST Registration. GST Number is completely based on the Pan Number and State code. First two digits represent the state code and another 10 digit represent the PAN number of the client, one digit represent the entity code (Like proprietorship or partnership etc), one digit is blank and last one is representing check digit.

- vi. **Transaction Value:** The value of supply of goods or services or both shall be the transaction value, which is the price actually paid or payable for the said supply of goods or services or both where the supplier and the recipient of the supply are not related and the price is the sole consideration for the supply. Sec 15(1) states that value of supply of goods and service shall be the transaction value i.e. the price actually paid or payable.
- The conditions for accepting the transaction value are –
- a) Supplier and the recipient of the supply are not related.
 - b) Price is the sole consideration for the supply.
- vii. **Composition Scheme:** Composition scheme specifies that registered person whose turnover in the preceding financial year is below certain specified limit (Currently RS.75 lakhs) may intimate the proper officer to pay in lieu of tax payable by him an amount calculated at such rate may be specified. Eligibility for composition scheme: Sec.10(2) of the central Goods and Services Tax Act, 2017 states that the registered person shall be eligible to opt under sub- section (1), if-
- He is not engaged in the supply of services other than supplies referred to in clause (b) of paragraph 6 of Schedule II;
 - He is not engaged in making any supply of goods which are not leviable to tax under this Act;
 - He is not engaged in making any inter-State outward supplies of goods;
 - He is not engaged in making any supply of goods through an electronic commerce operator who is required to collect tax at source under section 52; and
 - He is not a manufacturer of such goods as may be notified by the Government on the recommendations of the Council.
- viii. **SUPPLY OF SERVICE AND GOODS :**When there is a combined supply of many goods / services, it has to be determined whether it is a Composite supply or mixed supply of goods or services
- ix. **COMPOSITE SUPPLY:** A composite supply is one where all the goods or services or a combination has to be supplied together i.e., naturally bundled and there would be a Principal Supply that could be identified (Ex. Supply of Machinery with packaging, insurance and freight – the principal supply is machinery). In this case, the rate of principal supply will be applied on entire value.
- x. **MIXED SUPPLY:** A mixed supply is one where the goods or services or a combination thereof which could be individually supplied (like Pizza and Coke) but sold together at a single price. In this case, the highest rate to the good in that mix is applied on all the goods. The GST shall be applicable at appropriate prevailing rates as notified by GST Act. In the event of delay in execution of contract, the GST rate prevailing on the scheduled period or on the actual date of execution, whichever is less only will be admitted.

The bidders should have registered under GST Act and furnish GSTIN. In the event of Supplier/contractor is within TN, SGST & CGST shall apply and if the supplier/contractor is outside TN, IGST shall apply.

- 8.2. The Goods and Services Tax will be paid extra as applicable. The amount of CGST, SGST, and IGST as applicable shall be indicated in percentage payable and amount separately in the tender offer.

- 8.3. The TNPDCCL has been registered as a dealer under GST Act 2017 (Registration No. 33AADCT4784E1ZC)

In case of delayed delivery, the GST prevailing on the date of despatch or on the last day of the contractual delivery period whichever is LESS will be admitted. For both the cases, the supplier shall furnish documentary evidence while submitting the bills for payment.

It is the responsibility of the tenderer to make sure about the correct rates of duty leviable on the material at the time of tendering. If the rates assumed by the Tenderer are less than the current rates prevailing at the time of tendering, the TNPDCCL Ltd will not be responsible for the mistake. If the rates assumed by the tenderer are higher than the current rates prevailing at the time of tendering, the GST prevailing at the time of tendering will only be paid.

- 8.4. Any Variation in GST due to statutory Variation within the contract delivery date shall be considered by the TNPDCCL Ltd.

- 8.5. In case of delayed delivery, the GST prevailed on the date of actual delivery applicable or the date of contractual date of delivery whichever is less shall be admitted.

- 8.6. **GSTR-2A** of TNPDCCL will be verified to ensure the remittance of GST to Govt., by the supplier in respect of this PO. If the GST remitted by the supplier is found lesser than that claimed from TNPDCCL, the excess GST paid by TNPDCCL will be recovered from the supplier, duly adhering regular procedures. The supplier is requested to file the GST returns promptly to avoid delay in processing/payment of invoices. In case of non-filing of GSTR1 by supplier, the SD, EMD and other payments, if any, due to the supplier may be withheld.

8.7 **E-Invoice:**

The suppliers / contractors, whose annual turnover exceeds Rs.5 crores, to raise e invoices, so that TNPDCCL could avail Input Tax Credit under GST. E-Invoice is a system in which B2B invoices are authenticated electronically by GSTN for further use on the common GST portal.

Under the electronic invoicing system, an identification number will be issued against every invoice by the Invoice Registration Portal (IRP) to be managed by the GST Network (GSTN).

8.8 **GST – E-Way Bill:**

The Government of TamilNadu had notified that e-way bill is required to be generated for intra-state movement (within the state of TamilNadu) for consignment value exceeding Rs.1,00,000 with effect from 2nd June 2018. It may kindly be noted that E-Way bill on interstate movement of goods had been introduced with effect from 1st April 2018 and is required to be

generated for movement of goods having consignment value exceeding Rs.50,000. (please refer webpage portal <http://ewaybillgst.gov.in>. for procedure and generation of E-way bill).

8.9. TDS under GST as per Section 51 of the CGST Act, 2017: -

The Central Government vide Notification No.50/2018 dated 13th September 2018 has notified 1st day of October, 2018 as the date from which the provisions of Tax Deducted at Source (TDS) under GST as per Section 51 of the CGST Act, 2017 shall come into force.

Accordingly, Tax at the rate of 2% (i.e. CGST 1% and SGST 1%) or (IGST 2%) will be deducted from the payment made or credited to the supplier (i.e. deductee) of taxable goods or services or both from the invoices raised by the suppliers or service providers.

The Standard Operating Procedure (SOP) issued by CBIC is available in [www.cbic.gov.in/resources/htdocs-cbec/gst/28092018 SOP_ON_TDS.pdf](http://www.cbic.gov.in/resources/htdocs-cbec/gst/28092018_SOP_ON_TDS.pdf) which can be referred to for further clarification.

8.10. GST on Forfeiture of Security Deposit: -

GST @18% shall be applicable on forfeiture of Security Deposit (SD) and shall be recovered additionally from the Supplier/Contractor.

8.11. Releasing GST portion to Suppliers / Contractors :-

The guidelines for releasing GST portion is attached as **Annexure- XIV**

8.12. Provision of Section -194Q of IT Act :

1. Any person, being a buyer, who is responsible for paying any sum to any resident for purchase of goods of value (or) aggregate value exceeding Rs.50 lakhs in any previous year, shall, at the time of credit of such sum to the account of the seller (or) at the time of payment, whichever is earlier, shall deduct an amount equal to 0.1% of such sum exceeding Rs.50 Lakhs as TDS under Section-194Q of IT Act. The supplier of goods is required to furnish the PAN to TNPDCI for making the payment. In case the suppliers do not have PAN, TNPDCI is required to deduct tax at higher rate as per the provisions of section 206AA. In case of specified person i.e., Any person who has not filed Income Tax return for two previous years immediately before the previous year in which TDS is required to be deducted and the time limit for filing of income tax return u/s 139(1) of the Income Tax Act, 1961 has expired provided the total TDS & TCS in INR is Rs.50,000 (or) more in each of the two previous years the TDS rate u/s 194Q will apply at higher rate u/s.206AB.
2. The provisions of this section shall not apply to the transactions on which tax is deductible under any other provisions of the Income Tax Act 1961 and also on the transactions in which Tax is collectible under the provisions of Section 206C.
3. On purchase of goods/materials, TNPDCI shall have the primary and foremost obligation to deduct Tax at source and no tax shall be collected on such transaction u/s.206C(1H). TDS u/s 194Q is also applicable on the Advance paid for purchase of goods.

4. The above provisions comes into effect from 01.07.2021 onwards and hence no TCS under Section 206C(1H) has to be paid by TNPDCCL on purchase of Goods. Accordingly, TNPDCCL will deduct TDS under section 194Q on all the purchase of goods exceeding the threshold limit i.e. aggregate credit (or) payment exceeds Rs.50 Lakhs. It is mandatory for vendor to submit the declaration format in **Annexure XIV** to determine the applicability of TDS rate u/s 206 AB.
5. In case any procurement of goods/materials are made by TNPDCCL from overseas supplier and the payment is not taxable to the overseas supplier in India, the TDS under section 194Q will not apply.

9.0. FREIGHT & INSURANCE:

The tenderer shall quote Freight and Insurance component separately which shall be kept firm during the contract period. Contracting firms shall arrange to pay Freight & Insurance for the equipment and all its accessories being supplied by them, through any of the carriers and Nationalised Insurance Companies. The equipment shall be insured to cover transport (from Warehouse) and 90 days storage risk at site. It will be the responsibility of the supplier to replace the defective/damaged materials and make good the shortages and other losses in transit, free of cost, lodge and recover claim from insurance Under writers/Carriers.

10.0. PACKING, FORWARDING AND ERECTION:

- 10.1 The equipment and all its accessories shall be securely packed and despatched, freight paid, duly insured, at supplier's risk and cost. The packing may be in accordance with the manufacturer's standard practice. The supplier is responsible for ascertaining the facilities that exist for Road Transport to site. Each package shall be clearly marked and contain detailed packing list, such as gross weight, net weight etc. The supplier is solely responsible for any loss or damage during transport. The dispatch of materials shall be made only after the approval of test certificates by the TNPDCCL.

- 10.2 The scope shall include:

- (a) Supply of the transformer at TNPDCCL substation/ site anywhere in Tamil Nadu including unloading the transformer on the plinth or if the plinth is not ready the transformer shall be unloaded adjacent to plinth/any other site as decided by the site engineer. The accessories shall be unloaded at site.
- (b) Erection of the transformer at the substation/ site and assisting in testing and commissioning. Testing will be done by the purchaser in the presence of the supplier at TNPDCCL's cost.
- (c) Erection of the Transformer at Substation site by supplying, laying all the control cable required for all the protection/ necessary schemes for the successful testing and commissioning.

- (d) Supply, lay, erect and weld the M.S.flat and M.S.Channels for earthing the transformer with the earth pit and shall be present during testing and commissioning.
- 10.3 The despatch of materials shall be made only after the approval of test certificates by the TNPDCCL for the materials concerned.
 - 10.4 The supplier shall be responsible for any damage to the equipment during transit due to improper and inadequate packing.
 - 10.5 Only packages constructed out of sound material and of dimensions proportional to the size and weight of contents shall be used.
 - 10.6 Loose material eg. Bolts, Nuts etc., shall be packed in gunny bags and sealed in polythene bags with proper tagging.
 - 10.7 Components containing glass fragile materials shall be carefully covered with shock absorbing protective material such as expanded polystyrene (Thermocole).
 - 10.8 All openings in the equipment shall be tightly covered, plugged or capped to prevent foreign material from entering.
 - 10.9 In the case of large and bulk equipment, the vendor shall be responsible for ascertaining transport limitations and supply the equipment in the minimum number of components or sub-assemblies, within the frame work of transport limitations.
 - 10.10 Wherever necessary, proper arrangements for attaching slings for lifting shall be provided.
 - 10.11 The contents of the packages shall be sealed in thick polythene sheets and all the inside walls of the packages shall be lined with waterproof paper to protect the equipment from damage due to dust and moisture.
 - 10.12 All equipment shall be protected for the entire period of Dispatch, storage and erection against corrosion, incidental damage due to vermin, sunlight, rain, high temperature, humid atmosphere, rough handling in transit and storage in the open including possible delays in transit.
 - 10.13 Silicagel or approved equivalent moisture absorbing material in small cotton bags shall be placed and tied at various points on the equipment, wherever necessary.
 - 10.14 Adequate provision of skids or pellets shall be made to keep the packages above the collecting drainage. Crates and other large containers should have drain holes in the bottom to prevent collection of water within the packing.
 - 10.15 Each crate or package shall contain a packing list, in a waterproof envelope. Copies of the packing list, in triplicate, shall be forwarded to the consignee

prior to despatch. All items of material shall be clearly marked for easy identification against the packing list.

- 10.16 All spare parts shall be packed and treated for long storage conditions at site.
- 10.17 Any material found short inside the intact packing cases shall be supplied by the SUPPLIER at no extra cost to the PURCHASER, including transportation upto stores/site.
- 10.18 All packing cover and packing material shall become the property of the PURCHASER.
- 10.19 All packages shall be clearly, legibly and durably marked with uniform block letters (preferably with waterproof paint) on at least three sides with:
 - a) Destination address as communicated
 - b) Purchase order reference
 - c) Dimensions
 - d) Net and Gross Weights
 - e) Sign showing 'Side Up'
 - f) Sign showing 'fragile' marks in case of delicate equipment
 - g) Sign showing slinging and sling position
 - h) Any handling and unpacking instructions, if considered necessary.

11.0. DELIVERY :

- 11.1 The scope of the delivery shall cover the following:
 - (a) Delivering the complete equipment and accessories from the date of receipt of purchase order upto delivering at our substation site including un-loading on the plinth or nearer to the plinth if plinth is not ready, as decided by the field engineer.
 - (b) The erection of the transformer from the date of handing over of site/plinth upto intimation for readiness for testing, by the contractor.
- 11.2 The delivery schedule is as follows:

(A) SUPPLY:

- (i) Commencement : To commence with two units within 3 months from the date of receipt of purchase order.
- (ii) Balance Quantities: The indents for the balance quantity will be given by the Chief Engineer/Materials Management at least 60 days in advance, duly indicating the due date of delivery. (i.e) at the time of issuing indents the quantity allocation and delivery period will be approximately indicated so as to enable the bidder to supply the material within the said delivery period.

- iii) The vendor shall indicate the minimum and maximum number of units that can be supplied by them every month.

(B) ERECTION:

- (i) The erection work shall be completed for each transformer supplied within one month from the date of handing over of site/plinth.
 - (ii) Delivery Schedule required against this tender is furnished in SCHEDULE (B).
- 11.3 a) The tentative requirement of the TNPDCCL is 2 units per month. However the Chief Engineer/Materials Management reserves the right to revise this delivery schedule on either way depending on the actual requirement at the time of placing of purchase order and to take up the erection work of the transformer departmentally at the option of the TNPDCCL.
- b) Indents for subsequent quantities shall be based on the requirement, timeliness of supply by the bidder (s) and feedback on performance on the units supplied by the vendor, from the field.
- 11.4 It is the responsibility of the supplier to give advance information on inspection, despatch of materials and other obligations under the terms and conditions of this specification in order to deliver the unit within the contractual delivery period.
- 11.5 The delivery period will not normally be extended. Hence all efforts shall be taken to deliver the materials within contractual delivery period.
- 11.6 If any delivery period is indicated, then the tender is liable for rejection.
- 11.7 The above delivery shall be guaranteed under liquidated damages clause governed by Clause No.15 of the specification.
- 11.8 The date of receipt of last component of the main equipment will be reckoned as the date of delivery for the purpose of calculation of liquidated damages for delay in delivery, when the main equipment and accessories are received in piece-meal.
- 11.9 E-Way Bill is an electronic document to be generated to cover movement of goods more than Rs.1,00,000 and such generation needs to be done in e way bill portal. Consequently, transporters of goods are required to carry an e way bill under GST provisions for the movement of such goods. The value of goods shall be the value declared in an invoice, a bill of supply or a delivery challan and also includes the Central tax, State or Union territory tax, Integrated tax and cess charged, if any. But it will not include value of freight charges for the movement charged by the transporter.

11.10 QUANTITY ALLOCATION:

At the time of issuing indent for supply of materials, TNPDCCL reserves the right to allocate the quantity after ensuring the manufacturing capacity,

ability to supply, quantity offered and past performance.

- 11.11 The quantities mentioned in this specification are only tentative. The purchaser reserves the right to revise the quantities at the time of placing the orders, to the extent of 25% either way of the requirement indicated in the tender document as per the Tamil Nadu Transparency in Tenders Act 1998 and the Tamil Nadu Transparency in tender rules 2000 and subsequent amendments thereof as applicable to this Tender.

12.0. PAYMENT:

- 12.1 Payments will not be made for equipments /materials damaged during transit. All defective materials shall be replaced by the supplier on free of charge/cost.

- 12.2 The payment for the supplies will be made by e-payment /cheque on any one of the Nationalised Banks / Scheduled Banks approved by Reserve Bank of India in Tamil Nadu based on the dispatch instruction. The Bank charges involved in making the payment will be to the account of the Supplier. The supplier has to furnish the following details of the Bank account to which the payment be credited.

- i. Name of the Account Holder
- ii. Name of the Bank
- iii. Name of the Branch
- iv. Account No.
- v. IFSC code of the Branch

(a) For the Supply WITHIN DELIVERY PERIOD

- (i) 95% of the all inclusive price of the equipment/materials including GST will be paid within reasonable time after receipt of materials in good condition at site and submission of bills with required documents. 95% PVC (price variation claim on ex-works) including GST will be paid within reasonable time after completion of entire supply of individual unit and submission of bills with required documents.
- (ii) Balance 5% of the all inclusive price of the equipment / materials and PVC including GST will be paid within reasonable time after commissioning of supplied unit and submission of required documents, after recovery of dues, if any.

(b) For the Erection WITHIN DELIVERY PERIOD

- (i) 95% of the all inclusive value of erection charges with GST will be released within reasonable time after commissioning.
- (ii) Balance 5% of the all inclusive price of erection charges with GST will be released within reasonable time from the date of satisfactory commissioning.

(c) For the Supply BEYOND DELIVERY PERIOD

- (i) 95% of the all inclusive price of the equipment/materials including GST after deducting the appropriate amount of liquidated damages of each consignment will be paid within reasonable time after receipt of materials in good condition and submission of bills with required

documents. 95% PVC on ex-works with GST will be released within reasonable time from the date of receipt of equipment at site and submission of bills with required documents.

- (ii) Balance 5% of the all inclusive price of the equipment/ materials and PVC including GST will be paid after commissioning of the supplied unit and within reasonable time on closure of the purchase order, after recovery of dues, if any.

(d) For the Erection BEYOND DELIVERY PERIOD

- (i) 95% of the all inclusive value of erection charges with GST after deducting the appropriate amount of liquidated damages will be released within reasonable time on commissioning.

- (ii) Balance 5% of the all inclusive price of erection charges with GST will be released after commissioning of the unit and within reasonable time on closure of P.O., after recovery of dues, if any.

12.3. For the delayed payments, if any, TNPDCCL will not pay any interest on any account.

12.4(a) If the unit is supplied within contractual delivery, the date of final inspection and testing will be taken as the date of delivery for the purpose of price variation calculation only. In case the testing is postponed due to non-readiness, whichever is less on the date of readiness reported or actual date of final inspection, will be taken as the date of delivery for the purpose of Price variation calculation, if the unit is supplied within contractual delivery.

12.4(b) For the delayed supply, the price variation as per IEEMA's formula will be worked out for the actual date of delivery, scheduled date of delivery and the date of testing whichever is less and advantageous to the TNPDCCL will be allowed.

12.5 In case of delay in supply beyond the contractual delivery period, the materials will be accepted subject to the following conditions.

- (a) Payment will be restricted to the FOR(D) rates of the purchase order (or) FOR(D) rates of the recent purchase order/FOR(D) rates of the lowest offers recently opened if PO not yet issued whichever is less, subject to levy of liquidated damage for belated supplies.
- (b) TNPDCCL reserves the right to accept or reject the delayed supplies without assigning any reason there for and take action as per the other terms and conditions of this specification.

12.6. In case of decrease in PVC, the same will be adjusted in the initial payment itself.

12.7. Payments will not be made for materials damaged during transit. All defective materials shall be replaced by the contractor free of charge. Payments will not be made unless test certificates are approved by the purchaser.

12.8. The bills for payment will be passed only after the approval/acceptance of the following:

12.8.1 Acceptance / Approval of PO issuing Authority (CE/MM)

- (a) Security Deposit cum Performance Guarantee for 5% value of the order.
- (b) GST Registration Certificate.
- (c) Undertaking towards jurisdiction for legal proceedings
- (d) Guarantee Certificate for the ordered quantity
- (e) Undertaking towards Inpu© ©ax credit benefit passed on to TNPDCCL
- (f) Test Certificate furnished along with offer for supply /Inspection reports after carrying out inspection for the offered quantity of material.

12.8.2 Acceptance of Bill Passing Authority.: (SE / EDCs or CDCs)

- (a) Invoices/Bills
- (b) Guarantee Certificate for the supplied materials against DI issued by CE/MM
- (c) e-way bill as per GST norms for the transport of material against DI issued by CE/MM

12.9. The supplier should give a schedule of despatches one month prior to the actual date of despatch and should despatch only after getting approval from the CE/MM for such despatches.

12.10. The supplier should despatch only after getting despatch instruction. If the supplier despatches the materials without the prior approval of the purchaser, then the purchaser shall not be responsible for any demurrage or wharfage or both and only the supplier should bear any expenditure arising out of such unapproved despatches.

12.11 The tenderers are requested to contact CFC/General/TNPDCCL in regard to the release of payment.

13.0. SECURITY DEPOSIT CUM PERFORMANCE GUARANTEE :-

The successful tenderer will have to pay the Security Deposit cum Performance Guarantee as detailed below:

13.1. The successful tenderer/ Supplier will have to furnish 5% of the Purchase order value (All incl. price) as Security Deposit cum Performance Guarantee after deducting paid EMD amount. In case of EMD exemption availed/furnished BG towards EMD, 5% of the purchase order value to be remitted in the form of Electronic Mode (NEFT/RTGS) of Payment or DD / Banker's Cheque / Irrevocable Bank'guarantee within 30 days from the date of receipt of Purchase order. If the successful tenderer / supplier fails to remit the amount / furnish the Security Deposit cum Performance Guarantee within the above stipulated time, the EMD paid by the tenderer / supplier shall be forfeited and Purchase Order will be cancelled without any further reference and order will be placed on the next eligible bidder.

- 13.2. Bank Guarantee should be a single irrevocable Bank Guarantee **for a continuous period of 60 months from the anticipated date of successful commissioning of last Power Transformer.** In case of delay in supply, the Guarantee should be extended suitably.
- 13.3. The Security Deposit cum Performance Guarantee will not carry any interest.
- 13.4. The Security Deposit Cum Performance Guarantee shall be valid for a period of 60 months from the date of receipt of materials at site. In case of delay in supply, the security deposit cum performance bank Guarantee should be extended suitably to cover the guarantee period for its validity without break in period till the completion of Project/guarantee. The Security Deposit Cum Performance Bank Guarantee will be released on expiry of guarantee period after ensuring that defects/damages during the guarantee periods are rectified/replaced.
- 13.5. The Security Deposit Cum Performance Bank Guarantee will be refunded to the supplier only if the contract is completed to the satisfaction of the purchaser. If the purchaser incurs any loss or damages on account of breach of any of the clauses or any other amount arising out of the contract becomes payable by the supplier to the purchaser, then the purchaser will in addition to such other dues that he shall have under the law, appropriate the whole or part of the security deposit cum performance bank guarantee and such amount that is appropriated will not be refunded to the supplier.
- 13.6. The successful tenderers, who is having Permanent EMD backs out from the payment of security deposit, an equivalent amount of EMD shall be forfeited from their PEMD amount.**
- 13.7. The Security Cum Performance Guarantee shall guarantee the following:
- (a) Satisfactory operation of the power transformer.
 - (b) The equipment supplied is free from all defects in design, material and workmanship.
 - (c) The supplier shall repair/replace the power transformer that become defective under normal use within the guarantee period specified in the specification.
 - (d) The validity period of the above bank guarantee should be extended suitably to cover the additional guarantee period in case of repairing of defects/ failures within guarantee period as per the guarantee clause. For non-compliance of the above, the purchaser has the right to invoke the above bank guarantees.
- 13.8. In case of the requirement arising for extension of the Bank Guarantee, the extended Bank Guarantee shall have to be submitted to TNPDC within the date of expiry of the existing Bank Guarantee. In case of failure to submit such extended Bank Guarantee within the due date (expiry date), TNPDC shall invoke the Bank Guarantee by addressing the Bank directly.

14.0 LOSS OR DAMAGE :

- 14.1 External damages and/or shortages that are prima facie, the results of rough handling in transit or due to defective packing will be intimated within one month from the date of receipt of the materials at site. Internal defects, damages or shortages of integral parts which cannot ordinarily be detected on a superficial visual examination, though due to bad handling in transit or defective packing, would be intimated within 2 months from the date of receipt of materials. In either case, the defective materials shall be replaced/rectified by the supplier, free of cost as per Clause 18.
- 14.2 If during the period of supply, it is found that goods already supplied are defective in material or workmanship or do not conform to specification or are unsuitable for the purpose for which they are purchased, then it will be open to the purchaser either to reject the goods or repudiate the entire contract and claim such loss that the purchaser may suffer on that account or require the supplier to replace the defective goods, free of cost.
- 14.3 Similarly, if during the guarantee period any of the goods found to be defective in materials or workmanship or do not conform to specification, it will be open to the purchaser either to repudiate the entire contract and claim damages or accept such parts of the goods that are satisfactory and require the supplier to replace the balance or to claim compensation for the entire loss sustained by the purchaser on that account.
- 14.4 In the event of supplies being received damaged or any shortages at the destination stations, the cost of such materials, excise duty and sales tax (if payable) and other charges payable thereof will be paid only proportionate to the value of materials received in good condition, unless the damaged goods or short supplies are made good free of cost by the suppliers.
- 14.5 For all legal purposes, the materials shall be deemed to pass into the TNPDC's ownership at the destination substation, where they are to be delivered and accepted.
- 14.6 The supplier is responsible for any theft damage etc. for the materials from the date of receipt of materials at site upto commissioning.

15.0. LIQUIDATED DAMAGES:

- 15.1 The delivery as specified should be guaranteed by the supplier under the liquidated damages clause given below:
- (a) If the supplier fails to deliver the equipments/materials within the time specified in the contract or any extension thereof, the purchaser shall recover from the supplier as liquidated damages, a sum of HALF PERCENT (0.5%) of the contract price of the undelivered equipments/materials for each completed week of delay. The total liquidated damages shall not exceed TEN PERCENT (10%) of the contract price of the equipments/materials so delayed. Only the date of

actual receipt of materials with all its accessories in good condition at site will be reckoned as date of delivery for this purpose.

- (b) If the contractor fails to complete the erection works within the time specified in the contract or any extension thereof, the purchaser shall recover from the contractor as liquidated damages, a sum of HALF PERCENT (0.5%) of the erection charges for each completed week of delay. The total liquidated damages shall not exceed TEN PERCENT (10%) of the erection charges of the unit delayed.
 - (c) The defaulting contractors will be made liable to pay to the TNPDC, in addition to liquidated damages for delay, the actual difference in price, wherever TNPDC orders the delayed quantity to be supplied/executed by other agencies at a higher rate. This is without prejudice to other rights under the terms of contract.
- 15.2 Equipment will be deemed to have been delivered only when all its component parts and its accessories are also delivered. If certain components and accessories are not delivered in time the whole equipment will be considered as delayed unless, the missing parts are delivered. The Liquidated damages will also be levied for the quantity not supplied as is done for the delayed supplies. If supplies effected in part could not be beneficially used by the TNPDC (due to such incomplete supply), liquidated damage will be worked out on the basis of contract price of such power transformer which could not be beneficially used and not on the value of delayed portion.
- 15.3 If supplies to be rendered are made by the supplier beyond the period of delivery and they are accepted by the TNPDC, such acceptance is without prejudice to TNPDC's right to levy liquidated damages for the delay in supply.
- 15.4 If the ordered materials are not delivered, the purchaser shall recover from the supplier, as liquidated damages a sum equal to TEN PERCENT (10%) of the contract price of the equipments/materials undelivered besides forfeiture of Security Deposit.
- 15.5 The suppliers are liable to pay the amount of loss sustained by the TNPDC in the event of non-execution of orders, if any placed on them either in full or part to the satisfaction of the TNPDC under the terms and conditions of contract and in the event of placing orders for such quantities on some others at a higher price.
- 15.6 Tenderers not giving clear and specific acceptance to the above clauses are liable for rejection.
- 15.7 If there is any downward trend in prices on account of belated supplies, the tenderers have to accept the same with the levy of liquidated damages, for belated supplies.
- 15.8 The TNPDC will also be at liberty to cancel the order/contract if the supply is not completed within the accepted delivery period, notwithstanding the

liquidated damages clause applicable for the belated supplies. Any charge for canceling the contract will not be accepted under any circumstances.

- 15.9 In the event of cancelation of contract or non-completion of supply by the suppliers, then the short supplied items may be ordered fresh. The excess price if any between the original and new contract will be recovered from the original supplier from the amount due to the original supplier either from this contract or from any other source.

16.0. FORCE MAJEURE:

- 16.1. The supplier shall not be liable for delay in performing his obligations resulting directly or from any force majeure conditions herein defined as:
- (a) Any cause which is beyond the reasonable control of the supplier or purchaser as the case may be.
 - (b) Natural phenomena such as floods, drought, earthquakes and epidemics.
 - (c) Act of any Govt. Authority, domestic or foreign, such as wars declared or undeclared quarantines, embargoes licensing control on production or distribution restrictions.
 - (d) Accident and disruptions such as fire, explosion, break down of essential machinery or equipments etc.
 - (e) Strikes, slow down and lockouts.
 - (f) Failure or delay in the supplier's source of supply due to force majeure causes enumerated at 'b' to 'e' above shall be considered, provided the supplier produces documentary evidence to show that there were no other alternative source of supply available to him or if available the lead time required was likely to be longer than the duration of the force majeure at the normal source of supply.

All the provisions of this clause shall apply whether the disruption cause is total or partial in its effect upon the ability of the supplier to perform.

NOTE: The cause of force majeure condition will be taken into consideration only if the supplier notifies such delays within 15 days from the occurrence. The purchaser shall verify the facts and grant such extension as the facts justify. For extension due to force majeure conditions, the supplier shall submit his representation with documentary evidence for scrutiny by the purchaser and decision of the purchaser shall be binding on the firm.

- 16.2. Provided that if the performance in whole or part by the supplier on any obligation under this contract is prevented or delayed by reasons of any eventuality for a period exceeding 60 days, the TNPDC may at its option terminate the contract by a notice in writing.

- 16.3. The Power cut shall not be considered under force majeure condition. The period of extension shall be decided only by the authority who placed the order, after verifying the evidence for the cause of delay.

17.0. GUARANTEE:

- 17.1. The entire equipments should be guaranteed for satisfactory operation, free of defects **for a period of 60 months from the date of successful commissioning of Power Transformer.**

- 17.2 Any defects /failure noticed during this guarantee period shall be rectified, free of cost, within 3 months from the date of intimation of defect/failure. Irrespective of number of failures and repairs within the guarantee period, the suppliers are responsible for free replacement/repair of the defective materials. The guarantee period for such repaired/replaced equipment shall be THREE years from the date of re-commissioning for the entire transformer (or) the original guarantee period of 60 months from the date of first commissioning, (excluding the time taken for rectification (ie) from the date of the transformer is isolated from service due to fault to the date of putting the transformer back into service), whichever is later.
- 17.3 In case the major active parts such as HV winding, LV winding and OLTC, failed within the guarantee period, the Guarantee Period has to be extended for another three years from the date of re-commissioning for the whole Transformer only.
- 17.4 In respect of accessories such as Bucholz relay, PRD relay, OSR, MOG, WTI, OTI, TIMERS, CONTACTOR, OL RELAY and Differential relay (wherever applicable) the guarantee period will be 60 months.
- 17.5 The incidental expenses, charges towards dismantling and re-erection of failed unit/defective part, transport and freight charges for the replacement of defective materials within the guarantee period shall be borne by the supplier.
- 17.6 The tenderers shall guarantee among other things, the following.
- (i) Quality and strength of materials used.
 - (ii) Safe electrical and mechanical stresses on **all parts of the equipments** under all specified conditions.
 - (iii) Performance figures given by the tenderers in the Schedule of Guaranteed technical particulars.

18.0 REPLACEMENT OF DEFECTIVE / DAMAGED MATERIALS:

- 18.1. Notwithstanding anything contained in the above liquidated damages clause when the whole or part of the materials supplied by the supplier are found to be defective/damaged or are not in conformity with the specification, such defects or damages in the materials supplied shall be rectified within three months from the date of intimation of defect/damage at the supplier's works, at the cost of supplier, against furnishing of indemnity bond for the cost of the defective equipment valid till date of satisfactory commissioning of the rectified equipment. In the alternative, at the point of destination, the defective or damaged materials shall be replaced free of cost within three months from the date of receipt of the intimation from the purchaser of such defects or damages. If the defects or damages are not rectified or replaced within this period, the supplier shall pay a sum towards liquidated damages as per liquidated damages clause given above, for the delay in rectification/ replacement of the defects or damages. The charges towards loading, to and fro transport (anywhere in Tamil Nadu), un-loading and re-erection shall be borne by the supplier.
- 18.2. If even after such rectification or replacement of the damaged or defective part, if the equipment ordered is not giving the satisfactory performance as

per the contract, then it will be open to the purchaser to reject the goods and recover the entire cost of such goods and also claim such loss sustained by the TNPDCCL.

- 18.3. Notwithstanding any other remedies available, the purchaser shall be entitled to dispose of the defective/damaged materials in 'as is where is condition' without further notice, if the contractor/supplier fails to rectify the defect and/or replace the damaged materials within such period as may be notified by the purchaser through notice and the sale proceeds of such disposal shall be appropriated towards the dues to the TNPDCCL such as liquidated damages, ground, rent, etc. as may be determined by the purchaser.
- 18.4. Similarly if during the guarantee period stipulated under guarantee clause subsequent to the date of receipt of goods, any of the goods be found defective in materials or workmanship, or do not conform to the specification or unsuitable for the purpose for which they are purchased, then it will be open to the TNPDCCL either to repudiate the entire contract and claim damages or accept such part of the goods that are satisfactory and require the supplier to replace the balance or pay compensation to the extent of the loss sustained by the TNPDCCL on that account.

19.0. FAILURE TO EXECUTE THE CONTRACT:

Contractors failing to execute the order placed on them to the satisfaction of the TNPDCCL under the terms and conditions set-forth therein, will be liable to make good the loss sustained by the TNPDCCL, consequent to the placing of fresh orders elsewhere at higher rate, i.e. the difference between the price accepted in the contract already entered into and the price at which fresh orders have been placed. This is without prejudice to the imposition of penalty under the Liquidated Damages clause and forfeiture of security deposit cum performance guarantee etc., The tenderer will be recommended for black listing with due notice.

20.0. NON-ASSIGNMENT:

The supplier shall not assign or transfer the contract or any part thereof without the prior approval of the Purchaser.

21.0 RECOVERY OF DUES TO TNPDCCL:

- 21.1 Any loss, arising due to non-fulfillment of this contract or any other contract, will be recovered from the Security Deposit held and or any other amount due to the supplier from the TNPDCCL from the Contract as well as from other contracts.
- 21.2 The TNPDCCL is empowered to recover any dues against this contract in any bills/ Security Deposit cum Performance / Earnest Money Deposit due to the contractor either in this contract or any other contract with TNPDCCL/TANTRANSCO/TNEB Ltd.
- 21.3 The TNPDCCL is empowered to recover any dues against any other contracts of the contractor with TNPDCCL/TANTRANSCO/TNEB Ltd, with the available amount due to the contractor against this contract. The successful

Tenderer shall furnish an undertaking as per ANNEXURE-VIII in a non judicial stamp paper of Rs.500/- agreeing to the above condition.

22.0 RAW MATERIALS:

It is the responsibility of the tenderer to make his own arrangement to procure the necessary raw materials required for the manufacture.

23.0 INCOME TAX PERMANENT ACCOUNT NUMBER & GST NUMBER:

- 23.1 The tenderers should furnish the Permanent Account number issued by Income Tax Department with the Tender.
- 23.2 The tenderers are requested to furnish their GSTIN number along with the proof in the tender.

24.0 PATENT RIGHTS ETC., :

The supplier shall indemnify the purchaser against all claims, actions, suits and proceedings for the infringement or alleged infringement of any patent, design or copy right protected either in the country of origin or in India by the use of any equipment supplied by the supplier other than for the purpose indicated by or reasonably to be inferred from the specification.

25.0 ARBITRATION ACT NOT TO APPLY:

The TNPDCCL will not accept any arbitration in case of disputes arising in any respect under this contract. Any dispute arising out of this contract shall not be subject to arbitration under the provisions of Arbitration and Conciliation Act 1996 in the event of any dispute between the parties.

26.0 RESPONSIBILITY:

- 26.1 The tenderer is responsible for safe delivery of the materials with all its accessories at the destination site. The tenderer should include and provide for packing and secured protection of the materials with all its accessories so as to avoid damages or loss in transit.
- 26.2 The supplier is responsible to make sure about the facilities that exist for Road and Rail transport to site, the maximum packages which can be conveyed by the railways and crane lift available at the destination railway station. The supplier is also responsible for any loss or damage during transport and storage for 90 days.
- 26.3 Each case or package should be clearly marked and should contain detailed packing list.

27.0 INSPECTION:

- 27.1 The authorised representatives of agent/inhasser shall have access to the supplier's works at any time during working hours, for the purpose of inspecting the manufacturing of the materials and for testing the selected samples from the materials covered by the specification. The suppliers shall provide necessary facilities for such inspection.
- 27.2 Tenderers are requested to furnish in their tenders the exact location of

their factory with detailed address to enable inspection by TNPDCCL if considered necessary.

- 27.3 For New entrants, factory inspection will be done by the Board's officers to assess the genuineness in manufacturing the tendered materials and to assess whether the firm has infrastructural facilities to manufacture the same.
- 27.4 Not less than 15 days advance intimation shall be given about the quantity of materials that will be ready for inspection by the TNPDCCL's officers / Third Party Agency authorised by the TNPDCCL. Timetization for inspection shall be made by supplies in such a way that the delivery schedule is kept up. The materials shall not be despatched without instruction by TNPDCCL.
- 27.5 The supplier shall provide all the documents which is necessary to complete the inspections. TNPDCCL's representatives shall be allowed to inspect the Supplier's / Contractor's Quality assurance standards, procedures and records.
- 27.6 The Purchaser's right to inspect and test the materials whenever necessary to reject the materials after arrival at purchaser's site, shall in no way be limited by the reason for having tested and passed already by the Purchaser's representative prior to materials despatch.

28.0 COMPLETENESS OF TENDER:

The tender should be complete with all details of illustrative and descriptive literature and drawings. The tenderers shall furnish the complete technical details of the equipment. Information regarding the country of manufacture or origin of materials used in the manufacture of the articles should be furnished. The tenderer should include all minor accessories even though not specifically mentioned in this specification but which are essential for the completeness of the materials ordered. The tenderer shall not be eligible for any extra charges in respect of such minor accessories though not included in the tender.

29.0 INTERCHANGEABILITY:

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

30.0 ELECTRICITY RULES :

All works shall be carried out in accordance with the latest provisions of the Indian Electricity Act/Electricity Supply Act and the Indian Electricity Rules there-under unless modified by this specification.

31.0 MATERIALS AND WORKMANSHIP:

- 31.1 All materials, equipments and spare parts thereof shall be new, unused and originally coming from manufacturer's plant to the destination stores. Those including used, rebuilt or overhauled materials/equipments will not be accepted.
- 31.2 All the materials shall be of best class and capable of satisfactory operation in the tropics with humid atmospheric condition. Unless otherwise specified, they

shall conform to the requirements of appropriate Indian Standards. Where these are not available, IEC and American/British Standards shall be followed.

- 31.3 The equipment should be designed to facilitate inspection and repair and to ensure satisfactory operation under atmospheric conditions prevailing at site and under sudden variations of load and voltages as may be met with under working conditions in the system including those due to faulty synchronizing and short circuits within the rating of the apparatus.
- 31.4 The design shall incorporate every reasonable precautions and provisions for the safety of all those concerned in the operation and maintenance of equipment.
- 31.5 All the equipments should operate without undue vibration and with the least practicable amount of noise.

32.0 PAST PERFORMANCE:

- 32.1 The intending tenderers shall furnish the documentary evidence with details of various purchase orders/placed on them during the last ten years as on the date of tendering in the proforma enclosed to the tender specification and also proof for having manufactured the tendered item and for their satisfactory performance.
- 32.2. The Bidders shall furnish documentary evidence for the constitution of the firm such as Memorandum and Articles of Association, Attested copy of Registered partnership deed with details of name, address, telephone, Electricity Board Service Connection No. of the manufacturing plants.
- 32.3. The details furnished by the tenderers shall be in complete shape and if it is found that any information is found omitted, suppressed, incomplete or incorrect, the same will be taken note of while dealing with the Tenderers in future.
- 32.4 The bidder should have completed the supplies upto the date of Technical bid opening of this tender against all previous purchase orders of similar items irrespective of size/rating placed by TNPDCCL whose delivery period has already expired with maximum penalty, failing which the bid shall be treated as non-responsive and the price bid shall not be opened.

33.0 MAXIMUM WEIGHTS AND DIMENSIONS OF PACKINGS:

- 33.1 The supplier is responsible to make sure about the facilities that exist for Road and Rail transport to site, the maximum packages which can be conveyed by the railways and crane lift available at the destination railway station. The supplier is also responsible for any loss or damage during transport and storage.
- 33.2 Each case or package should be clearly marked and should contain detailed packing list.

34.0 STORAGE CHARGES :

Storage charges for storing the equipment at the supplier's premises will not be paid to the supplier, under any circumstances.

35.0 INCOME TAX:

- 35.1 As regards the Income Tax, Surcharge on Income Tax and any other Corporate Tax, the Owner shall not bear any Tax liability whatsoever. The Bidder shall be liable and responsible for Payment of such Taxes as mandated under the provisions of the Law.
- 35.2 The Owner shall have the right to make deduction at Source from the amounts payable to the Contractor against this Contract in respect of any Tax liability as may be Mandatory in terms of the Law. The Owner shall not bear any liability in this regard but shall issue necessary TDS Certificate in respect of such deductions made.

36.0 DEVIATIONS FROM SPECIFICATION:

No deviations in commercial and technical terms shall be acceptable.

37.0 JURISDICTION FOR LEGAL PROCEEDINGS : (After award of contract)

No suit or any proceedings in regard to any matter arising in respect of this contractor shall be instituted in any court, save in the High Court, Madras, City Civil court at Chennai or at the Court of small causes at Chennai. It is agreed that no other court shall have jurisdiction to entertain any suit or proceedings, even though, part of the cause of action might arise within their jurisdiction. In case, any part of cause of action might arise within the jurisdiction of any of the Courts in Tamil Nadu and rest within the jurisdiction of courts outside the Tamil Nadu, then it is agreed between the parties that such suits or proceedings shall be instituted in a court within the State of Tamil Nadu and no other Court outside the state of Tamil Nadu, shall have jurisdiction even though any part of the cause of action might arise within the jurisdiction of such courts.

The successful tenderer shall furnish an undertaking in a non-judicial Stamp paper of value not less than Rs.500/- agreeing to the above condition.

38.0. STATUTORY LEVIES :

Any statutory variations within the stipulated contractual delivery period are to TNPDC's account. In the event of delay, whichever less shall be admitted.

**Sd/-
CHIEF ENGINEER/
MATERIALS MANAGEMENT**

SECTION-VI TECHNICAL

1.0. SCOPE.

- 1.1. The scope of supply of the material (described in Schedule-A) includes design, engineering, manufacture, inspection, testing, packing, forwarding, transit cum storage insurance for 90 days and delivery of the power transformer detailed herein, at our substation site ie., un-loading on the plinth or nearer to the plinth in case the plinth is not ready as decided by the site Engineer, anywhere in Tamil Nadu, erection at site and assisting in testing and commissioning.
- 1.2. The equipment shall be manufactured in the manner setout in this specification or where not setout, to the reasonable satisfaction of the purchaser. The transformers shall conform in all respects to high standards of engineering, design and workmanship and latest revisions of relevant standards at the time of offer, and the purchaser shall have the power to reject any work or material, which, in his judgment is not in full accordance therewith.
- 1.3. All fittings and accessories or apparatus which may not have been specifically mentioned below, but which are necessary and essential for the efficient working of the equipment, shall be deemed to be included in the contract. All outdoor apparatus including bushing insulators with their mountings shall be designed so as to avoid any accumulation of water.

2.0. CLIMATIC CONDITIONS.

The climatic conditions at site under which the equipment shall operate satisfactorily are

(a) Atmosphere	: Highly polluted
(b) Maximum ambient air temperature	: 50° C.
(c) Minimum ambient air temperature	: 5° C.
(d) Maximum daily average ambient air temperature	: 40° C.
(e) Maximum yearly weighted average ambient air temperature	: 32 ° C
(f) Maximum Humidity	: 95%
(g) Average thunder storm days per annum	: 65
(h) Average dust storm days per annum	: Occasional
(i) Average rainy day per annum.	: 65
(j) Average annual rainfall	: 100 cm.
(k) Number of months during which tropical monsoon conditions prevails	: 5
(l) Maximum wind pressure	: 150kgf/sq.m.
(m) Altitude above M.S.L	: <1000 M

Environmentally, the region where the equipment will be installed includes coastal areas, subject to high relative humidity, which can give rise to condensation. Onshore winds will frequently be salt laden. On occasions, the combination of salt and condensation may create pollution

conditions for outdoor insulators. Therefore, outdoor material and equipment shall be designed and protected for use in exposed, heavily polluted, salty, corrosive, tropical and humid coastal atmosphere.

3.0. CODES AND STANDARDS.

3.1 The design, material, construction, manufacture, inspection, testing and performance of the power transformers shall comply with all currently applicable statutes, regulations and safety codes.

3.2 Except otherwise stated, the transformers and associated accessories shall conform in all respects to the latest issues of relevant Indian/International standards. Some of them are given below:

Indian Standard No.	TITLE	International and Internationally recognized Standards
IS-325	Three Phase Induction Motors	IEC- 34
IS-335	Insulating oils for transformers and Switchgears	IEC-296,BS-148
IS-778	Gun metal gate, globe and check-valves for general purpose.	
IS-1866	Code of practice for maintenance and supervision of insulating oil in service.	
IS-1886	Code of practice for installation and maintenance of transformers.	
IS-2099	Bushings for AC voltage above 1000V	IEC-137,BS 223
IS-2026	Power transformers	IEC-76
IS-2147	Degrees of protection provided by enclosures for low voltage switchgear and control gear	
IS-2705	Current Transformers	IEC-185
IS-3203	Code of practice of climatic proofing of electrical equipments.	
IS-3347	Specification for Outdoor Bushings.	
IS-3401	Silica gel	
IS-3637	Gas operated relays	
IS-3639	Fittings & Accessories for power transformers.	
IS-4253	Cork and rubber	
IS-5561	Electric power connector	
IS-5578	Marking and arrangements for switch gear, bus bars, Main connections and auxiliary wiring.	
IS-6272	Industrial cooling fans	
IS-6600	Guide for loading of oil immersed transformers	BSCP-0160
IS-8468	ON load tap changer	IEC-60214
IS-8478	Application guide for OLTC	IEC-60542
IS-9434 IS-10593	Guide for sampling and analysis of dissolved gas in oil filled equipments,	
IS-12676	Oil impregnated paper-insulated condenser Bushing Dimension and requirements.	
	Insulation Coordination, Indian Electricity Rules 1959	IEC-71
	High voltage test techniques	IEC-60
	IEEMA Standard publication – Transformer -1	
	CBIP Manual on power transformers-1999 & 2006	

IS	BUREAU OF INDIAN STANDARDS, Manak Bhawan, No.9, Bahadur Shah zafar Marg, New Delhi – 110 001, INDIA.	
	INTERNATIONAL ELECTRO TECHNICAL COMMISSION, Bureau Central de ta Commission Electro Technique International I, Rue de Verembe, Geneva, SWITZERLAND.	

- 3.3. Wherever the relevant ISS are not applicable, the specifications of IEC, CBIP and BSS may be adopted.
- 3.4. The equipment or materials, meeting recognized National or International Standards which ensure an equal or superior quality than Indian/IEC standards specified, will also be accepted. When the equipment offered by the supplier conforms to other standards, salient points of difference between standards adopted and the standards specified in this specification shall be clearly brought out in the offer.

4.0. TYPE, RATING AND OTHER TECHNICAL REQUIREMENTS :

The requirement of Power transformers shall be as per SCHEDULE-F(I).

5.0. INSULATION :

The insulation requirement of windings shall be as per SCHEDULE-F(I).

6.0. IMPEDANCES :

- 6.1. The percentage impedance voltage at principal tapping and on the rated primary/secondary MVA base shall be as per SCHEDULE- F(I).
- 6.2. Impedance shall include positive and zero sequence and shall be expressed in terms of branches of the star connected equivalent diagrams, all on the same MVA base, and the range shall be given for each branch of the equivalent circuit in turn.
- 6.3. The tenderer shall indicate the guaranteed impedance, tolerances and upper and lower limit of impedance which can be offered without an increase in the quoted price. Tenderer shall also indicate the percentage variation from the normal tap to extreme taps.
- 6.4. **Positive tolerance of + 10% for Impedance is accepted. (Negative tolerance shall not be accepted)**
- 6.5. To achieve the above percentage impedance values, no reactor, either inside or outside the tank, shall be used.
- 6.6. Tap 1 should correspond to highest voltage/lower impedance and the last Tap should correspond to the lowest voltage/higher impedance.

7.0 LOSSES :

- 7.1 The no load loss at rated voltage & frequency and load loss at the rated current, frequency and rated output at 75°C and auxiliary loss for the Power Transformer, shall not exceed the limits as follows.
- | | | |
|-------------------|---|----------------|
| 1. No load loss | : | 10.0 KW (max). |
| 2. Load loss | : | 58.0 KW (max). |
| 3. Auxiliary loss | : | 1.0 KW (max). |
- In addition, the conditions laid down in Clause 10.0 and 11.0 of Section -IV of this specification shall apply.

8.0 TEMPERATURE RISE :

The transformer shall be capable of operating continuously at full rating giving rated output without exceeding the temperature limits specified below, over and above the ambient temperature of 50° C.

Permissible Temperature rise of top oil, measured by thermometer: 50° C.

Permissible Temperature rise of winding, measured by resistance: 55° C.

9.0 DUTY REQUIREMENTS:

- 9.1. The transformers would be used for Bi-directional flow of rated power.
- 9.2. The transformer and all its accessories like bushing CTs etc. shall be designed to withstand, without injury, the thermal and mechanical effects of any external short circuit to earth and of short circuits at the terminals of any winding for a period of **3 seconds (thermal) and 0.25 seconds dynamic (mechanical)**. Transformer windings shall be capable of withstanding the thermal and mechanical stresses caused by symmetrical or asymmetrical faults.
- 9.3. The transformer shall be capable of being loaded in accordance with IS 6600. There shall be no limitation imposed by bushings, tap-changer etc. All accessories like bushings, CTs, OLTC's shall be rated to carry 120% of Transformer current on extreme minus tap.
- 9.4. The overload capacity of the transformer and their emergency short time ratings shall be in accordance with IS 6600.
- 9.5. The transformer shall be suitable for continuous operation with a frequency variation of $\pm 5\%$ without exceeding the specified temperature rise.
- 9.6. The transformer shall be capable of being operated without danger on any tapping at the rated MVA with voltage increase of 10% in the system corresponding to the voltage of that tapping and at the same time with a frequency of 5% below normal.
- 9.7. Transformers of similar ratio & impedance, now in service in TNPDC/ TANTRANSCO shall operate satisfactorily in parallel with each other.
- 9.8. Radio interference and Noise Level:
 - i) The transformer shall be designed with particular attention to the suppression of harmonic voltages, especially the third and fifth to the maximum extent, so as to minimise interference with c agnetiztion circuits.
 - ii) The noise-level, when energised at normal voltage agnetiziency with fans running if applicable, shall be less than 73 decibels, when measured under standard conditions.
- 9.9. The maximum flux density in any part of the core and yoke at the rated MVA, voltage and frequency shall not exceed 1.6 Tesla.
- 9.10. The maximum current density in any winding shall not exceed 300Amp/ sq.cm.
- 9.11. Transformer shall be capable of operating under the natural air cooled condition up to the specified load.
- 9.12. Transformer shall be capable of remaining in operation at full load for 10 minutes after failure of the fans without the calculated winding hot-spot temperature exceeding 140°C. Also, stopping of one or two cooling fans should not have any effect on the cooling system. Transformers fitted with two coolers each capable of dissipating 50 % of the loss at continuous maximum rating shall be capable of remaining in operation for 20 minutes in

the event of failure of fans associated with one cooler without the estimated winding hot-spot temperature exceeding 140°C.

- 9.13. Transformer shall accept, without injurious heating combined with increased voltage and reduced frequency fluctuation, which produce the following over fluxing conditions.
- (i) 10% continuously.
 - (ii) 125% for 1 minute.
 - (iii) 140% for 5 seconds.

10.0 CONSTRUCTIONAL FEATURES

- 10.1. The transformer and accessories shall be designed to facilitate operation, inspection, maintenance and repairs.
- 10.2. All materials used shall be of the best quality and of the class most suitable for working under the conditions specified and shall withstand the variations of temperature arising under working conditions and atmospheric conditions without undue distortion or deterioration or setting up of undue stresses in any part and also without affecting the strength and suitability of the various parts for the work which they have to perform.
- 10.3. Patching, plugging, shimming or other such means of over-coming defects, discrepancies or errors are not acceptable.
- 10.4. Corresponding parts liable for replacement shall be inter- changeable.
- 10.5. All outdoor apparatus, including bushing insulators with their mounting shall be designed so as to avoid pocket in which water can collect.
- 10.6. All mechanism shall, wherever necessary, be made out of stainless steel, brass or gun-metal to prevent sticking due to rust or corrosion.

10.7 FASTENERS:

- 10.7.1 All bolts, studs, screw threads, pipe threads, bolts and nuts shall comply with appropriate Indian Standards for metric threads or the technical equivalent.
- 10.7.2 Bolts or studs shall not be less than 6 mm. in diameter except when used for small wiring terminals.
- 10.7.3 If bolts and nuts are placed so that they are inaccessible by means of ordinary spanners, spectral spanners shall be provided.
- 10.7.4 Taper washers shall be provided where necessary.
- 10.7.5 Protective washers of suitable material shall be provided front and back of the securing screws.
- 10.7.6 All nuts and pins shall be adequately locked. Nuts, bolts and pins used inside the transformer and tap-changer compartment where gaskets are not used shall be provided with spring washers or locknuts. Where galvanizing is specified, it shall be applied by the hot dipped process or by electro-galvanizing process and for all parts, other than steel wires, shall consist of a thickness of zinc coating equivalent to not less than 610 gm of zinc per square metre of surface. The zinc coating shall be smooth, of uniform thickness and free from defects.
- 10.7.7. All taper pins used in any mechanism shall be of the split type.
- 10.7.8. Surfaces which are in contact with oil, shall not be galvanised or cadmium plated.
- 10.7.9 Plates of non-corrosive material shall be provided for all apparatus such as relays, switches and fuses, contained in any cubicle or marshalling kiosks.

- 10.7.10. Steel bolts and nuts exposed to atmosphere shall be with suitable finishes like cadmium plated or zinc coated.
- 10.7.11 All Fasteners shall be with proper size & rating of reputed make (TVS, LPS, Mohindra)

10.8. Painting

Interior Painting

- 10.8.1 Before painting or filling with oil, all ungalvanised parts shall be completely cleaned and freed from rust, scale and greases, and all external surface cavities on castings shall be filled by metal deposition.
- 10.8.2 The interior of transformer tank and other oil filled chambers and internal structural steel work shall be cleaned off all scale and rust by shot-blasting.
"These surfaces shall be coated with not less than two coats of heat resistant varnish (Hot oil proof)". Un-exposed welds need not be painted.
- 10.8.3 All interior surfaces of mechanism chambers and kiosks, except those which have received anticorrosion treatment, shall receive three coats of paint, applied to the thoroughly cleaned metal surface. The final coat shall be of a light coloured anti- condensation mixture.

Exterior Painting

- 10.8.4 Similarly the outer surface shall also be cleaned off all scale and rust by shot blasting, and then the primary coat shall be applied, immediately after cleaning. The second coat shall be of Aluminium paint. Before despatch, the transformer shall get another final coat of Aluminium paint. Primer paint shall be, ready made zinc chrome as per IS : 2932.
- 10.8.5 Metal parts not accessible for painting shall be made of corrosion - resistant material.
- 10.8.6—Marshalling box and drive mechanism box shall also be painted with aluminium paint. The RTCC panel shall be painted with light grey as per shade-631 of IS-5.

10.8.7. DAMAGED PAINT WORK:

- i) Any damage occurring to any part of a painting scheme shall be made good to the same standard of corrosion protection and appearance as that was originally applied.
- ii) Any damaged paint work shall be made good as follows:
 - a) The damaged area, together with an area extending 25mm. around its boundary, shall be cleaned down to bare metal.
 - b) A priming coat shall be immediately applied, followed by a full paint finish equal to that originally applied and extending 50mm around the perimeter of the original damage.
 - c) The repainted surface shall present a smooth surface. This shall be obtained by carefully chamfering the paint edges before and after priming.

10.8.8 DRY FILM THICKNESS

- i) To the maximum extent practicable the coats shall be applied as a continuous film of uniform thickness and free of pores. Overspray, skips, runs, sags, and drips should be avoided. The different coats may or may not be of the same colour.
- ii) Each coat of paint shall be allowed to harden before the next is applied as per manufacturer's recommendation.
- iii) Particular attention must be paid to full film thickness at the edges.

10.8.9 TESTS FOR PAINTED SURFACE:

- i) The painted surface shall be tested for paint thickness.
- ii) 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.

NOTE: Supplier shall guarantee the painting performance requirement for a period of not less than 5 years.

11.0. CORE.

- 11.1 The core shall be constructed from high grade, cold rolled, non-ageing, high permeability, low loss, grain oriented, silicon steel laminations, known as HI-BI **M4 or MOH** steel trade name. The maximum flux density in the core shall not exceed 1.6 Tesla at rated MVA, voltage and frequency. This has to be ensured during stage inspection. Otherwise the unit will not be accepted. Core assembly shall employ mitred-interleaved joints.
- 11.2 The oxide-silicate coating given on the core steel is adequate. However, laminations can be insulated at least on one side by hot resistant insulation, other than paper and varnish, is welcome. The insulation shall be inert to the action of hot transformer oil.
- 11.3 The design of the magnetic circuit shall be such as to avoid static 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 lamination which may cause local heating.
- 11.4 The insulation structure for the core to bolts and core clamp plates shall be such as to withstand a voltage of 2000V AC for one minute. The bolts and clamps, used in the assembly of the core, shall be suitably insulated with fibre glass tubes and the clamping structure shall be constructed so that eddy current will be minimum.
- 11.5 All steel sections, used for supporting the core, shall be thoroughly sand blasted or shot-blasted after cutting, drilling and welding.
- 11.6 Adequate lifting lugs shall be provided to enable the core and windings to be lifted.
- 11.7 Suitable projecting guides shall be provided on core assembly to facilitate removal of tank, in case Bell type tank construction or the core assembly from the transformer tank.
- 11.8 Core and winding shall be capable of withstanding the shock to which they may be subjected during transport, installation and service. Adequate provision shall be made to prevent movement of the core and winding, relative to the tank, during these conditions.

- 11.9 The core and winding assembly shall be secured independently, with no connections to the tank cover.
- 11.10 The supporting frame work of the core shall be so designed, as to avoid the presence of pockets which would prevent complete emptying of the tank through the drain valve, or cause trapping of air during filling.
- 11.11 Oil ducts shall be provided, where necessary, to ensure adequate cooling. The winding structure and major insulation shall not obstruct the free flow of oil through such ducts. Where the magnetic circuit is divided into segments by cooling ducts, parallel to the planes of the laminations or by insulating material above 0.25 mm thick, tinned copper bridging strips shall be inserted to maintain electrical continuity between segments. The frame work and clamping arrangements shall be earthed as specified separately, herein.
- 11.12 **The Serial Number of the transformer is to be engraved in the Yoke Plate / Channel of the Transformer.**

12.0. WINDINGS

- 12.1. The conductor shall be of electrolytic grade copper and windings shall be made in dust proof, conditioned atmosphere. The supplier shall furnish the facilities available in this regard at his works, along with the tender offer. The current density in any part of the winding shall not exceed **240** amps per sq.cm.
- 12.2. Coils of the windings of identical voltage and ratings shall be interchangeable.
- 12.3. The star connected winding shall have **uniform** insulation. The neutral point of the star connected winding shall be insulated for the voltages specified in IS:2026.
- 12.4. The windings shall be of interleaved continuous disc type designed to reduce the out-of-balance forces in the transformer to a minimum, at all voltage ratios. They shall withstand the impulse and power frequency test voltages as specified in this specification.
- 12.5. The insulation of transformer windings and connections shall be free from insulating compounds which are liable to soften, ooze out, shrink or collapse and be non-catalytic and chemically in-active in transformer oil during service.
- 12.6. Coil assembly and insulating spacers shall be so arranged as to ensure free circulation of oil and to reduce the hot spot temperature of the windings.
- 12.7. The stacks of windings shall receive adequate shrinkage treatment before final assembly. Adjustable devices shall be provided for taking up any possible shrinkage of coils in service.
- 12.8. Coils shall be supported at frequent intervals by means of wedge type insulation spacers permanently secured in place and arranged to ensure proper oil circulation. To ensure permanent tightness of winding assembly, the insulation spacers shall be dried and compressed at high pressure, before use. Interlayer insulation between tap leads shall be wound with crape papers of DP> 1200 with adequate thickness.
- 12.9 The completed core and coil assembly shall be dried in vacuum, at not more than 0.5 mm of mercury absolute pressure and shall be immediately impregnated with oil after processing to ensure the elimination of air and moisture within the insulation.

- 12.10. All threaded connections shall be provided with locking facilities. All leads from the winding to terminal board and bushings shall be framed and fastened rigidly to permallic wood with adequate clearances to prevent injury from vibration. Where applicable, guide tubes shall be used for the leads.
- 12.11 Adequate insulation and clearances between high voltage windings and low voltage windings shall be provided. All clearances of windings and other live parts shall be adequate for the normal voltage of operation plus **20%.**
- 12.12 The conductors shall be transposed at sufficient intervals in order to minimise eddy current and equalise the distribution of currents and temperature along the windings.
- 12.13 The connection of all tapping winding segment shall be silver braced. All the winding segment and joints are to be silver braced except where bracing is not possible they may be crimped.
- 12.14 The strip conductor wound on edge shall not have a width exceeding six times its thickness.
- 12.15 The transformer shall be capable of withstanding the stresses due to short circuits on HV and LV terminals.
- 12.16 The core coil assembly shall be securely held in position to avoid any movement under short circuit conditions.
- 12.17 Epoxy boned Continuous Transposed Conductor (CTC) shall be used in Main Winding for a Rated Current 400 A & above.

13.0. INSULATING OIL:

- 13.1. The insulating oil, supplied with the transformer, shall be new transformer oil of EHV grade conforming to IS:335/2018 of latest issue. No inhibitors shall be used in the oil. All the tests, specified in the standard, shall be carried out for confirmation of the quality on the oil samples, drawn at the following stages.
 - i) Prior to filling of the transformer.
 - ii) Before carrying out the Heat-Run test.
 - iii) After carrying out the Heat-Run test.
 - iv) Before energising the transformer a agnetizin.2 Oil shall be filtered and tested for breakdown voltage (BDV) and moisture content before filling. The design and all materials and processes used in the manufacture of the transformer shall be such as to reduce to a minimum the risk of the development of acidity in the oil.
- 13.3. The insulating oil shall be subjected to testing at the manufacturer's works/ reputed laboratory'before supply, in the presence of inspecting personnel.
- 13.4. Sufficient quantity of oil necessary for first filling of all tanks, coolers and radiators, conservator(s) shall be supplied in sealed non returnable containers, suitable for out door storage.
- 13.5. The tenderer shall furnish the following information in his offer to enable the purchaser, to procure, if decided to go for separate procurement.
 - i) Recommended Technical parameters of the oil.
 - ii) List of manufacturers of oil, who are preferred by the tenderer for the transformers offered by them.

- 13.6. Where the supplier prefers to despatch the transformer with magnetized, due to limitations in the handling and transport facility, the transformer tank shall be filled with dry Nitrogen or equivalent inert gas. A gas cylinder, with suitable reducer connection and pressure gauge, shall be supplied to monitor the pressure of the gas in the tank during transit and storage at site, till completion of oil filling. These accessories shall become the property of the Purchaser.
- 13.7 **The resistivity of the first filling of transformer oil shall be at least 50×10^{12} ohm cm at 90°C.**
- 13.8 A Minimum of 5% oil quantity shall be supplied as spare (in addition to first filling) for maintaining required oil level in case of leakage in tank, radiators, conservator etc.

14.0. TANK AND TANK ACCESSORIES

14.1. Tank Construction

- 14.1.1. The transformer tank shall be of conventional type construction, with removable top cover. The transformer tank and cover shall be fabricated from good quality, low carbon steel, of adequate thickness and shall be designed to withstand
- lifting of the complete transformer with the tank completely filled with oil, by crane or jacks and transportation, by road or rail, without overstraining any joints and without causing subsequent leakage of oil.
 - Mechanical shocks, during transportation
 - Vacuum filling of oil
 - Continuous internal pressure of 35 KN/sq.m, over normal hydrostatic pressure of oil.
 - Short circuit forces
- 14.1.2. The base of each tank shall be so designed that it shall be possible to move the complete unit by skidding on metal plates or rails in any direction without injury.
- 14.1.3. The minimum thickness of the tank plate shall be as per SCHEDULE-F(I). Adequate stiffeners shall be provided, wherever necessary, for general rigidity and these shall be designed to prevent retention of rain water.
- 14.1.4. Wherever possible the transformer tank and its accessories shall be designed without pockets wherein gas may collect. Where pockets cannot be avoided, pipes shall be provided to vent the gas into the main expansion pipes.
- 14.1.5 Adequate space shall be provided at the bottom of the tank for collection of sediments. Suitable guides shall be provided for positioning the core & coil assembly and other various parts during assembly or dismantling.
- 14.1.6. Suitable shielding arrangement with a magnetic material of low permeability shall be provided inside the tank to shield off the leakage/stray magnetic fields, entering the tank and causing local heating/temperature rise at the joints. If required, impermeable shields shall be provided at the coil ends. Tank shield shall not resonate when excited at the natural frequency of the equipment. The tenderer may confirm use of tank shields in the schedule of additional information.

- 14.1.7. All seam and joints, other than those which may have to be opened, shall be welded and wherever possible, double welded. After completion of construction of tank and before painting, dye penetration test shall be carried out on welded parts of jacking bosses, lifting lugs and all load bearing members.

14.2. Lifting and Haulage Facilities

Each tank shall be provided with:

- (a) Lifting lugs, suitable for lifting the transformer complete with oil.
- (b) Pulling eyes shall be provided to facilitate movement of the transformers and they shall be suitably braced in vertical direction, so that bending does not occur when the pull has vertical component.
- (c) Lashing lugs.
- (d) A minimum of four jacking pads at a height of about 500 mm (from the bottom of the tank) to enable the transformers, complete with oil, to be raised or lowered using hydraulic or screw jacks.

14.3. Tank Cover

- 14.3.1 The detachable top portion of the cover shall be designed for adequate strength. It shall be sloped to prevent collection of water on any part. It must be separate from the core and coil and shall be capable of being lifted separately from the tank for inspecting the core and winding at site. It shall not distort, when lifted.
- 14.3.2. Inspection openings shall be provided, as necessary to give easy access to bushings, core and windings, OLTC, earth connection, etc. Each inspection opening shall be of ample size for the purpose for which it is provided and at least two openings one at each end of the tank, shall be provided.
- 14.3.3 The inspection covers **either on the top or on the sides of transformer** shall be of box type to avert trapping of air during oil filling, or gas during incipient faults inside the transformers, from entering the Bucholtz relay. As an alternative the space under the cover shall be blanked with a solid insulating material, fitted to the cover itself. **The inspection covers shall not be of stud mounted type.**
- 14.3.4. The tank cover and inspection covers shall be provided with suitable lifting arrangements. Unless otherwise approved, inspection covers shall not weigh more than 25 kg, each.
- 14.3.5 The tank cover shall be provided with pockets for the probes/bulbs for oil temperature and winding temperature indicators. Metal sheath protection shall be provided to the capillary tubes of the temperature indicators. It shall be possible to remove these bulbs without lowering the oil in the tank.
- 14.3.6 The pockets for Temperature indicator shall be fitted with a captive screwed top to prevent ingress of water.
- 14.3.7 Bushing turrets, covers of inspection openings, thermometer pockets shall not permit ingress of water into or leakage of oil from the tank.
- 14.3.8 **The Serial Number of the Transformer is to be engraved in the Transformer Tank also.**

15.0. VALVES AND AIR RELEASE PLUGS

15.1. Each tank shall be fitted with the following valves.

- i) Oil valves between each cooler and main tank.
- ii) One 80 mm drain valve with padlocking arrangement, located on the low voltage side of the transformer at the bottom most point of the tank, enabling complete draining of oil.
- iii) Two 50 mm filter valves, one on the top of the tank and at a diagonally opposite end to that of drain valve and another at the bottom. The bottom valve shall be with padlocking arrangement. These shall have adaptor suitable for 32 mm hose.
- iv) Two sampling valves (size 25 mm) at top and bottom of the main tank, with provision for fixing PVC pipe. The position of sample valves shall have easy access to operate it.
- v) One 15 mm air release plug on the top cover.
- vi) Two plugged pipe outlets for applying vacuum.

15.2. All valves with opening to atmosphere, shall be fitted with blank flanges.

15.3. All valves shall be of gun metal or cast steel bodies with gun metal fittings.

15.4. Valves shall be provided with flanges, having machined faces/screw connection for external piping.

16.0. AXLES AND WHEELS

16.1. The transformers are to be provided with bi-directional flanged wheels and axles of suitable dimensions and so supported that under any service condition, they shall not deflect sufficiently to interfere with the movement of the transformer, complete with oil. Suitable locking arrangements shall be provided to prevent the accidental movement of the transformer.

16.2. All wheels should be detachable and shall be provided with suitable bearings which shall be rust and corrosion resistant. Fittings for lubrication shall also be provided. The flanged wheels shall be suitable for use on gauge track and shall be so placed that a pinch bar can be used to move the transformer. Track shall be of 1435 mm gauge between adjacent rails, both on longer and shorter axis.

16.3. The wheels shall be arranged so that they can be turned through an angle of 90 deg. (on both directions) when the tank is jacked up, clear of the rails or floor. Necessary jacking steps shall be provided. Bi directional wheels without locking and with swivel movements shall be provided.

17.0. CONSERVATOR, TANK AND ITS ACCESSORIES

17.1 The conservator shall have adequate capacity between the highest and the 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 to 100°C or 7.5% of the total volume of oil in the main tank whichever is higher.

17.2. One end of the conservator shall have bolted cover so that it can be removed for cleaning.

17.3. The conservator shall be bolted into position so that it can be removed for cleaning purpose.

17.4. The conservator shall be fitted in such a position, as not to obstruct the electrical connections to the transformer & lifting of the OLTC units.

- 17.5. The conservator shall be provided with one 50 mm flanged valve for oil filling and this **shall have a bend pipe extension arrangement attached to the valve flange and blanked** to avoid entry of water, if fitted on the top.
- 17.6. The conservator shall be provided with one 50 mm flanged valve to completely drain the oil from the conservator.
- 17.7. The conservator shall have provision to receive one 80mm dia. feed pipe from the main tank, fitted with Bucholtz relay with two shut off valves on either side of the Bucholtz relay. Of the two valves one shall be on the conservator side, beyond a length of 240mm (3 times the internal diameter of the pipe line) and another on the main tank side beyond a length of 400mm (5 times the internal diameter of the pipe line) from the Bucholtz relay.
The feed pipe shall be free from sharp bends and make an inclination of 3° to 7° to the horizontal.
- 17.8. The feed pipe shall extend inside the conservator for at least 25mm so as to form a sump inside the conservator.

17.9. Magnetic oil level gauge:

- 17.9.1. The conservator shall be fitted with one magnetic oil level gauge having,
- i) Dial with minimum, maximum and normal (at 30° C) oil level markings and a pointer. MOG with reflector type is accepted
 - ii) Low oil level alarm contacts of 0.5 Amp. 110V/30V D. C. rating
 - iii) Conservator for OLTC portion side shall have 2 Nos prismatic oil level gauge to show minimum and maximum oil level if single conservator tank is used for main tank and OLTC.
 - iv) IP 55 class for Magnetic oil level gauge (MOG) to be provided.

17.10. Oil sealing system

- 17.10.1. The conservator shall be fitted with 2 Nos. of silica gel breathers in parallel, each one with a valve shall be provided. Breather pipe shall be made to protrude inside the oil conservator through its bottom instead of having connected to an opening on top of the conservator and running around the conservator. Where ever single conservator for the main oil and OLTC oil is employed with a partition, in between, separate breathers shall be provided for the main and OLTC portion of the conservator. A single breather is sufficient for the OLTC portion of the conservator. Design shall be such that,
- (i) The passage of air is through silicagel, not less than 1 kg for every 3500 litres of oil in the tank.
 - (ii) The silicagel is isolated from atmosphere by an oil seal.
 - (iii) The moisture absorption, indicated by a change in colour of the tinted crystals, can be easily seen from a distance.
- 17.10.2. The Breathers shall be mounted at an approximate height of 1,400 mm above ground level.
- 17.10.3. Breather design shall be vermin proof to avoid water & moisture entry inside the power transformer.

18.0 PRESSURE RELIEF DEVICE

- 18.1. Adequate number of pressure relief devices of sufficient size shall be provided at suitable locations for rapid release of any pressure that may be generated inside the tank and which may result in damage to the equipment. They shall be mounted directly on the tank without any pipe for mounting. If mounted

on the tank cover, they shall be away from the active parts of the transformer and the openings in the top cover shall be provided with a skirt, extending 25 mm inside the tank and holding a deflector plate, sufficiently away from the opening, so as to avert inadvertent trapping of gas during incipient fault inside the transformer. The device shall operate at a static pressure less than the hydraulic test pressure of transformer tank. Suitable hood shall be provided to prevent ingress of rain in such a way that it shall not hinder the actuation of flag provided in the PRD.

- 18.2 It is desirable to provide the PRV on the top cover. If there is any constraint in the space on the top cover, in such cases the PRV may be fixed directly on one side of the main tank below the top cover.
- 18.3 The pressure relief device shall be of safety valve type, capable of resealing after any pressure developed inside the tank is released. It shall be provided with switches for actuating trip contacts, when it acts. The switches shall be able to reset, once the pressure is released, only by manually.
- 18.4 IP 55 class for Pressure relief devices (PRD) and Rapid Pressure relief devices (RPRD) to be provided.

19.0. EARTHING ARRANGEMENTS

- 19.1 All metal parts of the transformer with exception of the individual core laminations, core bolts and associated individual clamping plates shall be maintained at some fixed potential.

19.2. Earthing of core clamping structure

Main core clamping structure at the top shall be connected to the tank body by a copper strip. The bottom clamping structure shall be earthed by one or more of the following methods.

- a) By connecting through vertical tie-rods to the top structure.
- b) By direct metal-to-metal contact with the tank base maintained by the weight of the core and winding.
- c) By connection to the top structure on the same side of the core as the main earth connection to the tank.

19.3. Earthing of magnetic circuit

- a) The magnetic circuit shall be earthed to the clamping structure at one point only through a link placed in an accessible position beneath an inspection opening in the tank cover, the connection to the link shall be on the same side of the core as the main earth connection.
- b) Magnetic circuits having an insulated sectional construction shall be provided with a separate link for each individual section. Where oil ducts insulating barriers parallel to the plane the laminations divide the magnetic circuit in to two or more electrically separate parts the ducts or barriers shall be bridged and the magnetic circuit shall not be regarded as being of sectional construction.

19.4 Earthing of Coil clamping rings

Where coil clamping rings are of metal, each ring shall be connected to the adjacent core clamping structure on the same side of transformer as the main earth connections, so as to maintain at earth potential.

19.5 Size of earthing connection

All earthing connections with the exception of those from the individual coil clamping rings shall have a cross sectional area of not less than 0.8 sq.cm. Connections inserted between laminations of different sections of core and shall have a cross sectional area of not less than 0.2 sq.cm.

- 19.6** Two earthing pads shall be carrying of size min 65x10 mm flats, at diagonally opposite external ends of the main tank, at its bottom, capable of carrying the short circuit current for 4 seconds without injurious heating, shall be provided with clamp type terminal for external connection.

20.0 RATING AND DIAGRAM PLATES

20.1 The following plates, suitable for outdoor use, shall be fixed to the transformer tank, at an average height of about 1750 mm above ground level.

- (a) A rating plate, of not less than 300 X 300 mm size, bearing the data specified in the appropriate clause of IS 2026. The details of the current transformers and normal operating pressure of PRV may also be indicated.
- (b) A diagram plate, showing the internal connections and also the voltage vector relationship of the several windings in accordance with IS 2026 and in addition a plan view of the transformer giving the correct physical relationship of the terminals. No-load voltage shall also be indicated for each tap.
- (c) A plate, showing the location and function of all valves and air release cocks or plugs. This plate shall also warn operators to refer to the maintenance instructions before applying the vacuum treatment for drying.
- (d) A plate showing the schematic wiring diagram of the respective cubicle may be provided in the cubicle.
- (e) Guarantee period should be engraved in the name plate.** All drawings and datas shall be engraved in the non corrosive plates for Cooler control circuit in marshalling box and OLTC control circuit in OLTC Chamber.
- (f) The Nameplate details of all Bushing CTs including WTI shall be engraved and fixed on the respective turrets. The details shall not be worn-out during all climatic conditions, in cases where turrets are not provided.
- (g) The details of the CTs shall be provided separately along with the main Name plate details.
- (h) If the transformer has failed within the guarantee period the date of repair and the subsequent validity of Guarantee period (s) are to be engraved in the Name plate.**
- (i) The rating diagram and other plates shall be of brass or stainless steel.

21.0 JOINTS AND GASKETS

21.1 All gaskets used for making oil tight joints shall be of proven material such as neoprene RC 70C grade granulated cork bonded gaskets conforming to IS:4253, unless otherwise specified.

21.2 All bolted joints shall be fitted with weather proof, hot oil resistant gaskets in between, for complete oil tightness. Special attention shall be given to the oil tight joints between the tank and the cover and the bushing, the turrets, covers of inspection openings, thermometer pockets etc and the other outlets to prevent ingress of water into or leakage of oil even under hot condition

from the tank. If gasket is compressible, metallic stops shall be provided to prevent over compression.

- 21.3. One complete set of gaskets shall be supplied with the transformer additionally, for all openings.

22.0 TERMINAL ARRANGEMENT

- 22.1 **Bushings:** Porcelain bushings only shall be used for high & low voltage. No epoxy bushing shall be used.

- 22.1.1 Stress shield for the bushings shall be considered as an integral part of the bushing- assembly.

- 22.1.2 All bushings shall be equipped with suitable terminals and terminal clamps of approved type and size and all external current carrying contact surfaces shall be adequately silver plated. Main terminals shall be solder less. Flexible connectors shall be made from tinned copper sheets. Size of terminal/conductor for which the clamp is suitable and the rated current shall be embossed/ punched.

- 22.1.3 Clamps and flanges shall not be re-entrant shape, which may trap air.

- 22.1.4 Each bushing shall be co-ordinated with the insulation class of the winding.

- 22.1.5 All porcelain, used in bushings, shall be homogeneous and free from cavities or other flaws. The glazing shall be uniform in colour and free from blisters, burrs and other defects. The glaze shall be brown.

- 22.1.6 Bushing-turrets shall be provided with vent pipes which shall be connected to route the gas collection if any, through the Buchholtz relay. The bushings shall be removable without disturbing the current transformers.

- 22.1.7 Specific requirements of bushings and their ratings etc are given in the SCHEDULE-F(I).

- 22.1.8 HV & LV Bushing oil seals should be of high quality to avoid oil leak & to serve the entire life period of the Power Transformer.

22.2. TERMINAL CONNECTORS

A) CABLE BOX TYPE.

- i) The transformer shall have terminals on both LV & HV sides suitable for connections to XLPE Cable as below
 HV side : One run 630 Sq.mm Single core per phase
 LV side : Two runs of Single core of 630 sq.mm per phase
- ii) All leads including tappings and neutral shall be insulated and rigidly supported and shall be easily accessible without need for removing the winding from the tank.
- iii) The phase and neutral leads shall be brought out of the tank through porcelain bushing insulator which must be of suitable design to prevent failure due to switching or lightning surges and system faults.
- iv) The phase bushings shall be provided inside sealing end chamber and the neutral bushing shall be brought out of the tank.
- v) The terminals shall be marked as specified in the latest ISS/BSS.
- vi) Neutral bushing terminal shall be suitable to receive 2 Nos. **65 x 10** mm G.I flats placed side by side on insulators up to ground level. Necessary outdoor type porcelain insulators, GI flats and bi-metallic sleeves shall also be supplied.
- vii) Rainskirt shall be provided to HV&LV cable marshaling box.
- viii) All the gland plates shall be aluminium of 5 mm thickness for Power cables.

(B) CABLE BOXES.

- a) Cable box shall be suitable for terminating the cable in the form of sealing end chambers for accommodation sealing ends into which the cables will be terminated. Sealing end chambers shall be designed to accommodate all the cable joint fittings or sealing ends.
- b) Cable boxes shall be provided with inspection covers of adequate size for easy removal of flexible links and for testing purposes. The transformer tank shall be isolated separately from the cable box while testing. The LV bushing shall be connected by omega type flexible copper strip with supporting insulator of size min 100mmx17mm to carry 2000Amps. The HV bushing shall be connected by omega type flexible cable with supporting insulator of size min 60 mm x 15 mm to carry 1000 Amps.
- c) Air insulated cable boxes for PVC cables may be provided with compression glands.
- d) Where there is more than one core per phase, the socket block shall be so designed as to minimise bending of the cable.
- e) Facilities for testing shall be provided in the sealing end chambers.
- f) The sealing end chamber shall have a removable cover and the design of the chamber shall be such that ample clearances are provided to enable either the transformer or each cable to be subjected separately to high voltage tests when filled with transformer oil.
- g) An earthing terminal shall be provided in each sealing end chamber to which the connections from the transformer winding can be earthed during cable testing.
- h) The sealing end chamber shall also be capable of withstanding for 15 minutes, both at the time of the first tests on the cables and at any subsequent time as may be required, between phases and to earth a D.C. test equal to 2E KV or an A.C. test equal to 4E 3 KV where E is normal line voltage.
- i) During these tests the links in the sealing end chamber will be withdrawn and the transformer winding with connections thereto will be earthed.
- j) Terminals shall be marked in a clear and permanent manner.
- k) Main cabling jointing will be carried out by the TNPDC/TANTRANSCO.
- l) The cable box shall be provided in such a way that no moisture shall enter inside the box. Epoxy paint shall be coated inside wall of cable box to avoid rusting.
- m) All live parts exposed inside the cable box shall be covered with suitable high voltage class insulation sleeve.
- n) The HV and LV Cable box, Phase to Phase and Phase to Earth clearance should be maintained as per Specification even when flexible is connected.
- o) There should be adequate working space available inside the Cable box (For proper access of hand to Bushing).

23.0. BUSHING CURRENT TRANSFORMERS

- 23.1 Bushing current transformers of required ratio PS class may be provided in the bushing turrets of HV, LV and neutral ends of each phase for restricted earth fault protection. The requirement of the bushing current transformers shall be as per SCHEDULE-F(I).
- 23.2. The current transformers shall be of low resistance type, complying with I.S 2705, Part-IV of latest issue. The current transformers on HV and LV sides

shall have matching characteristics to the extent feasible to have differential protection scheme more effective. The bushing current transformers shall be housed in separate turrets and shall not be an in-built unit of the transformer. The housing of current transformers shall be so arranged that bushing can be removed, without disturbing the current transformers. The magnetization characteristic curves, indicating the knee point voltage, excitation current and secondary resistance shall be furnished.

- 23.3. It shall be possible to remove the current transformers from the tank without removing the tank cover. Necessary precautions shall be taken to minimise the eddy currents heat generation in the turret.
- 23.4. All secondary leads shall be brought into a terminal box near each bushing. The terminals shall be wired up to marshalling box, using separate 4.0 sq mm flexible multi-strand Copper Cables for each core.
- 23.5 The Nameplate details of all Bushing CTs including WTI shall be engraved and fixed on the respective turrets. The details shall not be worn-out during all climatic conditions, in cases where turrets are not provided the details of the CTs shall be provided separately along with the main Name plate details.
- 23.6 The secondary termination from the CTs to the terminal blocks shall only be lugged and no eyeing shall be made.

24.0. VOLTAGE CONTROL EQUIPMENT (ON LOAD TAP CHANGER)

- 24.1 The transformer shall be provided with reputed make voltage control equipment of the on-load tap changing type for varying its specified effective transformation ratio as furnished in SCHEDULE-F(I) SL.NO.15, without producing phase displacement and suitable for remote control operation from switch board in the control room, in addition to being capable of local-manual as well as local-electrical operation. The design, manufacture and performance of the OLTC shall comply with the CBIP regulations, other statutes and safety codes and IS 8468 of latest issue. The transformer supplier shall ensure the above.
- 24.2. a) On Load Tap Changer shall be sourced from reputed manufacturer and it should be type tested as per relevant IEC 60214 and test methods shall be in full conformance to the procedures indicated in IEC 60214.
 b) The On-load Tap Changer shall include the following:
 - (i) An oil immersed diverter switch of transition resistor type.
 - (ii) Motor driven mechanism for local as well as remote operation.
 - (iii) Control and protective devices.
 - (iv) Remote Tap Changer control panel.
 - (v) Annunciation schemes.
 - (vi) Local - manual operating device.
- 24.3. The tap changing switches and mechanism shall be mounted in oil tanks or compartments mounted in an accessible position on the transformer tank. It shall not be possible for the oil in the diverter switch to mix with oil in the transformer tank. The OLTC oil shall be of the same EHV grade oil as used for the main transformer or of higher quality insulating oil and low viscosity is preferred. The oil in the OLTC compartment shall be maintained under conservator head by means of a pipe connection from the highest point of the chamber to the OLTC conservator. This connection shall be controlled by a suitable valve, and shall be arranged so that any gas leaving the chamber will

pass into the gas and oil actuated relay. This surge relay shall be of reputed make.

- 24.4. The OLTC chamber shall have oil filling valve, air release plug, pressure relief device, tap position indicator, oil sampling valve and provision for circulation of oil in the OLTC compartment and equalization of OLTC compartment and main tank during application of vacuum. Necessary pipes, valves, blanking plates etc for the above purpose shall form part of the accessories.
- 24.5. The tap changer shall be so mounted that top cover of the transformer can be lifted without removing the connections between the windings and the tap changer.
- 24.6. It is preferable that the contact be accessible for inspection without lowering oil level in the main tank and the contact tips shall be replaceable. Special tools and tackles if any required for maintenance of OLTC gear shall be supplied.
- 24.7. The diverter switch or arcing switch shall be designed so as to ensure that its operation once commenced shall be completed independent of the operation of the control relays or switches, failure of auxiliary supply etc. OLTC shall have a mechanical fuse incorporated in the design to ensure the protection of diverter switch in the event of an undue mechanical stress on the Tap changer.
- 24.8. Drive mechanism chamber shall be mounted on to the transformer tank, in an accessible position. It shall be adequately ventilated and provided with anti-condensation metal clad heater. All contactors, relay coils or other parts shall be protected against corrosion or deterioration due to condensation, fungi, etc.
- i) The Tap selector contacts shall not be of the threaded type to ensure positive, full face and firm contact from Transformer leads to tap changer.
 - ii) No continuity break shall be allowed during changeover between any two taps. The OLTC shall be tested for the same by ensuring that there is no open circuit showing while changing two taps.
 - iii) OLTC design should have been seismic tested and qualified.
 - iv) OLTC manufacturer shall conduct the following routine tests fully in compliance with IEC 60214 on every unit, as given below, before despatch to assure the quality of products.

<u>Sl No.</u>	<u>IEC Reference</u>	<u>Test Description</u>
1.	Cl.5.3.1	- Mechanical Test
2.	Cl.5.3.2	- Sequence Test
3.	Cl.5.3.3	- Auxiliary circuits Insulation Tests
4.	Cl.5.3.4	- Pressure Test
5.	Cl.5.3.4	- Vacuum Test

All the relevant test reports shall be submitted along with the test report of transformer for approval.

- v) The Tap Changer shall be suitably protected through Oil Surge Relay. This surge relay shall be tested for an Oil flow velocity of 1.20 +/- 0.20 m/s. IP 55 Class for OSR & OLTC PRD to be provided.
- 24.9 The whole of the drive mechanism shall be of robust design and capable of giving satisfactory service and shall not require frequent maintenance under the operating conditions met with, in service.

- 24.10 A permanently legible lubrication chart shall be fitted within the driving mechanism chamber.
- 24.11 The OLTC driving mechanism and its associated control equipment shall be mounted in an outdoor, weather-proof and vermin proof housing which shall include
- a) Driving motor, operating on 3 phase 415V, 50HZ AC supply.
 - b) Remote/local electrical and local manual selector switch. It shall control in the following manner.
 - i) When the selector switch is in LOCAL position, it shall be possible to operate the RAISE/LOWER control switches. Remote control of RAISE/LOWER functions shall be prevented.
 - ii) When the selector switch is in REMOTE, the RAISE/LOWER switches in the local control cubicle shall become inoperative. Remote control of the RAISE, LOWER functions shall be possible from the remote control panel. The local REMOTE selector switch shall have at least two spare contacts per position which are closed in that position.
 - c) Motor starting contactor with thermal overload relay, isolating switch and MCB to protect the motor from overloading. All relays, switches, MCBs etc shall be mounted in the drive mechanism chamber and shall be clearly marked for the purpose of identification.
 - d) Limit switch, to prevent motor over-travel in either direction.
 - e) Counter (digital type), to indicate the number of operations completed.
 - f) Electrically interlocked reversing contactors.
 - g) Space heaters with switches.
 - h) Master/follower selector switch.
 - i) Cable termination glands for power and control cables.
 - j) Interior lighting with door switch.
 - k) Auxiliary relays.
 - l) Mechanical tap- position indicator.
 - m) Manual operating device. This cranking device for manual operation shall be removable and suitable for operation by man at ground level. It shall have mechanical stops to prevent over cranking of the mechanism beyond the extreme tap positions. The mechanism shall have interlock with the motor to block motor-start-up during manual operation.
 - n) Necessary lamp indications and annunciation schemes of various operations of OLTC gear from RTCC panel.
 - o) RAISE-LOWER CONTROL SWITCH shall be spring loaded to return to the centre OFF position and shall require movement to the RIGHT, to raise the voltage of the transformer. Movement to LEFT shall lower the voltage of the transformer. This switch shall be operative only when the LOCAL/REMOTE SELECTOR switch is in LOCAL position.
 - p) In OLTC lugs, terminal number shall be punched.

24.12. Tap changer control requirements :

- 1) It shall not be possible for any two controls (ie. MANUAL, LOCAL ELECTRICAL, REMOTE) to be in operation at the same time.
- 2) It shall be capable of permitting parallel operation with transformers of the same ratio, say maximum four units.

- 3) Suitable selector switch shall be provided, so that, any one transformer of the group can at a time be selected as 'Master' 'Follower' or Independent.
 - 4) An out-of-step device with timer contacts shall be provided, which shall be arranged to prevent further tap-changing when transformers in a group, operating in 'Parallel control', are one tap out-of-step.
 - 5) The equipment shall be suitable for supervisory control and indication with a "Make before Break" multi-way switch, having one potential free contact for each tap position. This switch shall be provided in addition to any other switch/switches which may be required for the purpose of remote tap position indication. All other components of the supervisory gear, if required, shall be provided separately.
 - 6) Operation from the local or remote control switch shall cause one tap movement only, until the control switch is returned to the 'off' position between successive operations.
 - 7) All electrical control switches and the local operating gear shall be clearly labeled in a suitable manner to indicate the direction of tap-changing.
 - 8) Limit switches to prevent motor 'over-travel' in either direction may be located in the control circuit of the operating motor, provided with a mechanical declutching mechanism.
 - 9) Necessary interlock, blocking the independent controls when the units are in parallel, shall be provided.
 - 10) A time delay relay for INCOMPLETE STEP alarm, consisting of a normally open contact, which closes, if the tap changer fails to make a complete tap change. The alarm shall not operate momentarily for loss of auxiliary supply.
- 24.13 OLTC barrier sheet & oil seal design should be of high quality to void the oil mix-up between Main tank & OLTC.

25.0 COOLING EQUIPMENTS

25.1 COOLER:

- 25.1.1 The cooler shall be supplied with the requisite number of radiators. The wall thickness of radiator shall be not less than 1.2 mm.
- 25.1.2 Each radiator shall have its own shutoff valve, lifting lugs, air release plug, a drain valve and thermometer pockets fitted with captive screw cap on the inlet and outlet.
- 25.1.3 Each radiator shall be designed to withstand the pressure test. When assembled, they shall be accessible for cleaning and painting. Each radiator unit shall be provided with the following:
- (a) An 80 mm shut-off valve at each point of connection to the header/transformer tank.
 - (b) Removable blanking plates to permit blanking-off the oil connection.
 - (c) A drain valve of size 25mm at the lowest point.
 - (d) Air release plug of 15 mm dia. at the highest point.
 - (e) Lifting lugs.
- 25.1.4 The clearance between all pipe work and live parts shall be more than the clearance for live parts to earth.
- 25.1.5 The radiator bank shall be designed for same pressure and vacuum conditions as specified for main tank.

- 25.1.6 The Manufacturer shall furnish the calculations including the detailed design of the cooling system after awarding of contract to analyze the performance.
- 25.1.7 IP55 Class to be provided for cooler fans.

26.0. GAS AND OIL ACTUATED RELAYS (BUCHHOLZ RELAY)

- 26.1. Double float gas detector relay (Buchholz relay) conforming to IS 3637 shall be provided with the following:
- Two electrically independent ungrounded contacts to cause an alarm and tripping in the event of accumulation of gas and sudden changes in oil pressure.
 - Shut off valve of 80mm on either side of the relay and flange coupling, to permit easy removal, without lowering oil level in the main tank.
 - A drain plug at the bottom most point of the relay-casing.
 - A test cock suitable for a flexible pipe connection for checking its operation and taking gas sample
 - A copper or stainless steel tube shall be connected from **the gas collecting device (which is connected to the Buchholz relay)** to a valve located at about 1200 mm above ground level to facilitate sampling, with the transformer in service.
 - Locking arrangement during transport.
 - The **relay with Mercury switches is dispensed with** and Buchholz relay with micro switches (or) reed type is acceptable.
 - The Buchholz relay should be insensitive to vibrations and shocks with acceleration up to 0.5 g.
 - The protection cables to the Buchholz relay and Oil Surge Relay(OSR) shall be terminated only in the bottom of the relay.
 - IP55 Class for Buchholz relay to be provided.
- 26.2. The arrangement for mounting this relay, the associated pipe work and the cooling plant shall be such that all gas emitted from the transformer shall pass into the relay and mal-operation of the relays shall not take place under normal service conditions.

27.0. TEMPERATURE INDICATORS/CONTROLLERS

27.1. 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 & 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 $\pm 1.00\%$.

27.2. Winding temperature indicator (WTI)

The transformer shall also be provided with a device for indicating the temperature of the winding (HV / LV). It shall comprise the following:

- Temperature sensing element suitably located on the top cover of the transformer
- Image coil

- c) Auxiliary CTs, if required to match the image coil, shall be mounted in the cooler control cabinet.
- d) 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 (besides that required for control of cooling equipment). The tripping contacts shall be adjustable to close between 60° C and 120°C and alarm contacts to close between 50° C and 100° C and both shall re-open when the temperature has fallen by a desired amount between 5°C and 20°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 $\pm 1.00\%$.
- e) 3 Nos of one liter capacity oil sampling flask (Stainless steel) shall be provided as per CBIP and latest CEA guidelines.

28.0. MARSHALLING BOX

The Marshalling Box shall be independent and Tank mounted type of **GI (Galvanized Iron)** with a facility for easy accessibility to wiring and temperature gauges, vermin and weather proof marshalling box, shall be provided with a controlled metal-clad heater to accommodate the following :

- (a) Temperature indicators/controllers.
- (b) Terminal blocks, made up of molded, non inflammable plastic material with adequate size terminals, washers, binding screws/nuts for external wire connections, a white marking strip for circuit identification and a molded plastic cover.
- (c) Suitable glands with gland plates for incoming and outgoing cables, meant for oil level alarm, Temperature alarm/Trip, Buchholtz alarm/trip, annunciation and indication provisions for RTCC panel etc.
- (d) Proper grounding shall be provided for the Marshalling box
- (e) The internal wiring provided in the marshalling Box shall be of FRLS 1100/650V grade **flexible multi-strand Copper Conductor**, PVC insulated, PVC sheathed, steel wire armoured and PVC jacketed cable of required size as applicable.
- (f) Isolation Transformer of adequate capacity with voltage ratio of 3 phase, 415 V shall be provided for the Main AC control supply in the Marshalling box to cater all AC loads of cooler circuit fans, OLTC motor and control circuit.
- (g) Suitable three (3) phase MCB with Neutral (3 phase 4 way MCB) and socket of current rating of 32 Amps shall be provided for AC supply arrangement.
- (h) Ladder to be provided to access marshaling box in accordance with site requirement.
- (i) All the MCBs and Contactors shall be reputed make (Siemens, L &T, ABB, Schneider)
- (j) All the gland plated shall be aluminium of 3 mm thickness for Control cables.

29.0. AUXILIARY POWER SUPPLY CONTROL PANEL FOR OLTC AND COOLER CONTROL

- 29.1. Auxiliary power supply shall be provided by the purchaser at one place for OLTC control and cooler control.
- 29.2. Control cabinet for OLTC control and cooler control shall be of free standing, floor mounting type.
- 29.3. Control cabinet can be made out of 3mm thick sheet steel or 10mm thick aluminium plate / Aluminium casting. Hinged door shall be provided with padlocking arrangement. Sloping Rain-hood shall be provided to cover all sides. 15mm thick Neoprime or better type of gaskets shall be provided to ensure high degree of protection as per IS 2147. The painting shall be as specified earlier.
- 29.4. Auxiliary electrical equipments to be supplied by the tenderer shall be suitable for operation on the following supply system :

a.	Power devices like drive motors rating 1 KW and above	415V, 3 phase 4 wire 50 Hz, neutral grounded AC supply
b.	Lighting, space heaters and fractional KW motors	240V, single phase, 50 Hz neutral grounded AC supply
c.	Alarm, control and protective devices	30/110V / 2 wire DC supply/220V

- 29.5. All AC loads shall be fed by one of the two feeders through an electrically interlocked automatic transfer switch housed in any one of the local control cabinets. Design features of the transfer-switch shall include the following:
(for applicable capacity of transformers)
- Selection of one of the feeders as normal source and other as stand by
 - Upon failure of normal source, automatic transfer of loads from normal source to the standby source after an adjustable time delay
 - Indication for "failure of normal source" and for transfer to standby Source" and also for "failure to transfer" shall be provided locally and as well as in the remote tap changer control panel.
 - Automatic re-transfer to normal source with an adjusted time delay, following re-energisation of the normal sources.
 - The transfer and re-transfer shall not cause paralleling of the two sources at any time.
- 29.6. Necessary Isolating-switches, MCBs and other components for the above power supply transfer arrangement shall be in the scope of the supply of the supplier.
- 29.7. Bus bars, if used, shall be tinned copper of adequate cross section to carry the normal current without exceeding the permissible temperature rise over an ambient temperature of 50° C.
- 29.8. Isolating-switches shall be group operated units (3/4 pole for use on 3 phase supply system and 2 pole for single phase supply system), quick make and break type capable of breaking the rated current of the associated circuit safely. Switch handle shall have provision for locking in both fully opened and fully closed positions.
- 29.9. Push button shall be rated for not less than 6 Amps, 415 V, AC or 2 Amps, 220/110V DC and shall be flush mounted on the cabinet door and provided with appropriate name plates. Red, Green and Amber indicating lamps shall be flush mounted.
- 29.10. Mini starters shall be provided with No-volt coils whenever required.

- 29.11. Purchaser's power cable shall be **FRLS** 1100/650V grade flexible multi-strand Copper conductor, PVC insulated, PVC sheathed, steel wire armoured and PVC jacketed cable. All cable terminating accessories such as brass cable glands, lugs etc. shall be included in the scope of supply.
- 29.12. Separate Terminal-Blocks shall be provided for circuits of various voltage classes.
- 29.13. The terminal blocks shall be 1100V grade and have 10 Amps continuous rating. They shall be fully enclosed with removable slip-on/clip-on covers and made of molded non-inflammable plastic material with block and barrier molded integrally. Such blocks shall have non-disconnecting stud type terminals, washers, nuts and lock nuts. All terminals shall be clearly marked with identification numbers or letters to facilitate connection to external wiring. No live metal shall be exposed at the back of the terminal blocks.
- 29.14. In all terminal blocks at least 20% spare terminals shall be provided uniformly.
- 29.15. The terminal blocks meant for control circuits shall be suitable for connecting minimum of 2 numbers of 2.5sq.mm. Copper cable. Terminals meant for CT circuits shall be capable of accommodating at least 2 numbers of 4sq.mm. Copper cable.
- 29.16. The terminal boards shall be mounted obliquely towards the rear doors to be easily accessed to termination and to enable ferrule numbers to be read without difficulty. The terminal boards shall be placed at least above a distance of 250mm from the cable gland so as to permit satisfactory arrangement of multi core cable tiles.
- 29.17. Terminal board rows should be spaced not less than 150mm apart to permit convenient access to wires and terminations.
- 29.18. Control cabinet shall be provided with a 230V energy efficient lamp operated by a door switch.
- 29.19. The cabinet shall be provided with a 240V, single phase, 5 amps, 3 pin socket for hand lamp.
- 29.20. Strip heaters shall be provided inside the cabinet with thermostat (preferably differential type) to prevent moisture condensation. The heaters shall be controlled by suitably rated double pole miniature circuit breakers.
- 29.21. Signal lamps provided shall be of neon, screw type, with wire & resistors enclosed in bakelite body. Each signal lamp shall be provided with a fuse integrally mounted in the lamp body. If separate fuse units are used they shall be of the cartridge type. Fuses shall be labeled.
- 29.22. Electric measuring instruments shall be of moving iron type. Ammeters for measuring currents upto 30 amps shall be directly connected while those for measuring above 30 amps shall be connected through suitable CT's. Ammeter and Voltmeters shall be provided with selector switches.
- 29.23. The terminal Box wiring pertaining to CTs shall be independent and not combined with annunciation and other indication circuits.
- 29.24. All tripping and alarm circuits shall be wired with 110/30 V DC auxiliary contactors.

30.0. REMOTE TAP-CHANGER CONTROL PANEL

The Remote In-door Tap Changer control cubicle of height 2312 mm with sufficient inner working space for easy access to the instruments, wherever necessary, shall house the following:

30.1. Controls :

- a) Push button switches to Raise/Lower the tap.
- b) Tap position indicator (digital type).
- c) Selector switches for Local/Remote operation.
- d) Four position Selector switch for Independent/OFF/Master/Follower.
- e) Emergency 'Supply - off ' push button.'
- f) Relays, heater, illumination lamps, MCBs etc.
- g) cooling fan ON/OFF status indications with ON/OFF switch.
- h) Annunciation (Test, Accept, Reset) on RTCC panel.
- i) All the MCBs & Contactors shall be reputed make (Siemens, L & T, ABB, Schneider)

30.2. LAMP INDICATIONS for the following (ON: Red indication; OFF: Green indication)

- a) OLTC supply HEALTHY.
- b) Tap change IN-PROGRESS.

30.3. Facia type annunciation scheme for the following trip, non-trip & alarm INDICATIONS, suitable for 110V/30V DC operation.

- a) Differential Protection Trip
- b) OLTC PRV Trip
- c) Bucholtz Relay - trip
- d) Tap Changer Surge Relay - trip
- e) Pressure Relief Device -trip
- f) Winding Temperature Indicator - Trip
- g) Tap Changer Drive Motor – trip
- h) Bucholtz Relay - alarm
- i) Winding Temperature Indicator - alarm
- j) Oil Temperature Indicator - alarm
- k) Tap Changer out of Step - alarm
- l) Low oil level - alarm
- m) Tap change delay – indication.
- n) OLTC supply failure – alarm.
- o) Spare contactors - 4Nos.

30.4 Differential Relay:

The RTCC panel shall house numerical differential relay of reputed make as per the specification as given below with suitable test terminal block & wired with 4 sq.mm. wire using disconnecting type terminal blocks. Test terminal Block shall be provided on the front panel of the RTCC. The differential relay shall be housed at a height of minimum 900 mm from ground level to have easy access and testing of relay.

NUMERIC DIFFERENTIAL RELAY FOR TRANSFORMER PROTECTION

I. SCOPE

This specification covers the requirements concerning the technical and operational characteristics and also testing requirements for numerical differential relays used for the protection of 3-phase, power transformers.

II. KEY WORDS

Numerical Transformer differential relays, for two – winding transformers. Areva, Easun Reyrolle, Siemens, ABB, SEL, NARI, GE make relays preferred.

III. USE

The digital differential relays are to be used for the protection of 3 – phase 16 MVA, 33/11 KV power transformers.

IV. STANDARDS

The relays shall conform to the latest IEC standards. Relays based on ANSI/IEEE or DIN/VDE standards can be offered, subject however, to the purchaser's approval.

V. OPERATING CONDITIONS

1. Installation : Indoor.
2. Temperature range : 50°C to 55°C.
3. Relative Humidity : 5% to 95%

VI. GENERAL - BIAS DIFFERENTIAL PROTECTI—N RELAY FOR TWO WINDING TRANSFORMER PROTECTION:

Shall be of Numerical type.

- (i) three phase with faulty phase identification.
- (ii) shall have continuous self monitoring and diagnostic feature.
- (iii) shall have instantaneous high set feature with facility to adjust 5 to 20 times normal current .
- (iv) shall have second & fifth harmonic restraint feature with harmonic content in the range of 15 to 25%.
- (v) the disturbance recording functions should be integrated in the relay module. The disturbance recorder shall have facility to record at least 4 numbers of digital signals apart from digital signal from the relay and currents in HV & LV winding.
- (vi) Facility to set transformer vector group and CT ratio selection/correction through software.
- (vii) Rated current of 1 amp.
- (viii) Thermal withstand current continuous 2 amps and for 1 sec 70 amps.
- (ix) Rated voltage: 30 / 110 / 220V DC.
- (x) Basis bias setting 20 to 40% in steps 10% or 15 to 45% in steps of 15%.
- (xi) Operating current setting range 15 to 30%.
- (xii) have operating time not greater than 35ms at 3 times normal current.
- (xiii) Maximum operating time for instantaneous operation: 25ms+/-4% of set value.
- (xiv) Recording memory capacity: 5 secs.
- (xv) Shall have inbuilt restricted earth fault protection inbuilt over fluxing protection and inbuilt LBB protection.
- (xvi) Shall have impedance protection. If the same is not an inbuilt feature of the differential protection relay then the same may be provided separately.
- (xvii) have front or back RS232 port for connecting Lap Top (suitable connecting

cards / converter to be supplied) and rear RJ45 or fibre optic port for local and remote communication. However for uniformity all the relays shall be provided either with RJ45 port or fibre optic port at the rear. The communication shall be through IEC61850 protocols.

(xviii) Have time synchronizing facility with IRIGB / DCF77/SNTP whichever is compatible to IEC 61850.

VII. CHARACTERISTICS OF THE ELECTRICAL SYSTEM

1. Rated Voltage (phase to phase) : 33 KV rms
2. Maximum Operating Voltage : 36 KV rms
3. Rated frequency : 50 Hz
4. System Neutral : Solidly Earthed.
5. Operating frequency range : 50 Hz $\pm$ 5 Hz
6. Rated short circuit level : 25 KA at 150 KV
7. Maximum permissible duration of fault in order to maintain stability : $\leq$ 500m sec.

VIII. CURRENT TRANSFORMER CHARACTERISTICS

The numerical differential relays will be used in conjunction with current transformers characteristics installed in the transformer.

IX. NUMERICAL DIFFERENTIAL RELAY REQUIRED PROTECTION CHARACTERISTICS

1. Protection capability:
 - a. Against all three and two phase internal faults.
 - b. Against all inter-turn faults
 - c. Against all phase to ground internal faults.
2. Operating Characteristic : Dual slope percentage operating characteristic.
 Relay should have a High set Instantaneous Over-current Protection which shall prevent operation unless the differential current is greater than a certain percentage of the through fault current. This percentage shall be adjustable either continuously or by steps.
3. a) Provision of compensation of Transformer vector group should be available in the Relay setting itself.
 b) Current transformer and ratio adaptation (correction): There shall be no need for external interposing CTs. In other words, the relay must be equipped with capability of adjusting CT ratio and angle (phase) in its input.
4. Blocking characteristics:
 - a. Second harmonic blocking or restrain plus **dc** blocking for transformer inrush current.
 - b. Fifth harmonic blocking against transformer over excitation current.
 - c. Zero – sequence current filtering so that out of-zone earth faults are not seen by the transformer protection as an in-zone fault.
5. Additional Blocking characteristics : Restraining against external faults with current transformer saturation.
6. Protection against out-of-balance current: The out-of-balance current produced by the transformer tap-changing or current transformer mismatch shall be compensated by means of the percentage bias feature.
7. SER/DFR Comtrade file Format Recording minimum 1 sec Record duration with atleast 5 record storage facility.
8. The Relay should have a provision for Zone segregation of faults based on the number of Bus-sections provided.

X. NUMERICAL DIFFERENTIAL RELAY REQUIRED TECHNICAL CHARACTERISTICS

1. Type of differential relay : **Numerical.**
2. Input rated current : 1A and 5A.
3. Auxiliary voltage supply : 30 or 110 V or 220 VDC as per requirement.
4. Auxiliary voltage supply tolerance : + 10% - 15%
5. Output Contacts
- a. Trip contacts
 - Number : at least four (4)
 - Continuous current rating : 5 A.
 - Switching making capacity : 1000 W at 110V DC
 - Switching breaking capacity : 30 W at 110V DC
 - Current rating for 0.5 sec : 30 A.
- b. Alarm contacts - Number of alarm contacts: At least two (2) selectable contacts, plus two N/O contacts all free of voltage. Contact continuous current rating: 1 A.
6. Construction: The relay shall be suitable for panel flush mounting.
7. Relay Housing (case): The housing shall provide a degree of protection of IP50 as per IEC.
8. Self – diagnostics: The relay shall be equipped with self - diagnostics capacity, thus—facilitating repairs.
9. Short circuiting of contacts of the current input unit (if any) : Automatic short – circuit of all current contacts shall be foreseen, if the input unit is of the draw – out type.
10. Construction design : The construction preferably will be of the modular design with plug – units.

11. COMMUNICATIONS

Shall be capable of uploading all settings (parameterization) HMI by means of an integrated keyboard and a display and by a PC/Laptop by Front Ethernet Port so as to provide Galvanic isolation. Also a rear Ethernet Port may be provided for future Networking of the Relays.

The settings shall be stored in a non-volatile-memory, so that they will not be lost even during interruption of the substation auxiliary voltage and relay's internal battery (if any).

XI. NUMERICAL DIFFERENTIAL RELAY REQUIRED ADDITIONAL FEATURES

1. Fault Recording : All faults shall be recorded and stored for analysis. The capacity of memory shall permit the storage of at least five (5) faults. Capability shall exist so that the fault data can be read remotely via modem. The recording shall include both analog and digital signals.
2. Measurements:
 - i) The measurement function shall be capable of measuring in real time all phase currents and capability shall exist so that this data can be read either locally or remotely via modem.
 - ii) Also Negative Differential current, 2nd harmonic current, 5th harmonic current and negative sequence current monitoring features should be available in the Relay monitoring menu.
3. Synchronization : Besides an internal synchronization clock, the relay shall be capable of being synchronized via a substation automation control system's master clock which has capability of GPS synchronization besides of its own.

4. External wiring of the relay : The relay shall be equipped with screw type terminals suitable for 4 mm² conductors.
5. Special Accessories : Any special accessories needed for testing and communication purposes must be provided (such as special communication cables, plugs, interfaces, adaptors etc).
6. Necessary Relay software, Manuals and Drawings- 2 sets for each Relay should be provided.
7. Disturbance Recorder : The relay shall have ability to store at least five nos of Disturbance recorder. The pre fault time and post fault time shall be 500 ms and 3000 ms respectively.

31.0. FITTINGS AND ACCESSORIES

The fittings and accessories, mentioned in this specification, are only indicative and any other fittings which are generally required for satisfactory operation of the transformer are deemed to be included.

32.0. 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.

33.0. CONTROL WIRING, TERMINAL BOARDS, FUSES ETC

- 33.1. All wiring connections, terminal boards, fuses and links shall be suitable for tropical atmosphere. Any wiring liable to be in contact with oil shall have oil resisting insulation and the Board ends of stranded wire shall be sweated together to prevent creepage of oil along the wire.
- 33.2. There shall be no possibility of oil entering into the connection boxes, used for cables or wiring.
- 33.3. Panel connections shall be neatly and squarely fixed to the panel. All instruments and panel wiring shall be run in PVC or non-rusting metal cleats of the limited compression type. All wiring to a panel shall be taken from suitable terminal boards.
- 33.4. Where conduits are used, the runs shall be laid with suitable falls, and the lowest parts of the run shall be external to the boxes. All conduit runs shall be adequately drained and ventilated. Conduits shall not be run at or below ground level.
- 33.5. When 415 Volt connections are taken through junction boxes or marshalling boxes they shall be adequately screened and "415 volts Danger" notices "must be affixed to" the outside of the junction boxes or marshalling boxes.
- 33.6. All box wiring shall be in accordance with relevant IS. All wiring shall be of flexible multi strand copper of 1100 grade and size not less than 4.0 sq.mm. for CT leads and not less than 2.5 sq.mm. for other connections.
- 33.7. All wires on panels and all multicore cables shall have ferrules which bear the same number at both ends.
- 33.8. At those points of interconnection between the wiring carried out by separate contractors, where a change of number cannot be avoided, double ferrule shall be shown on the appropriate diagram of the equipment.

- 33.9. The same ferrule numbers shall not be used on wires in different circuits on the same panels.
- 33.10. Ferrule shall be of yellow insulating material and shall be provided with glossy finish to prevent the adhesion of dirt. They shall be clearly and durably marked in black and shall not be affected by damp or oil.
- 33.11. Stranded wires shall be terminated with tinned Ross courtney terminals, claw was agnetizcrimped tubular lugs. Separate washers shall be used for each wire. The size of the washers shall be suitable to the size of the wire terminated. Wiring shall, in general, be accommodated on the sides of the box and the wires for each circuit shall be separately grouped. Back of panel wiring shall be arranged so that access to the connecting stems of relays and other apparatus is not impeded.
- 33.12. Wires shall not be jointed or tied between terminal points.
- 33.13. Wherever practicable, all circuits in which the voltage exceeds 125 Volts, shall be kept physically separated from the remaining wiring. The function of each circuit shall be marked on the associated terminal boards.
- 33.14. Where apparatus is mounted on panels, all metal cases shall be separately earthed by means of copper wire or strip having a cross section of not less than 2.0 sq.mm. where strip is used, the joint shall be sweated.
- 33.15. All wiring diagram for control and relay panel shall preferably be drawn as viewed from the back and shall show the terminal boards arranged as in service. All diagrams shall show, which view is employed.
- 33.16. Multicore cable tails shall be so bound that each wire may be traced without difficulty to its cable.
- 33.17. The screens or screen pairs of multicore cable shall be earthed at one end of the cable only. The position of earthing connections shall be shown clearly on the diagrams.
- 33.18. All terminal boards shall be mounted obliquely towards the rear doors to give easy access to terminations and to enable ferrule numbers to be read without difficulty.
- 33.19. Terminal board rows should be spaced adequately, not less than 100 mm apart, to permit convenient access to wires and terminations.
- 33.20. Terminal boards shall be so placed with respect to the cable gland (at a minimum distance of 200 mm), as to permit satisfactory arrangement of multicore cable tails.
- 33.21. Terminal boards shall have pairs of terminals of incoming and outgoing wires. Insulating barriers shall be provided between adjacent connections. The height of the barriers and the spacing between terminals shall be such as to give adequate protection while allowing easy access to terminals. The terminals shall be adequately protected with insulating dust-proof covers.
- 33.22. No live metal shall be exposed at the back of the terminal boards.
- 33.23. All fuses shall be of the cartridge type.
- 33.24. Fuses and links shall be labeled.

34.0. QUALITY PLAN AND INSPECTION

- 34.1. The tenderer shall furnish the programme of manufacturing works well in advance.
- 34.2. The purchaser or the accredited representative of the purchaser shall have access to the contractor or sub-contractor's works at any time during 'orking hours for the purpose of inspection of manufacture and selection of samples

of the materials going into the equipment and testing. The contractor shall provide necessary facilities for such inspection or test.

- 34.3. Documents like invoice or receipted chalang, detailing the source of supply of raw materials and their specification, shall be shown by the supplier on demand either during the manufacturing process or at the time of inspection of the transformer .
- 34.4. The core and coil assembly, shall be offered for inspection and to verify the guaranteed technical parameters prior to connections and tanking. The readiness for such inspection shall be intimated at least 15 days in advance. Further process of manufacture of core and coil assembly, shall be taken up only after our approval in this regard.
- 34.5. The transformers shall be completely assembled to arrange for conducting all the TYPE/SPECIAL at Government Laboratory and ROUTINE tests at Manufacturers work as per IS 2026 of latest, in the presence of purchaser or the accredited representative of the purchaser. The readiness of the transformer with all its accessories for testing/inspection shall be intimated at least 15 days in advance. The transformer shall be despatched only after the ap agnetizinthe test certificates by the purchaser.

34.6 **QUALITY ASSURANCE**

- A. A quality assurance programme shall generally cover the following:
 1. Organisation structure for the management and implementation of the proposed quality assurance programme
 2. Document control system
 3. Qualification data for bidder's key personnel
 4. The procedure for purchases of materials, parts, components and selection of Sub-contractor's services including vendor analysis, source inspection, incoming raw material inspection, verification of material purchases, etc.,
 5. System of shop manufacturing and site erection controls including process controls and fabrication and assembly control
 6. Control of non-conforming items and system for corrective actions
 7. Inspection and test procedure both for manufacture and field activities
 8. Control of calibration and testing of measuring instruments and field activities
 9. System for indication and appraisal of inspection status
 10. System for quality audits
 11. System for authorising release of manufacture product to the Purchaser
 12. System for maintenance of records
 13. System for handling storage and delivery
14. The manufacturing quality plan detailing out the specific quality control measures and procedures adopted for controlling the quality characteristics relevant to each item of equipment furnished and/or services rendered
15. A field quality Plan covering field activities
- B. The manufacturing & Field quality Plans shall be mutually discussed and approved by the Purchaser after incorporating necessary corrections by the Supplier as may be required

- C. The Purchaser or his duly authorised representative reserves the right to carryout quality audit and quality surveillance of the system and procedure of the Purchaser / his vendor's quality management and control activities
- D. The Bidder would be required to submit all the Quality Assurance documents as stipulated in the quality Plan at the time of Purchaser's Inspection of equipment/ material.

35.0. TESTING :

- 35.1. All the TYPE, ROUTINE & SPECIAL TESTS on the first unit or any other unit at the discretion of TNPDCCL at any one of the NABL accredited CPRI/ any other Government approved laboratory and all the Routine tests on the other units, as per IS 2026 of latest issue/IEC 60076 shall be carried out at suppliers COST in the presence of purchaser or purchaser's representative.**
- 35.2. If short circuit test conducted on the tendered item is more than 5 years as at the time of opening of tender, then the tenderer has to conduct short circuit test on the 1st unit, free of cost at any one of the NABL accredited CPRI/ any other Government approved laboratory, if purchase order is placed on them. Offers may be considered subject to production of a written undertaking as above.**
- 35.3. If short circuit test has been conducted on higher capacity/rating, then the tenderer has to conduct short circuit test on the 1st unit free of cost at any one of the NABL accredited CPRI/ any other Government approved laboratory, if purchase order is placed on them. Offers may be considered subject to production of a written undertaking as above.**
- 35.4. The supplier shall ensure that the testing instruments and equipments used for testing/measurements have calibration certificates issued by a recognized/standard laboratory not earlier than one year from the date of testing.
- 35.5. The correction for the errors of measuring instruments/testing transformers and resistance of test connections shall be applied, as specified in IEC before coming to the conclusion on the test results.
- 35.6. One unit of out of the ordered quantity will be selected at the discretion of TNPDCCL shall be tested for measuring No-load and load losses concurrently by CPRI or any other Government recognised high voltage testing laboratory as decided by TNPDCCL. The arrangements connected towards testing shall be made by the supplier and recouped from TNPDCCL on actuals, if the losses are proved to be within the guaranteed limits. If the losses are found to be higher than the guaranteed values, necessary compensation charges (for excess over losses) shall be levied as per the capitalization formula given in section IV (19) of this specification.**
- 35.7 The Purchaser has the right to have the test carried out at his own cost by an independent agency whenever there is a dispute regarding the quality of supply.
- 35.8 The Purchaser at its discretion may re-test the same transformer or any other transformer(s) at a Govt./or Govt. recognized laboratory of his choice for

reconfirmation of the test results, particularly no load losses, load losses and percentage impedance, which will be taken as the final and binding as per the clause 35.7 mentioned above.

36.0. Type/Special/Routine Tests :

36.1. (i) The following type/ special test as per IS 2026 of latest issue shall be carried out on the first unit or any other unit at the discretion of TNPDCCL at supplier's cost in the presence of TNPDCCL's representative.

(a) Vacu'm test on the transformer tank: The transformer tank shall be tested at an internal pressure of 3.33 KN/sq.m. (25 torr) for one hour. The permanent deflection of flat plates, after the vacuum has been released, shall not exceed the values below and the performance of the transformer shall not be affected in any way.

Horizontal length of Flat Plate (mm).	Permanent deflection (mm).
Upto and including 750	5
751- 1250	6.5
1251 to 1750	8.0
1751 to 2000	9.0
2001 to 2250	11.0
2251 to 2500	12.5
2501 to 3000	16.0
Above 3000	19.0

(b) Pressure test: The transformer tank shall be subjected to a pressure corresponding to twice the normal head of oil or to normal pressure plus 35 KN/sq.m. whichever is lower. The applied pressure shall be measured at the base of the tank and maintained for one hour. The equivalent air pressure corresponding to oil pressure calculated at the base of the tank to be considered for Air Pressure test. The permanent deflection of flat plates, after the excess pressure has been released, shall not exceed the values specified under the caption 'Vacuum test'.

(c) Temperat're rise tes' at the lowest tap.

(d) Full wave lightning Impulse voltage withstand test on all three phases including chopped impulses on principle tap and extreme taps. (This test shall precede power frequency high voltage tests).

(e) Capacitance and Tan-delta measurement

(f) Zero sequence impedance test.

(g) Noise Level Test.

(h) Measurement of harmonic voltages

36.1 (ii) Measurement of transformer oil required for first filling for entire transformer including radiators, coolers, conservator etc.

36.2. STAGE & FINAL INSPECTION

The supplier shall offer the core, windings and tank of each transformer for inspection by the purchaser's representative(s). During stage Inspection, all the measurements like diameter, window height, leg centre, stack width, stack thickness, thickness of laminations etc. for core assembly, conductor size, Insulation thickness, winding height, major and minor insulations for

both H.V and L.V windings, length, breadth, height and thickness of plates of Transformer tank, the quality of fittings and accessories will be taken / determined. The supplier can offer for final inspection of the transformers subject to clearance of the stage Inspection report by the purchaser.

The proforma for Stage & Final inspection is furnished in Annex. VII & VIII.

36.3 ROUTINE TESTS

The following Routine tests as per IS 2026 of latest issue and special tests shall also be carried out on all the transformers, at supplier's cost.

- (a) Measurement of winding resistance on all taps.
- (b) Measurement of voltage ratio on all taps and check of voltage vector relationship.
- (c) Measurement of impedance voltage/short circuit impedance, load-loss & spill current at principal and extreme taps. The test shall be repeated at 415 volts for comparison during pre-commissioning tests at site.
- (d) Measurement of No-load loss and current corresponding to normal & extreme taps at 100%, 90% and 110% of rated voltage.
- (e) Measurement of insulation resistance.
- (f) Dielectric Tests (Short duration Power frequency withstand voltage test and Induced over voltage withstand test with line/leakage current measured)
- (g) Oil leakage test on transformer tank: The tank and oil filled compartments shall be tested for oil tightness by completely filling with air/oil of viscosity not greater than that of insulating oil, conforming to IS:335 2018 at the ambient temperature and applying a pressure, equal to the normal pressure plus 35 KN/sq.m. measured at the base of the tank. This pressure shall be maintained for a period of not less than 12 Hours for oil and 1 Hour for air during which time no leakage shall occur.
- (h) Magnetic balance test.
- (i) Measurement of No-load current with 415 Volts supply.
- (j) Check of polarity and ratio, tests for knee point voltage, and magnetizing current for bushing current transformer.
- (k) Tests on on- load tap changer (fully assembled on transformer) as per clause 10.8 of IEC: 60076-1 as referred in Clause 5.3 of IEC:60214/2003.
- (l) Measurement of neutral unbalance current which shall not exceed 2% of the full rated current of the transformer.

The test sequence shall be:- Tests on transformer tank, Heat run test, Oil leakage test on the assembled transformer, Impulse test, Routine tests and Special tests.

- (m) Capacitance and Tan-delta measurement

36.4. FURTHER TESTS

- i) The purchaser reserves the right of having other reasonable tests carried out at his own expense either before transport or at site, to ensure that the transformer complies with the requirements of our specification.
- ii) It may also be noted that the purchaser reserves the right to conduct **short circuit test, temperature rise test and impulse voltage withstand test** in accordance with the IS, afresh on each ordered rating at purchaser's cost even if the transformers of the same rating and similar design are already tested. This test shall be carried out on any no. of transformer either offered

for inspection or randomly from supply already made at site and under erection. **The finding and conclusion of these tests shall be binding on the supplier.**

36.5. TEST CERTIFICATES

36.5.1 Six copies of the test certificates on the above type tests/ special tests/ routine tests with the endorsement of the inspecting officer shall be furnished to the Superintending Engineer/Materials Management - II/ 4th Floor, NPKRR Maalig—i, 144th Anna salai, Chennai -2.

36.5.2 The test report shall contain the following information.

- i) Complete identification data, including serial No. of the transformer.
- ii) Method of application where applied, duration, and interpretation of results in each test.
- iii) Details of Temperature rise corrected to 75 ° C.

36.5.3 The equipment will be rejected if test results are not in conformity with the Guaranteed Technical particulars.

36.5.4 Besides the above test certificates, manufacturer's test certificates in resp'ct of the following accessories shall also be furnished in sextuplicate.

- a) Bushings (HV, LV & Neutral).
- b) Buchholtz relay and surge relay.
- c) Magnetic oil level gauge.
- d) Winding Temperature Indicator.
- e) Oil Temperature Indicator.
- f) Radiators.
- g) Transformer oil (including Dissolved Gas Analysis tests)
- h) OLTC
- i) Pressure relief valve (PRV)

36.5.5 TYPE TEST FOR BOUGHT OUT COMPONENTS:

Tenderers are requested to furnish along with tender, the copy of type test certificates for the bought out components in full shape as conforming to relevant IS /IEC standards of latest issue obtained from a Government/Government Recognized Laboratory. The above test certificates should accompany the drawings of the material/equipments, duly signed under seal by the institution who have issued the type test certificate.

Otherwise the above type test certificates shall be furnished before the offer of inspection for the first lot of materials/ equipments at no extra cost to Board and no relaxation to Board's Delivery clause will be given on this accounts. All bought out components used in the Power Transformer shall have Proven, Reputed Make with high performance standard.

The above type test should have been conducted not earlier than five years (5 Years) as on the date of tender opening. Non submission of above type test certificates within the stipulated time will entail cancellation of Purchase Order without any further reference to supplier.

The original type test certificate shall be furnished for verification on request. The details of type test if already conducted for bought out components should also be furnished in the Section.-G.

36.5.6 The supplier shall also furnish test certificates to the effect that the withstand capability of the insulation between the core and all core bolts,

side plates & structural frame has been tested with 2000 Volts AC for one minute after assembling the core and prior to the despatch of the transformer.

36.6 TESTS AT SITE

36.6.1 After erection at site and prior to commissioning, the transformer shall be subjected to the following tests by the purchaser in the presence of the supplier at **TNPDCL's cost**.

- (a) Insulation resistance test.
- (b) Ratio and polarity test on all taps.
- (c) All relevant tests on oil.
- (d) Open circuit and short circuit test.
- (e) Tests on the operation of OLTC.
- (f) Tests on the protective devices and interlocks.
- (g) Measurement of winding resistance at all taps.
- (h) Vector group verification.
- (i) Capacitance and Tan-delta measurement on windings
- (j) Dissolved gas analysis on transformer (The test figures will form the base values for comparison in future).
- (h) Other test/tests that/those may require to ensure that the transformer complies with the requirements of the specification.

36.6.2 After erection at site and prior to commissioning, the transformer oil shall be subjected to the following tests by the purchaser in the presence of the **supplier at suppliers cost at TNPDCL / TANTRANSCO Laboratory**.

- (a) All relevant tests on oil.
- (b) Dissolved gas analysis on transformer (The test figures will form the base values for comparison in future).
- (c) Oil samples shall be taken from the main tank as well as from the OLTC and to be got tested separately.

37.0. DRAWING, TECHNICAL LITERATURE AND GUARANTEED TECHNICAL PARTICULARS.

- 37.1. (a) General out line drawing, showing front side elevations and plan views of the transformer and all accessories and external features with detailed dimensions, weights, crane lift for un-tanking and for erection/removal of bushings, size of lifting lugs and pulling eyes, HV and LV terminal clearances, live terminal to ground clearance, quantity of insulating oil, dimensional details for foundation etc with list of fittings and accessories.
- (b) Assembly drawings of HV, LV /cable box and Neutral bushings
 - (c) Mounting arrangement for cooling pipes, radiators, fans etc.
 - (d) Schematic control and wiring drawing and drawings showing temperature indicator/recorder circuits and control system for cooling equipment.
 - (e) Drawing, showing construction and mounting details of marshalling boxes.
 - (f) Drawing, giving details of name plate, terminal marking and connection diagram.
 - (g) Drawing on OLTC gear assembly.

- (h) Remote Tap Changer control panel.
- (i) Remote Tap Changer control circuit.
- (j) Drawing on Terminal Clamps.

- 37.2 The responsibility rests with the supplier in case of any corrections or modification on scrutiny of the drawings.
- 37.3 Six complete sets of final drawings shall be supplied for the transformer, sufficiently before the actual despatch of the equipment. agnetizix copies of all bulletins, complete instruction manuals for the erection, operation and maintenance of the transformer are to be supplied, before they are despatched.
- 37.4 Any approv agnetizino the detailed drawings by the purchaser shall not relieve the contractor of the responsibility for correctness of the design, completeness of the equipment supplied and in the execution of the works in accordance with the terms of specification.

38.0 REJECTION

- 38.1 The transformer may be rejected if any of the following conditions arise during the tests or while in service.
- (a) No load loss exceeds the guaranteed value.
 - (b) Load loss exceeds the guaranteed value.
 - (c) Percentage impedance values exceed by the guaranteed figure.
 - (d) Temperature rise of oil and or windings exceed the specified values.
 - (e) Transformer fails during impulse test.
 - (f) Transformer fails during power frequency voltage withstand test.
 - (g) If either of the test results conducted at factory and site (during pre-commissioning test) are not satisfactory.
 - (h) Transformer has not been manufactured in accordance with the specification and approved drawings.

39.0 GENERAL:

All values shall be specifically mentioned instead of referring IS/IEC/CBIP standards in schedule of guaranteed performance and other technical particulars of 16 MVA 33/11KV Indoor Power Transformer (TO BE FILLED BY THE TENDERER)

**Sd/-
CHIEF ENGINEER/
MATERIALS MANAGEMENT**

SECTION - VII

ERECTION

1.0 GENERAL

- 1.1. Unless otherwise stated the work shall be carried out as per Section-K of CBIP guidelines.
- 1.2. The following shall supplement the conditions already contained in the other parts of these specifications and documents and shall govern that portion of the work on this Contract to be performed at site.
- 1.3. The Contractor, shall nominate a responsible person as its representative at site suitably designated for the purpose of overall responsibility and co-ordination of the works to be performed at site.

2.0. SCOPE OF WORK

- 2.1. The scope of work shall be to make the transformer ready for testing and commissioning and include the following.
 - a) Placing of the transformer on the plinth and fixing of wheels and carrying- out stop block welding including moving the transformer to the plinth, where the transformer is supplied and unloaded near the plinth.
 - b) The Contractor has to supply, lay, erect and weld M.S.Channel, Flat of the **65x10 mm.** sizes, including green painting and providing with adequate bolts and nuts as applicable. **65x10 mm.** Flat with suitable M.S.Channel for earthing with neutral bushing at two different earth points of existing earth pit, transformer tank, Cooler fan and pumps. D.M.box RTCC panel & other accessories body earthing with required standards. **No of joints should be a max of one (1) joint only for Neutral Earth.**
 - (c) Erection of the following, wherever applicable:
 - (i) HV bushing with turrets
 - (ii) LV and neutral bushing with turrets.
 - (iii) Cable boxes
 - (iv) Bushing current transformers
 - (v) Conservators
 - (vi) Valves
 - (vii) Radiators
 - (viii) Fans/pumps
 - (ix) Buchholz relay
 - (x) Surge relay
 - (xi) Gaskets
 - (xii) Temperature indicators
 - (xiii) Others wherever stated
 - (d) Erection of the Drive Mechanism Box, Marshalling Box at site with equipment and RTCC Panel in the control room after removing the existing panel, if any.
 - (e) First Filling of transformer oil in the transformer and OLTC under hot oil circulation, vacuum drying wherever applicable/necessary to the required level and circulation of oil till satisfactory results are obtained before commissioning. (Power supply for hot oil circulation will be provided by TNPDC/ TANTRANSCO)

- (f) i. The Contractor scope of work shall include all the control cables of minimum seven strands required for the successful commissioning of Auto/Power Transformers including supply, laying, providing suitable glands ferrules, lugs, termination etc., but not limited to the above mentioned for successful commissioning of the transformer as per standard requirement.
1. Protection schemes of auto/power transformer including differential protection cable.
 2. Indication/Annunciation scheme for cooler fan and pumps.
 3. OLTC Remote operation
 4. OLTC fan, pump D.M. power supply cable
 5. DC cable from control room to Transformer
 6. Scada scheme for Remote/Automation operation
 7. CTs cable from CT secondaries to Marshalling Box and Marshalling box to LV panel/RTCC panels
 8. Any other control cable with required site for successful commissioning of the transformer
 9. Interconnection of cables for AC/DC panels to RTCC/LV panels
- ii. All CT cables shall be 4 sq.mm. (minimum) and shall be copper, armoured cables. The other cables that are to be provided shall be 2.5 sq.mm. (minimum), copper multi-strand (**minimum seven strands**) and armoured cables, separate cables for AC and DC are to be used. The AC supply flexible multi-strand copper cables shall be sufficient to cater the load of pumps, fans and the loads of transformer for the AC panel around in the transformer end.
The LT cable shall comply as per IS 1554 –Part-I Standard.
- iii. Additional adequate quantity of cable length shall be provided at the Transformer end and at the RTCC/LV panels ends in case of shifting of panels/ Transformers. All the cables shall be laid end to end without any joints and it should be ensured that the cables so provided shall comply with TNPDCCL control cable specification and should be strictly adhered all the control cables shall be neatly laid /buried in control cable duct/trench by suitable dressing.
- iv. Laying of all control cables from ground to marshalling box and OLTC chamber shall be laid through cable tray with support. Laying through PVC pipes shall not be accepted.
- v. However any additional work and in the schedule of cables shall be discussed with the site Engineers/TNPDCCL Engineers before laying of cables and necessary approval shall be obtained before connection to the panels/Transformer ends.
- (g) Painting as required will be carried out so as to maintain the finish of the surface of the transformer and accessories prior to the erection of the same at site.
- (h) Required assistance for testing and commissioning

Any other works not covered in items(a) to (h) but required for satisfactory commissioning of the power transformer shall also to be carried out by the contractor free of cost.

- (i) **Civil work related to Cooler Banks, Marshalling box and other panels related to the transformers shall be provided by the transformer supplier/erection contractor.**

2.2. The supplier shall prepare a schedule of the works to be carried out with specific periods for each item of work involved. All assembly and erection drawing shall be made available at site.

2.3. If the commissioning of the transformer is delayed due to incompleteness of erection works, the TNPDCCL has the right to recover an estimated amount for such pending erection works from the contractor besides Levy of L.D. clause.

3.0. REGULATION OF LOCAL AUTHORITIES AND STATUTES

The Contractor shall comply with all the rules and regulations of local authorities during the performance of its field activities. The Contractor shall also comply with the Minimum Wages Act, 1948 and the payment of Wages Act (both of the Government of India) and the rules made there under in respect of any employee or workman employed or engaged by it or its Sub-Contractor.

4.0. OWNER'S LIEN ON EQUIPMENT

The owner shall have lien on all equipment including those of the Contractor, brought to the Site for the purpose of erection, testing and commissioning of the plant. The owner shall continue to hold the lien on all such equipment throughout the period of Contract. No material brought to the site shall be removed from the site by the contractor and/or its sub-contractors without prior written approval of the Site Engineer.

5.0. INSPECTION, TESTING AND INSPECTION CERTIFICATES

The provisions of the clause entitled inspection, Testing and Inspection certificates under technical specification applicable to the erection portion of the Works. The site engineer shall have the right to re-inspect any equipment, even though the same may have been previously inspected and approved by him at the contractor's works, before and after the same are erected at site. If by the above inspection, the site engineer rejects any equipment, the contractor shall make good such rejected equipment etc., either by replacement or modification/ repairs as may be necessary to the satisfaction of the site engineer. Such re-placements will also include the replacements or re-execution of such of those works of other contractors and/or agencies, which might have got damaged or affected by the replacements or re-work done to the contractor's work.

6.0. ACCESS TO SITES AND WORKS ON SITE

6.1 The works so far as it is carried out on the owner's premises, shall be carried out at such time as the owner may approve and the owner shall give the contractor reasonable facilities for carrying-out the works.

6.2 In the execution of the works, no person other than the contractor or its duly appointed representative, sub-contractor and workmen, shall be allowed to do

work on the site except by the special permission, in writing of the site engineer or his representative.

7.0. CO-OPERATION WITH OTHER CONTRACTORS

7.1 The contractor shall co-operate with all other contractors or tradesmen/representative(s) of the owner, who may be performing other works on behalf of the owner and the workmen who may be employed by the owner and doing work in the vicinity of the works under the contract. The contractor shall also so arrange to perform its work as to minimise, to the maximum extent possible, interference with the work of other contractors and their work-men. Any injury or damage that may be sustained by the employee(s) of the other contractors and the owner, due to the contractor's work shall promptly be made good by the contractor at its own expense. The site engineer shall determine the resolution of any difference or conflict that may arise between the contractor and other contractors or between the contractor and the workmen of the owner in regard to their work. If the work of the contractor is delayed because of any acts of omission of another contractor, the contractor shall have no claim against the owner on that account other than an extension of time for completing its works.

7.2. The site engineer shall be notified promptly by the contractor of any defects in the other contractor's works that could affect the contractor's works. The site engineer shall determine the corrective measures, if any, required to rectify this situation after inspection of the works and such decisions by the site engineer shall be binding on the contractor.

8.0. DISCIPLINE OF WORKMEN

The contractor shall adhere to the disciplinary procedure set by the site engineer in respect of its/its sub-contractor's employees and workmen at site. The site engineer shall be at liberty to object to the presence of any representative or employee of the contractor/its sub-contractor at the site, if in the opinion of the site engineer such representative/employee has misconduct himself or is incompetent or negligent or other-wise undesirable. The contractor shall remove such person(s) objected to, and provide competent replacement in his place.

9.0. PROTECTION OF WORK

The contractor shall have total responsibility for protecting its works till it is finally taken over by the site engineer. No claim will be entertained by the owner or by the site engineer for any damage or loss to the contractor's works and the contractor shall be responsible for complete restoration of the damaged works to original conditions, to comply with the specification(s) and drawings. Should any such damage to the contractor's works occur because of any other party not being under its supervision or control, the contractor shall make its claim directly to the party concerned without involving the owner. If disagreement or conflict or dispute develops between the contractor and the other party or parties concerned regarding the responsibility for damage to the contractor's works the same shall be resolved as per the provisions of Clause 6.0 above titled co-operation with other contractors. The contractor shall not cause any delay in the repair of such damaged works because of any delay in

the resolution of such disputes. The contractor shall proceed to repair the work immediately and no cause thereof will be assigned pending resolution of such disputes.

10.0. EMPLOYMENT OF LABOUR

- 10.1 The contractor will be expected to employ on the work only its regular skilled employees with experience in the particular type of work. No female labour shall be employed after darkness. No person below the age of eighteen years shall be employed.
- 10.2 All traveling expenses including agnetizinns of all necessary transport to and from site, lodging allowances and other payments to the contractor's employees shall be the sole responsibility of the contractor.
- 10.3 The hours of work on the site shall be decided by the owner and the contractor shall adhere to it. Working hours will normally be eight (8) hours per day-Monday through Saturday.
- 10.4 Contractor's employees shall wear identification badges while on work at Site.
- 10.5 In case the Owner becomes liable to pay any wages or dues to the labour or any Government agency under any of the provisions of the Minimum Wages Act, Workmen Compensation Act, Contract Labour Regulation Abolition Act or any other law due to act of omission of the Contractor, the Owner may make such payments and shall recover the same from the Contractor's bills.
- 10.6 The Contracto' shall be provided with free supply of electricity for the purposes of the Contract only, at one point in the project Site. The Contractor, at its own cost shall make its own further distribution arrangement. All temporary wiring shall comply with local regulations and will be subject to Site Engineer's inspection and approval b'fore connection to supply.

11.0. FACILITIES TO BE PROVIDED BY THE CONTRACTOR

- 11.1 Tools, scaffolding and tackle
 - 11.1.1 The Contractor shall bring to site all the construction/erection equipment tools, tackle, scaffolding etc required for pre-assembly, erection of the equipment covered under the contract. He shall submit a list of all such materials to the Site Engineer before the commencement of pre- assembly at Site.
 - 11.1.2 The following items are generally required
 - (1) Lifting equipment:
 - (a) Derrick or mobile crane of adequate capacity.
 - (b) wire ropes
 - (c) pulley blocks
 - (d) chain blocks
 - (e) Manila ropes,
 - (f) shackles
 - (g) sleepers.
 - (2) Oil purifier with heating and vacuum facilities and hot oil resistant hose pipes.
 - (3) Vacuum pump
 - (4) Oil storage tank.
 - 11.1.3 The owner shall have a lien on such goods for any sum or sums which may at any time be due or owing to it by the contractor.

- 11.1.4 After the completion of the works, the contractor shall not remove from the site, the materials such as construction equipment, erection tools and tackle, scaffolding etc. without permission of the site engineer.

11.2. First - Aid

The contractor shall provide necessary first-aid facilities for all its employees, representatives and workmen working at the site. Adequate number of contractor's personnel shall be trained in administering first-aid.

11.3 CLEANLINESS

- 11.3.1 The contractor shall be responsible for keeping the entire allotted area clean and free from rubbish, debris etc. during the period of contract.
- 11.3.2 Waste oil shall be disposed off in a manner acceptable to the owner. Under no circumstances shall waste oil be dumped into uncontrolled drains.

12.0 FIRE PROTECTION

- 12.1 All the contractor's supervisory personnel and sufficient number of workers shall be trained for fire-fighting and shall be assigned specific fire protection duties. Enough of such trained personnel shall be available at the site during the entire period of the contract.
- 12.2 The contractor shall provide enough fire protection equipment of the types and number for the ware-house, office, temporary structures, labour colony area etc. Access to such fire protection equipment, shall be easy and kept open at all times.

13.0 SECURITY

The contractor shall have total responsibility for all equipment and materials in its custody, stored, loose, semi-assembled and/or erected by it at site. The contractor shall make suitable security arrangements including employment of security personnel to ensure the protection of all materials, equipment and works from theft, fire, pilferage and any other damages and loss. All materials of the Contractor shall enter and leave the work site only with the written permission of the site engineer in the prescribed manner.

14.0 MATERIALS HANDLING AND STORAGE

- 14.1 All the equipment furnished under the contract and arriving at site shall be promptly received, unloaded and transported and stored in the storage by the contractor.
- 14.2 The contractor shall be responsible for examining all the consignment and shall notify the site engineer immediately of any damage, shortage, discrepancy etc. for the purpose of site engineer's information only. However the contractor shall be solely responsible for any shortages or damage in transit, handling and/or in storage and erection of the equipment at site as well as for preferring all claims with the underwriter(s). Any demurrage, wharfage and other such charges claimed by the transporters, railways etc., shall be to the account of the contractor.
- 14.3 The contractor shall maintain an accurate and exhaustive record detailing out the list of all equipment received by it for the purpose of erection and keep all such record open for the inspection of the site engineer.

- 14.4 All equipment shall be handled very carefully to prevent any damage or loss. No bare wire ropes, slings, etc. shall be used for unloading and/or handling of the equipment without the specific written permission of the site engineer. The equipment stored shall be properly protected to prevent damage either to the equipment or to the floor where they are stored.
- 14.5 The contractor shall ensure that all the packing materials and protection devices used for the various equipment during transit and storage are removed before the equipment are installed.
- 14.6 All the materials stored in the open or dusty location(s) shall be covered with suitable weather-proof and flameproof covering material, wherever applicable.
- 14.7 The contractor shall be responsible for making suitable indoor storage facilities, to store all equipment which require indoor storage. Normally, all the electrical equipment such as motors, control gears and consumables shall be stored in the closed storage space.

15.0. CONSTRUCTION MANAGEMENT

- 15.1. The field activities of the contractor's working at site, will be co-ordinated by the site engineer and the site engineer's decision shall be final in resolving any dispute or conflict between the contractor and other contractors and tradesmen of the owner regarding scheduling and co-ordination of work. Such decision by the site engineer shall not be a cause for extra compensation or extension of time for the contractor.
- 15.2. Time is the essence of the contract and the contractor shall be responsible for performance of its works in accordance with the specified construction schedule.

16.0. PROTECTION OF PROPERTY AND CONTRACTOR'S LIABILITY

The contractor shall be responsible for any damage resulting from its operations. It shall also be responsible for protection of all persons including members of public and employees of the owner and the employees of other contractors and sub-contractors and all public and private property including structures, building, other plants and equipment and utilities either above or below the ground.

17.0. INSURANCE

- 17.1. In addition to the conditions covered under the clause, titled Insurance the following provisions will also apply to the portion of works to be done beyond the Contractor's own or its sub-contractor's manufacturing Works.

17.2' Workmen's Compensation Insurance

This insurance shall protect the contractor against all claims applicable under the Workmen's Compensation Act, 1948 (Government of India). This policy shall also cover the contractor against claims for injury, disability disease or death of its or its sub-contractor's employees, which for any reason are not covered under the Workmen's Compensation Act, 1948. The liabilities shall not be less than

Workmen's Compensation	:	As per statutory Provisions
Employee's liability	:	' As per statutory Provisions

17.3 Comprehensive Automobile Insurance

This insurance shall be in such form to protect the contractor against all claims for injuries, disability, disease and death to members of public including the owner's men and damage to the property of other arising from the use of motor vehicles during on or off the site operations, irrespective of the ownership of such vehicles. The minimum liability covered shall be as herein indicated:

Fatal Injury	:	Rs. 100,000 each person
	:	Rs. 200,000 each occurrence
Property Damage	:	Rs. 100,000 each occurrence

17.4 Comprehensive General Liability Insurance

- 17.4.1 The insurance shall protect the contractor against all claims arising from injuries, disabilities, disease or death of members of public or damage to property of others, due to any act or omission on the part of the contractor, its agents, its employees, its representatives and sub contractors or from riots, strikes and civil commotion. This insurance shall also cover all the liabilities of the contractor arising out of the clause titled Defence of Suits under General Conditions of Contract of this Volume-1A.
- 17.4.2 The hazards to be covered will pertain to all the works and areas where the Contractor, its sub-contractors, its agents and employees have to perform work pursuant to the contract.
- 17.5 The above are only illustrative list of insurance covers normally required and it will be the responsibility of the contractor to maintain all necessary insurance coverage to the extent both in time and amount to take care of all its liabilities either direct or indirect, in pursuance of the contract.

18.0 WORK & SAFETY REGULATIONS

- 18.1 The contractor shall ensure proper safety of all the workmen, materials plant and equipment belonging to it or to the others, working at the site. The contractor shall also be responsible for provision of all safety notices and safety equipment required by the relevant legislations and deemed necessary by the site engineer.
- 18.2 All equipment used in construction and erection by contractor shall meet Indian/ International Standards and where such standards do not exist, the contractor shall ensure these to be absolutely safe. All equipment shall be strictly operated and maintained by the contractor in accordance with manufacturer's operation manual and safety instructions and as per Guidelines / Rules in this regard.
- 18.3 Periodical examinations and all tests for all lifting/hoisting equipment & tackle shall be carried-out in accordance with the relevant provisions of Factories Act 1948, Indian Electricity Act and associated Laws/Rules in force from time to time. A register of such examinations and tests shall be properly maintained by the contractor and will be promptly produced as and when desired by site engineer or by the persons authorised by him.

- 18.4 No electric cable in use by the contractor/owner will be disturbed without prior permission.
- 18.5 No repair work shall be carried out on any live equipment. The equipment must be declared safe by the site engineer and a permit to work shall be issued by the site engineer before any repair work is carried out by the contractor. While working on electric lines/equipment whether live or dead, suitable type and sufficient quantity of tools will have to be provided by Contractor to electricians/ workmen/officers.
- 18.6. The contractor shall employ necessary number of qualified, full time electricians/electrical supervisors to maintain its temporary electrical installations.
- 18.7. In case any accident occurs during the construction/ erection or other associated activities undertaken by the contractor, thereby causing any minor or major or fatal injury to its employees due to any reason whatsoever, it shall be the responsibility of the contractor to promptly inform the same to the site engineer in prescribed form and also to all the authorities envisaged under the applicable laws.
- 18.8. The site engineer shall have the right at its sole discretion to stop the work, if in its opinion the work is being carried out in such a way as may cause accidents and endanger the safety of the persons and/or property, and/or equipment. In such cases, the contractor shall be informed in writing about the nature of hazards and possible injury/accident and he shall comply to remove short-comings promptly. The contractor, after stopping the specific work, can, if felt necessary, appeal against the order of stoppage of work to the site engineer within 3 days of such stoppage of work and the decision of the site engineer in this respect shall be conclusive and binding on the Contractor.
- 18.9. The contractor shall not be entitled for any damages/compensation for stoppage of work due to safety reasons as provided above and the period of such stoppage of work will not be taken as an extension of time for completion of work and will not be the ground for waiver of levy of liquidated damages.
- 18.10. The contractor shall follow and comply with all Safety Rules, relevant provisions of applicable laws pertaining to the safety of workmen, employees plant and equipment as may be prescribed from time to time without any demur, protest or contest or reservation. In case of any unconformity between statutory requirement and Safety Rules referred above, the latter shall be binding on the Contractor unless the statutory provisions are more stringent.
- 18.11. If the contractor does not take all safety precautions and/or fails to comply with the Safety Rules as prescribed by the owner or as prescribed under the applicable law for the safety of the equipment, plant and personnel and the contractor does not prevent hazardous conditions which may cause injury to its own employees or employees of other contractors, or owner or any other

person at site or adjacent thereto, the contractor shall be responsible for payment of compensation to the owner as per the following schedule :-

- | | | |
|---|------------------------------------|--|
| a) Fatal injury or accident causing death | } Rs. 1,00,000/)
(per person) | } These are applicable for death injury to any person whosoever. |
| b) Major injuries or accident causing 25% or more permanent disability to work men or employees | } Rs. 20,000/-
(per person) | |

Permanent disability shall have the same meaning as indicated in Workmen's Compensation Act. The compensation mentioned above shall be in addition to the compensation payable to the workmen/employees under the relevant provisions of the Workmen's Compensation Act and rules framed there under or any other applicable law as applicable from time to time. In case the owner is made to pay such compensation, the contractor will be liable to reimburse the owner such amount(s) in addition to the compensation indicated above.

19.0. CODE REQUIREMENTS

The erection requirements and procedures to be followed during the installation of the equipment shall be in accordance with the relevant ASME codes, accepted good engineering practice, the engineer's drawings and other applicable Indian codes and laws and regulations of the Government of India.

20.0. CHECK OUT OF CONTROL SYSTEMS

After completion of wiring and cabling the contractor shall check out the operation of all control systems for the equipment furnished and installed under these specifications and documents.

21.0. CABLING

- 21.1 All cables shall be supported by conduits or cable tray run in air or in cable channels. These shall be installed in exposed runs parallel or perpendicular to dominant surfaces with right angle turn made of symmetrical bends for fittings. When cables are run on cable trays, they shall be clamped at a minimum intervals of 2000 mm or otherwise as directed by the site engineer.
- 21.2 Each cable, whether power or control, shall be provided with a metallic or plastic tag of an approved type, bearing a cable reference number indicated in the cable and conduit list (prepared by the Contractor), at every 5 meter run or part thereof and at both ends of the cable adjacent to the terminations. Cable routing is to be done in such a way that cables are accessible for any maintenance and for easy identification.
- 21.3 Sharp bending and kinking of cables shall be avoided. The minimum radii for PVC insulated cables 1100 V grade shall be 15 D where D is the overall diameter of the cable. Installation of other cables like high voltage, coaxial, screened, compensating, mineral insulated shall be in accordance with the cable manufacturer's recommendations. Wherever cables cross roads and

water, oil, sewage or gaslines, special care should be taken for the protection of the cables in designing the cable channels.

- 21.4 In each cable run some extra length shall be kept at a suitable point to enable one or two straight through joints to be made, should the cable develop fault at a later date.
- 21.5 Control cable terminations shall be made in accordance with wiring diagrams, using identifying codes subject to site Engineer's approval. Multicore control cable jackets shall be removed as required to train and terminate the conductors. The cable jacket shall be left on the cable as far as possible to the point of the first conductor branch. The insulated conductors from which the jacket is removed shall be neatly twined in bundles and terminated. The bundles shall be firmly but not tightly tied utilising plastic or nylon ties or specifically treated fungus protected cord made for this purpose control cable conductor insulation shall be securely and evenly out.
- 21.6 The connectors for control cables shall be covered with a transparent insulating sleeve so as to prevent accidental contact with ground or adjacent terminals and shall preferably terminate in Elmex terminals and washers. The insulating sleeve shall be fire resistant and shall be long enough to over pass the conductor insulation. All control cables shall be fanned out and connection made to terminal blocks and test equipment for proper operation before cables are corded together.

22.0. **GOODS AND SERVICES TAX [GST]:**

- 22.1. Goods and Services Tax [GST] as a modern law, has been brought after Article 366(12A) of the Constitution as amended by 101 st Constitutional Amendment Act, 2016. GST is an indirect tax system, commonly used by both the Central Government and the State/UT to final consumption with credit of taxes paid at previous stages available as set off . In a nutshell, only value addition will be taxed and burden of tax Governments on goods and services. GST is a destination based tax on consumption of goods and services. It is proposed to be levied at all stages right from manufacture up is to be borne by the final consumer. GST has been rolled out w.e.f. 01.07.2017, across India.
- 22.2 The GST to be levied by the Centre on intra-State supply of goods and / or services would be called the Central GST (CGST) and that to be levied by the States/ Union territory would be called the State GST (SGST)/ UTGST. Similarly, Integrated GST (IGST) will be levied and administered by Centre on every inter-state supply of goods and services.
- 22.3 Any supplier of goods and service Provider of services who makes a taxable supply with an aggregate turnover of over Rs.20 lakhs in a financial year is required to obtain GST registration. In special category states, the aggregate turnover criteria is set at Rs.10 lakhs. In simple words Every business whose taxable supply of goods or services under GST (Goods and Service Tax) and whose turnover exceeds the threshold limit of Rs. 20 lakh / 10 Lakh as applicable will be required to register as a normal taxable person.

GST Registration Number: TNPDCCL has migrated into GST regime on 15.06.2017 by duly uploading various mandatory data as required by the GST portal. The provisional ID issued to TNPDCCL is **33AADCT4784E1ZC**. The details are also posted in TNPDCCL web portal.

GST Registration Number or GSTIN is 15 Digit identification number which is allotted to each applicant who applied for GST Registration. GST Number is completely based on the Pan Number and State code. First two digit represent the state code and another 10 digit represent the PAN number of the client, one digit represent the entity code (Like proprietorship or partnership etc), one digit is blank and last one is represent check digit.

Transaction Value: The value of a supply of goods or services or both shall be the transaction value, which is the price actually paid or payable for the said supply of goods or services or both where the supplier and the recipient of the supply are not related and the price is the sole consideration for the supply. Sec 15(1) states that value of supply of goods and service shall be the transaction value i.e. the price actually paid or payable. The conditions for accepting the transaction value are- a) Supplier and the recipient of the supply are not related. B) Price is the sole consideration for the supply.

Composition Scheme : Composition scheme specifies that registered person whose turnover in the preceding financial year is below certain specified limit (Currently 75₹ lakhs) may intimate the proper officer to pay in lieu of tax payable by him an amount calculated at such rate may be specified.

Eligibility for composition scheme: Sec10(2) of the central Goods and Services Tax Act, 2017 states that the registered person shall be eligible to opt under sub- section (1), if- he is not engaged in the supply of services other than supplies referred to in clause (b) of paragraph 6 of Schedule II;

- he is not engaged in making any supply of goods which are not leviable to tax under this Act;
- he is not engaged in making any inter-State outward supplies of goods;
- he is not engaged in making any supply of goods through an electronic commerce operator who is required to collect tax at source under section 52; and
- he is not a manufacturer of such goods as may be notified by the Government on the recommendations of the Council.

Supply of Service and Goods: When there is a combined supply of many goods / services, it has to be determined whether it is a Composite supply or mixed supply of goods or services

COMPOSITE SUPPLY: A composite supply is the one where all the goods or services or a combination has to supplied together i.e., naturally bundled and there would be a Principal Supply that could be identified (Ex. Supply of Machinery with packaging, insurance and freight – the principal supply is machinery). In this case, the rate of principal supply will be applied on entire value.

MIXED SUPPLY: A mixed supply is where the goods or services or the combination thereof which could be individually supplied (like Pizza and Coke) but sold together at a single price. In this case, the highest rate to the good in that mix is applied on all the goods. The GST shall be applicable at appropriate prevailing rates as notified by GST Act. In the event of delay in execution of contract, the GST rate prevailing on the scheduled period or on the actual date of execution, whichever is less only will be admitted.

The bidders should have registered under GST Act and furnish GSTIN. In the event of contractor is within TN, SGST & CGST shall apply and if the contractor is outside TN, IGST shall apply.

23.0 INCOME TAX:

Income Tax will be recovered from the contractors every running bill at the prevailing rate of tax in force with amendments issued from time to time as per the Income Tax Act.

24.0. LABOUR WELFARE FUND:

An amount of 1% of the gross value of the contractor's running bill or as applicable will be recovered towards the contribution to the Manual Workers General Welfare Fund and remitted to T.N Construction Workers Welfare Board, Chennai – 18.

25.0. EMPLOYEES PROVIDENT FUND:

25.1 To entrust the works contracts to only those Contractors who have separate main EPF code number and to comply with the EPF Act in respect of the Contract workers engaged for various works contracts through the respective Contractors by stipulating the following conditions:

- a. The Contractor who desires to take up works contracts for TNPDC/ TANTRANSCO is required to comply with all the relevant provisions stipulated in the EPF & MP Act;
- b. The Contractor should have taken separate EPF main code number;
- c. The Contractor shall be responsible for the payment of necessary EPF contributions both Employer's and Employee's contribution as per the provisions of the EPF Act in respect of the actual workers engaged for the specified works;
- d. The contractor shall submit necessary returns to EPF Organization within the stipulated time as required under the said EPF & MP Act;
- e. The Contractor shall produce the proof of payment of contribution – both Employer's and Employee's contributions made to EPF Organization in order to claim the Bills for the respective works.
- f. The contractor shall be fully liable to meet and fulfill all the relevant provisions of the EPF act in the respect of the execution of the Tendered work;

- g. In case the Contractor fails to fulfill any of the statutory provisions of the EPF & MP Act and consequently it happens that TNPDC/L/TANTRANSCO Ltd has to meet such requirements of the said Act or Statutory provisions in the capacity of Principal Employer, TNPDC/L/TANTRANSCO shall make good such requirements out of the money due and payable to the said Contractor and further the performance of the said Contractor in this regard will be noted for all future Contracts of TNPDC/L/TANTRANSCO.
- h. Further, as per the Pradhan Mantri Rojgar Protsahan Yojana (PMRPY) Scheme launched by the Government of India, Ministry of Labour and Employment on 09.08.2016, the contractors should register their establishment under this scheme with the Employees Provident Fund Organisation to avail benefits of employer's contribution (both EPF & EPS) from Government of India.

26.0. EMPLOYEES STATE INSURANCE:

26.1 All statutory obligations/liabilities like Salary, ESI, P.F., as per Labour Laws for the manpower employed for this contract will be the responsibility of the Contractor. As per the ESI Act, 1948, for the welfare of Labourers engaged by the contractors, the following has to be strictly adhered to,

1. To Comply with the ESI Act 1948 and the scheme provisions and extend the ESI benefits to the contract workers which comes under the purview of ESI Act 1948 through the respective contractors and if the revenue village, where the office located comes under the ESI implemented area .
2. To entrust the works contracts to only those contractors who have separate main ESI code number and to comply with the ESI Act 1948 in respect of the contract workers engaged for the various works contract which comes under the purview of ESI Act 1948 through the respective contractors.
3. The contractor should have taken separate ESI main code number.
4. The contractor shall be responsible for the payment of necessary ESI contributions – both Employer's and Employee's contributions as per the provisions of the ESI Act in respect of the actual workers engaged for the specified works.
5. The contractor shall submit necessary returns to the ESI Organization within the stipulated time as required under the said ESI Act.
6. The contractor shall produce the proof of payment of contributions — both Employer's and Employee's contributions made to ESI Organization in order to claim the Bills for the respective work.

7. The contractor shall be fully liable to meet and fulfill all the relevant provisions of the ESI Act in respect of the execution of the Tendered work.
8. In case the Contractor fails to fulfill any of the statutory provisions of the ESI Act and consequently it happens that TNPDCCL & TANTRANSCO has to meet such requirements of the said Act or Statutory provisions in the capacity of Principal Employer, TNPDCCL & TANTRANSCO shall make good such requirements out of money due and payable to the said Contractor and further the performance of the said Contractor in this regard will be noted for all future Contracts of TNPDCCL & TANTRANSCO.
9. To claim the works bill only after ensuring the remittance of both the Employer's and Employee's ESI contributions by the Contractors and to claim/reimburse the actual Employer's contribution paid for the respective works.
10. The contractor who claims exemption under the ESI Act shall produce the exemption order obtained from the Government/ESI organization and for those areas that are not covered under the purview of the ESI Act, necessary evidences should be submitted by the contractor to ensure that the revenue village where the work is being carried out has not been covered under the implemented area of ESI Act.
11. In such cases, where the revenue village in which work is being carried out has not been covered under the implemented area of ESI Act, provisions in the Agreements shall be given instructing the Contractors "to ensure the medical benefits for the Contract Workers engaged by the Contractors for the works and to take relevant group insurance policies with the applicability for giving compensation to the workers".

**Sd/-
CHIEF ENGINEER/
MATERIALS MANAGEMENT**

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SECTION —VIII**SCHEDULES**

Sl.No.	Contents
A	Price Schedule
B	Schedule of materials and delivery period
C1	Deviation from Technical Specification
C2	Deviation from Commercial Specification
D	Declaration Form
E	Statement of Supply orders Executed/ Under Execution during the past Ten Years as on the date of Tender
F	Guaranteed Technical Particulars (I-V)
G	Statement of Type Test particulars
H	Statement of Special Test particulars
I	Questionnaire

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SECTION –VIII
SCHEDULE –A
PRICE SCHEDULE
(To be filled in by the Tenderer)

Sl. No	Description	Qty in Nos. (Tentative/ Apprx.)	HSN Code (***)	UNIT PRICE IN Rs.				FOR (D) * Price in Rs.	
				Ex-works Price	F&I Charge **	Erection Charges	CGST/SGST/IGST in % and Amount	Unit	Total
1.	Unit price of 16 MVA, 33/11KV, three phase, 50 C/S, Dyn11 Indoor, Cable box type Power Transformer with On-Load Tap-Changing gear, RTCC panel and complete accessories with transformer oil and conforming to relevant IS & as per the tender Specification	32 Nos.		(To be filled on line in BOQ format)					

COMPANY SEAL :

SIGNATURE :

DESIGNATION :

COMPANY :

DATE :

NOTE :

(*) For supply at the Destination TNEB Stores/Site anywhere in Tamil Nadu.

(**) Freight and Insurance Charges including unloading at Stores/Site.

(***) While quoting the rates, the bidder shall indicate the HSN code for all the tendered items as per GST Act.

SCHEDULE — B
SCHEDULE OF MATERIAL AND DELIVERY PERIOD

Supply :

Sl. No	Description	Qty in Nos.	FROM THE DATE OF RECEIPT OF PURCHASE ORDER		
			Time required in months for commencement of supply	Number of units to commence with	Rate of supply per month (Tentative)
1)	16 MVA, 33/11KV Indoor, Cable box type power transformers		3 (THREE)	2 (TWO)	For balance quantities, the schedule of supply will be intimated by the CE/Materials Management atleast 60 days in advance prior to actual supply.

Erection :

1.	Completion of Erection work of the above materials	One month from the date of handing over of site/Plinth
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COMPANY SEAL :

SIGNATURE :

DESIGNATION :

COMPANY :

DATE :

SCHEDULE - C1
DEVIATION FROM TECHNICAL SPECIFICATION

All technical deviations from the specification shall be filled in by the Tenderer, clause by clause, in the Schedule.

SECTION NO.	CLAUSE NO.	DEVIATION

The Tenderer hereby certifies that the above mentioned are the only deviations from the Technical Specification and the tender conforms to the specification in all other respects.

COMPANY SEAL:

SIGNATURE :

DESIGNATION :

COMPANY :

DATE :

SCHEDULE - C2
DEVIATIONS FROM COMMERCIAL TERMS

All deviations from the Commercial terms shall be filled in by the Tenderer, clause by clause, in this schedule.

SECTION NO.	CLAUSE NO.	DEVIATION

The Tenderer hereby certifies that the above mentioned are the only deviations from the Commercial terms of the Specification and the tender conforms to the specification in all other respects.

COMPANY SEAL:

SIGNATURE :

DESIGNATION:

COMPANY :

DATE :

SCHEDULE - D**DECLARATION FORM**

To
 The Chief Engineer/Materials Management,
 TNPDCCL,
 4th floor, Western Wing,
 NPKRR Maaligai, Electricity Avenue,
 144, Anna Salai,
 Chennai – 600 002.

Dear Sir,

Having examined the above specification together with the accompanying schedules etc., we hereby offer to manufacture and supply the equipment/materials covered in this specification at the rates entered in the attached schedule of prices.

1. We hereby guarantee the particulars entered in the schedules attached to the specification.
2. In accordance with security deposit cum performance guarantee clause, Section-V, of the specification we agree to furnish security to the extent of 5% of the total value of the contract.
3. Our company is not a potentially Sick Industrial Company or a Sick Industrial Company in terms of Section-23 of Section-15 of the Sick Industrial Companies (Special Provisions) Act, 1985.

Yours faithfully,

PLACE	:	SIGNATURE	:
DATE	:	DESIGNATION	:
COMPANY SEAL :		COMPANY	:

SCHEDULE — E

**STATEMENT OF SUPPLY ORDERS EXECUTED/UNDER EXECUTION DURING THE
PAST TEN YEARS AS ON THE DATE OF TENDER**

Sl. No.	Name and address of the organization	Description of material	P.O.NO. & Date	Qty.	Value of order in Rs. In Lakh	Scheduled date of completion of order	Actual date of completion of order	Whether PO copy furnished	Whether end user certificate furnished
1	2	3	4	5	6	7	8	9	10

COMPANY SEAL:

SIGNATURE :

DESIGNATION :

COMPANY :

DATE :

SCHEDULE — F**GUARANTEED TECHNICAL PARTICULARS (GTP) AND REQUIREMENTS****(i) TYPE, RATING AND TECHNICAL REQUIREMENTS FOR 16 MVA,
33/11 KV INDOOR POWER TRANSFORMERS**

Sl. No	DESCRIPTION	REQUIREMENT
1.	Maximum continuous rating(MVA)	
	(a) HV	16
	(b) LV	16
2.	Maximum continuous rating and cooling (MVA)	
	(a) ONAN	10
	(b) ONAF	16
3.	Type of cooling	(a) ONAN/ONAF (b) 1 X 100% or separately 2X50% cooler Banks © 2 fans as stand-by one for each cooler bank)
4.	Temperature rise over ambient of 50 ° C.	
	(a) winding	55° C
	(b) oil	50° C
	© Limit of hot spot temperature with yearly weighted average ambient temperature of 32 °C	98° C
	(d)Maximum hot spot temperature	140° C
5.	Maximum flux density at normal voltage and frequency.	1.6 Tesla
6.	(i) Rated system voltage(KV)	
	(a) H.V winding	33
	© L.V winding	11
	(ii) Variation in the system voltage	± 10%
7.	Number of phases	3
8.	Rated frequency	50 ± 5%
9.	Voltage ratio (KV)	33/11
10	(i) Type of connection	
	(a) HV	Delta
	(b) LV	Star
	(ii) Vector group	Dyn11
	(iii)Neutral	Effectively earthed
11.	Type of winding	
	(a) HV	Continuous disc
	(b) LV	Continuous disc/Helical
12.	Max current density of winding	240A/cm ²

13.	Insulation levels	HV	LV & Neutral
	(1) Winding voltage KV (RMS)	33	11
	(2) Highest system voltage KV (RMS)	36	12
	(3) Lightning impulse withstand voltage KV (PEAK)	170	75
	(4) Power frequency rated short duration with stand voltage (KV rms)	70	28
14.	Duration of short circuit withstand Capacity	3 secs	
15.	(a) Tap changer	OLTC with remote control panel	
	(b) Tapping range.	On HV winding for HV variation of +5% to -15% in steps of 1.25%	
16.	D.C. voltage for relays etc.	30/110 Volts.	
17.	Percentage impedance.	9 % + 10% tolerance (Negative tolerance is not accepted)	
18.	Cooling medium/insulating oil.	EHV grade transformer oil conforming to IS 335 /2018	
19.	Losses		
	(a) No-load loss	10.0 KW (Max.)	
	(b) Load loss	58.0 KW (Max.)	
	© Auxiliary loss	1.0 KW (Max.)	
20.	Termination arrangement.	Cable box type with cable sealing end chamber for phases and the neutral bushing shall be brought out of the tank.	
21.	Terminal bushings	HV	LV
	System voltage	33	11
	(a) Voltage rating(KV rms)	36	12
	(b) Current rating (Amps)	800	2000
	© Impulse withstand voltage (KV Peak)	170	75
22.	Bushing current transformers		
	a) Ratio HV LV	300/1 A. 900/0.577 A	
	b) Accuracy class	PS	
	c) Knee point voltage	shall be more than $40 \cdot I \cdot (R_{ct} + R_a)$ where R _{ct} = secondary resistance of the current transformer R _a = lead resistance (2 ohms)	

23.	Tank:		
	i) Type	Conventional	
	ii)Thickness (mm)		
	(a) Bottom	12	
	(b) Sides	10	
	© Top	12	
	iii)Pressure release device		
	(a) Type	Safety valve type spring operated	
	(b) Number	One	
	The minimum length of insulator (only porcelain bushing) used in respect of cable box shall be as follows:		
	HV -300 mm		LV-125 mm
24	Clearances (mm)	Cable box type	
		HV	LV
	(a) Phase to phase	356	130
	(b) Phase to Earth	222	80
25.	Noise level	Less than 73 db	
26.	Oil preservation (Main conservator) (OLTC conservator)	2 Nos. silicagel breather associated with oil seal closing valve and 1 No. silicagel breather with oil seal.	
27.	Expected life period of the transformer	25 Years.	

**TECHNICAL PARAMETERS OF OIL AS PER IS 335:2018.
NEW TRANSFORMER OIL TO BE SUPPLIED IN BARRELS OR TANKERS**

I(a). SCHEDULE OF CHARACTERISTICS OF TRANSFORMER OIL

New Transformer Oil		: As per IS 335/2018 with latest revisions thereof
S.No	Characteristics	Requirements
1.	Appearance	: Oil shall be clear and transparent and free from suspended matter and sediments.
2.	Density (Max) at 29.5° C	: 0.895 g/ml
3.	Kinematic viscosity (max)	: 15 mm²/s, Max at 40°C
4.	Flash point (Min)	: 135°C
5.	Neutralization value :	:
	a. Total acidity (Max)	: 0.01mgKOH/g
	b. Inorganic acidity/Alkalinity	: Nil
6.	Pour point (max)	: - 10°C
7.	Corrosive sulphur	: Non Corrosive
8.	Dielectric dissipation factor (tan delta) at 90°C (Max)	: 0.005
9.	Electric strength (break down voltage) (min) with 2.5mm gap	:
	a) New unfiltered oil as in received condition.	: 30kV rms
	b) After filtration	: 60kV rms
10.	SK Value (Max)	: 12%
11.	Water content (Max)	: 40mg/kg.
12.	Oxidation Stability	:
	a. Neutralization value after oxidation (Max.)	: 1.2 mg KOH/g.
	b. Total sludge after oxidation (Max.)	: 0.8 % by weight
13.	Presence of oxidation inhibitor	: The oil shall not contain anti oxidant inhibitors.
14.	PCA Content	: 3% Max
15.	PCB content	: Not detectable

(II) SCHEDULE OF GUARANTEED PERFORMANCE AND OTHER TECHNICAL PARTICULARS OF 16 MVA, 33/11 KV INDOOR POWER TRANSFORMERS.
(TO BE FILLED BY THE TENDERER).

Sheet 1/8.

Sl.No	Item	Values
1.	Name of the manufacturer and address	
2.	Applicable standards.	
3.	Continuous ratings under conditions specified in IS 2026(Part-I) 1977 Clause-3	
(a).	Type of cooling	
(b).	Rating in (MVA) (i) With ONAN cooling (ii) With ONAF cooling	
©.	Rated System Voltage. (i) HV (KV) (ii) LV (KV)	
(d)	Variation in the system voltage	
©	Rated frequency (Hz)	
(f)	Frequency variation	
(g)	Number of phases.	
(h)	Current at rated load and voltage on principal tap (i) HV amps. (ii) LV amps.	
4.	Connections. (i) HV. (ii) LV.	
5.	Connection Symbol.	
6.	Maximum Temperature rise (above peak ambient).	
(a)	Temperature rise of oil (By thermometer) (Deg C) (i) at full ONAN rating. (ii) at full ONAF rating.	
(b)	Temperature rise of winding (By resistance method) (Deg C) (i) at full ONAN rating. (ii) at full ONAF rating.	
©	Temperature gradient between Oil and Winding (Deg C)	
(d)	Limit of hot spot temperature for which the transformer is designed (Deg C).	
(e)	Time in minutes for which the transformer can be run at full load without exceeding the maximum permissible temperature at reference ambient temperature when supply of fan is cut off.	
(f)	Ambient peak temperature specified °C.	

7.	Tappings on windings on HV side.	
(a).	Number of steps	
(b).	Range of tappings for variation	
8.	Losses (KW-MAX)	
(a)	No-load losses at rated voltage and Frequency at principal tap.	
(b)	Load-losses at rated output rated Frequency and corrected for 75°C.	
©	Auxiliary losses at rated output, normal ratio, rated voltage, rated frequency and ambient temperature (KW).	
(d)	Total losses at normal ratio inclusive of auxiliary equipment losses (KW) corrected to 75°C.	
9.	Resistance per phase (ohms)	
(a)	H.V. winding.	
(b)	L.V. winding.	
10	Positive sequence impedance on rated MVA base at rated current and frequency at 75 deg C. winding temperature in percentage.	
(a)	At Principal tap (normal voltage).	
(b)	At Highest voltage tap (tap 1).	
©	At Lowest voltage tap (Last tap).	
11.	Zero Sequence impedance at reference temperature of 75 Deg. C at principal tap percent .	
12.	Noise level in decibels when agnetizi at normal voltage and normal frequency at No Load.	
13.	Reactance at rated MVA base at rated Current and frequency in percentage.	
	(i) At unity power factor	
	(ii) At 0.8 pf (lagging)	
14.	Regulation at full load and 75 deg C Winding temperature expressed as a percentage of normal voltage	
	(i) At unity power factor percent	
	(ii) At 0.8 pf(lagging) percent	
15	Efficiency at 75 deg C winding temperature as derived from guaranteed loss figures and at UPF	
	(a) Full load percent	
	(b) 3/4 load percent	
	© 1/2 load percent	
	(d) 1/4 load percent	
	Efficiency at 75 deg C winding temperature as derived from guaranteed loss figures and at UPF	

16	Short time rating for 3 seconds of	
(a)	HV winding	
(b)	L V winding	
17	Permissible over loading	
(a)	HV winding	
(b)	L V winding	
18(a)	Over load capacity of transformer duration for the following over loads starting with transformer unexcited (ambient temp 50° C) (j) 10 % (ii) 20 % (k) 30 % (iv) 50 % (l) 75 % (vi) 100 %	
18(b)	Overload capacity of transformer duration for the following overloads, starting with Transformer after continuous running on Open circuit. (Ambient Temp. 50° C) (m) 10 % (ii) 20 % (n) 30 % (iv) 50 % (o) 75 % (vi) 100 %	
18©	Permissible emergency short time, loading of the transformer immediately following full load run (ambient temp 50° C) (i) 2 seconds. (ii) 5 seconds. (p) 10 seconds. (iv) 30 seconds. (v) 1 minute . (vi) 5 minutes.	
19.	Terminal arrangement (q) High voltage (HV) (ii) Low voltage (LV) (iii) Neutral	
20.	Insulating and cooling medium	
21.	Test Voltage	
	(i) Lightning impulse withstand voltage (KV Peak)	
	(ii) Power frequency withstand test voltage (dry & wet) (kV rms)	
	(iii) Induced over voltage withstand voltage (kV rms)	
	(iv) Voltage to earth for which star Points of the transformer LV windings will be insulated.	
22.	External short circuit withstand capacity (MVA) and duration (seconds)	
23.	Over flux withstand capacity of the transformer	

ADDITIONAL TECHNICAL PARTICULARS.		
1.	Details of core	
(a)	Type of core construction	
(b)	Type of core joints	
(c)	Flux density at rated voltage and frequency and at principal tap Tesla (i) at rated voltage. (ii) at 110% rated voltage. (iii) at 90% rated voltage	
(d)	Magnetising current on HV side at normal ratio and frequency and at (i) 85 % of rated voltage (ii) 100 % of rated voltage (iii) 110 % of rated voltage	
(e)	Power factor of magnetizing current at normal voltage ratio and frequency	
(f)	(i) Material of core laminations (CRGO) (ii) Thickness of core laminations (mm) (iii) Specific loss of the core material watts per kg at working flux density.	
(g)	(i) Whether core construction is without core bolts (j) Insulation of core bolt (k) Insulation of core bolt washers (iv) Insulation between core lamination (l) Core bolt insulation withstand voltage for 1 minute (KV rms)	
(h)	Insulation of clamping plate	
(i)	Describe location / Method of core grounding.	
(j)	Details of oil ducts in core	
2.	Method of making joints carrying current	
3.	Details of winding	HV LV
(a)	Type of winding	
(b)	Material of winding conductor	
©	Maximum current density of windings (at rated current) and conductor area (i) H.V. (ii) L.V. (iii) Regulating	
(d)	Whether HV windings are interleaved	
(e)	Whether windings are preshrunk	
(f)	Whether adjustable coil clamps are provided for HV and LV windings	
(g)	Whether steel rings used for the windings if so, whether they are split.	
(h)	whether electro-static shields are provided to obtain uniform voltage.	
(i)	Insulating material used for (i) HV winding (ii) LV winding (iii) Regulating winding	

(j)	Insulating material used between (i) HV and LV winding (ii) LV winding and core (iii) Regulating winding and earth																							
(k)	Type of axial coil supports (i) H.V. Winding (ii) L.V. Winding																							
(l)	Type of radial coil supports (i) H.V. winding (ii) L.V. winding																							
(m)	Maximum allowable torque on coil clamping bolts																							
4.	Bushings:	HV LV																						
(a)	Make and type																							
(b)	(i) Rated Voltage class KV (ii) Rated current (Amps)																							
©	Lightning impulse withstand test voltage (1.2x50 micro second (KV peak)																							
(d)	Switching surge withstand test voltage(KVp)																							
(e)	Power frequency withstand test voltage (i) Wet for 1 minute (KV rms) (ii) Dry for 1 minute (KV rms)																							
(f)	Visible corona discharge voltage (KVrms)																							
(g)	Partial discharge level																							
(h)	Creepage distance in mm																							
(i)	Creepage distance (protected)																							
(j)	Whether test tap is provided																							
(k)	Quantity of oil in bushing and specification of oil used (Kg)																							
(l)	Weight of assembled bushing (Kg)																							
(m)	Minimum clearance height for removal of bushing (mm)																							
5.	Details of bushing current transformers																							
(a)	Type and Make.																							
(b)	Ratio.																							
©	Class of Accuracy as per IS 2705 Part IV of latest issue.																							
(d)	V.A.Burden.																							
(e)	Knee point voltage.																							
(f)	Magnetising current at knee point voltage.																							
(g)	Secondary resistance.																							
6.	Minimum clearance (mm) :																							
	<table border="1"> <tr> <td></td> <td>In Oil</td> <td></td> <td>In Air</td> <td></td> </tr> <tr> <td></td> <td>Between phases</td> <td>Between phase and ground</td> <td>Between phases</td> <td>Between phase and ground</td> </tr> <tr> <td>(i) HV</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>(ii) LV</td> <td></td> <td></td> <td></td> <td></td> </tr> </table>					In Oil		In Air			Between phases	Between phase and ground	Between phases	Between phase and ground	(i) HV					(ii) LV				
	In Oil		In Air																					
	Between phases	Between phase and ground	Between phases	Between phase and ground																				
(i) HV																								
(ii) LV																								

7.	Approximate weight in Kgs.	
(a)	Core steel	
(b)	Coil with insulation	
©	Core and winding	
(d)	Oil required for first filling	
©	Fittings & accessories	
(f)	Tank and fittings with Accessories	
(g)	Un tanking weight	
(h)	Total weight with oil and fittings	
8.	Details of Tank	
(a)	Type of tank	
(b)	Approximate thickness of sheet (i) Sides (mm) (ii) Bottom (mm) (iii) Cover (mm) (iv) Cooling tubes/Radiators (mm)	
©	Materials of tank and construction	
(d)	Vacuum to be maintained during oil filling in transformer tank (torr)	
(e)	Vacuum to which the tank can be subjected without distortion (torr)	
(f)	No of bi-directional wheels provided	
(g)	Track gauge required for the wheels	
(h)	Size of rail recommended for the track	
(i)	Type and quantity of pressure relief device/and pressure at which it operates	
9.	Conservator	
(a)	Total volume (in liters).	
(b)	Volume between the highest and lowest visible oil levels (in liters).	
10.	Oil.	
(a)	Governing Standard	
(b)	Specific resistance at (i) 27 deg C (ohms-cms) (ii) 90 deg C (ohms-cms)	
©	Tan delta	
(d)	Water content	
(e)	Dielectric strength (Break down voltage) (KV) (min)	
(f)	Characteristic of oil after ageing test as per ASTM D — 1934 (j) Specific resistance at 27°C (ii) Tan delta (k) Sludge content (ii) Neutralisation number	
(g)	Details oil preserving equipment offered	

11.	Radiator.		
(a)	No. of banks attached whether attached/separate		
(b)	Overall dimensions (lxbxh) (mm)		
(c)	Total weight with oil (kg)		
(d)	Total weight without oil (kg)		
(e)	Thickness of radiator tube (mm)		
(f)	Type of mounting		
(g)	Vacuum withstand capability		
12.	Cooling System.		
(a)	Make and type		
(b)	No. of connected units		
(c)	No. of stand by units		
(d)	Rated power input		
(e)	Capacity (cu m/min) or (litres/min)		
(f)	Rated voltage (volts)		
(g)	Locked rotor current (Amps)		
(h)	Efficiency of motor at full load (in %)		
(i)	Estimated time constant in hours for (i) Natural cooling (ii) Forced air cooling		
(j)	Temp.rise of motor at full load (in° C)		
(k)	BHP of driven equipment		
(l)	Temperature range over which control is adjustable(Deg.C)		
(m)	Whether the fans suitable for continuous operation at 85 percent of their rated voltage		
13.	Gas and oil operated relay Make and type:		
14.	Magnetic oil level gauge make and type		
15.	Temperature controllers	For Oil.	For winding.
	(i) Make and Type		
	(ii) Permissible setting ranges for alarm and trip		
	(iii) Number of contacts		
	(iv) Current rating of each contact		
	(v) Diameter of the dial		
16.	(i) Minimum clearance height for lifting core and winding from tank cover: mm (ii) Minimum clearance height for lifting tank cover :mm:		
17.	Shipping details		
(a)	Approximate weight of heaviest package :kg		
(b)	Approximate dimension of largest package : l x b x h		
18.	Transformer will be transported with oil/gas		

19.	Tap-changing equipment	
(a)	Make.	
(b)	Type.	
(c)	Power flow - unidirectional / bidirectional/ restricted bi-directional	
(d)	Rated voltage to earth (KV)	
(e)	Rated Current (Amps)	
(f)	Step Voltage (Volts)	
(g)	Number of steps	
(h)	Control-Manual / Local Electrical / Remote Electrical	
(i)	Line drop compensation provided/not provided	
(j)	Parallel operation	
(k)	Protective devices	
(l)	Auxiliary supply details	
(m)	Approximate overall dimensions of tap changer	
(n)	Approximate overall weight	
(o)	Approximate mass of oil (in Litres)	
(p)	Details of the OLTC control panel for installation in the control room	
	(1) Tap change delay	
	(2) Tap change out of step	
	(3) Tap change drive motor trip	
	(4) Oil temperature alarm	
	(5) Winding temperature alarm	
	(6) Winding temperature trip	
	(7) Buchholz alarm	
	(8) Buchholz trip	
	(9) Tap changer surge relay trip	
	(10) Tap changer out of step alarm.	
	(11) Oil flow fail alarm	
	(12) Cooling fan trip (for each group of fans and standby)	
	(13) Pressure relief device acted	
	(14) Cooler supply failure	
	(15) OLTC buchholz alarm	
	(16) Low oil level alarm	
20.	Driving mechanism box (i) Make and Type (ii) Details of apparatus proposed to be housed in the box.	
21.	Weight of copper used (in kg)	
22.	Quantity of transformer oil used (K.litres) (including cooling system, OLTC & conservator)	
23.	Type of gaskets used in the transformer	
24.	Overall Dimensions in mm. Length x Breadth x Height	

(III) TECHNICAL DATA—WINDING

Sl. No.	PARTICULARS	16 MVA, 33/11KV POWER TRANSFORMER HV / LV / TAP
1	Phase Current	
2	Cross sectional Area(A)	
3	Current density	
4	a) Type of oil	
	b) ID-mm	
	c) OD-mm	
	d) Mean dia (Dm)	
	e) Size of conductor including parallels	
5	No. of turns/phase (T)	
6	No. of spacers per circle	
7	Winding radial Duct	
8	Oil duct	
9	Length of mean turn(Lmt)=Dm*T	
10	Wt. of copper (kg) =Lmt x A x8.89 x10 ⁻³	
11	Per phase resistance of winding (Ohms) = 0.0211 x Lmt ----- A	
12	I ² R Loss (Kw)	
13	Eddy Current & Stray loss (Kw)	
14	Total copper loss	
15	Guaranteed loss at 75 degree cent.	
16	Source of receipt including details of import of following:	
	(a) EC grade copper	
	(b) Paper Insulation	
	© Press board & other insulating materials	

Note: The Tenderers may please note that all data as per Sl.No. 1 to 16 are to be brought out separately for each winding i.e. HV, LV and tap. Also it may be noted that the loss figures against Sl.No. 12,13,14,15 are to be indicated at 75°C.

SIGNATURE
WITH SEAL OF TENDERER

(IV) TECHNICAL DATA — CORE

Sl.No.	PARTICULARS	16 MVA, 33/11KV POWER TRANSFORMER
1	Core material	
2	(a) No. of steps of core	
	(b) Thickness of steps	
	© No. of limbs	
3	Gross core area	
4	Stacking factor	
5	Net core area (A)	
6	Core circle dia.(D)	
7	Height of window (H) Width of window	
8	Centre to centre distance of limb (C)	
9	Voltage per turn (V/t)	
10	Weight of core in kg. = $(2.1 \times D + 3H + 4C) \times A \times 0.00765$	
11	Working flux density (B in tesla) = $(V/t) \times 10^4$ 4.44 f A	
12	Core loss in watt per kg. from graph for grade of core material and selected flux density	
13	Building factor	
14	No Load Loss in Watts = Core wt. x watts per kg. x Building factor	
15	Guaranteed No load Loss (W)	
16	Source of receipt with proof of import	

SIGNATURE
WITH SEAL OF TENDERER

**V. Guaranteed Technical particulars of Transformer Differential Relay for
16 MVA, 33 KV class Power Transformers.**

Transformer Biased Differential Relay:

1. Make & Type :
2. Numerical :
3. Rated DC Voltage :
4. Rated Current :
5. Continuous :
6. For 1 sec :
7. Two Winding Relay :
8. Operating time at 3 times
normal current :
9. Operating time for
instantaneous operation :
10. Bias setting range with steps :
11. Availability of faulty phase
identification :
12. Availability of instantaneous
High set feature with current
setting range :
13. Range of second harmonic
restrain feature available :
14. Availability of continuous self
monitoring and diagnostic
features :
15. Transformer vector group and
CT ratio selection/ corrections
through software :

Disturbance recorder:

1. No. of external digital signal
that can be recorded :
2. Facility to record currents in
HV & LV Winding :

Memory Capacity of D.R:

1. Fault records :
2. No. of fault records that can be
stored :

Details of ports available with protocol :

Sheet no. 1/2.**VI. FITTING AND ACCESSORIES TO BE SUPPLIED ALONG WITH EACH UNIT**

1. Conservator with partition for main transformer and OLTC:
 - (1) For main transformer :
 - (a) 50 mm oil filling valve.
 - (b) 25 mm drain cum sampling valve with dummy plug.
 - (c) 40 mm filter valve with dummy plug.
 - (d) Lifting hooks.
 - (e) Ladder.
 - (2) For OLTC conservator :
 - (a) 50 mm oil filling valve.
 - (b) 25 mm drain cum sampling valve with dummy plug.
 - (c) 25 mm shut-off valve.
 - (d) Prismatic oil level gauge.
 - (e) Surge relay.
2. Magnetic type oil gauge with low oil level alarm contacts.
3. Silicagel breather with oil seal 100% (2 Nos.).
4. Buchholz relay double float with alarm and trip contacts with shut off valves on either side of the relay of size 80 mm.
5. Pressure relief device (safety valve type) with alarm contacts.
6. Pockets for thermometer on tank cover.
7. Oil temperature controller with maximum pointer and two sets of contacts, with micro switches.
8. Winding temperature controllers with maximum pointer and four sets of contacts with micro switches.
9. Valves.
 - (i) between cooler and tank.
 - (ii) One 80 mm drain valve with padlocking arrangement, located on the low voltage side.
 - (iii) Two 50 mm filter valves at diagonally opposite corners with padlocking arrangement for the bottom valve.
 - (iv) Two sampling valves of 25 mm with provision for fixing PVC pipe.
 - (v) One 15 mm air release plug.
10. 2 Nos. earthing terminals.
11. Rating, diagram, terminal marking, schematic wiring and valve position plates, (stainless steel) of not less than 300 x 300 mm.
12. Inspection cover.
13. Bi-directional rollers with greasing duct and nipple.
14. Wiring upto marshalling box with PVC stranded copper cables of 1100V grade from various points.

Sheet no. 2/2.

- 15 Lifting and hauling facilities.
 - (i) Lifting lugs.
 - (ii) Pulling eyes.
 - (iii) Jacking pads at a height of 500 mm.
 - (iv) Latching lugs.
 - (v) Lifting eyes for the tank cover.
 - (vi) Fixed ladder with anti clamping device.
- 16 Weather-proof marshalling boxes for housing control equipment and terminal connections.
- 17 OLTC gear with remote control panel comprising, among other things,
 - a) Necessary valves for filling drain and sampling of oil.
 - b) Conservator for OLTC.
 - c) Equaliser pipe with valve between divertor and main tank.
 - d) Drive mechanism box.
 - e) Local control panel with necessary wiring and with the following:
 - (i) Remote/Local selector switch.
 - (ii) Push button switch; Raise/off/lower.
 - (iii) Limit switch to prevent motor over-travel in either direction.
 - (iv) Counter.
 - (v) Electrically interlocked reversing contractors.
 - (vi) Heaters with switch and HRC fuse.
 - (vii) Master/follower selector switch.
 - (viii) Interior lighting
 - (ix) Auxilliary relays.
 - (x) Manual operating device.
 - (f) Remote control panel.
 - (i) Control push button switch: Raise/off/lower.
 - (ii) Independent/Off/Master/follower selector switch.
 - (iii) Lamp indications and initiating contacts as specified.
 - (iv) Remote top position indicator. (digital type)
 - (v) Alarm annunciation scheme for trip and non-trip alarm as specified.
 - (vi) Local/remote selector switch for OLTC.
 - (vii) Provision with dummy plate for fixing differential relay in the panel.
- 18 Cooling accessories:
 - (1) Requisite number of radiators with shut-off valves at top and bottom, air release plug, drain plug and lifting eyes.
 - (2) Transformer oil required for first filling at site including wastage in pre — commissioning process.
- 19 HV & LV cable boxes and neutral bushing.
20. Bushing current transformers as specified on HV & LV (as applicable).
21. Terminal clamps for HV, LV and Neutral.
22. One set of spare gaskets for assembling at site.

SCHEDULE – G
STATEMENT OF TYPE TEST PARTICULARS
(TO BE FILLED IN BY THE TENDERER)

SL. NO.	NAME OF THE TEST	NAME OF LAB	DATE OF TEST
	TYPE TEST:		
1.	IMPULSE VOLTAGE TEST		
2.	TEMPERATURE RISE TEST		

Type Test reports for tendered (or) higher capacity/voltage class Power Transformer, issued by the **NABL accredited CPRI / ERDA / any other Government approved /Government recognized laboratory** as per IS 2026/ IEC 60076 of latest issue, shall be submitted. The Type test should have been conducted within 5 years as on the date of tender opening and uploaded along with the tender.

Note: If the type tests conducted on the tendered item is more than 5 years as on the date of opening of tender (or) conducted on higher capacity/rating, then the tenderer has to conduct the Type tests on the 1st unit free of cost, if purchase order is placed on them and offers of such bidders shall be considered subject to uploading of undertaking **in a Non-judicial stamp paper of value not less than Rs.500/-**.

COMPANY SEAL:

SIGNATURE :

DESIGNATION :

COMPANY :

DATE :

SCHEDULE - H**STATEMENT OF SPECIAL TEST PARTICULARS**

S. NO.	NAME OF THE TEST	NAME OF LAB	DATE OF TEST
1.	SPECIAL TEST: SHORT CIRCUIT TEST		

Special Test reports for tendered (or) higher capacity/voltage class Power Transformer, issued by the **NABL accredited CPRI / ERDA / any other Government approved /Government recognized laboratory** as per relevant IS/IEC of latest issue, shall be submitted. The Special test should have been conducted within 5 years as on the date of tender opening and uploaded along with the tender.

Note: If the Special test conducted on the tendered item is more than 5 years as on the date of opening of tender (or) conducted on higher capacity/rating, then the tenderer has to conduct the Special test on the 1st unit free of cost, if purchase order is placed on them and offers of such bidders shall be considered subject to uploading of undertaking **in a Non-judicial stamp paper of value not less than Rs.500/-**.

COMPANY SEAL:

SIGNATURE :

DESIGNATION :

COMPANY :

DATE :

SCHEDULE — I
QUESTIONNAIRE

(TO BE KEPT IN THE "COMMERCIAL AND TECHNICAL BID")

INSTRUCTIONS:

- (a) Strike off, whichever is not applicable
(b) Separate sheets should be used, wherever necessary:

S.No.	PARTICULARS	BIDDERS'S RESPONSE
1.	Name and Address of the Firm/Company	
	a. Registered Office	
	b. Factory/Works Address	
	c. Fax. No:	
	d. e-mail Id:	
	e. Contact No.	
	f. If the factory address is within Tamil Nadu, the bidder is requested to indicate service connection number either LTCT or HT as the case may be.	
2.	Name, Designation and Address of the person signing the tender.	
3.	a. Whether the Company is Small /Medium /Large Scale Unit.	
	b. If SSI Unit, whether registered with Udyam	YES/NO
	c. Whether the company is located inside Tamil Nadu	YES/NO
	d. Legal Status of the Firm/Company	
	e. Permanent Account Number- PAN	
	f. GSTIN	
4a.	Confirm whether tenderer is a manufacturer of Power/Auto Transformer	YES/NO
b.	Details of documents furnished towards proof for manufacturer	Mention the details of documents furnished
5a.	Whether manufactured and supplied satisfactorily a minimum of 8 Nos. of tendered or higher capacity/higher voltage class Power/Auto transformers along with on-load tap changer during the preceding ten years as on date of tender opening to any of the State Electricity Boards/ Govt.(or) Public Power Utilities/ Govt. Generating Companies/ any DISCOMS, either directly (or) through turnkey contracts.	YES/NO
b.	Whether the copies of POs along with end user certificate for satisfactory supply uploaded.	YES/NO
c.	Whether the end user certificates for satisfactory performance of minimum 8 Nos. Power/Auto Transformer for a continuous period of three years uploaded.	
6a.	Annual Turnover of the bidder during last three years (2022-23, 2023-24 & 2024-25).	2022-23: 2023-24: 2024-25:
b.	Whether Audited financial statements (or) Annual turnover certified by the practicing Chartered Accountant.	YES/NO

S.No.	PARTICULARS	BIDDERS'S RESPONSE
7.	TYPE TEST AND SPECIAL TEST CERTIFICATES:	
a.	Whether the copy of the Type/Special Test reports as per Schedule G & H for tendered (or) higher capacity/voltage class Power Transformer uploaded.	YES/NO
b.	Whether the tests have been conducted in NABL accredited CPRI / ERDA / any other Government approved /Government recognized laboratory within 5 years as on the date of tender opening.	Name of LAB: Date of Test:
8.	EARNEST MONEY DEPOSIT (Rs. 51,22,000/-) :	
	Mode of Payment :	"online"
	a. Whether EMD Payment has been made "online"	YES/NO
	b. Whether EMD furnished in the form of E-Bank Guarantee i. If Yes, e-BG Details ii. Whether scanned copy of the e-BG uploaded.	YES/NO BG No , Date, Name of Bank & Validity YES/NO
	c. If exempted from payment of EMD, i. Whether the bidder is Micro & Small/SSI unit located in Tamil Nadu ii. Whether registered under Udyam Portal for the tendered item. iii. Whether Udyam Registration Certificate uploaded iv. Whether Undertaking as part of EMD uploaded as per Annexure I(A) v. Whether documents in support of investment held in plant and machinery and Annual turnover uploaded .	YES/NO YES/NO YES/NO YES/NO YES/NO
	d. If PEMD holder of Rs.1 Crore and above with TNPDC Head Quarters, held on or after 03.12.2021. i. Whether Scanned copy of proof of PEMD uploaded as per Annexure I(A). ii. Whether undertaking as part of EMD uploaded	YES/NO YES/NO
	After confirming the EMD paid / Exemption uploaded, then only the system will allow to submit the technical and financial bids.	

S.No.	PARTICULARS	BIDDERS'S RESPONSE
9.	VALIDITY:	
	Whether your offer is valid for 90 days from the date of tender opening of Commercial / Technical Bids (Offers with validity period of less than 90 days are liable to be rejected)	YES/NO
10.	PRICE:	
	a. Whether the price quoted is variable.	YES/NO
	vi. Whether the following break-up details for the quoted Unit Price have been mentioned: Unit Ex-Works Price, Freight and Insurance (Firm), Erection charges per unit (Firm price)	YES/NO
	c. Whether SGST/CGST/IGST (in Percentage and Amount) applicable has been mentioned	YES/NO
	d. Whether you are agreeable, in case of delayed delivery, the GST prevailed on the date of actual delivery or the GST applicable on the date of contractual date of delivery whichever is less shall only be payable.	YES/NO
	e. Confirm that Freight & Insurance charges quoted are applicable for delivery to any of the TNPDCCL stores/sites in Tamil Nadu.	YES/NO
11.	Whether you are agreeable for the following clauses specified under SECTION- V of the specification:	
	a. Price (Cl.-7.0)	YES/NO
	b. Payment terms (Cl.—12.0)	YES/NO
	c. Security Deposit cum Performance Guarantee (Cl.—13.0)	YES/NO
	d. Delivery (Cl.—11.0)	YES/NO
	e. Liquidated Damages.(Cl.—15.0)	YES/NO
	f. Guarantee. (Cl.—17.0)	YES/NO
	g. Recovery of dues to TNPDCCL (Cl.—21.0)	
	h. Jurisdiction for Legal Proceedings.(Cl.—37.0)	
12.	Minimum and Maximum number of units that can be supplied every month	----- / ----- Units
12.	QUANTITY OFFERED (Minimum Qty 1 Nos.)	 Nos.

DATE :
PLACE :

SIGNATURE OF THE TENDERER
NAME :
DESIGNATION:
(SEAL OF THE COMPANY)

UNDERTAKING

I _____, Sole Proprietor/
Partner of
M/s. _____ give undertaking
that details given in the above QUESTIONNAIRE are correct to the best of my
knowledge and I agree to abide by all your Tender / Order terms and conditions.

DATE :
TENDERER
PLACE :

company)

SIGNATURE OF THE

NAME :
DESIGNATION:
(Seal of the

SECTION- IX**ANNEXURES**

Sl.No.	CONTENTS
I	Format for undertaking - E.M.D through e-BG
I (A)	Undertaking - E.M.D as part of PEMD/SSI units of Tamil Nadu.
II	Undertaking towards Jurisdiction for Legal Proceedings
III	Proforma for Stage & Final Inspection
IV	Price Variation Clause
V	Proforma of Bank Guarantee for SD cum Performance
VI	Declaration Form for Input Tax Credit Benefit
VII	Tender Acceptance Letter
VIII	Undertaking towards Recovery of Dues to TNPDC
IX	Additional Details
X	Source of Materials / Places of Manufacture, Testing and Inspection
XI	Check-list for Inspection of Prime quality CRGO for Transformers
XII	On Load Tap Changer for 33/11KV Power Transformer
XIII	Checklist for Inspection of Power Transformer at Site
XIV	Guidelines for releasing GST portion to suppliers / Contractors
XV	Declaration pursuant to Section 206AB
XVI a	Undertaking for purchase preference in case of sole proprietor firm owned by any person belonging to a SC/ST
XVI b	Undertaking for purchase preference in case of bidder been partnership firm owned by not less than three-fourths of the partners belonging to a SC/ST
XVI c	Undertaking for purchase preference in case of bidder been company with more than fifty per cent of the ordinary shareholdings pertain to persons belonging to the Scheduled Castes or Scheduled Tribes

ANNEXURE-I**Format for undertaking - E.M.D through e-BG**

(TO BE FURNISHED IN NON-JUDICIAL e-STAMP OF VALUE NOT LESS THAN Rs.500/-)

Beneficiary: The Finance Department Procurement Cell Government of Tamil Nadu

Date:

Bid Guarantee No:

We have been informed that M/s..... (here after called "the bidder") has submitted to you its bid dated (herein after called, "the bid") for TNPDC e-Tender Specification No: M-.... / 2026-27.

Furthermore, we understand that, according to the conditions, bids must be supported by a Bid Guarantee.

At the request of the bidder, we the..... BANK, Banking company, a body corporate, constituted under the Banking companies (Acquisition and Transfer of Undertakings) act, 1970, with their head office at, and having among others at branch office at, India hereby irrevocably undertake to pay you a sum or sums not exceeding in total an amount of **Rs. /- (Rupees Only/-)** upon receipt by us of your first demand in writing accompanied by a written statement stating that the bidder is in breach of its obligation(s) under the bid conditions, because the bidder :

- a) has withdrawn its bid during the period of bid validity specified by the Bidder in the form of bid ;or
- b) having been notified of the acceptance of its bid by the TNPDC during the period of validity
 - i. fails or refuses to execute the contract form, if required ,or
 - ii. fails or refuses to furnish the Security deposit cum performance Bank Guarantee, in accordance with the instructions to Bidders.

This Guarantee will expire:

- a) if the bidder is the successful Bidder, upon our receipt of copies of the contract signed by the bidder and the security deposit cum Performance Bank Guarantee issued to upon the instruction of the bidder and

b) if the bidder is not successful Bidder, upon the earlier of

i. our receipt of copy of the notification to the Bidder of the name of the successful Bidder or

ii. Six months after the expiration of the Bidder's Bid.

Consequently, any demand for payment under this Guarantee must be received by us at the office on or before that date.

This Guarantee is subject to the Uniform Rules for Demand Guarantees, ICC Publication No.758.

NOTWITHSTANDING ANYTHING CONTAINED HEREIN:

1. Our liability under this Bank Guarantee shall not exceed Rs./-
(Rupees Only/-)

2. The Bank Guarantee shall be valid up to

3. We are liable to pay the guarantee amount or any part thereof under this Bank guarantee only and only if you serve upon us a written claim or demand on or before (mention period of the guarantee as found under clause (2) above plus claim period)"

IN WITNESS WHERE OF THIRU and THIRU..... . acting for and on behalf of the Bank has signed this deed on the day, month and year first above written.

In the presence of witnesses:

1.

2.

(Signature with seal of the Bank (Name in Block letters) and

(Name in capitals to be subscribed with designation, address of office or residential)

ANNEXURE-I(A)**Undertaking - E.M.D as part of PEMD/SSI units of Tamil Nadu**

(TO BE FURNISHED IN NON-JUDICIAL STAMP PAPER OF VALUE NOT LESS THAN Rs.500/-)

THIS DEED OF UNDERTAKING executed
at.....

..... on thisday of
..... hereafter called 'TENDERER' (which expression shall

where the context so admits mean and include their Agents, Representatives, Successors – in – office and Assigns).

TO AND IN FAVOUR OF THE TAMIL NADU POWER DISTRIBUTION CORPORATION LIMITED, a corporation incorporated under companies act , 1956 and a subsidiary of TNEB Ltd., having its office at NPKRR Maaligai , 144, Anna Salai, Chennai – 600 002, herein called the "TNPDC" (which expression shall where the context so admits mean and include its successors in office and Assigns)

WHERE AS the Tenderer is required to pay Earnest Money Deposit of Rs...../- (Rupees.....Only) for participation in the tender for supply of in terms of Specification No.....

AND WHERE AS the Tenderer is exempted by the TNPDC from payment of EMD in the form of cash, subject to the tenderer executing an undertaking to the value of Rs...../- (RupeesOnly) representing the amount equivalent to the amount of EMD specified to be paid to the TNPDC in the event of non-fulfillment of breach of any of the conditions of the tender by Tenderer as mentioned hereunder.

AND WHEREAS in consideration of the acceptance by the TNPDC of the above proposal, the tenderer has agreed to pay to the TNPDC the said amount of Rs...../-(RupeesOnly) in event of –

1. Withdrawing his tender before the expiry of the validity period OR
2. Withdrawing his tender after acceptance , OR
3. Violating any of the conditions of the tender issued by the competent authority.

NOW THIS UNDERTAKING WITNESETH that in pursuance of the said agreement

the Tenderer hereby doth covenant with the TNPDCCL that in consideration of the "TNPDCCL" waiving the condition of payment of EMD in cash in terms of the said specification, the Tenderer has agreed to pay to the TNPDCCL Rs. (only) in the event of:

- i) Withdrawing his tender before the expiry of the validity period.
- ii) Withdrawing his tender after acceptance.
- iii) Violating any of the conditions of the tender issued by the competent authority.

NOW THE CONDITIONS OF THE above written undertaking is such that if the tenderer shall duly and faithfully observe and perform the conditions specified as above, then the above written undertaking shall be void, otherwise it shall remain in full force.

The tenderer undertakes not to revoke this guarantee till the contract is completed under the terms of contract.

The expression, 'TENDERER' and the 'TNPDCCL' hereinafter before used shall include their respective successors and assigns in office.

IN WITNESS WHERE OF THIRU.....

acting

for and on 'behalf' of the Tenderer has signed this deed on the day, month and year

herein before first mentioned.

SIGNATURE :
NAME IN BLOCK LETTERS :
SEAL OF THE COMPANY :

In the presence of Witnesses :

1. Signature

(Name and Address)

2. Signature

(Name and Address)

ANNEXURE - II**UNDERTAKING TOWARDS JURISDICTION FOR LEGAL PROCEEDINGS
(TO BE FILLED BY THE TENDERER IN A NON-JUDICIAL STAMP PAPER OF
VALUE NOT LESS THAN Rs.500/-)**

THIS DEED OF UNDERTAKING executed at.....on this day of by M/s..... a company registered under Companies Act, 1956 having its Registered Office athereinafter called the "TENDERER" (which expression shall where the context so admits mean and include its successors in office and assigns) with the TAMIL NADU POWER DISTRIBUTION CORPORATION LIMITED, a corporation incorporated under companies act , 1956 and a subsidiary of TNEB Ltd., having its office at 144, Anna Salai, NPKRR Maaligai, Chennai – 600 002, hereinafter called the purchaser (which expression shall where the context so admits mean and include its successors in office and assigns).

WHERE AS the contract is for the supply ofin terms of the Purchase Order No.....Dated.....AND WHEREAS in accordance with clause (Payment Clause) and Clause (Jurisdiction for Legal Proceedings) of the above said P.O. certain terms were stipulated for the above supply.

AND WHEREAS in accordance with Clause of the above mentioned Purchase Order, the supplier has to furnish an undertaking that no suit or any proceedings in regard to any matter arising in any respect under this contract shall be instituted in any court other than in the High Court, Chennai, City Civil Court of Chennai or other court of small causes at Chennai.

In consideration of the TNPDCCL having agreed to accept the undertaking, the undertakes that no suit or any proceedings in regard to any matter arising in any respect under this contract shall be instituted in any court, other than the High Court, Chennai, City Civil court at Chennai or the Court of Small Causes at Chennai. It is also agreed that no other court shall have the jurisdiction to entertain any suit or proceedings, even though part of the cause of action might arise within their jurisdiction. In case any part of cause of action arises within the jurisdiction of any of the Courts in Tamil Nadu and rest within the jurisdiction of Courts outside Tamil Nadu, then it is agreed to between the parties that such suits or proceedings shall be instituted in Court within the State of Tamil Nadu and no other Court outside Tamil Nadu shall have jurisdiction, even though any part of the cause of action might arise within the jurisdiction of such Courts.

IN WITNESS WHERE OF THIRU..... of the Tenderer hereby put his hand and seal for the Undertaking in the presence of the following witnesses.

SIGNATURE OF THE TENDERER WITH SEAL

In the presence of Witnesses :

1.Signature
(Name and Address)

2. Signature

ANNEXURE-III**I. PROFORMA FOR STAGE INSPECTION OF POWER TRANSFORMERS****(A) GENERAL INFORMATION:**

1. Name of firm :
2. Order No. and date :
3. Voltage Rating :
4. Details of offer :
 - a) Capacity :
 - b) Quantity :
 - c) Serial Nos. :
5. Details of last stage inspected lot :
 - a) Total quantity inspected :
 - b) Serial Nos. :
 - c) Date of stage inspection :
 - d) Quantity offered for final :
Inspection of (a) above with :
Date

- (B) Availability of material for offered quantity:
Details to be filled in :

- (C) Position of manufacturing stage of the offered quantity
- a) Complete tanked assembly :
 - b) Core assembled :
 - c) Coils ready for assembly :
 - (i) HV coils :
 - (ii) LV coils :

S. No.	Particulars	As per PO	As observed during inspection	Deviation & Remarks
(D)	Inspection of Core			
	(I) Core material			
	(1) Manufacturer's characteristic Certificate in respect of grade of Lamination used (Please furnish Test certificate)			
	(2) Remarks regarding Rusting & smoothness of core			
	(3) Whether laminations used for top and bottom yoke are in one Lot			

	(II) Core construction:															
	(1) No. of steps															
	(2) Dimension of steps															
	Step No.	1	2	3	4	5	6	7	8	9	10	11	12			
	As offered:															
	W mm															
	T mm															
	As found:															
	W mm															
	T mm															
	(3) Core dia. (mm)															
	(4) Total cross sectional area of core															
	(5) Effective cross sectional area of core															
	(6) Clamping arrangement															
	(i) Channel size															
	(ii) Bolt size and no.															
	(iii) Tie rods size and no.															
	(iv) Painting															
	(a) Channels															
	(b) Tie Rods															
	(c) Bolts															
	(7) Thickness of insulation provided between core base and support channel															
	(8) Core length (leg center to leg center)															
	(9) Window height															
	(10) Core height															
	(11) Core weight only (without channels etc.)															
	(12) Core/Yoke bolt															
	(a) Insulation provided															
	(b) No. of core/yoke bolts															
	(c) Insulation checked for 2KV															
	(E) INSPECTION OF WNDING															
	(I) Winding material															
	(1) Material used for															
	(a) HV winding															
	(b) LV winding															

	(c) Tapping winding			
	(2) Grade of material for			
	(a) HV winding			
	(b) LV winding			
	(c) Tapping winding			
	(3) Test certificate of manufacturer (enclose copy) for winding material of			
	(a) HV winding			
	(b) LV winding			
	(c) Tapping winding			
	(II) Constructional details			
	(1) Size of cross sectional area of conductor for:			
	(a) HV winding			
	(b) LV winding			
	(c) Tapping winding			
	(2) Type of insulation for conductor of			
	(a) HV winding			
	(b) LV winding			
	(c) Tapping winding			
	(3) Diameter of wire used for delta formation (mm)			
	(4) Diameter of coils in			
	(a) LV winding			
	i) Internal dia. (mm)			
	ii) Outer dia. (mm)			
	(b) HV winding			
	i) Internal dia. (mm)			
	ii) Outer dia. (mm)			
	(5) Current density of winding material used for			
	(a) HV			
	(b) LV			
	(6) No. of taps			
	(7) Method of HV coil joints			

	(8) Total weight of coils of LV winding (Kg.) HV winding (Kg.)			
(F)	INSULATION MATERIALS			
	(I) Material			
	1) Craft paper			
	a) Make			
	b) Thickness (mm)			
	c) Test certificate of manufacturer (enclose copy)			
	2) Press Board			
	a) Make			
	b) Thickness (mm)			
	c) Test certificate of manufacturer (enclose copy)			
	(3) Material used for top and bottom yoke and insulation			
	(II) Type and thickness of material used (mm)			
	a) Between core and LV			
	b) Spacers			
	c) Interlayer			
	d) Between HV & LV winding			
	e) Between phases			
	f) End insulation			
(G)	TANK			
	(I) Constructional details			
	1) Thickness of side wall (mm)			
	2) Thickness of top & bottom plate (mm)			
	3) Tank internal dimensions(mm)			
	a) Length			
	b) Breadth			
	c) Height			
	(i) On HV side			
	(ii) On LV side			
	(II) General details			
	1) Inside painted by oil corrosion resistant paint (please specify which type of coating done)			

	2) Gasket between top cover and tank			
	i) Material			
	ii) Thickness (mm)			
	iii) Jointing over laps (mm)			
	3) Reinforcement of welded angle (specify size and no. of angle provided) on side walls of tank			
	4) Provision of lifting lugs			
	a) Numbers			
	b) Whether lugs provided			
	5) Provision of air release plugs			
	6) Deformation of lengthwise side wall of tank when subject to			
	a) Vacuum of 3.33 KN/sq.m (25 torr) for 1 hour			
	b) Pressure in KN/sq.m			
(H)	Radiators			
	1) Fin Radiators of 1.2mm thick sheet			
	a) Dimension of each fin (LxBxT)			
	b) Fins per radiator			
	c) Total no. of radiators			
	2) Verification of manufacturer's test certificate regarding heat dissipation (excluding top and bottom) in w/sq.m.			
(I)	Conservator			
	1. Dimensions (LXD) in mm.			
	2. Volume (m3)			
	3. Inside dia. Of Conservator tank pipe			
	4. Whether drain valves and filling hole with cover is provided			
(J)	Bushings			
	1. Whether HV bushings mounted on side walls (for cable box type)			
	Position of mounting of LV bushings (as applicable for cable box type)			
	3. Bushing clearance (mm) (as applicable for cable box type)			
	a) LV to earth			
	b) HV to earth			

	c) Between LV bushings			
	d) Between HV bushings			
	4. Whether support insulation for cable box provided			
	5. Neutral bushing			
	6. Neutral channels support insulator			
	7. LV & LV side Omega flexible copper with current density of 1.2 Amps/sq.mm			
(K)	Tank Base Channel/Rollers			
	1. Size of channel(mm)			
	2. Whether channels welded across the length of the tank			
	3. Size and type of Roller (mm)			
	4. Whether rail gauge bi-directional wheels provided			
	5. Whether jacking pads provided			
(L)	No. of Valves:			
	i) Tank			
	ii) Conservator			
	iii) OLTC			
	iv) Radiators			
(M)	Engraving:			
	1. Engraving of Sl.No. and name of firm			
	i) On bottom of clamping channel of core-coil assembly			
	ii) On side wall and top cover of tank			
	2. CT details/ Name plate			
	3. Bushing mountings			

TNPDCL
INSPECTING OFFICER

FIRM'S REPRESENTATIVE

DATE OF INSPECTION:

II. PROFORMA FOR PRE-DELIVERY (FINAL) INSPECTION OF POWER TRANSFORMERS

1. Name of firm :
2. Details of offer made :
 - (i) Order No. and date :
 - (ii) Rating :
 - (iii) Quantity :
 - (iv) Sl.No. of transformers :
3. Date of stage inspection of the lot :
4. Reference of stage inspection clearance :
5. Quantity offered and inspected against the order prior to this lot :

ACCEPTANCE TESTS TO BE CARRIED OUT

S. No.	Particulars	Observations
1.	(a) Ratio Test	
	(b) Polarity Test	
2.	No load loss measurement	
	TOTAL	
	Multiplying factor	
	CT	
	Wattmeter	
	Total x Mf	
	NET LOSS	
3.	Load loss measurement	
	TOTAL	
	Multiplying factors:	
	CT	
	Wattmeter	
	PT	
	Total x Mf	
	NET LOSS	
	Loss at ambient temperature (watt)	
	Loss at 75oC (with calculation sheet) (watt)	
4.	Winding Resistance :	
	HV (in ohms)on all taps	
	(a) At ambient temperature of 45oC	
	(b) Resistance at 75oC	

	LV (in ohms)	
	(a) At ambient temperature of 45oC	
	(b) Per phase Resistance at 75oC	
5.	Insulation Resistance in M. ohms	
	HV-LV	
	HV-E	
	LV-E	
6.	Separate source POWER FREQUENCY withstand test voltage	
	HV	 for 60 secs
	LV	 for 60 secs
7.	Induced over-voltage withstand test at double voltage and double frequency	
8.	No load current at	
	90% volts	
	110% volts	
9.	Unbalance current	
10.	Vector group test	Diagram and readings be shown in separate sheets
11.	Percentage Impedance at 75oC (Please furnish calculation sheet)	
12.	Transformer oil test (BDV)	
13.	Oil leakage test	
14.	Heat run test (Temperature Rise)	To be carried out once against the order
15.	Bushing clearance (mm)	HV LV
	(a) Phase to phase	
	(b) Phase to earth	
16.	Comments on compliance by the firm on the modifications done as per stage inspection clearance letter issued	
17.	Whether silica gel breather with tin container is fitted on the transformers offered	
18.	Whether engraving of Sl.No. & name of the firm on core clamping channel has been verified.	
19.	Oil:	
	1. Name of Supplier	
	2. Break down voltage of oil (KV)	
	i) Filled in tanked transformer	
	ii) In storage tank (to be tested by Inspecting Officer)	
	3. Supplier's test certificate (enclose copy)	

20.	Test certificate for painted surface	
21.	Routine test reports for OLTC	
22.	Type test reports for 1st unit	
23.	Magnetic Balance test	
24.	Pressure test (Type test for 1st unit)	
25.	Vacuum test (Type test for 1st unit)	
26.	Test on Bushing CT	
	a) Polarity & ratio check	
	b) Knee point voltage test	
	c) Magnetising current	
27.	Impulse test	
28.	Manufacturer's Test certificate for accessories (bought out components) as per Technical VI –Cl. 36.5	
29.	i) Rating plate of size 300X300 mm. welded on width side of stiffener	
	ii) Following details engraved (as per approved GTP)	
	a) Serial Number	
	b) Name of firm	
	c) Order No. and date	
	d) Rating	
	e) Name of Inspecting Officer	
	f) Designation	
	g) Probable Date/month of dispatch	
30.	Name Plate details	
	Whether name plate is as per approved drawing	

NOTE: Apart from the tests mentioned above, any other tests as per the requirement of the P.O./ Specification, shall also to be conducted during final inspection.

TNPDCL
INSPECTING OFFICER

FIRM'S REPRESENTATIVE

DATE OF INSPECTION:

ANNEXURE – IV**16 MVA, 33/11 KV POWER TRANSFORMERS.**

Ref: IEEMA/PVC/DIST_CU_Above 2.5 MVA/2021 Effective from 1st September 2021.

PRICE VARIATION CLAUSE FOR COPPER WOUND DISTRIBUTION TRANSFORMERS

COMPLETE WITH ALL ACCESSORIES AND COMPONENTS

(of ratings above 2,500 KVA and voltage class up to 33KV) supplied against domestic contracts.

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 the 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.

$$P = P_0 / 100 (8 + 40 C/C_0 + 24 ES/ES_0 + 8 IS/IS_0 + 4 IM/IM_0 + 8 TO/TO_0 + 8 W/W_0)$$

Wherein,

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

P₀ = Price quoted/confirmed.

C₀ = Price of CC copper rods. This price is as applicable for the month, **ONE** month prior to date of tendering.

ES₀ = Price of CRGO Electrical Steel Lamination. This price is as applicable for the month, **ONE** month prior to date of tendering.

IS₀ = Price of MS Plate of 6 mm thickness. This price is as applicable for the month, **ONE** month prior to date of tendering.

IM₀ = Price of insulating Materials. This price is as applicable for the month, **ONE** month prior to date of tendering.

TO₀ = Price of Transformer Oil. This price is as applicable for the month, **ONE** month prior to date of tendering.

W₀ = All India average consumer price index number for industrial workers, as published by the Labour Bureau, Ministry of Labour, Govt. of India (Base 2016=100). This index number is as applicable for the month, **THREE** months prior to the date of tendering.

For example, if date of tendering falls in December 2021, applicable prices of Copper (C₀), transformer oil (TO₀), CRGO Steel Sheets (ES₀), MS Sheet (IS₀) and Insulating material (IM₀) should be as on 1st November 2021 and all India average

consumer price index no. (W_0) should be for the month of September 2021.

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

- C = Average LME settlement price of copper wire bars. This price is as applicable for the month, **ONE** month prior to the date of delivery.
- ES = Price of CRGO Electrical Steel Lamination. This price is as applicable for the month, **ONE** month prior to the date of delivery.
- IS = Price of MS Plate of 6 mm thickness. This price is as applicable for the month, **ONE** month prior to the date of delivery.
- IM = Price of Insulating Materials. This price is as applicable for the month, **ONE** month prior to the date of delivery.
- TO = Price of Transformer Oil. This price is as applicable for 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 2016 = 100). This index number is as applicable for the month, **THREE** months prior to the date of delivery.

For example, if date of delivery in terms of clause given below falls in December 2022, the applicable prices Copper Wire Bars (C), Transformer Oil (TO), CRGO Steel Sheets (ES), MS Sheet (IS) and Insulating material (IM) should be as on 1st November 2022 and all India average consumer price index no. (W) should be for the month of September 2022.

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

ANNEXURE- V
(To be submitted after award of contract)
PROFORMA OF BANK GUARANTEE FOR
SECURITY DEPOSIT CUM PERFORMANCE
(TO BE FILLED BY THE TENDERER IN A NON-JUDICIAL STAMP PAPER
OF VALUE NOT LESS THAN Rs.500/-)

To

The Chief Engineer, Materials Management
 TNPDC

GUARANTEE NO.:

VALUE OF GUARANTEE:

GUARANTEE COVER FROM:

LAST DATE FOR LODGEMENT OF CLAIM:

THIS DEED OF GUARANTEE made on thisday ofTwo thousand and by the bank of (hereinafter called "The Bank") to and in favour of the TAMILNADU POWER DISTRIBUTION CORPORATION LTD, a corporation incorporated under companies act , 1956 and a subsidiary of TNEB Ltd., having its office at NPKRR Maaligai, 144, Anna Salai, Chennai – 600002 represented by the Chief Engineer / Materials Management (hereinafter called "The Purchaser").

WHEREAS M/s. (herein after called "the Contractor") have by virtue of Contract entered into with the Purchaser as per the Lr. No.dt..... agreed with the purchaser for Supply and Erection of 16 MVA Indoor Power Transformer in accordance with the terms and conditions of the contract.

AND WHEREAS in accordance with the terms of the contract in Lr. No. dt..... the Contractor has to pay a sum of Rs...../- (Rupees only) as security deposit cum performance guarantee from a nationalized bank.

AND WHEREAS the Contractor has requested the Purchaser to accept the Bank Guarantee in lieu of Security Deposit cum Performance Guarantee for a sum equivalent to five percent of the value of the contract for the satisfactory performance of the contract.

AND WHEREAS the Bank has at the request of the contractor, agreed to guarantee the payment of the said sum in case the contract is not performed in accordance with the specification indicated in the terms and conditions in the Lr. No. dt.

NOW THIS DEED WITNESSES AS FOLLOWS:

1. In consideration of the Purchaser having agreed to accept the Bank Guarantee from a Nationalized Bank towards Security Deposit/Performance Guarantee for a sum equivalent to Rs...../- (Rupeesonly) the Bank do hereby guarantee that if the Contractor fails to perform the Contract in accordance with the specifications and conditions of the contract as subsequently amended, the Bank shall pay forthwith merely on demand without any demur to the Purchaser such amount or amounts as the Bank may be called upon to pay by the Purchaser.

PROVIDED that the liability of the bank under this deed shall not at any time exceed the amount of Rs...../- (Rupeesonly)

PROVIDED further, that the Guarantee hereunder furnished shall be released as soon as the Contractor has performed his part of the Contract in accordance with the terms of the Contract and period of performance guarantee is over and a certificate to that effect is issued by the Purchaser.

2. The Bank further undertakes to indemnify the Purchaser to the extent of Rs...../- (Rupees..... only) against any loss or damage that may be caused or suffered by the Purchaser by reason of any breach of the terms and conditions of the said Lr. No. dt.
3. The Guarantee herein contained shall remain in force till the terms and conditions of the Lr. No.dt..... have been fully and properly carried out by the said Contractor and in any case, the Guarantee shall not hold good after (date of expiry of Guarantee).
4. The Bank further agrees with the Purchaser that the Purchaser shall have the fullest liberty (without the consent of the Bank and without affecting in any manner the obligations of the bank hereunder) to vary any of the terms and conditions of the Contract or to extend the time of performance of the contract by the said Contractor for time to time or to postpone from time to time any of the powers exercisable by the Purchaser against the said Contractor and to forbear or to enforce any of the terms and conditions relating to the said Contract and the Bank shall not be relieved of its liability by reason of any such variation, or extension being granted to the said contractor or by reason of any forbearance, act or omission on the part of the Purchaser or any indulgence by the Purchaser to the said Contractor or by any such matter or thing whatsoever which under the Law relating to sureties would but for these provisions have the effect of so relieving the Bank.
5. Any account settled between the Purchaser and the Contractor shall be the conclusive evidence against the Bank for the amount due and shall not be questioned by the Bank.
6. The expressions "Bank", "Contractor" and "The Purchaser" herein before used shall include their respective successors and assigns.

NOTWITHSTANDING anything contained herein above

- (a) Our liability under this Bank Guarantee shall not exceed Rs...../-
(Rupees.....only)
- (b) This Bank Guarantee shall be valid up to and
- (c) We are liable to pay the Guaranteed amount or any part thereof under this Bank Guarantee only and only if you serve upon us a written claim or demand on or before, the expiry of this Guarantee.

IN WITNESS WHEREOF THIRU.....for and on behalf of the Bank has signed this Deed on the day, month and year first above written.

Confirmation of issue of this Bank Guarantee should be sought for by the beneficiary from our Regional office at the following address:

SIGNATURE

WITH THE SEAL OF THE BANK

(Name in Block letters)

IN THE PRESENCE OF WITNESS:

1.

(Name in Capital with Address)

2.

(Name in capital to be superscribed with
Designation office address or residential address)

ANNEXURE- VI
Declaration Form for Input Tax Credit Benefit
(To be Submitted by the bidders in NJS paper of value not less than
Rs.500/-)

To
The Chief Engineer/Materials Management
TNPDCCL

We hereby declare and confirm that we are registered vendor under GST Act having GSTINin State of Our applicable GST% for the above reference job is under code

We hereby declare and confirm that we are unregistered vendor under GST Act being turnover is less than Rs.....Lakhs (being threshold limit) per annum. (For unregistered vendor, the vendor has to submit an affidavit in the enclosed format).

We hereby declare and confirm that we are registered vendor under composite scheme having GSTIN.

We are aware that as per sec 171 of CGST Act, any reduction in rate of tax on any supply of goods or services or the benefit of input tax credit should be passed on to TNPDCCL by way of commensurate reduction in prices and as such we hereby declare that we are extending Rs.-----/- of % as rebate in my quoted price against input tax credit benefit.

We hereby declare that we do not have any input tax credit benefit on account of GST applicable against this job. If it is established that we have availed input tax credit benefit against this job, the differential tax benefit will be returned to TNPDCCL failing which TNPDCCL may take appropriate action

Signature of the bidder with Company Seal

Witness with address:

- 1)
- 2)

Note: Bidder may strike out the para not applicable

ANNEXURE – VII
(To be signed with company seal on letter head and uploaded in the
technical Bid)
TENDER ACCEPTANCE LETTER

(To be given on Company Letter Head) Date:

To,
 The Chief Engineer, Materials Management
 TNPDC

Sub : Acceptance of Terms & Conditions of Tender.

Tender Reference No :

Name of Tender/Work :

Dear Sir,

1. I/We have downloaded / obtained the tender document(s) for the above mentioned 'Tender/Work' from the web site(s) namely: -----

 ----- as per your advertisement, given in the above mentioned website(s).
2. I/We hereby certify that I/We have read the entire terms and conditions of the tender documents from page No.----- to -----(including all documents like annexure(s), schedule(s), etc.,) which form part of the contract agreement and I/We shall abide hereby the terms / conditions / clauses contained therein.
3. The corrigendum(s) issued from time to time by your department/ organization too has also been taken into consideration, while submitting this acceptance letter.
4. I/We hereby unconditionally accept the tender conditions of above mentioned tender document(s) corrigendum(s) in its totality / entirety.
5. In case any provisions of this tender are found violated, then your department/organization shall without prejudice to any other right or remedy be at liberty to reject this tender/bid including the forfeiture of the full said earnest money deposit absolutely.

Yours faithfully,
 (Signature of the bidder, with official Seal)

ANNEXURE-VIII

UNDERTAKING TOWARDS RECOVERY OF DUES TO TNPDC
(TO BE FURNISHED BY THE TENDERER IN A NON-JUDICIAL STAMP PAPER
OF VALUE NOT LESS THAN Rs.500/- AS PER CLAUSE 21.0 OF COMMERCIAL)

THIS DEED OF UNDERTAKING executed at.....on this.....day of
.....by

M/s..... hereinafter
called the "TENDERER" (which expression where the context so admits mean and
include their agents, their representatives, successors in office and assigns).

TO AND IN FAVOUR OF THE TAMIL NADU POWER DISTRIBUTION CORPORATION
LIMITED, a corporation incorporated under companies act , 1956 and a subsidiary
of TNEB Ltd., having its office at NPKRR Maaligai, New No. 144, Anna Salai,
Electricity Avenue, Chennai – 600 002, hereinafter called the "TNPDC" (which
expression shall where the context so admits mean and include the successors in
office and assigns).

WHEREAS the TNPDC has called for an undertaking from the Tenderer
empowering the TNPDC to recover the dues if any,

NOW THIS UNDERTAKING WITNESSETH that the TNPDC is empowered to
recover any dues against this contract in any bills /Security Deposit / E.M.D. due
to the Tenderer either in this contract or any other contracts with the TNPDC.
Further, the Tenderer hereby authorizes the TNPDC to recover any dues against
any other contract of the Tenderer with the TNPDC/TANTRANSCO/TNEB Ltd with
the available amount due to the Tenderer against this contract.

IN WITNESS WHERE OF THIRU.....acting for and on
behalf of the Tenderer has signed this deed on the day, month and year herein
before first mentioned.

SIGNATURE OF THE TENDERER.

In the presence of witnesses.

1. Signature

(Name in capital letters with address)

2. Signature

(Name in capital letters with address)

ANNEXURE-IX
ADDITIONAL DETAILS

Sl.No.	Description	
1.	Core grade	
2.	Core dimensions	mm
3.	Gross core area	cm ²
4.	Net Core area	cm ²
5.	Flux density	Tesla
6.	Mass of Core	kg
7.	Loss per kg of core at the specified flux density	watt
8.	Core window height	mm
9.	Center to center distance of the core	mm
10.	No. of LV Turns	
11.	No. of HV turns	
12.	Size of LV Conductor bare/ covered (dia)	mm
13.	Size of HV conductor bare / covered (dia)	mm
14.	No. of parallels	
15.	Current density of LV winding	A/sq mm
16.	Current density of HV winding	A/sq mm
17.	Mass of the LV winding for Transformer	Kg
18.	Mass of the HV winding for Transformer	Kg
19.	No. of LV Coils/phase	
20.	No. of HV coils phase	
21.	Height of LV Windings	Mm
22.	Height of HV winding	Mm
23.	ID/OD of HV winding	Mm
24.	ID/OD of LV winding	Mm
25.	Size of the duct in LV winding	Mm
26.	Size of the duct in HV winding	Mm
27.	Size of the duct between HV and LV	Mm
28.	HV winding to LV clearance	Mm
29.	HV winding to tank clearance	Mm
30.	Calculated impedance	%
31.	HV to earth creepage distance	Mm
32.	LV to earth creepage distance	Mm

ANNEXURE-X**SOURCE OF MATERIALS / PLACES OF MANUFACTURE, TESTING
AND INSPECTION**

Sl.No.	Item	Source of Material	Place of Manufacture	Place of testing and inspection
1.	Laminations			
2.	Aluminium / Copper			
3.	Insulated winding wires			
4.	Oil			
5.	Pressboards			
6.	Kraft paper			
7.	MS plates/Angles/Channels			
8.	Gaskets			
9.	Bushing HV/LV			
10.	Paints			

ANNEXURE – XI

1.0 Check-list for Inspection of Prime quality CRGO for Transformers

During inspection of PRIME CRGO, the following points needs to be checked by the Transformer manufacturer. Utility's inspector shall verify all these points during inspection:-

A) In case PRIME CRGO cutting is at works of Transformer Manufacturer:

- 1.0 Review of documents:
 Purchase Order (un priced) to PRIME CRGO supplier/Authorized Agency
 Manufacturer's test certificate
 Invoice of the Supplier
 Packing List
 Bill of Lading
 Bill of Entry Certificate by Customs Dept.
 Reconciliation Statement as per format below
 Certificate of Origin
 BIS Certification

1.1 Format for Reconciliation/Traceability records

Packing List No./date /Quantity of PRIME CRGO received

Name of Manufacturer

Manufacturer test certificate No./date

Serial No.	Details of Package/Job	Drawing Reference	Quantity Involved	Cumulative Quantity Consumed	Balance Stock

2.0 Inspection of PRIME CRGO Coils:

- 2.1 PRIME CRGO-Manufacturer's Identification Slip on PRIME CRGO Coils
- i) Visual Inspection of PRIME CRGO Coils offered as per packing list (for verification of coil details as per Test certificate & healthiness of packaging).
 - ii) Unique numbering inside of each sample of PRIME CRGO coil and verification of records to be maintained in the register for consumption of CRGO coil.
 - iii) ISI logo sticker on packed mother coil and ISI logo in Material TC.
- 2.2 During inspection of PRIME CRGO, surveillance testing of sample shall be carried out for Stacking Factor, Permeability, Specific watt loss at 1.5 Tesla and/or 1.7 Tesla depending on the grade of PRIME CRGO and aging test etc.

applicable as per relevant IS/ IEC standard, Tech. Spec., MQP and Transformer manufacturer plant standard.

Inspection Clearance Report would be issued after this inspection

3.0 Inspection of PRIME CRGO laminations: Transformer manufacturer will maintain records for traceability of laminations to prime CRGO coils and burr/bow on laminations shall be measured. Utility can review these records on surveillance basis.

4.0 Inspection at the time of core building: Visual Inspection of PRIME CRGO laminations. In case of suspected mix-up/ rusting/decoloration, samples may be taken for testing on surveillance basis for tests mentioned in A.2.2 above.

Above tests shall be witnessed by Utility. In case testing facilities are not available at Manufacturer's work, the sample(s) sealed by Utility to be sent to approved labs for testing.

Inspection Clearance Report would be issued after this inspection

B) In case PRIME CRGO cutting is at Sub-vendor of Transformer Manufacturer:

1.0 Review of documents:

Purchase Order (unpriced) to PRIME CRGO supplier/ Authorised Agency
 Purchase Order (unpriced) to Core Cutter
 Manufacturer test certificate
 Invoice of the Supplier
 Packing List
 Bill of Lading
 Bill of Entry Certificate by Customs Deptt.
 Reconciliation Statement as per format below
 Certificate of origin
 BIS Certification

7.2 **Format for Traceability records as below:-**

Packing List No./date /Quantity of PRIME CRGO received

Name of Manufacturer

Manufacturer test certificate No./date

Sl. No.	Name of Customer	Details of Package/Job	Drawing Reference	Quantity Involved	Cumulative Quantity Consumed	Balance Stock	Dispatch details

2.0 Inspection of PRIME CRGO Coils:

2.1 PRIME CRGO-Manufacturer's Identification Slip on PRIME CRGO Coils. Visual Inspection of PRIME CRGO Coils offered as per packing list (for verification of coil details as per Test certificate & healthiness of packaging). Unique numbering inside of each sample of PRIME CRGO coil and verification of records to be maintained in the register for consumption of CRGO coil. ISI logo sticker on packed mother coil and ISI logo in Material TC.

2.2 During inspection of PRIME CRGO, surveillance testing of sample shall be carried out for Stacking Factor, Permeability, Specific watt loss at 1.5 Tesla and/or 1.7 Tesla, thickness depending on the grade of PRIME CRGO and aging test etc. applicable as per relevant IS/ IEC standard, Tech. Spec., MQP and Transformer manufacturer plant standard.

Inspection Clearance Report would be issued after this inspection

3.0 Inspection of PRIME CRGO laminations:

Transformer manufacturer representative will inspect laminations and issue their internal Inspection Clearance Report. Inspection will comprise of review of traceability to prime CRGO coils, visual Inspection of PRIME CRGO laminations and record of burr/bow. After clearance given by transformer manufacturer, Utility will issue an Inspection Clearance Report after record review. If so desired by Utility, their representative may also join transformer manufacturer representative during this inspection.

4.0 Inspection at the time of core building:

Visual Inspection of PRIME CRGO laminations. In case of suspected mix-up/rusting/decoloration, samples may be taken for testing on surveillance basis for tests mentioned in B.2.2.

Inspection Clearance Report would be issued after this inspection

NOTE :-

a) Transformer Manufacturer to ensure that PRIME CRGO is procured from POWERGRID approved vendors and CRGO manufacturer should have valid BIS Certificate for respective offered Grade.

b) Transformer Manufacturer should also involve themselves for ensuring the quality of CRGO laminations at their Core Cutter's works. They should visit the works of their Core cutter and carry out necessary checks.

C) General

If a surveillance sample is drawn and sent to TPL (if testing facility not available with the manufacturer), the Transformer manufacturer can continue manufacturing at their own risk and cost pending TPL test report on PRIME CRGO sample drawn. Decision for acceptance of PRIME CRGO shall be based upon report of the sample drawn.

These checks shall be read in-conjunction with approved Quality Plan, specification as a whole and conditions of contract.

Sampling Plan (PRIME CRGO)

33 / 11 Kv - 1st transformer and subsequently at random 10% of Transformers (min. 1) offered for inspection.

NOTE:-One sample for each lot of CRGO shall be drawn on surveillance basis. CRGO steel for core shall be purchased only from the POWERGRID approved vendors, list of which is available at

"[http://apps.powergridindia.com/ims/ComponentList/2017/2/Power-former%20upto %20420%20kV-CM%20List% 20updated%20on%2022.02.2017.pdf](http://apps.powergridindia.com/ims/ComponentList/2017/2/Power-former%20upto%20420%20kV-CM%20List%20updated%20on%2022.02.2017.pdf)"

Since the list is dynamic in nature, the site may be checked from time to time to see the list of approved vendors.

ANNEXURE-XII

ON LOAD TAP CHANGER FOR 33/11KV POWER TRANSFORMER

- 1.0 The tapping range of On Load Tap Changer shall be +5% to- 15% in steps of 1.25% each. The number of taps shall be 17. The On Load Tap Changer shall be supplied with RTCC panel and AVR (Automatic Voltage Regulating Relay).
- 2.0 The Continuous current rating of the tap changer shall be based on connected winding rating and shall have liberal and ample margin. Lower rated tap changers connected in parallel are not acceptable.
- 3.0 The on-load tap changing equipment shall have the provision for mechanical and electrical control from a local position and electrical control from a remote position. For local mechanical operation, the operating handle shall be brought outside the tank for operation from floor level with provision to lock the handle in each tap position. Remote electrical operation shall have an AUTO-MANUAL selection at the remote location. When selected AUTO, the tap changing gear shall maintain steady voltage with in practical limit on the transformers secondary bus from which the reference shall not respond to transient variation of voltage due to grid disturbance and system fault.
- 4.0 The required voltage relay shall not be sensitive to frequency variation and shall be suitable for sensing voltage from the secondary of potential transformers mounted on the 33KV or 11KV bus.
- 5.0 The tap changer shall be provided with over-current protection in order to prevent the tap-change operation during a short circuit, which would to greatly stress the contacts of the diverter switch. The function of protection shall be arranged as follows:
 - (i) Whenever over current occurs, the control circuit for commanding OLTC motor operation shall be blocked by the normally close contacts of the over current relays.
 - (ii) If during tap change over current occurs, the OLTC motor circuit shall be blocked through the mechanical cam switch, which is close from the very beginning to the very end of every tap change operation and to the normally open contacts of the over current relays. The stop action of the motor shall be made through the motor brake contactor.
- 6.0 The design of the tap changing equipment shall be such that the mechanism will not stop in any intermediate position; however, if the mechanism through faulty operation does stop in an intermediate position, the full load must be carried by the transformer without injury to the equipment. The mechanical position indicator shall be equipped in the motor drive cubicle. The motor shall be designed to be of step control. In any case the operation shall be of step by step.

7.0 The control circuit of the transformer shall be completely designed and provisions shall be made for parallel operation with another transformer.

8.0 The following accessories, control and selector switches and other necessary accessories shall be furnished.

a) Remote tap changer control board

(Placed in the control room)

- Voltmeter
- "AUTO-MANUAL" control switch
- "RAISE-LOWER" control switch
- Tap position indicator
- Tap changer operation program indicator.

b) Transformer Tap Changer driving mechanism control cubicle

- "REMOTE-LOCAL-TEST" selector switch
- "AUTOMATIC-MANUAL" control switch
- "RAISE-LOWER" control switch
- Tap position indicator
- Tap changer operation program indicator
- Voltmeter
- Tap change operation counter
- Means for manual operation when power supply is lost

9.0. REMOTE TAP-CHANGER CONTROL PANEL

The Remote In-door Tap Changer control cubicle of height 2312 mm with sufficient inner working space for easy access to the instruments, wherever necessary, shall house the following:

9.1. Controls :

- a) Repeater dial of winding temperature indicator.
- b) Push button switch to Raise/Lower the tap.
- c) Tap position indicator (digital type).
- d) Selector switch for Local/Remote operation.
- e) Four position Selector switch for Independent/OFF/Master/Follower.
- f) Emergency 'supply - off ' push button.
- g) Relays, Heater, illumination lamps, MCBs etc.

9.2. LAMP INDICATIONS for the following (ON: Red indication; OFF: Green indication)

- a) OLTC supply HEALTHY.
- b) Tap change IN-PROGRESS.

9.3. Facia type annunciation scheme for the following trip, non-trip & Alarm INDICATIONS, suitable for 110V/30V DC operation.

- a) Bucholtz Relay - trip

- b) Tap Changer Surge Relay - trip
- c) Pressure Relief Device -trip
- d) Winding Temperature Indicator - Trip
- e) Tap Changer Drive Motor – trip
- f) Bucholtz Relay - alarm
- g) Winding Temperature Indicator - alarm
- h) Oil Temperature Indicator - alarm
- i) Tap Changer out of Step - alarm
- j) Low oil level - alarm
- k) Tap change delay - indication
- l) OLTC supply failure alarm
- m) Spare contactors-4Nos.

ANNEXURE-XIII**CHECKLIST FOR INSPECTION OF POWER TRANSFORMER AT SITE**

Sl. No.	Description	Status (Yes/ No)	Observation	Picture No.	Location as per SLD
1	Major Material – Power Transformer as per specifications				
2	Record S. No., make and year of manufacturing of Power transformer				
3	Major Material dispatched without inspection				
4	Construction as per Approved Drawing				
5	Civil works FQP documentation maintained during construction				
6	Verification of pre-commissioning and commissioning tests of Power Transformer				
7	Present condition of equipment				
8	Functional Status of Power Transformer: WTI, OTI etc				
9	Transformer oil tested				
10	Transformer Relays				
11	Equipment charged after commissioning test				
12	Earthing of equipment, fence etc done properly				
13	Glands, lugs used (wherever need - at cable entries)				
14	Dead end marking for cables is done				
15	Earth mat provided				
16	Undersized conductor/ cables used				
17	Correct size of earthing conductor - flats, GI wires etc used				
18	Fasteners (nut, bolts, clamps connectors, hard wares etc) as per specification				
19	FQP for material receipt and storage maintained by TNPDC				

20	Water logging/ Earth filling in the yard trench				
21	Partition wall between two Power Transformers				
22	Availability of Permit & Work Book				
23	Tracing of Earth connection of Power/ Distribution Transformer up to Earth Pit				
24	Connection at Earth Pit				
25	Jointing & Clamping of Earth Conductors				
26	All Terminal Blocks at Junction Box				
27	Earthing is as per specification				
28	Earthing of Control Panel				
29	Termination of power cables at 11 KV sides/LT sides of Power Transformer.				
30	Approximate clearance of live part				
31	Oil leakage in Power/ Transformer				
32	Connection at the bus-bar jumpers				
33	Loop cables LT/HT/Control				
34	Tagging on cable terminals				
35	Work clearance on control panels and sufficient lightening on the control panel				

DATE :
PLACE:

SIGNATURE OF THE TENDERER
NAME :
STATUS IN THE COMPANY
(AFFIX SEAL OF THE COMPANY)

ANNEXURE- XIV

Guidelines for releasing GST portion to suppliers / Contractors:

As per GST guidelines TNPDCCL / TANTRANSCO has to ensure the remittance of GST to Govt. made without omissions by the supplier / contractors, since GSTR 2A is getting updated regularly.

Hence the following guidelines were issued to the Supplier / Contractor:

1. The Tax invoices shall have the details of rates, quantity and admissible rate of GST.
2. The suppliers shall pay the GST and file the returns under GST promptly to avoid delay in processing / payment of invoices could be avoided/ minimized. If the supplier paid the GST, their invoices would be exhibited in the GSTR-2A and the same will be taken as GST compliance of Supplier/contractor.
3. The running bills will be passed after verification of the GST paid in the previous month. In case of high value bills (say 10 lakh or above) the GSTR-2A will be verified before passing the bills.
4. In case of one and only bill against the PO/W.C, the bill will be passed after verification of GSTR-2A only.
5. The updated GSTR-2A available in the portal will be utilized in lieu of documentary proof for any GRT claim.
6. Instead of insisting for the hard copy of any document proof such as returns filed, Challons remitted, CA certificate, GSTR-3B the GSTR-2A will be verified for admitting invoices.

The Tax supplier who has availed the scheme of quarterly filing of returns (i.e when turnover is upto 150 Lakhs) the following mechanism will be adopted for passing the bills.

- i. If it is only one bill, the GST payment of the supplier's bill will be verified during PO closure.
- ii. If there are multiple bills, then
 - (a) Bills related to first 3 months i.e Initial quarter will be admitted inclusive of GST without verifying with GSTR-2A reports.
 - (b) Bills for the subsequent quarter will be passed if GST payment of bills raised on TNPDCCL in the earlier processed quarter has been updated and exhibited in GSTR-2A.

If discrepancies arises between the value shown in the GSTR-2A and the invoices available, the liability towards GST may be restricted to the lower of the above two.

ANNEXURE-XV**Declaration pursuant to Section 206AB****(To be obtained from applicable Suppliers)**

This is to declare that(Name of the supplier) have filed the Return of Income (ROI) under the relevant provisions of the Income Tax Act, 1961 for the Assessment Year 2023-24 and 2024-25 (FY 2022-23 and FY 2023-24) and we shall file the ROI for Assessment Year 2025-26 (Financial Year 2024-25) within the due date as per the provisions of the said Act.

Permanent Account No. (PAN) of our Company/Firm/Individual is The details of Return of Income filed are as below:

S. No	Assessment Year	Acknowledgement No	Date of Filing
1	2023-24	_____	_____
2	2024-25	_____	_____

Place :

Date :

(Authorized Signatory)
Signature & Seal

ANNEXURE-XVI (a)

Undertaking from the sole proprietor of the firm

(To be uploaded by the bidder been sole proprietor firm owned by any person belonging to a SC/ST)

Name of the sole proprietor:

PAN No.:

Tender specification No.

I (Name of the sole proprietor) hereby state that the social category of enterprise (i.e. M/s.) specified in Udyam registration certificate vide Udyam regn no. dated uploaded with the bid remains unchanged till date.

Signatory of the Proprietor
(With name & seal)

Date:

Place:

ANNEXURE-XVI(b)

Certificate to be furnished by Chartered Accountant

(In case of bidder been partnership firm owned by not less than three-fourths of the partners belonging to a SC/ST)

Tender specification No.

This is to certify that M/s. (firm's name) been partnership firm is owned by not less than three-fourths of the partners belonging to a SC/ST as on this date.

The social category of the partnership firm (i.e. M/s.) specified in Udyam registration certificate consequent of been registered in Udyam portal vide Udyam regn No. remains unchanged till date.

Signatory of the Chartered Accountant

(With name, membership no. & seal)

Date:

Place:

ANNEXURE-XVI (c)

Certificate to be furnished by Practicing Company Secretary

(In case of bidder been company with more than fifty per cent of the ordinary shareholdings pertain to persons belonging to the Scheduled Castes or Scheduled Tribes)

Tender Specification No.

This is to certify that in M/s. (Company's name), persons belonging to the Scheduled Castes or Scheduled Tribes are having more than fifty per cent of the ordinary shareholdings and the control of the company, as defined in section 2 (27) of the Companies Act, 2013 (Central Act 18 of 2013) vests with persons belonging to the Scheduled Castes or Scheduled Tribes. This is duly confirmed for the purpose of submission of bid against the provisions of tender specification No.

Signatory of the Company Secretary

(With name, membership no. & seal)

Date:

Place: